



## FUSION FOR ENERGY

The European Joint Undertaking for ITER and the Development of Fusion Energy  
The Governing Board

### **DECISION OF THE GOVERNING BOARD ADOPTING THE SINGLE PROGRAMMING DOCUMENT (SPD) OF THE EUROPEAN JOINT UNDERTAKING FOR ITER AND THE DEVELOPMENT OF FUSION ENERGY**

THE GOVERNING BOARD OF FUSION FOR ENERGY,

HAVING REGARD to the Statutes annexed to Council Decision (Euratom) No 198/2007 of 27 March 2007 establishing the European Joint Undertaking for ITER and the Development of Fusion Energy (hereinafter "Fusion for Energy") and conferring advantages upon it<sup>1</sup> (hereinafter "the Statutes") and in particular Article 9 (a) thereof, last amended on 10 February 2015<sup>2</sup> by Council Decision Euratom 2015/224;

HAVING REGARD to Council Decision (Euratom) No 198/2007 establishing the European Joint Undertaking for ITER and the Development of Fusion Energy and conferring advantages upon it, last amended on 22 February 2021 by Council Decision (Euratom) No 2021/281<sup>3</sup>;

HAVING REGARD to the Financial Regulation of Fusion for Energy<sup>4</sup> adopted by the Governing Board on 10 December 2019 (hereinafter "the Financial Regulation"), and in particular Title III thereof;

HAVING REGARD to the Commission Delegated Regulation (EU) 2019/715<sup>5</sup> of 18 December 2018 on the framework financial regulation for the bodies set up under the TFEU and Euratom Treaty and referred to in Article 70 of Regulation (EU, Euratom) 2018/1046 of the European Parliament and of the Council, and in particular Title III thereof.

HAVING REGARD to the endorsement by the Governing Board of the draft SPD in accordance with Article 32 (1) of the Financial Regulation.

WHEREAS:

- (1) The Director shall, in accordance with Article 11 of the Statutes, prepare each year the submission of the project plan to the Governing Board, the resource estimates plan and the detailed annual work programme, now merged in the Single Programming Document;
- (2) The Administration and Management Committee shall, in accordance with Article 8a (2) of the Statutes, comment on and make recommendations to the Governing Board on the proposal for the project plan, the work programme, the resource estimates plan, the staff establishment plan, the staff policy plan and other related matters, now part of the Single Programming Document drawn up by the Director;
- (3) The Technical Advisory Panel, in accordance with Article 6 (1) of the Statutes, shall advise the Governing Board on the adoption and implementation of the project plan and work programme, now part of the Single Programming Document;
- (4) The Governing Board, in accordance with Article 6 (3) (d) of the Statutes, shall adopt the project plan, work programme, resource estimates plan, the staff establishment plan and the staff policy plan, now part of the Single Programming Document;

HAS ADOPTED THIS DECISION:

<sup>1</sup> O.J. L 90, 30.03.2007, p. 58.

<sup>2</sup> O.J. L 37, 13.02.2015, p.8.

<sup>3</sup> OJ L 62, 23.2.2021, p. 41

<sup>4</sup> F4E (19) GB45 21.1 adopted on 10.12.2019.

<sup>5</sup> OJ L 122, 10.5.2019, p. 1–38.

*Article 1*

The SPD 2025-2029 of Fusion for Energy annexed to this Decision is hereby adopted.

*Article 2*

The Governing Board hereby delegates to the Director of Fusion for Energy the power to make non-substantial amendments to the annual Work Programme approved by the Governing Board.

Amendments are considered to be “non-substantial” if they do not cause the financial resources allocated to the Action concerned in Table 2 of the annual Work Programme to increase by more than EUR 1 million or 10%, whichever is higher.

In any event, the increase of the financial resource of an action shall not exceed 3% of the total budget of the annual Work Programme for the given year.

In addition, any related changes to the scope of the annual Work Programme shall not have significant impact on the nature of the Actions or on the achievement of objectives of the multiannual Project Plan.

Non-substantial amendments shall not lead to any increase in the total operational expenditure for Title 3 of the annual Budget approved by the Governing Board.

*Article 3*

This Decision shall have immediate effect.

Done in Barcelona, 10 December 2024.

For the Governing Board

**Dr. Carlos Alejandre**

Chair of the Governing Board

[Signed electronically in IDM]

For the Secretariat

**Romina Bemelmans**

Secretary of the Governing Board

[Signed electronically in IDM]



**FUSION  
FOR  
ENERGY**

# Single Programming Document

Years 2025-2029

F4E\_D\_35HGB9

## **Fusion for Energy**

**The European Joint Undertaking for ITER  
and the Development of Fusion Energy  
C/ Josep Pla 2,  
Torres Diagonal Litoral  
Edificio B3  
08019 Barcelona  
Spain**

**Tel: +34 933 201 800**

**Fax: +34 933 201 851**

**E-mail: [info@f4e.europa.eu](mailto:info@f4e.europa.eu)**

**[fusionforenergy.europa.eu](http://fusionforenergy.europa.eu)**

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## Foreword

Welcome to Fusion for Energy's (F4E) Single Programming Document for the period 2025-2029!

This will be one of the most challenging periods for F4E. For ITER, a new baseline is under consideration by the ITER Council that will impact F4E's contribution to ITER. Additionally, F4E will contribute towards bringing the ITER Organisation and F4E closer together to improve the execution of the project.

During this period, F4E should finish most of the buildings and deliver, among others, the vacuum vessel sectors, and many other key components.

At the same time F4E will continue working closely with Japan on the Broader Approach projects allowing for the restart of operations using the JT-60SA tokamak for the benefit of our scientific community and as a preparation to ITER operation.

Last but not least, F4E will put the knowledge gained from its projects to the use of the next phase of its mission – preparing Europe for the construction of a demonstration fusion reactor. Supporting the DONES project is a first step towards this goal that you find in this Single Programming Document.

Let me conclude by thanking all our stakeholders for supporting the ambitious plan set on in this document.

Marc LACHAISE  
Director

# Section I. General Context

## Introduction

### Purpose of the Annual and Multi-Annual Programming document

According to Article 32 (Single Programming Document) of the Fusion for Energy (F4E) Financial Regulation (F4E(19)-GB45-21.1 Adopted on 10/12/2019), the F4E Single Programming Document (SPD) contains:

1. The Project Plan (PP),
2. The Financial Resource Estimates Plan (financial REP),
3. The Human Resource Estimates Plan (human REP),
4. The annual Work Programme (WP).

According to the F4E Statutes and Financial Regulation, the final Single Programming Document shall be adopted by the Governing Board (GB). The first step of the adoption process requests the preparation of a draft Single Programming Document for the year N – N+4 to be sent in January of the year N-1 to Commission, GB Chair, EU Parliament and Council.

In line with a recommendation from the MAP Ad Hoc Group adopted by Governing Board 45, the Single Programming Document is built in a modular approach with a “Main text” that is complemented by 4 sets of annexes:



**SPD\_figure 1 . Structure of SPD document**

The reference for the budget data is the MFF 2021-2027 approved by the Council on 22/02/2021.<sup>1</sup>

For year 2028 and 2029, the budget figures are indicative and in line with the staff paper accompanying the communication of the European Commission (EC) on ITER for the period 2028-2035<sup>2</sup>.

The reference date for the planning information in the present document is end of March 2024.

Due to the above-mentioned cut-off date, the document is not capturing any subsequent evolutions, including the decisions taken at the recent ITER Governance meetings.

### **F4E's vision, overall mission and values**

*"Bringing the power of the sun to earth".*

The following vision considers recent input including the mission letter from the GB to the Director<sup>12</sup>, draft F4E-IO Integration Plan<sup>13</sup>, the Report of the Industrial Policy Working Group<sup>14</sup>, presentations made during the first Strategic Governing Board and the outcome of a series of ten "Vision Labs" conducted with around 200 staff from F4E who were given the opportunity to express their views in an open and participative setting.

#### **1. We commit as top priority to the successful construction and operation of the ITER, Broader Approach, DONES and other fusion projects through:**

- a. Working in close partnership with the ITER Organization to:
  - i. *Deliver EU contributions to the ITER project to the required quality, within the agreed budget and schedule.*
  - ii. *Improve the efficiency of the ITER project through integration of teams with shared culture, pooled expertise, joint processes, databases, etc.*
  - iii. *Jointly own and equitably govern a feasible project baseline consistent with the capabilities of F4E and with adequate contingencies.*
  - iv. *Actively engage in all phases of the ITER project including assembly, commissioning, and operations.*
- b. Delivering EU contributions to JT-60SA and IFMIF-EVEDA Broader Approach projects including enhancements together with the Voluntary Contributors.
- c. Supporting EUROfusion and European Fusion Laboratories in exploitation of the JT-60SA and return of experience to the ITER project.
- d. Contributing to the construction and future phases of the DONES materials testing facilities leveraging experience gained from the Broader Approach.

#### **2. We develop the fusion talent and knowledge base for the future development of commercially viable fusion power plants in Europe through:**

- a. Learning lessons and retaining the knowledge gained from F4E's involvement in the ITER and the Broader Approach projects.

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<sup>1</sup> MFF figures were updated in May 2022.

<sup>2</sup> COMMISSION STAFF WORKING DOCUMENT The ITER Project Status Accompanying the document Communication from the Commission to the European Parliament and to the Council EU contribution to a reformed ITER project - 14.6.2017 SWD(2017) 232 final.(table 3 p 23)



- b. Developing strategic fusion technologies with EUROfusion and European Fusion Laboratories by providing the “value chain integration” towards industry.
- c. Attracting and growing the next generations of fusion talent through outreach and training activities in collaboration with EUROfusion.
- d. Driving the engineering design and validation activities for DEMO in close collaboration with EUROfusion, European Fusion Laboratories and industry.

**3. We pave the way for a transition from the research to the industrial sector, and the creation of a competitive European industrial fusion sector through:**

- a. Lowering entry barriers for industry, especially SMEs, to work with F4E and moving from “customer-supplier” to new models of public-private partnership.
- b. Developing geographically broad and sustainable supply chains capable to construct power plants in Europe and to export strategic fusion technologies.
- c. Supporting growth of European private sector fusion start-ups, including possible incentivising programmes and maximisation of return of investment.
- d. Actively supporting the European Commission and other stakeholders in the development of fusion specific regulation, codes, and standards.

**F4E’s values, as described in “F4E’s Charter of Engagement”, are the following:**

- Value 1: We care for individuals and trust their competence,
- Value 2: We achieve our objectives with uncompromising integrity,
- Value 3: We deliver our projects with respectful teamwork,
- Value 4: We focus on contribution and achievement,
- Value 5: We encourage flexibility and innovation.

## **F4E Projects**

### ***ITER***<sup>3</sup>

The task of F4E, as the Euratom Domestic Agency for ITER, is to discharge Euratom’s obligations to deliver its share of in-kind components and cash contributions to the ITER project, about 45% of the total value of the project in the construction phase and 34% of the cost of operation, deactivation and decommissioning of the facility as well as preparing the site in Cadarache.

### ***BROADER APPROACH (BA)***

The Broader Approach agreement, concluded between Euratom and Japan, includes activities which support and complement the ITER project by developing and operating some advanced research infrastructures and technologies necessary for future demonstration reactors. The Euratom resources for the implementation of the BA were provided in the past in part by several participating European states (Belgium, France, Germany, Italy, Spain and, Switzerland) as well as EUROfusion<sup>4</sup>. In BA Phase II, the Voluntary Contributors continue to provide personnel, while EUROfusion has an increased role by providing both hardware and personnel.

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<sup>3</sup> Info on ITER can be found on [www.iter.org](http://www.iter.org) and <https://f4e.europa.eu/understandingfusion/iter.aspx>

<sup>4</sup> [www.euro-fusion.org](http://www.euro-fusion.org)

## DEMO

The task of F4E is to prepare and coordinate a programme of activities in preparation for the construction of a demonstration fusion reactor, the successor of ITER.

### Key Performance Indicators

F4E is using specific Key Performance Indicators (KPI) in order to measure how effectively the organisation achieves the targets set in different areas (i.e. schedule, cost, quality, budget consumption, etc.). Some of them were developed by F4E, some by its Governing Board and ITER IO. F4E monitors these KPIs and reports internally to the Project Steering Meeting (PSM) to discuss any possible event or risk that could threaten their achievement.

### Reporting

Fusion for Energy produces a dashboard on progress and performance against the Project Plan and the Work Programme that is sent monthly to the Governing Board and its committees.

## General background

Since its creation in 2007, Fusion for Energy (F4E) is responsible to provide Europe's contribution to ITER, the Broader Approach (BA) and the Demonstration Fusion Power Reactor (DEMO) projects.

### 2.1 ITER

ITER aims to produce a significant amount of fusion power to allow scientists to study "burning" plasma (i.e. heated by fusion reactions rather than by external heating systems) and also to test many of the key technologies needed for future fusion reactors. Euratom (represented by the European Commission) is one of the seven parties to ITER that represent half the world's population together with the Russian Federation, Japan, China, India, South Korea and the United States.

ITER is being built near Cadarache in the south of France. F4E's task, as the Euratom Domestic Agency for ITER, is to discharge Euratom obligations to deliver its share of in-kind components and cash contributions to the ITER project, about 45% of the total value of the project in the construction phase and 34% of the cost of operation, deactivation and decommissioning of the facility as well as preparing the site.

The main characteristic of ITER is that the most significant part of the project is built by in-kind contributions distributed among the seven parties through the ITER Agreement to achieve the agreed level of contribution from each of them. The design, coordination, integration, commissioning and operations are managed by the Central Team of the ITER Organization (IO).

The project will reach its ultimate operational configuration [the so-called Deuterium-Tritium (DT) operation] via a series of intermediate configurations of gradually increasing capability. This is referred to as the staged approach and reflects the approach commonly adopted on complex developments with a progressive step-by-step assembly and commissioning process, validating each phase before moving on to the next.

A new "proposed 2024 baseline" has been presented by the IO and is under scrutiny by the ITER Council (IC). IC agreed to make the 2016 baseline obsolete and to use the "proposed 2024 baseline" as the "working baseline" for the project, even though it is not yet approved and may still be revised.

As of January 2025, F4E will therefore be using this “working baseline” as basis for schedule planning until the new baseline is officially approved.

The F4E schedule baseline will then be formally modified once the 2024 baseline is approved by the ITER Council, in the meantime the absence of an approved baseline means that the presented SPD is not completely stabilized and may need revisions in the future.

The two major F4E responsibilities are:

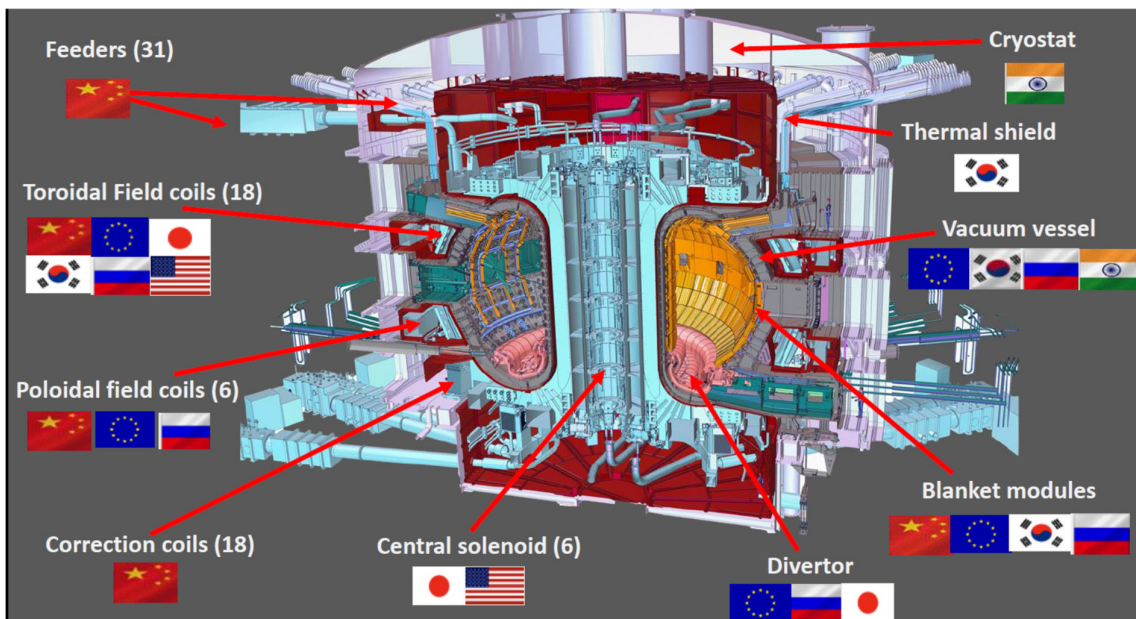
- (a) Europe, as host, is providing components (including all buildings) representing 45 % of ITER’s nominal value; European industries manufacture and provide them to the ITER Project as ‘in kind’ contributions. These are progressively delivered in line with the ITER assembly schedule, completing with the final deliveries for the DT phase components.
- (b) the payment of an annual cash contribution to IO to fund the IO internal activities and the tasks subcontracted directly by IO. The cash contributions cover the four major phases of the ITER project:
  - ITER **construction phase** through to the configuration of the machine for the final DT configuration
  - ITER **operations phase** running from FP through to the scheduled end of operation in 2037<sup>5</sup>
  - ITER **deactivation phase** from 2037 until the end of the ITER Agreement in October 2042. During this phase the ITER machine is returned to a safe state following its operation with the DT fuels.
  - Finally the **decommissioning phase** which starts in 2042, aimed to dismantle the machine and return the ITER site to green-field. Since this phase falls outside the timeframe of the ITER Agreement, F4E and the other Domestic Agencies will make the corresponding cash contributions to a decommissioning fund during the ITER operations phase.

During these phases the main F4E role is to provide the agreed in-kind and cash contribution. However, F4E is also increasingly providing technical support to IO during machine assembly and it is anticipated that F4E will have a support role during commissioning and operations. The type and level of support, and mechanism to provide this support is not yet defined.

| ITER Construction Phase | Overall cost IC-33 (klUA) | EU share (klUA) | EU share already released (klUA) |
|-------------------------|---------------------------|-----------------|----------------------------------|
| In-kind                 | 2847.57                   | 1113.63         | 587.10                           |
| In-kind cash to Japan   | NA                        | 227.65          | 193.03                           |
| In-cash                 | 4898.63                   | 2180.15         | 1282.19                          |
| <b>Total</b>            | <b>7746.2</b>             | <b>3521.43</b>  | <b>2062.32</b>                   |

**SPD\_table 1. Summary table of European contribution to ITER (Reference IC-33 contribution end of December 2023)**

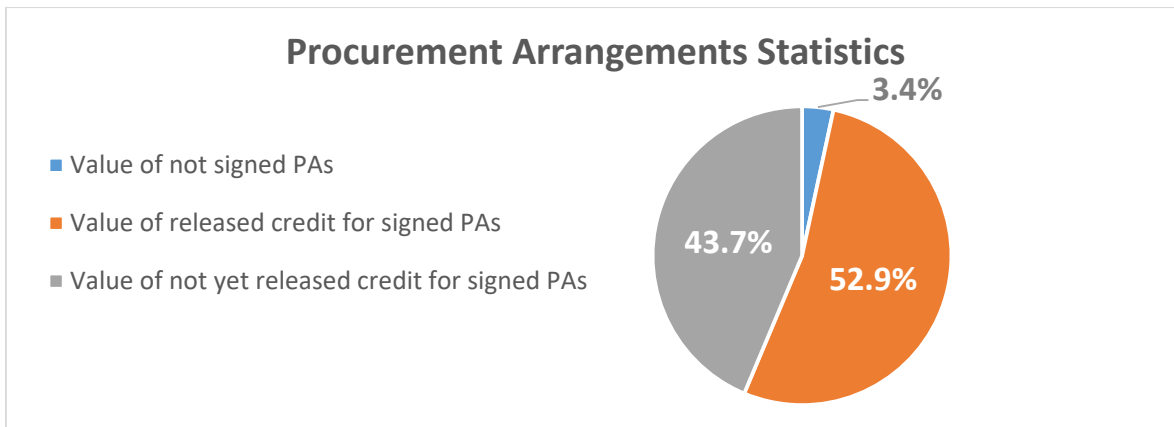
<sup>5</sup> To be noted that the ITER parties plan to discuss starting in 2033 a possible extension of the Agreement beyond 2042. Such decision, if taken, would impact the duration of the operation phase and the dates of deactivation and dismantling phases.



SPD\_figure 2 . Main DAs obligations towards IO

**IN KIND CONTRIBUTIONS TO ITER**

The Procurement Arrangements (PAs), progressively signed between the ITER Organization and each DA, define the specifications of the components to be provided in-kind. The level of detail of those specifications may vary depending on the level of development of the components. In some cases, Build-to-Print specifications will be provided, whilst in others, Detailed Design or only Functional Specifications will be available. These PAs are the basis for F4E to start the procurement procedures to competitively tender for the work. Once a contract is awarded, the work of the supplier can start. Each component has its development and manufacturing process with predefined stages and phase gates when F4E and IO will review and approve the design or manufacturing progress in order to determine the readiness to move to the next stage. The following table provides the state of play of the EU deliverables.

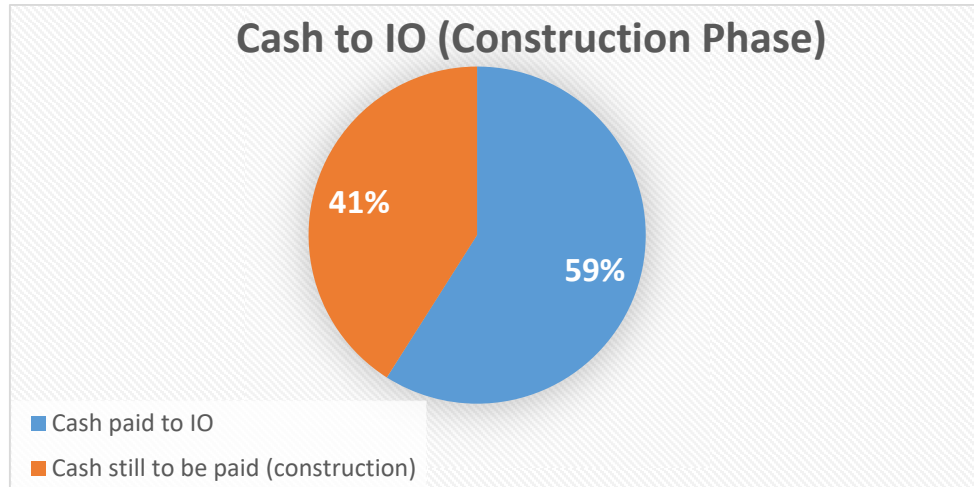


SPD\_figure 3 . PA Credits of in-kind contribution in percentage: value of PA Signed & credit released / PA Signed & credit to be released / not Signed EU PA (status end March 2024)

## CASH CONTRIBUTION TO ITER ORGANIZATION

F4E delivers to ITER International Organization (IO) annual in cash contribution in accordance with the ITER Agreement<sup>6</sup> and under the terms approved by ITER Council<sup>7</sup>.

By the end of March 2024, F4E has provided 1,220.34 kIUA credits (excluding “short in-kind contribution”) to ITER Organization in the form of cash contributions to ITER Construction Phase.



**SPD\_figure 4. Ratio cash paid to IO versus total expected cash contribution  
(status end March 2024)**

## CASH CONTRIBUTION TO JAPAN

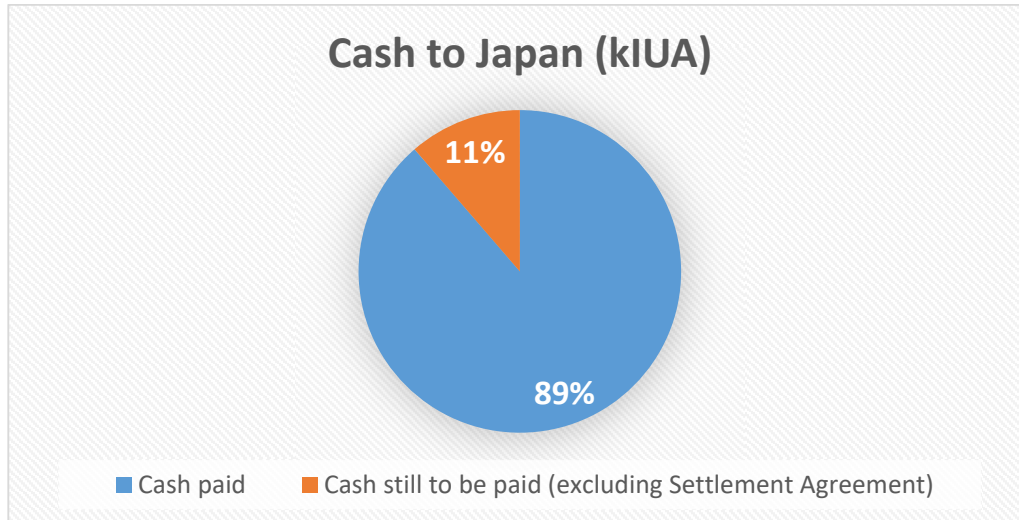
According to the ITER Agreement, 10% of in-kind procurement arrangements (PA) equivalent to 227.65183 kIUA credits shall be transferred from Euratom to Japan under the supervision of the ITER Organization<sup>8</sup>. This is financed through cash contribution paid by F4E (EU DA) to Japanese Domestic Agency (JA DA).

F4E provides a yearly payment based on progress reports and according to the agreed payment schedule.

<sup>6</sup> Article 8 "Resources of ITER Organization" (ITER Agreement 2006)

<sup>7</sup> According to Article 9 of ITER Agreement, the ITER Project Resource Management Regulations (PRMR Regulations) shall govern the administration of the resources of the ITER Organization. It provides a detailed description of the applicable rules for contributions in kind, cash income, commitments and payments for the ITER Organization. The final figures are approved or modified by the ITER Council.

<sup>8</sup> Decision 12 of Interim ITER Council, Tokyo, 11-12 July 2007 on transfer of procurement responsibilities from Euratom to Japan



**SPD\_figure 5. Cash paid to Japan / cash still to be paid to Japan (status end March 2024) (excluding settlement agreement<sup>9</sup>)**

## RECENT CHANGES AND DEVELOPMENT AT OVERALL ITER LEVEL WHICH AFFECT F4E's OPERATIONS

As mentioned earlier in this document, a new “proposed 2024 baseline” has been presented by the IO and is under scrutiny by the ITER Council (IC). Even though it is not yet approved and may still be revised, the ITER Council agreed to use the “proposed 2024 baseline” as the working baseline for the project.

This 2024 baseline (scope, schedule and cost) will be presented to the ITER Council for a decision during future meetings. This will have impacts on some of the F4E in-kind delivery programs, including for example the Blanket First Wall, the Hot Cell Complex building, ECH and the Diagnostics programmes. Although the 2024 baseline is not yet approved, F4E and the other DAs are supporting the ITER Organization in this challenge by re-defining in kind scope and procurement strategies to match the new configuration and delivery dates. At the same time F4E is also supporting initiatives to further integrate F4E and IO teams, to increase the overall efficiency and performance of the project.

Once agreed, the 2024 baseline will deeply modify the scope of the ITER Project as well as the Staged Approach defined by the 2016 baseline, removing the First Plasma step and introducing a Start of Research Operations (SRO) step, featuring H-H and D-D plasmas and culminating by operating the tokamak in long D-T pulses at Full Magnetic Energy and Plasma Current (15MA). The 2024 baseline foresees a new machine configuration including the change of the FWs armour material (tungsten will replace beryllium), the introduction of an inner-wall boronization system to be used as oxygen getter, and an upgraded plasma heating strategy.

The ITER operation phase following SRO will be the DT-1 phase, characterized by a lower plasma fluence in comparison to the 2016 Baseline and a different nuclear maintenance strategy and aimed to

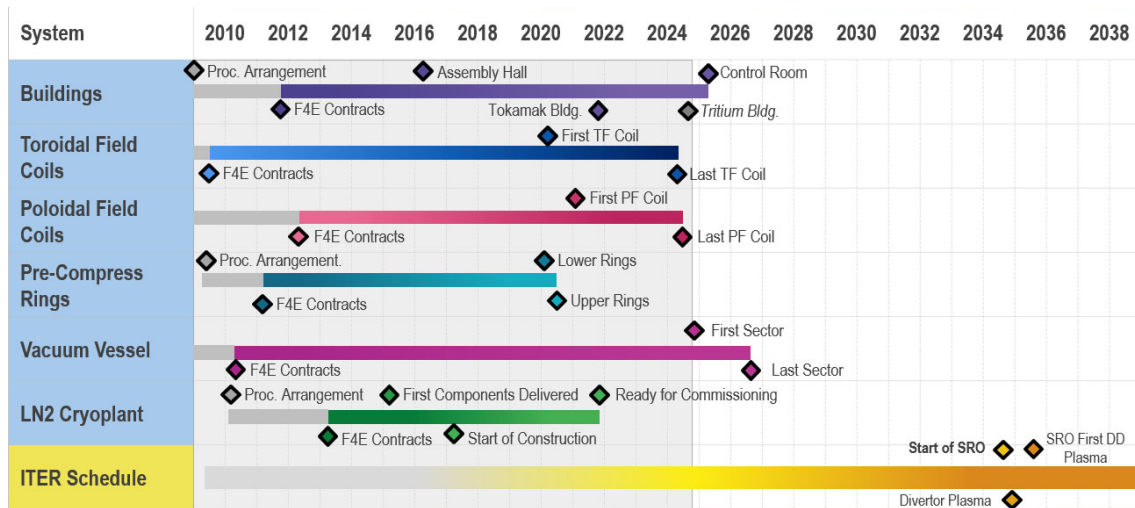
<sup>9</sup> Excluding the settlement agreement signed in 2015 between EU and Japan, under which F4E committed an additional cash contribution to Japan, equivalent to EUR 75 million valued at 10 February 2014.

reach  $Q \geq 10$  (ITER Project Objective) as well as to thoroughly test control systems and understand the profile of neutron distribution in a way that will facilitate DT-2 operations (at full fluence) with greater regulatory confidence and more realistic safety margins.

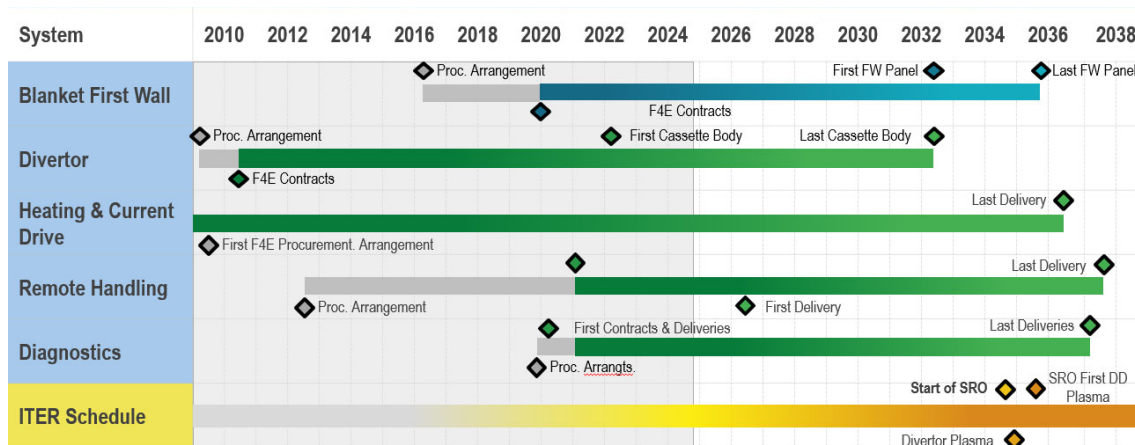
As of the end of March 2024, the EU has achieved a total of 32 ITER Council (IC) and Governing Board (GB) milestones out of a total of 57. 2 milestones are at risk of experiencing delays with respect to the agreed quarter. 24 milestones show some delays; in some cases these delays will be cancelled once the new Required Arrival Dates (RAD) are implemented into the new baseline. The remaining IC and GB milestone is on track.

On 12th April 2024, the Governing Board approved the Director’s proposal on the improved F4E’s organisation and the proposed changes to the organisational structure at the level of departments and proposal on the allocation of units.

Based upon the updated ITER baseline schedule, F4E’s own top-level baseline schedule (fig. 6), known as “Level 0”, outlines the most important ITER and F4E activities.



**SPD\_figure 6 . Top level schedule for Start Researching Operations (status end of September 2024)**



**SPD\_figure 7 . Top level schedule for other Systems (status end of September 2024)**

Note that dates are under review with IO for schedule re-planning and that Tritium building & Hot Cell will be planned at a later time.

## 2.2 Broader Approach

Fusion for Energy is the Implementing Agency for the Euratom contribution to the three BA projects, designated by the European Commission to discharge its responsibilities as defined in the BA Agreement. In particular, F4E is the organisation delegated to agree and execute Procurement Arrangements (PAs) with the Japanese Implementing Agency (QST).

The first phase of BA activities covered the construction of facilities and the provision of equipment. All BA Phase I credits have been achieved.

The second phase of the BA activities, the so called "BA Phase II", started from April 2020 on the basis of the Joint Declaration by the representatives of the Government of Japan and the European Atomic Energy Community for the further joint implementation of the Broader Approach activities agreed on 2<sup>nd</sup> March 2020. This new phase is focussed largely on enhancements as well as operation of the jointly developed infrastructures, and resources will mainly be provided by Fusion for Energy with a substantial contribution from European Laboratories channelled through the EUROfusion consortium. For BA Phase II, both Parties pledge to contribute a certain amount of credit on an annual basis and subject to budget availability.

The BA Projects, while having some important differences, share the common feature of being based on a collaboration in which the Parties contribute both to the definition of the overall integrated design and to the detailed design and realization.

The table below defines the planned contribution in summary and the already released credit for BA Phase II.<sup>10</sup>

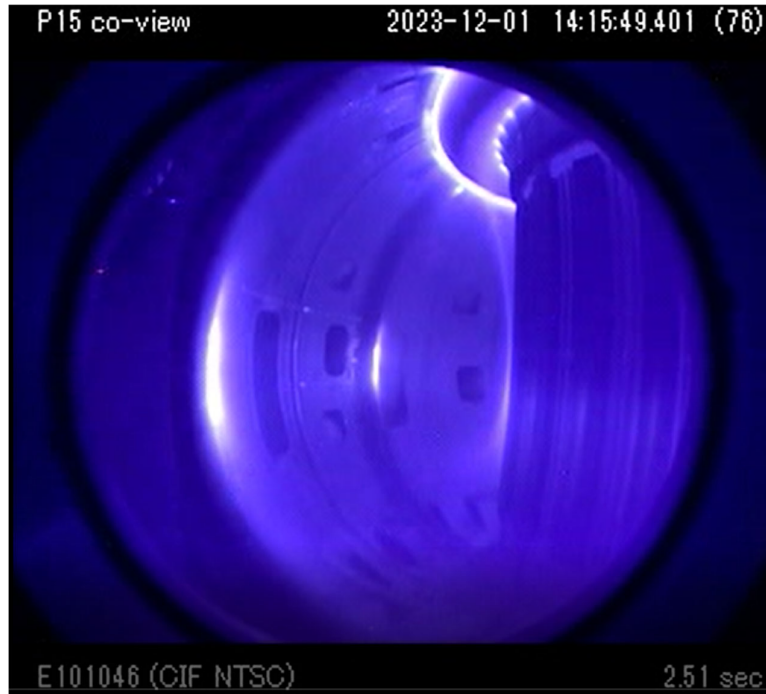
Further details are available in PP\_table 8 of Annexes to Project Plan.

|                            |                                | BA<br>EU Scope<br>April 2020 - March 2029 |                               |                               |
|----------------------------|--------------------------------|---|-------------------------------|-------------------------------|
| Actions                    | Name                           | Commitment<br>Credit<br>(kBAUA)           | <i>Of which<br/>committed</i> | <i>Of which<br/>completed</i> |
| 14-<br>Broader<br>Approach | Satellite Tokamak<br>(JT-60SA) | 311.34                                    | 112.35                        | 37.10                         |
|                            | IFMIF/EVEDA                    | 81.10                                     | 53.74                         | 15.62                         |
|                            | IFERC                          | 26.45                                     | 14.23                         | 10.67                         |

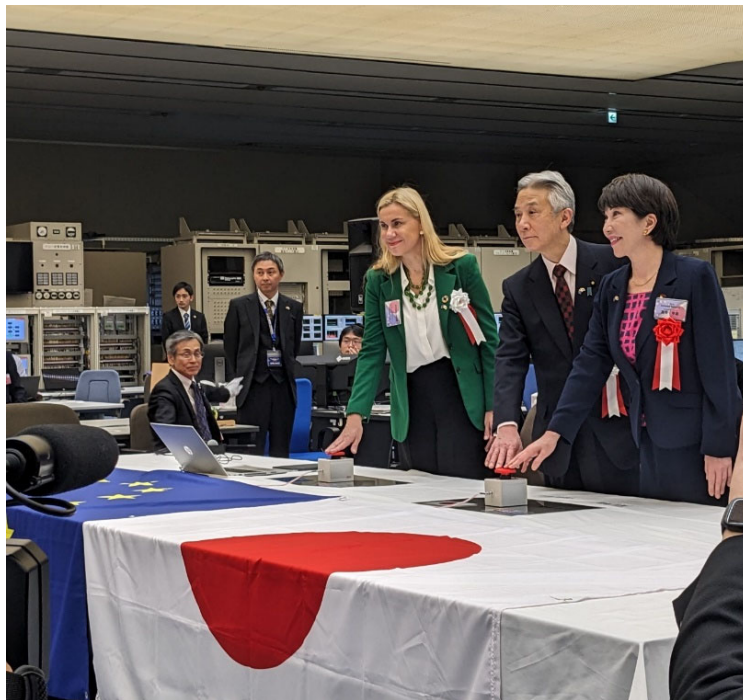
**SPD\_table 2 . Correspondence between Actions, WBS and WP ref for BA**

<sup>10</sup> Not all PAs are signed yet.

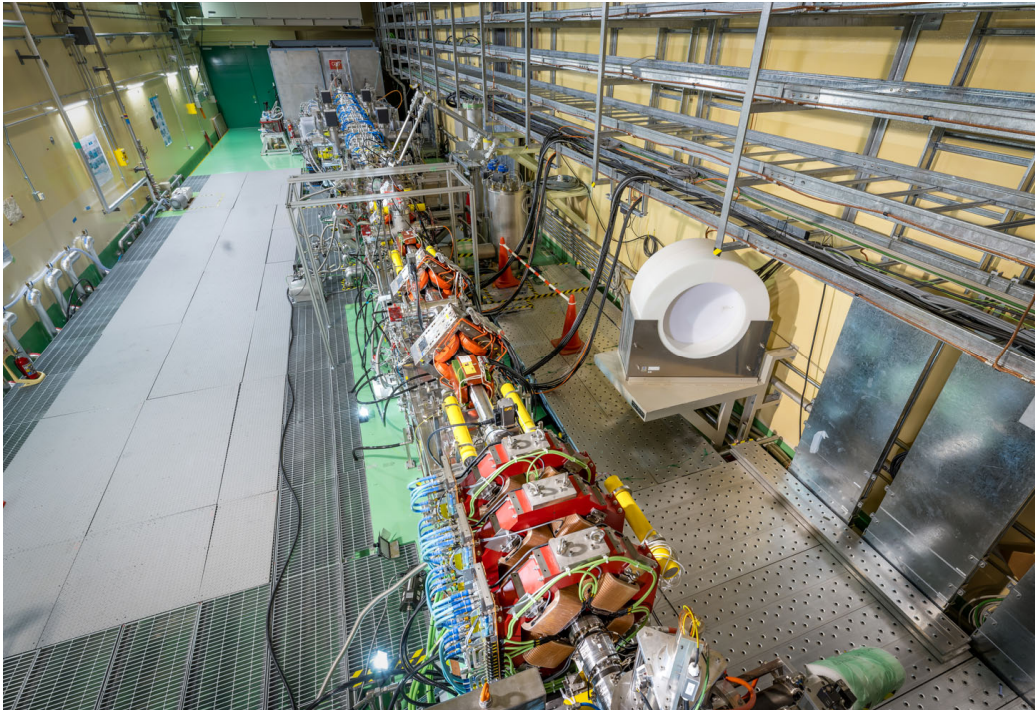




***SPD\_figure 8 . First plasma in the JT-60SA device***



***SPD\_figure 9 . JT-60SA - Initiation of the first plasma by Commissioner K. Simson, Minister M. Moriyama, and Minister S. Takaichi***



***SPD\_figure 10 . LIPAc accelerator in phase B+ configuration.***



***SPD\_figure 11 . IFMIF/LIPAc control rooms on Rokkasho site during the phase B+ beam operations carried out in 2023 and 2024: Left local control room, right central control room.***



**SPD\_figure 12 . Assembly activities in April 2024 in the clean room on the Rokkasho site. The superconducting cavities mounted on their support frame are visible in the foreground.**

## **CHANGES AND DEVELOPMENT OVER THE LAST YEAR THAT AFFECT BROADER APPROACH OPERATIONS**

- **Satellite Tokamak (JT-60SA):**

In October 2023 the JT-60SA Project reached a major milestone with the obtention of the first plasma. The event was duly celebrated and was the result of an intense commissioning campaign.

After the decision was taken in late 2022 to go ahead and operate the machine even though it was known to be not Paschen tight, the activities during 2023 were devoted to readying the machine for operation. The final repairs on the EF coils were carried out in the first half of 2023, and the cryogenic system was prepared for its first real operation. Cooldown of the machine started just before the summer, followed by integrated testing of the magnet systems immediately after the summer. All magnet power supplies were operated together during October, and shortly after the first JT-60SA plasma was produced on October 23. Over the following two months, many experiments were conducted providing valuable information about the overall status of the magnet systems of the machine.

In mid-December, the machine was shut down for the start of the Maintenance Enhancements 1 period during which many additional items will be installed. This includes additional heating systems, stabilizing plates and many diagnostics, and the expected duration of the shutdown is around 2 years. The opportunity will also be taken to complete further repairs on the CS and the EF magnets with a view to improving the Paschen tightness of the machine. The complete scope of work will be defined during 2024, which may affect the overall schedule of the maintenance and enhancement period ME-1.

In addition to the preparation of the machine for operation, a number of components were delivered for ME-1. This included the laser and polychromators for the Thomson Scattering System, the complete MGI system and the cryopumps. Contracting for other activities proceeded, including significant progress on the design and manufacture of the high and normal heat flux elements for the actively cooled carbon divertor and additional power supplies for the ECRF system.

- **IFMIF/EVEDA:**

The Engineering Validation and Engineering Design Activities for the International Fusion Materials Irradiation Facility (IFMIF/EVEDA) are focused on the design and validation of key components needed for the future Fusion Neutron Source facilities to characterize materials envisioned for DEMO. While

the Engineering Validation Activity of the Lithium Target Facility and the Test Facility was completed with the validation of prototypes, it is still on going for the Accelerator Prototype Facility (LIPAc). The primary goal is the full demonstration of the IFMIF accelerator concept, namely, acceleration and transport of a 9-MeV, 125-mA deuteron beam meeting the beam characteristics requirements in Continuous Wave. This is the primary objective for the DONES and A-FNS project, for it will validate the use of a superconducting Linac to accelerate in continuous wave a beam of light ions up at such an unprecedented intensity.

In parallel with these efforts, key subsystems such as the injector, RF power supplies, and Machine Protection System are undergoing enhancements based on operational feedback. These improvements are scheduled for implementation following the completion of the primary objectives of the IFMIF/EVEDA program. Furthermore, to boost the maintainability, reliability, and availability of the accelerator, additional maintenance strategies and obsolescence management activities will be conducted with the assistance of specialized external providers. After the completion of the enhancement period, whose aim is the demonstration of the reliability and availability required for DONES and A-FNS, an optimization period should follow aiming at supporting the preparation and implementation of their commissioning phases. LIPAc is also an ideal platform to develop and test models for machine learning and artificial intelligence that could be later on deployed on DONES and A-FNS. The objective will be to streamline operations, improve maintenance efficiency, enhance performance, and support operators in maintaining the operability and safety. Additionally, LIPAc will serve as a test stand to test new equipment like diagnostics as well as beam operation strategies, train scientists, engineers, and operators, who will be involved in the design, construction and operation of the future neutron source facilities.

- **IFERC:**

The IFERC project comprises three activities, DEMO design and R&D activities, CSC (Computational Simulation Centre) and REC (Remote Experimentation Centre).

- The DEMO Design Activity (DDA) has focused on the definition of joint design work in key issues, which will impact the selection of main machine parameters and technical specifications for pre-conceptual designs of DEMO. In the DEMO R&D activity, the focus is on the compilation of databases and engineering design handbooks.
- The CSC activity aims to provide HPC (High Power Computer) resources for simulation projects in support of the high priority areas defined in the IFERC Project Plan (ITER, JT-60SA and DEMO).
- REC activities support actively the remote participation in the IFMIF/EVEDA and ITER Projects. In 2024 a collaboration to support remote access for JT-60SA started.

## **DONES**

DONES (DEMO-Oriented Neutron Source) will be a facility to provide a source of neutrons to test materials under conditions expected in fusion reactors so as to evaluate their lifetime. This project aims to build upon the knowledge gained with the IFMIF/EVEDA project in the Broader Approach.

F4E's role in relation to DONES is to support the host state in its preparations for the project and to support negotiations between Euratom and Japan on the possible implementation of this project in the frame of an international collaboration. Fusion for Energy will contribute to the construction of DONES with the delivery of the main Accelerator System – a component which F4E is currently engaged to test in a full-scale prototype form in the IFMIF/EVEDA project of the Broader Approach (Rokkasho – Japan) and other systems, which F4E is currently developing for ITER, such as remote handling.

An overall budget of EUR 100 million (2008 value) for DONES is foreseen in the 2021-2027 MFF.

In July 2024, the Governing Board approved the decision on F4E's contribution to DONES with a financial ceiling of EUR 202 million for the construction and commissioning phase, subject to annual budgetary appropriations.

The baseline was assessed by an external group in October 2023 and the recommendations were presented at the F4E Governing Board in December 2023 and at the DONES Steering Committee in March 2024.

The DONES Steering Committee meeting was held on 14<sup>th</sup> March 2024. The DONES Steering Committee acknowledged the progress made, the achievement of the tasks assigned to the DONES Mobilization Working Group. The DONES Steering Committee also agreed to implement the DONES Programme Team and to appoint an interim Programme Manager to maintain the momentum and to proceed with the signature of the first Procurement Arrangement. F4E takes a leading role of the management of the DONES Programme.

## 2.3 DEMO

F4E's task is to prepare and coordinate a programme of activities in preparation for the construction of a demonstration fusion reactor and related facilities. F4E is working closely on DEMO with EUROfusion (a European consortium of fusion laboratories) to which it has seconded a person and will increase its involvement as the construction of ITER will be progressively completed.

In particular, as first programmes of ITER in kind delivery ramp down during the period of this SPD, F4E will ensure that the know-how gained in these programmes benefits the DEMO research and design activities. F4E will increase its involvement by partly or fully making available a few key persons from those programmes .

## Section II. Project Plan 2025-2029

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In accordance with the Financial Regulation of F4E, this programming document is composed of a Project Plan (PP) that lays down an overall strategic programming foreseen to cover five years (i.e. 2025-2029). The Resource Estimate Plan (REP) complements it and covers the same period.

Within the scope of the Broader Approach programme, this document covers three individual projects: Satellite Tokamak Programme, IFMIF/EVEDA and IFERC (International Fusion Energy Research Centre).

DEMO, still in a far earlier stage if compared to ITER or BA, is also presented here with the provision of high-level information.

### Challenges

F4E is facing a number of significant challenges in technical, procurement, budget and human resource areas.

#### *Technical and Procurement challenges*

The most significant challenges for F4E are related to its major task of delivering the EU in-kind contributions to ITER. The nature of the F4E activities with respect to ITER is changing throughout its lifecycle. While at the beginning the focus was on the launching of the procurement of the EU in-kind components, the work has evolved into the follow-up of the manufacturing activities and will further evolve in the coming years with a higher degree of involvement in the assembly and testing of the machine.

The next years, represent a period of high uncertainty and significant changes for the organisation. Very significant efforts will be required to deliver the remaining IC/GB milestones. An updated F4E schedule baseline will also need to be developed once the new ITER Project Baseline is approved by the ITER Council. F4E will face the parallel activities of launching a large number of new contracts, while at the same time managing the ongoing delivery of the running contracts and supporting ITER IO with assembly.

#### *Budgetary challenges*

In 2022 and 2023, F4E experienced significant impediments in the execution of its budget foreseen under the Multiannual Financial Framework (MFF) 2021-2027. This issue primarily stemmed from the 2016 ITER baseline, which is currently under revision by ITER Organization. Compounding these challenges were the necessary repairs for ITER's in-kind components and the interim cessation of assembly activities. These factors collectively contributed to a slowdown in the overall advancement of the project. Consequently, this led to a notable under-execution of F4E's commitment budget, with only 72% in 2022 and 73% in 2023.

The revised ITER baseline is likely to bring forth substantial alterations in the project's scope and timeline. The proposal for re-baselining of the ITER project was presented to the ITER Council (IC) in June 2024. The largest impact on F4E's budget is the increased EU cash contribution to ITER project.

The scope, schedule and financial impact on F4E of the proposed baseline were discussed during F4E Bureau meetings in September and October 2024.

F4E performed an impact assessment whether the remaining EURATOM contribution to F4E under the current MFF will be sufficient to cover the proposed increase in the EU cash contributions to ITER project. Measures were outlined and discussed with the impacted project teams to ensure the stakeholders that the remaining Euratom contribution in commitments, including the unused appropriations from the previous years will be sufficient to cover the EU contribution to ITER project and F4E operational needs until 2027. Nevertheless, uncertainties have been identified, analysed and taken into account in order to prepare F4E resources needed to execute the new ITER baseline as proposed to IC.

The resource estimates provided in this document are based on allocation of the commitment forecasts and uncertainties having regard to their probability.

The reference commitment forecast used for the preliminary impact assessment was transformed into a budgetary forecast, whereby the commitments with probability of 70% or above have been fully included per year, while the less probable were delayed to subsequent years. Uncertainties were covered by the budget at 50%. Risk provisions were not included in the resource estimates at this stage due to budget constraints. Payment budget needs were adjusted accordingly.

The future financial and staffing needs will be subject to the outcome of the EURATOM budgetary procedures that shall be adjusted according to the ITER Council decisions on the new ITER baseline, as well as discussions on the next MFF.

### ***Human Resources challenges***

In 2024 F4E is also undergoing a significant internal reorganization, with the creation of new departments and units and the corresponding launch of several selection procedures for management positions. The natural turnover in 2025 (7 foreseen retirements) will also impact the vacancy rate and the selection and recruitment activities. This work as well as the associated staff reassignments is expected to have some effect on the regular activities of the different services.

While integration does not automatically imply relocation of staff any staff, movements between the different sites will have to be managed. If the enhanced collaboration between F4E and IO requires calls for many such reassignments, it may represent a challenge from an HR perspective.

Finally, following the 2023 IAS audit on HR management, F4E will have to implement a series of actions such as adopt a comprehensive HR strategy, update its L&D Strategy and staff mobility policy, and design a comprehensive methodology for assessing its overall staff needs. Last but not least, F4E will need to put in place the necessary mechanisms to establish a centralised workforce planning function and strengthen the digital tools used to manage the ESPs to enhance its mitigation measures against the risks of assimilation and better ensure the taxonomy and cost-effectiveness of the external resources it relies on.

Taken together these changes are expected to help ensure a better balancing of the strict requirements of the regulatory framework, on the one hand, and the flexibility needed to efficiently respond to the project's constantly changing resource needs.

In the same vein, the envisaged workforce planning enhancements will help ensure that F4E has the requisite skills and competencies for the remaining phases of ITER and clarity on possible other needs for its other mandated activities.

### ***Schedule challenges***

The dates provided in this document are according to the F4E Detailed Work Schedule (DWS) at the end of March 2024.



# 1. PROJECT EVOLUTION

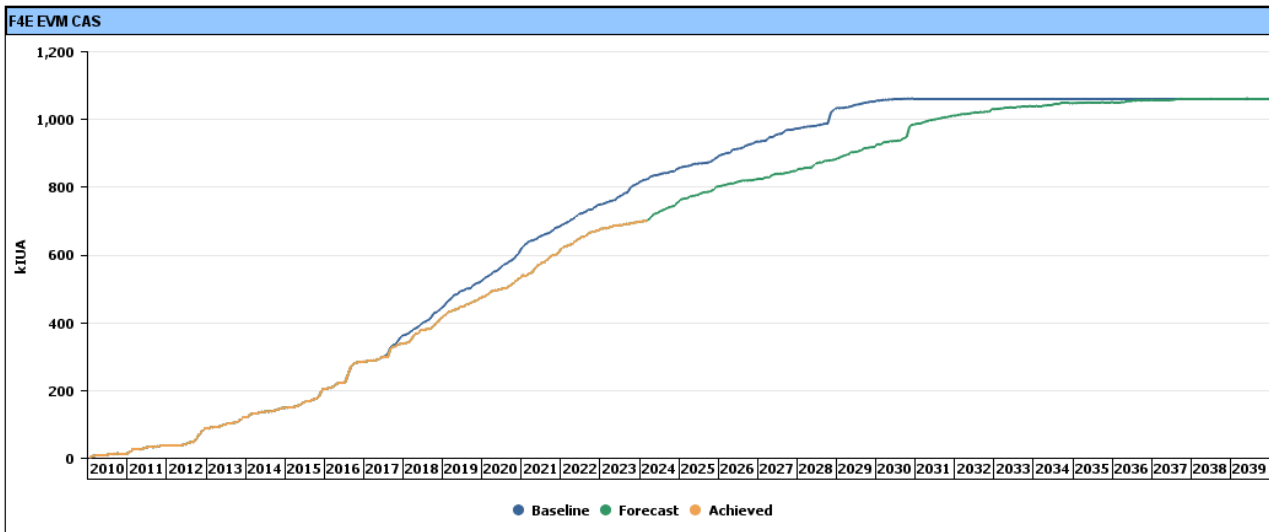
## 1.1 ITER

Having in mind that IO is currently proposing the implementation of a new project baseline impacting several F4E in kind contributions, F4E is requested to operate with two different approaches: the classical project management approach, focused on time, cost and quality, for the F4E deliveries not impacted by the 2024 ITER Project re-baselining, and a more elastic approach for those deliveries impacted by the re-baseline and for which F4E supports to IO is key for the successful implementation of the new staged approach and machine and plant system configurations. This requires a continual balance of prioritisations made at management level, and in the daily work of all the staff.

F4E is progressing with delivery of the various components under its responsibility to IO. The success of this will be critically dependent upon several factors:

- The performance of the various suppliers, and their ability to overcome the inevitable technical challenges and maintain the schedule and quality through the delivery;
- F4E’s management of the suppliers, working with them to ensure a good performance in terms of schedule, quality and cost;
- The avoidance of changes in requirements, design and/or interfaces of the various components to ensure a smooth progression into production and test without perturbations. This has been a significant problem in the past, and considerable efforts have been devoted by both the IO and F4E to achieving a stability in requirements and design.
- In light of the current rebaseline exercise, IO and F4E should jointly focus on reducing complexity.

The graph in Fig. 10 shows the ITER credit achieved until end of March 2024, and the forecast, compared to the 2016 baseline.



**SPD\_figure 13 . Credit Graph for all EU in-kind procurements**

SPD\_table 3 hereafter shows the progress, for all actions for ITER in kind deliveries, in terms of both achieved and released credits against the baseline as well as the forecast of credits for the next five years.

While the total credit value per action is largely stable as modifications would need the approval of the ITER Council through the Overall Project Cost (OPC) document, the credit profile over the years is prone to changes due to many reasons (e.g. delays in the schedule, change of strategy in specific procurements or modification of the IO assembly sequence).

|           | Action*                               | Baseline to end March 2024 (kIUA) | Achieved Credit (kIUA) | Released Credit (kIUA) | 2025     | 2026     | 2027     | 2028     | 2029     | 2030+     |
|-----------|---------------------------------------|-----------------------------------|------------------------|------------------------|----------|----------|----------|----------|----------|-----------|
|           |                                       | 821.77233                         | 698.83100              | 589.51928              | 48.59279 | 21.77055 | 24.85542 | 33.25795 | 37.79320 | 142.83974 |
| Action 1  | Magnets                               | 185.87481                         | 177.92581              | 162.71281              | 0.00000  | 0.00000  | 0.00000  | 0.00000  | 0.00000  | 0.00000   |
| Action 2  | Vacuum Vessel                         | 86.26629                          | 70.03147               | 47.01400               | 3.75247  | 7.14288  | 0.00000  | 0.00000  | 0.00000  | 0.00000   |
| Action 3  | In Vessel- Blanket                    | 1.10000                           | 0.50000                | 0.20000                | 0.45000  | 1.27000  | 5.60000  | 0.00000  | 11.72200 | 25.04269  |
| Action 4  | In Vessel- Divertor                   | 3.70000                           | 3.70000                | 3.62000                | 0.00000  | 0.47000  | 1.06500  | 1.52000  | 1.14000  | 17.76500  |
| Action 5  | Remote Handling                       | 16.68974                          | 5.50000                | 2.90000                | 4.70000  | 0.49000  | 2.10000  | 2.49000  | 1.60000  | 23.02055  |
| Action 6  | Cryoplant and Fuel Cycle              | 40.97830                          | 31.60009               | 29.17033               | 2.72957  | 0.49069  | 0.17223  | 1.30000  | 1.60000  | 0.30000   |
| Action 8  | Heating & Current Drive               | 65.81075                          | 50.03240               | 44.26240               | 9.31851  | 3.09906  | 6.52452  | 8.71333  | 5.83249  | 5.67349   |
| Action 9  | Diagnostics                           | 10.78767                          | 6.62055                | 4.41102                | 2.26333  | 1.30192  | 1.48509  | 2.72684  | 4.97497  | 9.08841   |
| Action 11 | Site and Buildings and Power Supplies | 410.56478                         | 352.92068              | 295.22872              | 25.37891 | 7.50600  | 7.90858  | 16.50778 | 10.92374 | 61.94960  |

\* Action 7 Plasma Engineering & Operations, action 10 TBM, action 12 Cash Contributions, action 13 Technical Support Activities, action 15 DONES and action 16 Technology Development Programme are not listed in the above table since no kIUA are associated to these actions. Action 14 Broader Approach uses kBAlUA instead of kIUA (see full table under PP\_table 8).

**SPD\_table 3 . Credit per Action<sup>11</sup>**

The maturity of each component evolves through a series of phases from design to delivery as normal for any development project. The transition from one phase to the next is authorized through gates where the maturity of the component to move to the next phase is assessed by an independent panel and approved by the internal project governance including IO actors.

While the design phases and the related reviews could be competence of either the ITER Organization or F4E, depending on the agreed level of detail of the specific Procurement Arrangement (i.e. functional specifications, detailed design, build-to-print), the reviews for cost and manufacturing are always a F4E responsibility. A policy for the management of the phase gates across F4E has been approved and is being implemented.

<sup>11</sup> **Achieved credit** corresponds to milestones completed by F4E. **Released credit** corresponds to milestones for which F4E received the associated credits (in IUA) from IO.

Figures in column **Baseline** correspond to “Total credit initially planned to be achieved at the end of March 2024”,

Figures in column **Achieved Credit** correspond to “Total achieved credit at the end of March 2024”.

Figures in column **Released Credit** correspond to “Total released credit at the end of March 2024”.

Figures in columns **Forecast** correspond to the “yearly credit to be achieved”.

## 1.2 Cash contribution to Japan

According to the ITER Agreement, there is a transfer of 10% of in-kind procurement responsibility from Euratom to Japan under the supervision of the ITER Organization. This is financed through a cash contribution from EU to Japan paid by F4E.

## 1.3 Broader Approach

All BA projects are now in an advanced implementation stage. The strategy defined in the early stages to implement these projects has proven successful and hence continues to be employed. This is underpinned by the very close collaboration with the Japanese Implementing Agency QST and all other European stakeholders. The management model follows an agreed Common Quality Management System, defining resources and processes crossing the lines between all involved organisations. Such an approach has allowed to control costs and hence will continue to be pursued.

For **JT-60SA**, the same strategy is planned for the period when the facility will be jointly operated and enhanced by the EU and JA. After the experience of the EF incident F4E is taking a more active role in on-site maintenance & repair in support of QST, in the overall interest of the project. This will continue in the next years to ensure the best chance of success of the JT 60SA project.

For **IFMIF/EVEDA**, the R&D results planned to be achieved thanks to the finalization of LIPAc's construction, checkout tests and the beam commissioning will provide solid grounds when its full experimental phase is carried in 2026. These results are pivotal for the development of the accelerator of the future fusion neutron sources facilities such as DONES and A-FNS.

For **IFERC**, F4E will continue to rely on the full support of EUROfusion for DEMO design activities, R&D activities in materials, and High Power Computing exploitation. F4E will continue to take the lead in Remote Experimentation (REC) activities with IFMIF-EVEDA, ITER and JT-60SA.

## 1.4 DONES

Considering the possible F4E contribution to the DONES Programme, early procurements process of essential equipment for DONES for risk mitigation using LIPAc as testing facility have been initiated. These procurements are essential to validate the final design of key components, integrating the design improvement as feedback of the ongoing LIPAc engineering validation phases, and also to increase the availability of LIPAc during the commissioning phases by providing spare parts.

It is worth to underline that:

- these commissioning phases are identified in the DONES Programme milestones as interface points with the construction phase of the IFMIF-DONES facility (i.e. validation of the RFQ in high duty cycle and SRF Linac at low duty cycle),
- the activities will be performed within the commonalities/interfaces programme agreed between the two projects, in complement of the enhancements already planned within the IFMIF/EVEDA Project (BA), such as the enhancement of the Injector and the RF Power System; this will ensure a matching of the updated designs of LIPAc and the DONES requirements, and will also help to define properly the manufacturing process to avoid duplication,
- the engineering activities will be performed through insourcing contracts.

The scope of the equipment to be procured and manufactured early will be of the same nature (if not the same components) as the potential new in-kind contribution. During the procurement and manufacturing of the early components, F4E will focus in acquiring the preparatory knowledge to limit

as much as possible setbacks for the future contribution (e.g. RF couplers, SC Cavities, etc.). F4E will then be able to monitor progress and swiftly assess whether the procurement and manufacturing of the future contribution will need to be modified. Hence, the risk of overcosts and schedule slippage will be minimized substantially.

### 1.5 DEMO

EUROfusion is currently carrying out the DEMO-related activities. It is foreseen that F4E will play a stronger role once ITER activities decrease. A continued and strengthened coordination between F4E and the EUROfusion DEMO activities has been suggested in recent reviews. In particular, it is desirable that F4E gradually becomes more involved on key design decisions, and cost & schedule parameters during the DEMO conceptual design phase. F4E should be linked to the EUROfusion Project Governance of the DEMO design activities and other associated supporting technology projects (e.g., ITER TBM and DEMO breeding blanket work packages).

As a step in this direction, a DEMO Programme Steering Board has been established at the end of 2017, to coordinate the DEMO Programme between EUROfusion and F4E, ensuring consistency between design activities and high-level milestones (i.e. IFMIF/DONES, DEMO Design, TBM/BB, BA etc.). F4E is represented by its Director and the Chairman of the Governing Board and EUROfusion is represented by the Programme Manager and the Chair of the General Assembly. In addition, the two Directorates of the EU Commission that are involved in Fusion, namely Research & Technology Development (RTD) and Energy policy (ENER) are represented in this Board together with Industry.

### 1.6 Collaboration with EUROfusion

A collaboration with EUROfusion has been implemented on the activities of the ITER Test Blanket Module (TBM) Systems and the BA Projects (i.e. the Satellite Tokamak Programme JT-60SA, IFMIF/EVEDA and IFERC). A Memorandum of Understanding (MoU) between F4E and EUROfusion was signed in the areas of their respective fusion research and development activities, on the basis of mutual benefit and overall reciprocity. The collaboration activities within each specific fusion research and development area are further specified in a Multiannual Programme Plan, drawn up and agreed by the Parties. In 2025, an increased coordination is being implemented, with the collaboration extended to coordination of training programmes, technology transfer and other fields.

### 1.7 Technology Development Programme

Another important area of activity is the Technology Development Programme (TDP). This new Programme was launched in 2024 as one of the branches of the F4E Industrial Policy in line with the Governing Board's mandate.

According to F4E's renewed vision, F4E must play a fundamental role for supporting Fusion European Supply Chain and ensure its competitiveness in the promising fusion energy sector. This enhanced scope is to support both the technology needs of F4E projects and the technological demands recognized in the roadmap to fusion power plants, mitigating risks associated with future European fusion endeavors.

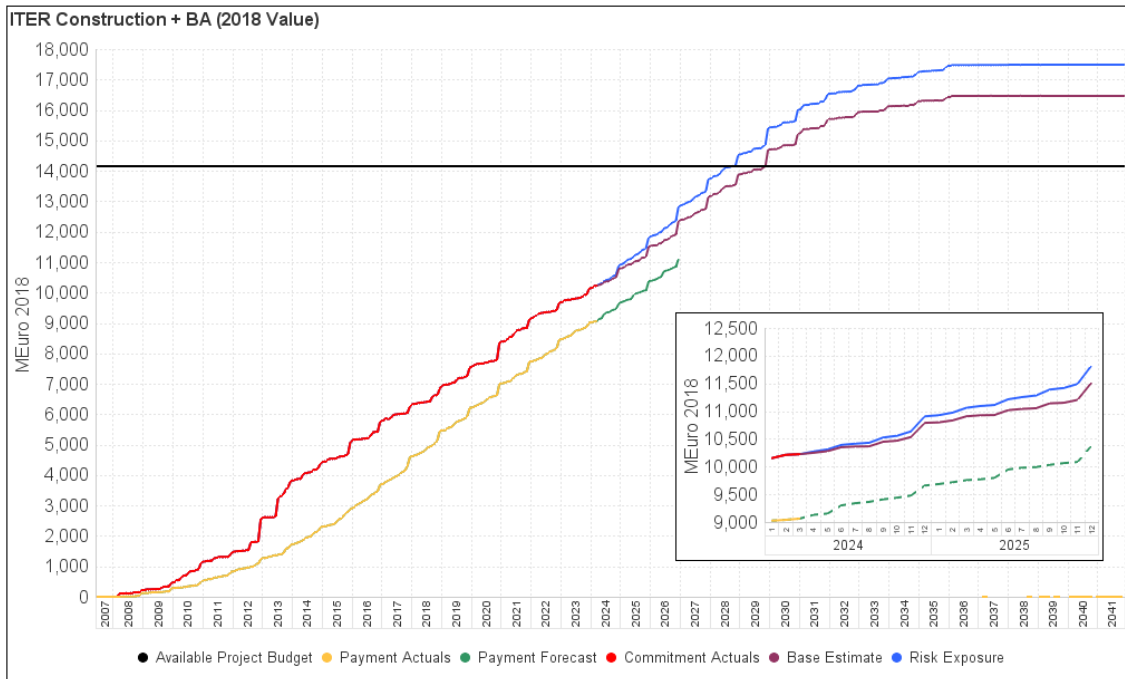
The Technology Development Programme aims to periodically identify and assess the fusion key enabling technologies (critical technologies mapping) and support European industry to develop and test those technological capacities for ITER, DONES, DEMO and other fusion projects of European interest, such as plasma heating and exhaust systems, advanced materials, tritium breeding and handling, remote handling, magnets, and diagnostics.

In preparation for a full Technology Development Programme, an initial activity to assess overall concepts and implementation tools is being launched via two pilot actions. Lessons learned during tendering and implementation will be captured and exploited during next action campaigns that shall address a wider number of activities.

The Technology Development Programme represents F4E’s commitment to foster a culture of excellence and innovation. By focusing on key enabling technology development, we are ensuring that F4E remains at the cutting edge of fusion technology, contributing to a sustainable energy future and reinforcing Europe’s leadership in this transformative field.

**1.8 F4E financial evolution**

The F4E financial evolution is described in the below chart, with achieved values up to March 2024.



**SPD\_figure 14. Project Budget, Payments, Actual commitments and EAC.**

The Allocated Project Budget is the portion of the Total Project Budget allocated to individual PAs, ITAs, TBs and Other funded activities.

The “available budget” is the budget that F4E assumes will be made available for all activities (including Broader Approach, F4E administration and Cash Contributions to IO and Japan) through to the end of the ITER construction phase in 2035.

The Payment Actuals represent the cash disbursement to honor legal obligation.

The Payment Forecast represents the most likely value of all payments in period to be done.

The Commitment Actuals represent the total amount of legal obligations already signed.

EAC Base is computed as the sum of Actual Commitments and the Estimate to Complete Base. Within F4E it does not include Risk Exposure. The “Estimate to complete Base” are the future planned Commitments.

The “Risk Exposure” is the possible Commitment impact of the risks(s) multiplied by the probability of the risk(s) associated to a given activity.

## 2. Multiannual Objectives

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This section of the document describes the strategic medium-term objectives of F4E and the way the progress in their achievement is monitored.

F4E has a number of key corporate objectives covering important areas, in particular Health & Safety, nuclear safety and some related to stakeholder satisfaction. The ones included here are the most relevant ones to measure the progress of the projects.

F4E's operative objectives are divided in two types:

- Multiannual objectives;
- Annual objectives.

### 2.1 Selection Criteria

It is important to select objectives which are not only top-level ones but also representatives of the work to be performed in the forthcoming years. Therefore milestones relevant to design, manufacturing, assembly and commissioning are the ideal candidates.

At the same time, it is important to establish a link between the long-term (i.e. Project Plan) planning and the short-term (i.e. work programme) activities. Therefore, as it can be seen in the work programme annex of this document, the multiannual objectives are mirrored on the annual milestones selected as the predecessors of the long-term ones. Such milestones in the short-term will act as an alert against the increasing risk of missing any critical and near-critical path milestones in the longer term.

Regarding the annual objectives, F4E has selected them to monitor those activities that have been identified during the last years as being most relevant for F4E stakeholders, both external (Commission, EU Member States, IO, etc.) and internal. Some of them have been defined after specific request from the Commission.

## 2.2 Multiannual objectives for ITER project

There are 3 multiannual objectives for the ITER Project:

| AREA                      | Objective   |
|---------------------------|---|
| GB/IC milestones          | Achieve the GB and IC milestones within "agreed quarters"   |
| EVM-CAS SPI <sup>12</sup> | SPI above a defined value   |
| Overall Costs             | Cost estimation for ITER + Broader Approach for period up to 2027 should be less than the total budget available for this period. |

The GB/IC milestones have been selected by the ITER Council and the F4E Governing Board to represent at best critical achievements for the project and therefore their completion is very important for the progress in the construction of the machine. They are defined with a rolling wave approach with new ones added to the list as the project progresses. They encompass activities required for the first plasma as well as activities covering later phases of the project (see PP\_table 2 in Annex to Project Plan).

The GB/IC milestones concern the in-kind procurements and do not include the Test Blanket Module (TBM) for which the work is not covered by a standard Procurement Arrangement, but by specific TBM Arrangements (TBMA) signed by F4E in 2014. TBM milestones complement the GB/IC milestones as technical objectives and are presented in PP\_table 3 of the Annexes to the Project Plan.

## 2.3 Multiannual objectives for Broader Approach

Since 2020, the Broader Approach focuses on enhancing, operating and exploiting the facilities that have been jointly developed with Japan. As ITER is approaching its own tokamak assembly and commissioning phases, teams working on the Broader Approach will work ever more closely with ITER to ensure that it moves forward as smoothly as possible – the collaboration has been underpinned by an agreement between IO, F4E and QST concluded in 2019.

The technical objectives defined for the period up to March 2029 are listed in PP\_tables 4, 5, and 6 of the Annexes to the Project Plan. These simplified tables are largely based on the grouping of the relevant project milestones, originally defined and valorized in the EU (draft or already signed) relevant Procurement Arrangements.

## 2.4 Multiannual objectives for DEMO

The revised DEMO development plan foresees three phases:

- (i) a Pre-Concept Design Phase;
- (ii) a Conceptual Design Phase; and
- (iii) an Engineering Design Phase.

Specific activities have been identified to be carried out by EUROfusion up to 2025. Some of them are also partially conducted as part of the BA effort.

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<sup>12</sup> This new EVM-CAS indicator will start being used as from 01.01.2025 relying on the "working baseline".

## 2.5 Annual objectives

In addition to the multiannual objectives, annual objectives are identified and are constantly monitored by F4E and are reported upon during the year. The annual objectives are the following ones:

| AREA                                    | Objective <sup>13</sup>  |
|---|--|
| Annual M-SPI                            | Reach a minimum SPI value by end of the year   |
| Annual commitment budget                | Implement a defined percentage of Commitment Appropriations by end of the year   |
| Budgeted forecast of the Work Programme | Implement a defined percentage of allocated commitment appropriation to Work Programme Actions, without reserves, by end of the year |
| Annual payment budget                   | Implement a defined percentage of Payment Appropriations by end of the year  |
| Quality – NCR closure time              | Ensure Nonconformity Reports (NCR) closure in due time   |
| Quality – NCR closure rate              | Close a minimum percentage of NCR annually   |
| Human Resources                         | Vacancy rate to be less than a defined value by end of the year  |

## 2.6 Key Performance Indicators

A Key Performance Indicator (KPI) is defined for each of the annual and multiannual objectives. The RAG status (Red, Amber, Green status) associated to each of these KPIs is described in the Project Plan.

On request of the Commission the following 2 Key Performance Indicators are also monitored:

- Turnover rate
- Absenteeism rate

## 2.7 Implementation of the F4E strategy to achieve the objectives and define recovery plans

The achievement of the objectives is based on defined strategies. The schedule has been reorganized so as to minimize the risks of delay for the delivery of the components on the critical path. Furthermore, resources have been redistributed to better support the areas where more effort is needed.

The forum for reviewing project progress and taking any necessary actions/decisions to maintain or recover the project status is the Project Steering Meeting (PSM), held once a month with the participation of both senior and middle management. On top of scheduled presentations on progress, KPIs and milestones trend analyses, the Programme managers who have identified a specific issue in their areas are requested to present the reason of the issue and to propose a strategy to recover it. The proposal is discussed and an immediate decision is taken.

Actions are assigned to support the decision taken and due dates for the actions are agreed.

<sup>13</sup> Targets are defined in the Project Plan under section "Objectives and KPIs".



The record of recovery plans and issues arising from KPIs are the Record of Decisions (RoD) of the PSM.

#### ***“Red-flagging” and KPI Control Process***

The Project Management KPI process runs on a monthly basis in the background of the PSM.

In the case that a KPI is either amber or red, the Programme Manager may propose one of the following alternatives:

- **Accept:** The Programme Manager proposes in the PSM that the KPI value is accepted. This may be, e.g. because the milestone is not critical, a global commitment is allowed instead of an individual one, etc. If the Director accepts the proposal, the Programme Manager will continue to monitor the KPI and either he/she or the Project Planning and Controlling Group may raise the issue again at a subsequent PSM if the situation regarding the KPI changes or worsens.
- **Recover:** The Programme Manager presents in the PSM the recovery actions launched to bring back the KPI within the accepted range. A due date is also assigned for the completion of the action.

The Programme Manager will report on its progress in subsequent PSMs. When reporting on a recovery plan, the Programme Manager may propose the following alternatives:

- **Close:** The Programme Manager demonstrates in the PSM that the KPI has returned within the agreed range;
- **Accept:** The Programme Manager proposes in the PSM that the current KPI value is accepted. If the Director accepts this proposal, the Programme Manager will continue to monitor the KPI and either he/she or the Project Planning and Controlling Group may raise the issue again at a subsequent PSM if the situation regarding the KPI changes or worsens;
- **Continue to recovery:** The Programme Manager presents the progress on the existing recovery actions in the PSM and updates the PSM on the time period in which the recovery will be complete.

In the case that the Programme Manager has exhausted all available actions to solve the issue, it should be escalated to the next level of management.

## Section III. Resource Estimates Plan

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The Resource Estimates Plan (REP) sets out the indicative human and financial resources deemed necessary for the implementation of the Project Plan and the Annual Work Programme of the Joint Undertaking for the following five financial years<sup>14</sup>.

### FINANCIAL RESOURCE ESTIMATES PLAN

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The EURATOM contribution to ITER for the whole period 2021 to 2027 amounted to EUR 5 614 million of which EUR 5 560 million (in current prices) for F4E were authorised by the last amendment to F4E Constituent act in 2021<sup>15</sup>. Out of the total EURATOM contribution to ITER for this Multiannual Financial Framework, EUR 1 052 million (18.9%) has already been transferred back to the Commission in 2023,2024 and 2025.

The figures for 2028 and 2029 are indicative subject to the outcome of the EURATOM budgetary procedures and shall be adjusted according to the ITER Council decisions on the new ITER baseline, as well as discussions on the next MFF.

The ITER Host State and Membership contributions are complementing the EURATOM contribution to F4E budget.

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<sup>14</sup> Article 32 of the F4E Financial Regulation and Communication from the Commission on the Guidelines for Programming Documents for decentralised agencies

<sup>15</sup> COUNCIL DECISION (Euratom) 2021/281 of 22 February 2021 amending Decision 2007/198/Euratom establishing the European Joint Undertaking for ITER and the Development of Fusion Energy and conferring advantages upon it (OJ L62/41 of 23.2.2021)

# 1. Overview of the past and the current situation

## 1.1 Execution of Budget 2023

|             |  |                           |                      |             |
|-------------|--|---------------------------|----------------------|-------------|
| Commitments | <b>73% execution of the final available budget</b> | Final Budget: 806.98      | Execution: 586.18    | EUR million |
|             | <b>58% compared to the original budget</b>         | Original Budget: 1,018.65 | Execution: 586.18    | EUR million |
|             | <b>76% without additional revenue from ITER IO</b> | Standard Budget: 757.09   | Execution: 571.73    | EUR million |
|             | <b>99% in individual commitments</b>               | Execution: 586.18         | Ind. Commit.: 578.68 | EUR million |
| Payments    | <b>95% execution of the final available budget</b> | Final Budget: 631.54      | Execution: 597.71    | EUR million |
|             | <b>73% compared to the original budget</b>         | Original Budget: 820.58   | Execution: 597.71    | EUR million |
|             | <b>98% without additional revenue from ITER IO</b> | Standard Budget: 587.45   | Execution: 578.42    | EUR million |

**SPD\_figure 15 Budget Implementation 2023**

The execution rate of F4E's final available budget for 2023 is 73% in commitments and 95% in payments. The main factors impacting F4E's ability to execute it, were largely outside of its control, as explained in the budgetray challenges section.

The main consequences from the current situation of the ITER project on the 2023 implementation of F4E commitment budget are the following:

- EUR 48.4 million decrease in the 2024 Cash Contribution to IO proposed in May 2023,
- EUR 120.9 million decrease in In-Vessel programme mainly due to on-going discussions on changing the First Wall (FW) armor material from Beryllium to Tungsten,
- Delays in contract signatures or reduction achieved during the successful clarification and negotiation phase concerning the programmes for Heating and Current Drive (EUR 64.8 million), Site and Building (EUR 69.5 million) and Broader Approach (EUR 21.9 million),
- F4E has been working on establishing a more realistic project schedule based on the available technical and commercial resources. This exercise also influenced the commitment execution in 2023,
- EUR 50.3 million carry overs from 2022 linked to revenue cashed from IO that were transferred to the chapters for contributions from EURATOM (EUR 49.1 million) and ITER Host State - IHS (EUR 1.2 million).

Following the conservative approach to using global commitments requested by Euratom based on commitment forecasts for 1st quarter of 2024 (and not the full year of 2024), F4E globally committed only EUR 7.5 million covering one well advanced procurement procedure.

## 1.2 Budget 2024

F4E budget 2024 was originally adopted by the F4E Governing Board in its December 2023 meeting. The Original Budget is aligned to the outcome of the EU budgetary procedure 2024. In order to cover the F4E needs and to align the Budget with F4E Work Programme, EUR 150 million of unused appropriations from previous years are allocated in commitments.

A first amendment to F4E Budget 2024 was adopted by the Governing Board for its meeting in July 2024 with the purpose to approve (i) the decrease in ITER Host State contribution by EUR 66.4 million in payments as officially communicated by the French High representative for ITER Project on 26 April 2024, and (ii) the increase in the ITER Host State contribution by EUR 6.2 million in commitment coming from the adjustment following the final execution of 2022 Budget.

A second amendment to F4E Budget 2024 is proposed to the Governing Board for its meeting in December 2024 with the purpose to approve (i) the increase of EUR 5.2 million in EURATOM contribution, in commitments, coming from unused appropriations from previous years to cover the projects needs reflected in Work Programme 2024 amendment 2, (ii) the increase of EUR 54.3 million in EURATOM contribution, in payments, to cover the gap in F4E operational budget due to decreased ITER Host State contribution by EUR 66.4 million in Budget 2024 Amendment 1, and (iii) the miscellaneous revenue of EUR 0.3 million in commitments and payments, coming from recoveries and liquidated damages on F4E operational contracts.

## 2. FINANCIAL OUTLOOK FOR 2025 – 2029

### 2.1 Assumptions

#### For the period 2025-2027

As the ITER Baseline has not been officially approved, F4E has been working on the basis of best effort to interpret provisional information from ITER IO and assess its impact on its financial and staffing needs. The largest impact is the expected increase of Cash Contributions to ITER IO. Adjustments of the expenditure profiles for the main projects, including those impacted by rebaselining were also made to accommodate the budgetary ceilings in the current MFF.

The plan to call the unused appropriations has been adjusted accordingly. Based on the above, it is foreseen that the available amount of unused appropriations will be fully committed under the current MFF.

The budgetary impact of the DONES programme is now aligned with the overall ceiling, as determined in the outcome of the GB meeting in July 2024.

The total EURATOM contributions until 2027 are in line with the updated MFF programming. However, the internal allocation of EURATOM operational and administrative contributions does not fully correspond to the updated MFF figures to ensure that the administrative expenditure is covered by the EURATOM contribution and F4E's membership contributions.

Financial contributions for years 2025-2027 are subject to the outcome of the respective budgetary procedures of the F4E contributors (EURATOM, ITER Host State and Members).

The F4E operational expenditure for 2025 will be covered by the dedicated EURATOM contribution and by the ITER Host State contribution. The biggest part of the operational budget for 2025 will be spent for the provision of the EU cash contribution to ITER which is due to IO for year 2026. Other significant expenditure includes those related to Buildings and Power supplies for the ITER site in Cadarache, Heating and Current Drive, Broader Approach and In Vessel Blanket.

The F4E administrative expenditure for 2025 will be covered by the dedicated EURATOM contribution, and by the Membership contributions to the Joint Undertaking. The administrative expenditure 2025 is based on the following main assumptions:

- Annual salary adjustment<sup>16</sup> for 2025: 4.3% based on cost of living in Brussels as reference with a correction coefficient for Spain,
- Vacancy rate in 2025: 4.0%,
- Inflation coefficient on other administrative expenditure: 2.0%,
- Other salary factors: allowances, annual travel expenses, promotions, advancements in step.

### For the period 2028-2029

The figures of the EURATOM contribution for 2028 and 2029 are indicative and will be subject to the outcome of the ITER Council decision, the EURATOM budgetary procedures, as well as discussions on the next MFF.

### Unused commitment appropriations

The F4E Financial Regulation foresees the possibility to make the unused appropriations available again as revenue in subsequent budgetary years according to the project needs. End of September 2024, the level of unused appropriations amounted to EUR 705.9 million, estimated to be EUR 720.9 million following forecasted decommitments. Its detailed evolution since then is provided in the Annex to Section III "Resource Estimates Plan", including the summary of the planning to reuse them until the end of this MFF.

The tables below show the final execution for 2023, the status for 2024, and the Estimates of Revenue and Expenditure for the next five years, from 2025 to 2029. The explanatory notes of the Estimates for revenue and expenditure are provided in the annexes.

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<sup>16</sup> Includes already salary adjustment for 2023 of 1.25% and for 2024 of 3.4% that will be later adjusted by the official EU salary update and the change in the Spanish correction coefficient by the end of 2024.

2.2 Estimate of Revenue in Commitment Appropriations for next five years

| REVENUE<br><br>Commitment appropriations (EUR)                                | 2023               | 2024               |                    |               | 2025                 |               | 2026                 |               | 2027               |               | 2028                 |              | 2029                 |               |
|---|--------------------|--------------------|--------------------|---------------|----------------------|---------------|----------------------|---------------|--------------------|---------------|----------------------|--------------|----------------------|---------------|
|   | Execution          | Budget AM2         | Forecast           | VAR 2024/23   | Budget               | VAR 2025/24   | Planned needs        | VAR 2026/25   | Planned needs      | VAR 2027/26   | Planned needs        | VAR 2028/27  | Planned needs        | VAR 2029/28   |
| <b>1 REVENUE FROM FEES AND CHARGES</b>  |                    |                    |                    |               |                      |               |                      |               |                    |               |                      |              |                      |               |
| <b>2. EU CONTRIBUTION</b>   | <b>591 984 584</b> | <b>437 498 571</b> | <b>437 498 571</b> | <b>-26.1%</b> | <b>479 663 795</b>   | <b>9.6%</b>   | <b>844 259 592</b>   | <b>76.0%</b>  | <b>654 732 051</b> | <b>-22.4%</b> | <b>1 234 896 746</b> | <b>88.6%</b> | <b>1 153 058 354</b> | <b>-6.6%</b>  |
| <i>Administrative (To Title 1 and 2)</i>                                      | 65 347 477         | 72 781 757         | 72 781 757         | 11.4%         | 73 213 274           | 0.6%          | 80 390 750           | 9.8%          | 81 714 046         | 1.6%          | 84 270 746           | 3.1%         | 86 897 354           | 3.1%          |
| <i>Operational (To Title 3)</i>   | 476 781 095        | 355 220 669        | 355 220 669        | -25.5%        | 405 121 795          | 14.0%         | 763 868 842          | 88.6%         | 573 018 005        | -25.0%        | 1 150 626 000        | 100.8%       | 1 066 161 000        | -7.3%         |
| <i>Recovery from previous years administrative</i>                            | 726 813            | 957 743            | 957 743            | 31.8%         | 1 328 726            |               |                      |               |                    |               |                      |              |                      |               |
| <i>Recovery from previous years operational</i>                               | 49 129 199         | 8 538 402          | 8 538 402          |               |                      |               |                      |               |                    |               |                      |              |                      |               |
| <b>3 THIRD PARTIES CONTRIBUTION</b>   | <b>115 886 340</b> | <b>97 473 155</b>  | <b>97 473 155</b>  | <b>-15.9%</b> | <b>86 972 936</b>    | <b>-10.8%</b> | <b>178 570 000</b>   | <b>105.3%</b> | <b>136 400 000</b> | <b>-23.6%</b> | <b>267 510 000</b>   | <b>96.1%</b> | <b>237 715 000</b>   | <b>-11.1%</b> |
| <i>Of which ITER Host State contribution</i>                                  | 108 586 340        | 89 273 155         | 89 273 155         | -17.8%        | 78 772 936           | -11.8%        | 169 670 000          | 115.4%        | 127 400 000        | -24.9%        | 258 210 000          | 102.7%       | 228 115 000          | -11.7%        |
| <i>Of which Membership contribution</i>                                       | 7 300 000          | 8 200 000          | 8 200 000          | 12.3%         | 8 200 000            | 0.0%          | 8 900 000            | 8.5%          | 9 000 000          | 1.1%          | 9 300 000            | 3.3%         | 9 600 000            | 3.2%          |
| <i>Of which Other contributions</i>   |                    |                    |                    |               |                      |               |                      |               |                    |               |                      |              |                      |               |
| <b>4 MISCELLANEOUS REVENUE</b>  | <b>281 462</b>     | <b>329 351</b>     | <b>329 351</b>     | <b>17.0%</b>  |                      |               |                      |               |                    |               |                      |              |                      |               |
| <b>5 ADMINISTRATIVE OPERATIONS</b>  |                    |                    |                    |               |                      |               |                      |               |                    |               |                      |              |                      |               |
| <b>6 REVENUES FROM SERVICES RENDERED AGAINST PAYMENT</b>                      |                    |                    |                    |               |                      |               |                      |               |                    |               |                      |              |                      |               |
| <b>7 CORRECTION OF BUDGETARY IMBALANCES</b>                                   |                    |                    |                    |               |                      |               |                      |               |                    |               |                      |              |                      |               |
| <b>8 INTERESTS GENERATED</b>  |                    |                    |                    |               |                      |               |                      |               |                    |               |                      |              |                      |               |
| <b>9 UNUSED APPROPRIATIONS FROM PREVIOUS YEARS - CARRIED OVER</b>             | <b>48 589 098</b>  | <b>54 198 963</b>  | <b>54 198 963</b>  | <b>11.5%</b>  |                      |               |                      |               |                    |               |                      |              |                      |               |
| <b>9 BIS UNUSED APPROPRIATIONS FROM PREVIOUS YEARS - MADE AVAILABLE AGAIN</b> |                    | <b>155 192 675</b> | <b>155 192 675</b> |               | <b>444 064 302</b>   |               | <b>3 124 158</b>     |               | <b>118 533 485</b> |               |                      |              |                      |               |
| <b>TOTAL REVENUE</b>  | <b>756 741 483</b> | <b>744 692 716</b> | <b>744 692 716</b> | <b>-1.6%</b>  | <b>1 010 701 033</b> | <b>35.7%</b>  | <b>1 025 953 750</b> | <b>1.5%</b>   | <b>909 665 536</b> | <b>-11.3%</b> | <b>1 502 406 746</b> | <b>65.2%</b> | <b>1 390 773 354</b> | <b>-7.4%</b>  |
| <b>ADDITIONAL REVENUE</b>   | <b>50 234 993</b>  | <b>57 391 638</b>  | <b>57 391 638</b>  | <b>14.2%</b>  | <b>p.m.</b>          |               | <b>p.m.</b>          |               | <b>p.m.</b>        |               | <b>p.m.</b>          |              | <b>p.m.</b>          |               |
| <i>Revenue from ITER Organization</i>   | 30 713 075         | 29 799 595         | 29 799 595         | -3.0%         | <i>p.m</i>           |               | <i>p.m</i>           |               | <i>p.m</i>         |               | <i>p.m</i>           |              | <i>p.m</i>           |               |
| <i>Revenue from ITER Organization carried over</i>                            | 19 173 461         | 27 065 502         | 27 065 502         | 41.2%         |                      |               |                      |               |                    |               |                      |              |                      |               |
| <i>Other Assigned Revenue</i>   |                    |                    |                    |               |                      |               |                      |               |                    |               |                      |              |                      |               |
| <i>Recoveries</i>   | 340 030            | 281 329            | 281 329            | -17.3%        |                      |               |                      |               |                    |               |                      |              |                      |               |
| <i>Recoveries carried over</i>  | 8 427              | 245 213            | 245 213            | 2809.9%       |                      |               |                      |               |                    |               |                      |              |                      |               |
| <b>TOTAL REVENUE AVAILABLE</b>  | <b>806 976 476</b> | <b>802 084 354</b> | <b>802 084 354</b> | <b>-0.6%</b>  | <b>1 010 701 033</b> | <b>26.0%</b>  | <b>1 025 953 750</b> | <b>1.5%</b>   | <b>909 665 536</b> | <b>-11.3%</b> | <b>1 502 406 746</b> | <b>65.2%</b> | <b>1 390 773 354</b> | <b>-7.4%</b>  |

Note 1: the 2024-2029 breakdown is only indicative subject to the outcome of the budget procedure

Note 2: The EU contribution - recovery from previous years operational in 2023 and 2024 corresponds to the regularisation of extraordinary assigned revenue from ITER Organization

**SPD\_table 4 Revenue in Commitment Appropriations for 2023-2029**

**2.3 Estimate of Revenue in Payment Appropriations for next five years**

| REVENUE<br><br>Payment appropriations                             | 2023               | 2024               |   |   |                | 2025               |                | 2026                 |                | 2027                 |                | 2028                 |                | 2029                 |                |
|---|--------------------|--------------------|---|---|----------------|--------------------|----------------|----------------------|----------------|----------------------|----------------|----------------------|----------------|----------------------|----------------|
|   | Execution          | Budget AM2         | Budget AM2<br>(including admin<br>carry over) | Forecast<br>(including admin<br>carry over) | VAR<br>2024/23 | Budget             | VAR<br>2025/24 | Planned needs        | VAR<br>2026/25 | Planned needs        | VAR<br>2027/26 | Planned needs        | VAR<br>2028/27 | Planned needs        | VAR<br>2029/28 |
| <b>1 REVENUE FROM FEES AND CHARGES</b>                            |                    |                    |   |   |                |                    |                |                      |                |                      |                |                      |                |                      |                |
| <b>2. EU CONTRIBUTION</b>   | <b>455 012 774</b> | <b>564 897 902</b> | <b>564 897 902</b>                            | <b>564 897 902</b>                          | <b>24.1%</b>   | <b>635 395 490</b> | <b>12.5%</b>   | <b>896 890 750</b>   | <b>41.2%</b>   | <b>854 114 046</b>   | <b>-4.8%</b>   | <b>897 470 746</b>   | <b>5.1%</b>    | <b>884 897 354</b>   | <b>-1.4%</b>   |
| <i>Administrative (To Title 1 and 2)</i>                          | 65 347 477         | 72 781 757         | 72 781 757                                    | 72 781 757                                  | 11.4%          | 73 213 274         | 0.6%           | 80 390 750           | 9.8%           | 81 714 046           | 1.6%           | 84 270 746           | 3.1%           | 86 897 354           | 3.1%           |
| <i>Operational (To Title 3)</i>                                   | 334 161 525        | 482 391 497        | 482 391 497                                   | 482 391 497                                 | 44.4%          | 560 685 405        | 16.2%          | 816 500 000          | 45.6%          | 772 400 000          | -5.4%          | 813 200 000          | 5.3%           | 798 000 000          | -1.9%          |
| <i>Recovery from previous years administrative</i>                | 726 813            | 957 743            | 957 743                                       | 957 743                                     | 31.8%          | 1 328 726          |                |                      |                |                      |                |                      |                |                      |                |
| <i>Recovery from previous years operational</i>                   | 54 776 959         | 8 766 906          | 8 766 906                                     | 8 766 906                                   | -84.0%         | 168 085            |                |                      |                |                      |                |                      |                |                      |                |
| <b>3 THIRD PARTIES CONTRIBUTION</b>                               | <b>120 700 000</b> | <b>68 200 000</b>  | <b>68 200 000</b>                             | <b>68 200 000</b>                           | <b>-43.5%</b>  | <b>142 200 000</b> | <b>108.5%</b>  | <b>162 400 000</b>   | <b>14.2%</b>   | <b>186 600 000</b>   | <b>14.9%</b>   | <b>166 100 000</b>   | <b>-11.0%</b>  | <b>191 600 000</b>   | <b>15.4%</b>   |
| <i>Of which ITER Host State contribution</i>                      | 113 400 000        | 60 000 000         | 60 000 000                                    | 60 000 000                                  | -47.1%         | 134 000 000        | 123.3%         | 153 500 000          | 14.6%          | 177 600 000          | 15.7%          | 156 800 000          | -11.7%         | 182 000 000          | 16.1%          |
| <i>Of which Membership contribution</i>                           | 7 300 000          | 8 200 000          | 8 200 000                                     | 8 200 000                                   | 12.3%          | 8 200 000          | 0.0%           | 8 900 000            | 8.5%           | 9 000 000            | 1.1%           | 9 300 000            | 3.3%           | 9 600 000            | 3.2%           |
| <i>Of which Other contributions</i>                               |                    |                    |   |   |                |                    |                |                      |                |                      |                |                      |                |                      |                |
| <b>4 MISCELLANEOUS REVENUE</b>                                    | <b>281 462</b>     | <b>329 351</b>     | <b>329 351</b>                                | <b>329 351</b>                              | <b>17.0%</b>   |                    |                |                      |                |                      |                |                      |                |                      |                |
| <b>5 ADMINISTRATIVE OPERATIONS</b>                                |                    |                    |   |   |                |                    |                |                      |                |                      |                |                      |                |                      |                |
| <b>6 REVENUES FROM SERVICES RENDERED AGAINST PAYMENT</b>          |                    |                    |   |   |                |                    |                |                      |                |                      |                |                      |                |                      |                |
| <b>7 CORRECTION OF BUDGETARY IMBALANCES</b>                       |                    |                    |   |   |                |                    |                |                      |                |                      |                |                      |                |                      |                |
| <b>8 INTERESTS GENERATED</b>                                      |                    |                    |   |   |                |                    |                |                      |                |                      |                |                      |                |                      |                |
| <b>9 UNUSED APPROPRIATIONS FROM PREVIOUS YEARS - CARRIED OVER</b> | <b>10 305 332</b>  | <b>1 500 000</b>   | <b>7 179 136</b>                              | <b>7 179 136</b>                            | <b>-85.4%</b>  |                    |                |                      |                |                      |                |                      |                |                      |                |
| <b>TOTAL REVENUE</b>  | <b>586 299 568</b> | <b>634 927 254</b> | <b>640 606 390</b>                            | <b>640 606 390</b>                          | <b>8.3%</b>    | <b>777 595 490</b> | <b>22.5%</b>   | <b>1 059 290 750</b> | <b>36.2%</b>   | <b>1 040 714 046</b> | <b>-1.8%</b>   | <b>1 063 570 746</b> | <b>2.2%</b>    | <b>1 076 497 354</b> | <b>1.2%</b>    |
| <b>ADDITIONAL REVENUE</b>   | <b>45 235 556</b>  | <b>49 735 516</b>  | <b>49 735 516</b>                             | <b>49 735 516</b>                           | <b>9.9%</b>    | <b>p.m.</b>        |                | <b>p.m.</b>          |                | <b>p.m.</b>          |                | <b>p.m.</b>          |                | <b>p.m.</b>          |                |
| <i>Revenue from ITER Organization</i>                             | 26 979 145         | 32 774 872         | 32 774 872                                    | 32 774 872                                  | 21.5%          | p.m.               |                | p.m.                 |                | p.m.                 |                | p.m.                 |                | p.m.                 |                |
| <i>Revenue from ITER Organization carried over</i>                | 17 107 255         | 16 263 115         | 16 263 115                                    | 16 263 115                                  | -4.9%          |                    |                |                      |                |                      |                |                      |                |                      |                |
| <i>Other Assigned Revenue</i>                                     | 736 528            | 388 991            | 388 991                                       | 388 991                                     | -47.2%         |                    |                |                      |                |                      |                |                      |                |                      |                |
| <i>Recoveries</i>   | 340 030            | 281 329            | 281 329                                       | 281 329                                     | -17.3%         |                    |                |                      |                |                      |                |                      |                |                      |                |
| <i>Recoveries carried over</i>                                    | 72 597             | 27 208             | 27 208  | 27 208                                      | -62.5%         |                    |                |                      |                |                      |                |                      |                |                      |                |
| <b>TOTAL REVENUE AVAILABLE</b>                                    | <b>631 535 124</b> | <b>684 662 769</b> | <b>690 341 905</b>                            | <b>690 341 905</b>                          | <b>8.4%</b>    | <b>777 595 490</b> | <b>13.6%</b>   | <b>1 059 290 750</b> | <b>36.2%</b>   | <b>1 040 714 046</b> | <b>-1.8%</b>   | <b>1 063 570 746</b> | <b>2.2%</b>    | <b>1 076 497 354</b> | <b>1.2%</b>    |

Note 1: The 2024-2029 breakdown is only indicative subject to the outcome of the budget procedure.

Note 2: The EU contribution - recovery from previous years operational in 2023 corresponds to the recovery of the outturn plus the regularisation of extraordinary assigned revenue from ITER Organization

Note 3: The ITER Host State contribution for 2026 foresees the remaining reimbursement of the 2024 cut (61.4 Meur as 5 Meur is already foreseen in 2025)

**SPD\_table 5 Revenue in Payment Appropriations for 2023-2029**

2.4 Expenditure in Commitment Appropriations for next five years

| EXPENDITURE<br>In Commitment Appropriations (EUR)                 | 2023               | 2024               |                    |              | 2025                 |               | 2026                 |               | 2027               |               | 2028                 |               | 2029                 |               |
|---|--------------------|--------------------|--------------------|--------------|----------------------|---------------|----------------------|---------------|--------------------|---------------|----------------------|---------------|----------------------|---------------|
|   | Execution          | Budget AM2         | Forecast           | VAR 2024/23  | Budget               | VAR 2025/24   | Planned needs        | VAR 2026/25   | Planned needs      | VAR 2027/26   | Planned needs        | VAR 2028/27   | Planned needs        | VAR 2029/28   |
| <b>Total Title 1 &amp; Title 2<br/>Administrative Expenditure</b> | <b>73 143 712</b>  | <b>81 954 032</b>  | <b>78 663 500</b>  | <b>12.0%</b> | <b>82 742 000</b>    | <b>1.0%</b>   | <b>89 290 750</b>    | <b>7.9%</b>   | <b>90 714 046</b>  | <b>1.6%</b>   | <b>93 570 746</b>    | <b>3.1%</b>   | <b>96 497 354</b>    | <b>3.1%</b>   |
| <b>Title 1<br/>Staff Expenditure</b>                              | <b>62 658 207</b>  | <b>70 551 000</b>  | <b>66 507 500</b>  | <b>12.6%</b> | <b>71 198 000</b>    | <b>0.9%</b>   | <b>75 023 750</b>    | <b>5.4%</b>   | <b>76 162 046</b>  | <b>1.5%</b>   | <b>78 727 746</b>    | <b>3.4%</b>   | <b>81 356 354</b>    | <b>3.3%</b>   |
| Salaries & allowances   | 55 445 404         | 62 380 000         | 58 393 000         | 12.5%        | 62 793 000           | 0.7%          | 66 152 000           | 5.3%          | 67 112 046         | 1.5%          | 69 496 746           | 3.6%          | 71 940 354           | 3.5%          |
| Establishment plan posts  | 42 382 697         | 49 470 000         | 45 077 000         | 16.7%        | 48 811 000           | -1.3%         | 51 023 000           | 4.5%          | 52 129 224         | 2.2%          | 54 075 918           | 3.7%          | 56 069 725           | 3.7%          |
| External staff  | 13 062 707         | 12 910 000         | 13 316 000         | -1.2%        | 13 982 000           | 8.3%          | 15 129 000           | 8.2%          | 14 982 822         | -1.0%         | 15 420 828           | 2.9%          | 15 870 629           | 2.9%          |
| Expenditure relating to Staff recruitment                         | 721 898            | 964 000            | 908 000            | 33.5%        | 980 000              | 1.7%          | 972 750              | -0.7%         | 992 000            | 2.0%          | 1 012 000            | 2.0%          | 1 032 000            | 2.0%          |
| Mission expenses  | 800 000            | 650 000            | 1 200 000          | -18.8%       | 663 000              | 2.0%          | 800 000              | 20.7%         | 816 000            | 2.0%          | 832 000              | 2.0%          | 849 000              | 2.0%          |
| Socio-medical infrastructure                                      | 601 990            | 592 000            | 649 500            | -1.7%        | 604 000              | 2.0%          | 827 000              | 36.9%         | 844 000            | 2.1%          | 861 000              | 2.0%          | 878 000              | 2.0%          |
| Training  | 850 000            | 807 000            | 937 000            | -5.1%        | 818 000              | 1.4%          | 900 000              | 10.0%         | 918 000            | 2.0%          | 936 000              | 2.0%          | 955 000              | 2.0%          |
| External Services   | 630 000            | 800 000            | 662 000            | 27.0%        | 816 000              | 2.0%          | 783 000              | -4.0%         | 799 000            | 2.0%          | 815 000              | 2.0%          | 831 000              | 2.0%          |
| Receptions, events and representation                             | 2 500              | 5 000              | 5 000              | 100.0%       | 5 000                | 0.0%          | 5 000                | 0.0%          | 5 000              | 0.0%          | 5 000                | 0.0%          | 5 000                | 0.0%          |
| Social welfare  | 61 520             | 60 000             | 77 000             | -2.5%        | 61 000               | 1.7%          | 90 000               | 47.5%         | 92 000             | 2.2%          | 94 000               | 2.2%          | 96 000               | 2.1%          |
| Other Staff related expenditure                                   | 3 544 895          | 4 293 000          | 3 676 000          | 21.1%        | 4 458 000            | 3.8%          | 4 494 000            | 0.8%          | 4 584 000          | 2.0%          | 4 676 000            | 2.0%          | 4 770 000            | 2.0%          |
| <b>Title 2<br/>Infrastructure and operating expenditure</b>       | <b>10 485 506</b>  | <b>11 403 032</b>  | <b>12 156 000</b>  | <b>8.8%</b>  | <b>11 544 000</b>    | <b>1.2%</b>   | <b>14 267 000</b>    | <b>23.6%</b>  | <b>14 552 000</b>  | <b>2.0%</b>   | <b>14 843 000</b>    | <b>2.0%</b>   | <b>15 141 000</b>    | <b>2.0%</b>   |
| Rental of buildings and associated costs                          | 1 881 624          | 2 056 001          | 1 944 000          | 9.3%         | 2 098 000            | 2.0%          | 2 585 000            | 23.2%         | 2 637 000          | 2.0%          | 2 690 000            | 2.0%          | 2 744 000            | 2.0%          |
| Information, communication technology and data proc.              | 5 238 282          | 5 235 000          | 6 412 000          | -0.1%        | 5 350 000            | 2.2%          | 6 805 000            | 27.2%         | 6 941 000          | 2.0%          | 7 080 000            | 2.0%          | 7 222 000            | 2.0%          |
| Movable property and associated costs                             | 220 740            | 460 000            | 260 000            | 108.4%       | 461 000              | 0.2%          | 411 000              | -10.8%        | 419 000            | 1.9%          | 427 000              | 1.9%          | 436 000              | 2.1%          |
| Current administrative expenditure                                | 1 783 912          | 2 113 500          | 2 268 000          | 18.5%        | 2 155 000            | 2.0%          | 2 876 500            | 33.5%         | 2 934 000          | 2.0%          | 2 993 000            | 2.0%          | 3 053 000            | 2.0%          |
| Postage / Telecommunications                                      | 571 422            | 639 000            | 543 000            | 11.8%        | 584 000              | -8.6%         | 636 000              | 8.9%          | 649 000            | 2.0%          | 662 000              | 2.0%          | 675 000              | 2.0%          |
| Meeting expenses  | 589 120            | 576 000            | 427 500            | -2.2%        | 587 000              | 1.9%          | 644 500              | 9.8%          | 657 000            | 1.9%          | 670 000              | 2.0%          | 683 000              | 1.9%          |
| Running costs linked to operational activities                    |                    | 14 531             |                    |              |                      |               |                      |               |                    |               |                      |               |                      |               |
| Information and publishing  | 13 000             | 40 000             | 32 500             | 207.7%       | 40 000               | 0.0%          | 40 000               | 0.0%          | 41 000             | 2.5%          | 42 000               | 2.4%          | 43 000               | 2.4%          |
| Studies   |                    |                    |                    |              |                      |               |                      |               |                    |               |                      |               |                      |               |
| Other infrastructure and operating expenditure                    | 187 406            | 269 000            | 269 000            | 43.5%        | 269 000              | 0.0%          | 269 000              | 0.0%          | 274 000            | 1.9%          | 279 000              | 1.8%          | 285 000              | 2.2%          |
| <b>Total Title 3 &amp; Title 4<br/>Operational Expenditure</b>    | <b>513 033 978</b> | <b>720 130 322</b> | <b>674 398 635</b> | <b>40.4%</b> | <b>927 959 033</b>   | <b>28.9%</b>  | <b>936 663 000</b>   | <b>0.9%</b>   | <b>818 951 490</b> | <b>-12.6%</b> | <b>1 408 836 000</b> | <b>72.0%</b>  | <b>1 294 276 000</b> | <b>-8.1%</b>  |
| <b>Title 3<br/>Operational expenditure</b>                        | <b>389 079 729</b> | <b>519 793 108</b> | <b>523 083 640</b> | <b>33.6%</b> | <b>849 186 097</b>   | <b>63.4%</b>  | <b>766 993 000</b>   | <b>-9.7%</b>  | <b>691 551 490</b> | <b>-9.8%</b>  | <b>1 150 626 000</b> | <b>66.4%</b>  | <b>1 066 161 000</b> | <b>-7.3%</b>  |
| ITER construction including site preparation                      | 326 585 852        | 451 893 108        | 455 183 640        | 38.4%        | 738 741 547          | 63.5%         | 668 453 688          | -9.5%         | 613 301 740        | -8.3%         | 1 024 627 480        | 67.1%         | 896 595 000          | -12.5%        |
| Technology for ITER and DEMO                                      | 3 899 736          | 7 500 000          | 7 500 000          | 92.3%        | 17 137 970           | 128.5%        | 13 339 312           | -22.2%        | 16 549 750         | 24.1%         | 22 498 520           | 35.9%         | 35 966 001           | 59.9%         |
| Technology for Broader Approach                                   | 32 798 899         | 23 400 000         | 23 400 000         | -28.7%       | 56 319 280           | 140.7%        | 23 500 000           | -58.3%        | 10 300 000         | -56.2%        | 43 100 000           | 318.4%        | 65 500 000           | 52.0%         |
| Technology for DONES  | 0                  | 2 000 000          | 2 000 000          |              | 11 275 850           | 463.8%        | 33 700 000           | 198.9%        | 23 400 000         | -30.6%        | 31 900 000           | 36.3%         | 39 600 000           | 24.1%         |
| External Support Activities                                       | 20 275 776         | 29 000 000         | 29 000 000         | 43.0%        | 19 611 450           | -32.4%        | 22 000 000           | 12.2%         | 22 000 000         | 0.0%          | 22 500 000           | 2.3%          | 22 500 000           | 0.0%          |
| Other Operational Expenditure                                     | 5 519 466          | 6 000 000          | 6 000 000          | 8.7%         | 6 100 000            | 1.7%          | 6 000 000            | -1.6%         | 6 000 000          | 0.0%          | 6 000 000            | 0.0%          | 6 000 000            | 0.0%          |
| <b>Title 4<br/>Earmarked Expenditure</b>                          | <b>123 954 249</b> | <b>200 337 214</b> | <b>151 314 995</b> | <b>61.6%</b> | <b>78 772 936</b>    | <b>-60.7%</b> | <b>169 670 000</b>   | <b>115.4%</b> | <b>127 400 000</b> | <b>-24.9%</b> | <b>258 210 000</b>   | <b>102.7%</b> | <b>228 115 000</b>   | <b>-11.7%</b> |
| ITER construction- from ITER host state contribution              | 109 511 279        | 143 472 118        | 143 472 118        | 31.0%        | 78 772 936           | -45.1%        | 169 670 000          | 115.4%        | 127 400 000        | -24.9%        | 258 210 000          | 102.7%        | 228 115 000          | -11.7%        |
| Tasks from ITER Organization                                      | 14 442 970         | 56 865 096         | 7 842 877          | 293.7%       |                      | p.m.          |                      | p.m.          |                    | p.m.          |                      |               |                      | p.m.          |
| Other Earmarked expenditure                                       |                    |                    |                    |              |                      |               |                      |               |                    |               |                      |               |                      |               |
| <b>TOTAL EXPENDITURE</b>  | <b>586 177 690</b> | <b>802 084 354</b> | <b>753 062 135</b> | <b>36.8%</b> | <b>1 010 701 033</b> | <b>26.0%</b>  | <b>1 025 953 750</b> | <b>1.5%</b>   | <b>909 665 536</b> | <b>-11.3%</b> | <b>1 502 406 746</b> | <b>65.2%</b>  | <b>1 390 773 354</b> | <b>-7.4%</b>  |

SPD\_table 6 Expenditure in Commitment Appropriations for 2023-2029



2.5 Expenditure in Payment Appropriations for next five years

| EXPENDITURE<br>In Payment Appropriations (EUR)                    | 2023               |                    | 2024  |  |                | 2025               |                | 2026                 |                | 2027                 |                | 2028                 |                | 2029                 |                |
|---|--------------------|--------------------|---|--|----------------|--------------------|----------------|----------------------|----------------|----------------------|----------------|----------------------|----------------|----------------------|----------------|
|   | Execution (1)      | Budget AM2         | Budget AM2<br>(including admin<br>carry over) | Forecast<br>(including<br>admin carry<br>over) | VAR<br>2024/23 | Budget             | VAR<br>2025/24 | Planned needs        | VAR<br>2026/25 | Planned needs        | VAR<br>2027/26 | Planned needs        | VAR<br>2028/27 | Planned needs        | VAR<br>2029/28 |
| <b>Total Title 1 &amp; Title 2<br/>Administrative Expenditure</b> | <b>73 068 513</b>  | <b>81 954 032</b>  | <b>87 633 168</b>                             | <b>84 342 636</b>                              | <b>12.2%</b>   | <b>82 742 000</b>  | <b>1.0%</b>    | <b>89 290 750</b>    | <b>7.9%</b>    | <b>90 714 046</b>    | <b>1.6%</b>    | <b>93 570 746</b>    | <b>3.1%</b>    | <b>96 497 354</b>    | <b>3.1%</b>    |
| <b>Title 1<br/>Staff Expenditure</b>                              | <b>63 686 160</b>  | <b>70 551 000</b>  | <b>72 543 054</b>                             | <b>68 499 554</b>                              | <b>10.8%</b>   | <b>71 198 000</b>  | <b>0.9%</b>    | <b>75 023 750</b>    | <b>5.4%</b>    | <b>76 162 046</b>    | <b>1.5%</b>    | <b>78 727 746</b>    | <b>3.4%</b>    | <b>81 356 354</b>    | <b>3.3%</b>    |
| Salaries & allowances   | 57 313 449         | 62 380 000         | 62 627 003                                    | 58 640 003                                     | 8.8%           | 62 793 000         | 0.7%           | 66 152 000           | 5.3%           | 67 112 046           | 1.5%           | 69 496 746           | 3.6%           | 71 940 354           | 3.5%           |
| Establishment plan posts  | 43 852 313         | 49 470 000         | 49 560 000                                    | 45 167 000                                     | 12.8%          | 48 811 000         | -1.3%          | 51 023 000           | 4.5%           | 52 129 224           | 2.2%           | 54 075 918           | 3.7%           | 56 069 725           | 3.7%           |
| External staff  | 13 461 136         | 12 910 000         | 13 067 003                                    | 13 473 003                                     | -4.1%          | 13 982 000         | 8.3%           | 15 129 000           | 8.2%           | 14 982 822           | -1.0%          | 15 420 828           | 2.9%           | 15 870 629           | 2.9%           |
| Expenditure relating to Staff recruitment                         | 705 057            | 964 000            | 1 001 327                                     | 945 327  | 36.7%          | 980 000            | 1.7%           | 972 750              | -0.7%          | 992 000              | 2.0%           | 1 012 000            | 2.0%           | 1 032 000            | 2.0%           |
| Mission expenses  | 786 921            | 650 000            | 727 506                                       | 1 277 506                                      | -17.4%         | 663 000            | 2.0%           | 800 000              | 20.7%          | 816 000              | 2.0%           | 832 000              | 2.0%           | 849 000              | 2.0%           |
| Socio-medical infrastructure                                      | 609 811            | 592 000            | 753 788                                       | 811 288  | -2.9%          | 604 000            | 2.0%           | 827 000              | 36.9%          | 844 000              | 2.1%           | 861 000              | 2.0%           | 878 000              | 2.0%           |
| Training  | 586 563            | 807 000            | 1 412 940                                     | 1 542 940                                      | 37.6%          | 818 000            | 1.4%           | 900 000              | 10.0%          | 918 000              | 2.0%           | 936 000              | 2.0%           | 955 000              | 2.0%           |
| External Services   | 676 836            | 800 000            | 906 577                                       | 768 577  | 18.2%          | 816 000            | 2.0%           | 783 000              | -4.0%          | 799 000              | 2.0%           | 815 000              | 2.0%           | 831 000              | 2.0%           |
| Receptions, events and representation                             | 1 152              | 5 000              | 6 348   | 6 348  | 334.2%         | 5 000              | 0.0%           | 5 000                | 0.0%           | 5 000                | 0.0%           | 5 000                | 0.0%           | 5 000                | 0.0%           |
| Social welfare  | 60 852             | 60 000             | 70 664  | 87 664   | -1.4%          | 61 000             | 1.7%           | 90 000               | 47.5%          | 92 000               | 2.2%           | 94 000               | 2.2%           | 96 000               | 2.1%           |
| Other Staff related expenditure                                   | 2 945 520          | 4 293 000          | 5 036 900                                     | 4 419 900                                      | 45.7%          | 4 458 000          | 3.8%           | 4 494 000            | 0.8%           | 4 584 000            | 2.0%           | 4 676 000            | 2.0%           | 4 770 000            | 2.0%           |
| <b>Title 2<br/>Infrastructure and operating expenditure</b>       | <b>9 382 352</b>   | <b>11 403 032</b>  | <b>15 090 114</b>                             | <b>15 843 082</b>                              | <b>21.5%</b>   | <b>11 544 000</b>  | <b>1.2%</b>    | <b>14 267 000</b>    | <b>23.6%</b>   | <b>14 552 000</b>    | <b>2.0%</b>    | <b>14 843 000</b>    | <b>2.0%</b>    | <b>15 141 000</b>    | <b>2.0%</b>    |
| Rental of buildings and associated costs                          | 1 794 246          | 2 056 001          | 2 615 500                                     | 2 503 499                                      | 14.6%          | 2 098 000          | 2.0%           | 2 585 000            | 23.2%          | 2 637 000            | 2.0%           | 2 690 000            | 2.0%           | 2 744 000            | 2.0%           |
| Information, communication technology and data proc.              | 4 656 909          | 5 235 000          | 7 106 633                                     | 8 283 633                                      | 12.4%          | 5 350 000          | 2.2%           | 6 805 000            | 27.2%          | 6 941 000            | 2.0%           | 7 080 000            | 2.0%           | 7 222 000            | 2.0%           |
| Movable property and associated costs                             | 127 854            | 460 000            | 603 894                                       | 403 894  | 259.8%         | 461 000            | 0.2%           | 411 000              | -10.8%         | 419 000              | 1.9%           | 427 000              | 1.9%           | 436 000              | 2.1%           |
| Current administrative expenditure                                | 1 681 068          | 2 113 500          | 2 716 381                                     | 2 870 881                                      | 25.7%          | 2 155 000          | 2.0%           | 2 876 500            | 33.5%          | 2 934 000            | 2.0%           | 2 993 000            | 2.0%           | 3 053 000            | 2.0%           |
| Postage / Telecommunications                                      | 471 016            | 639 000            | 830 343                                       | 734 343  | 35.7%          | 584 000            | -8.6%          | 636 000              | 8.9%           | 649 000              | 2.0%           | 662 000              | 2.0%           | 675 000              | 2.0%           |
| Meeting expenses  | 466 083            | 576 000            | 816 564                                       | 668 064  | 23.6%          | 587 000            | 1.9%           | 644 500              | 9.8%           | 657 000              | 1.9%           | 670 000              | 2.0%           | 683 000              | 1.9%           |
| Running costs linked to operational activities                    | 0                  | 14 531             | 14 531  | 0  |                |                    |                |                      |                |                      |                |                      |                |                      |                |
| Information and publishing  | 8 813              | 40 000             | 44 193  | 36 693   | 353.9%         | 40 000             | 0.0%           | 40 000               | 0.0%           | 41 000               | 2.5%           | 42 000               | 2.4%           | 43 000               | 2.4%           |
| Studies   | 0                  | 0                  | 0   | 0  |                |                    |                |                      |                |                      |                |                      |                |                      |                |
| Other infrastructure and operating expenditure                    | 176 363            | 269 000            | 342 075                                       | 342 075  | 52.5%          | 269 000            | 0.0%           | 269 000              | 0.0%           | 274 000              | 1.9%           | 279 000              | 1.8%           | 285 000              | 2.2%           |
| <b>Total Title 3 &amp; Title 4<br/>Operational Expenditure</b>    | <b>524 641 156</b> | <b>602 708 737</b> | <b>602 708 737.48</b>                         | <b>562 961 282</b>                             | <b>14.9%</b>   | <b>694 853 490</b> | <b>15.3%</b>   | <b>970 000 000</b>   | <b>39.6%</b>   | <b>950 000 000</b>   | <b>-2.1%</b>   | <b>970 000 000</b>   | <b>2.1%</b>    | <b>980 000 000</b>   | <b>1.0%</b>    |
| <b>Title 3<br/>Operational expenditure</b>                        | <b>389 729 474</b> | <b>491 781 759</b> | <b>491 781 759</b>                            | <b>495 072 291</b>                             | <b>26.2%</b>   | <b>560 853 490</b> | <b>14.0%</b>   | <b>816 500 000</b>   | <b>45.6%</b>   | <b>772 400 000</b>   | <b>-5.4%</b>   | <b>813 200 000</b>   | <b>5.3%</b>    | <b>798 000 000</b>   | <b>-1.9%</b>   |
| ITER construction including site preparation                      | 339 444 126        | 432 769 083        | 432 769 083                                   | 436 059 614                                    | 27.5%          | 480 093 490        | 10.9%          | 739 500 000          | 54.0%          | 697 400 000          | -5.7%          | 686 700 000          | -1.5%          | 678 500 000          | -1.2%          |
| Technology for ITER and DEMO                                      | 3 379 134          | 3 700 000          | 3 700 000                                     | 3 700 000                                      | 9.5%           | 9 130 000          | 146.8%         | 12 000 000           | 31.4%          | 8 000 000            | -33.3%         | 16 000 000           | 100.0%         | 29 000 000           | 81.3%          |
| Technology for Broader approach                                   | 23 799 270         | 23 300 000         | 23 300 000                                    | 23 300 000                                     | -2.1%          | 40 580 000         | 74.2%          | 27 000 000           | -33.5%         | 12 000 000           | -55.6%         | 74 000 000           | 516.7%         | 37 000 000           | -50.0%         |
| Technology for DONES  |                    | 2 000 000          | 2 000 000                                     | 2 000 000                                      |                | 4 050 000          | 102.5%         | 10 000 000           | 146.9%         | 27 000 000           | 170.0%         | 8 000 000            | -70.4%         | 25 000 000           | 212.5%         |
| External Support Activities                                       | 17 841 112         | 25 000 000         | 25 000 000                                    | 25 000 000                                     | 40.1%          | 22 000 000         | -12.0%         | 22 000 000           | 0.0%           | 22 000 000           | 0.0%           | 22 500 000           | 2.3%           | 22 500 000           | 0.0%           |
| Other Operational Expenditure                                     | 5 265 832          | 5 012 677          | 5 012 677                                     | 5 012 677                                      | -4.8%          | 5 000 000          | -0.3%          | 6 000 000            | 20.0%          | 6 000 000            | 0.0%           | 6 000 000            | 0.0%           | 6 000 000            | 0.0%           |
| <b>Title 4<br/>Earmarked expenditure</b>                          | <b>134 911 682</b> | <b>110 926 978</b> | <b>110 926 978</b>                            | <b>67 888 991</b>                              | <b>-17.8%</b>  | <b>134 000 000</b> | <b>20.8%</b>   | <b>153 500 000</b>   | <b>14.6%</b>   | <b>177 600 000</b>   | <b>15.7%</b>   | <b>156 800 000</b>   | <b>-11.7%</b>  | <b>182 000 000</b>   | <b>16.1%</b>   |
| ITER construction- from ITER host state contribution              | 115 279 263        | 61 500 000         | 61 500 000                                    | 61 500 000                                     | -46.7%         | 134 000 000        | 117.9%         | 153 500 000          | 14.6%          | 177 600 000          | 15.7%          | 156 800 000          | -11.7%         | 182 000 000          | 16.1%          |
| Tasks from ITER Organization                                      | 19 284 883         | 49 037 987         | 49 037 987                                    | 6 000 000                                      | 154.3%         | p.m.               |                | p.m.                 |                | p.m.                 |                |                      |                | p.m.                 |                |
| Other Earmarked expenditure                                       | 347 536            | 388 991            | 388 991                                       | 388 991  | 11.9%          |                    |                |                      |                |                      |                |                      |                |                      |                |
| <b>TOTAL EXPENDITURE</b>  | <b>597 709 669</b> | <b>684 662 769</b> | <b>690 341 905.37</b>                         | <b>647 303 918</b>                             | <b>14.5%</b>   | <b>777 595 490</b> | <b>13.6%</b>   | <b>1 059 290 750</b> | <b>36.2%</b>   | <b>1 040 714 046</b> | <b>-1.8%</b>   | <b>1 063 570 746</b> | <b>2.2%</b>    | <b>1 076 497 354</b> | <b>1.2%</b>    |

(1) including execution on administrative carry over

SPD\_table 7 Expenditure in Payment Appropriations for 2023-2029

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# HUMAN RESOURCE ESTIMATES PLAN

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## HUMAN RESOURCES – OUTLOOK FOR 2025-2029

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### Recruitment policy

The Fusion for Energy personnel structure consists of EU Officials, Temporary Agents and Contract Agents.

All F4E recruitments are consistent with article 53 of the Condition of Employment of Other Servants for Temporary Agents and article 80 of Condition of Employment of Other Servants for Contract Agents, as well as their Model Decision on the engagement and use of Temporary staff under article 2.f.

The tasks related to the operational mission of F4E require highly specialised profiles especially in the core areas related to the ITER and Broader Approach projects. This is also true for many of the staff working in the support functions as the project complexity and amount of capital involved are considerable.

EU Officials (FO) and Temporary Agents (TA) may be recruited under two function groups:

- Administrator (AD) profiles for senior and non-senior technical/legal/financial/procurement officers, contract managers, etc.
- Assistant (AST) profiles for senior and non-senior assistant positions.

Contract Agents (CA) work under the supervision of EU Officials and/or Temporary Agents and may be recruited under four function groups (from FGI to FGIV). However, F4E typically recruits the majority of its contract agents at the level of:

- FGII, who are in charge of clerical and secretarial tasks;
- FGIII, who are in charge of administrative and financial tasks in various support and operational units (e.g. Team Assistants); and
- FGIV, who are mainly specialized technical staff (e.g. Technical Support Officers, Project Management Support Officers) and qualified specialists in administrative fields (e.g. human resources, procurement, project management, legal, finance, etc.).

In terms of contract duration, F4E distinguishes between (1) long-term and (2) short-term employment contracts as follows:

1. Long-term employment

**EU Officials (FO)** – appointed by F4E from reserve lists or transferred from other EU institutions.

**Temporary Agents (TA)** - recruited on five-year renewable contracts which can be extended once for another period of five years and which are then followed by an indefinite duration contract if extended beyond the end of the first extension. The employment contract of the F4E Director falls under the short-term category as it cannot be extended more than once and is hence limited to a maximum period of two consecutive 5 year periods.

**Contract Agents (CA)** - recruited on a three-year renewable contract which can be extended once for a further period of four years, and which is then followed by an indefinite duration contract if extended beyond the end of the first extension.

Following the request from Fusion for Energy for staff reinforcement in the Strategic Resource Plan 2021-2027, the Commission has granted 10 new Temporary Agents positions and 15 conversions of Contract Agent posts into Temporary Agents posts. This reinforcement is effective from 2023 and must be followed by a reduction of 15 FTEs (9 Temporary Agents and 6 Contract Agents) before 2027. In addition, the Commission accepted the conversion of 5 CA FGII into 5 CA FGIII.

## 2. Short-term employment.

Following the agreement between F4E and the Commission to reinforce the F4E staff from 2023, out of the existing 31 short-term posts at the end of 2022, 16 were converted in long-term posts.

As part of the reinforcement agreement, F4E is to return 15 posts by 31 December 2026. The offset may come from the remaining 15 short-term posts.

Fusion for Energy may also employ **Seconded National Experts (SNE)**. These are seconded to F4E for an initial maximum period of two years, renewable for another period of two years and up to a total maximum period of four years. SNEs are paid by the seconding organisation (although F4E may reimburse the annual emoluments to the seconding organisation) and receive a daily allowance and monthly allowance paid for by F4E.

|                | Staff population and its evolution, overview of all categories of staff |                                  |                                 |                                  |                   |                   |                   |                   |                   |                   |
|----------------|---|----------------------------------|---------------------------------|----------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
|                | Authorised under 2022 EU budget   | Actually filled as of 31.12.2022 | Authorised under 2023 EU budget | Actually filled as of 31.12.2023 | Requested in 2024 | Envisaged in 2025 | Envisaged in 2026 | Envisaged in 2027 | Envisaged in 2028 | Envisaged in 2029 |
| Subtotal FO/TA | 280   | 269                              | 305                             | 272                              | 305               | 305               | 305               | 296               | 296               | 296               |
| Subtotal CA    | 170   | 164                              | 155                             | 157                              | 155               | 155               | 155               | 149               | 149               | 149               |
| Subtotal SNE   | 7   | 3                                | 7                               | 5                                | 7                 | 7                 | 7                 | 7                 | 7                 | 7                 |
| TOTAL          | 457   | 436                              | 467                             | 434                              | 467               | 467               | 467               | 452               | 452               | 452               |

**SPD\_table 8. Overview of staff population and its evolution**

The staff numbers indicated in the above table for the years 2025-2029 are subject to the outcome of the respective budgetary procedures as well as the outcome of the discussions on the next Multiannual Financial Framework.

For a more detailed view on staff see HR\_table 01 of the annexes to HR REP.

## Section IV. Work Programme 2025

This Work Programme 2025 offers an overview of the objectives of the European Joint Undertaking for ITER and the Development of Fusion Energy (F4E) for 2025 and also identifies the financial decisions for the actions that are planned to be carried out in 2025 with the available budget.

It covers the work on both ITER and Broader Approach (BA) according to the tasks entrusted to the organisation.

The WP2025 objectives, the main milestones and the allocation of the human resources provide a good idea of the complexity of the tasks to be carried throughout the year and of the technical challenges they entail.

The table below provides a quick overview of the expected results in 2025 in terms of achieved credit for ITER in kind deliveries.

|               | Action*                               | Baseline to end March 2024 (kIUA) | Achieved Credit (kIUA) | Released Credit (kIUA) | 2025            |
|---------------|---------------------------------------|-----------------------------------|------------------------|------------------------|-----------------|
| <b>Number</b> | <b>Name</b>                           | <b>821.77233</b>                  | <b>698.83100</b>       | <b>589.51928</b>       | <b>48.59279</b> |
| Action 1      | Magnets                               | 185.87481                         | 177.92581              | 162.71281              | 0.00000         |
| Action 2      | Vacuum Vessel                         | 86.26629                          | 70.03147               | 47.01400               | 3.75247         |
| Action 3      | In Vessel- Blanket                    | 1.10000                           | 0.50000                | 0.20000                | 0.45000         |
| Action 4      | In Vessel- Divertor                   | 3.70000                           | 3.70000                | 3.62000                | 0.00000         |
| Action 5      | Remote Handling                       | 16.68974                          | 5.50000                | 2.90000                | 4.70000         |
| Action 6      | Cryoplant and Fuel Cycle              | 40.97830                          | 31.60009               | 29.17033               | 2.72957         |
| Action 8      | Heating & Current Drive               | 65.81075                          | 50.03240               | 44.26240               | 9.31851         |
| Action 9      | Diagnostics                           | 10.78767                          | 6.62055                | 4.41102                | 2.26333         |
| Action 11     | Site and Buildings and Power Supplies | 410.56478                         | 352.92068              | 295.22872              | 25.37891        |

\* Action 7 Plasma Engineering & Operations, action 10 TBM, action 12 Cash Contributions, action 13 Technical Support Activities, action 15 DONES and action 16 Technology Development Programme are not listed in the above table since no kIUA are associated to these actions. Action 14 Broader Approach uses kBAUA instead of kIUA (see full table under PP\_table 8).

### ***SPD\_table 9<sup>17</sup>: Expected 2025 results in terms of discharge of Euratom obligations to ITER (status: end of March 2024)***

<sup>17</sup> **Achieved credits** corresponds to milestones completed by F4E. **Released credits** corresponds to milestones for which F4E received the associated credits (in IUA) from IO.

Figures in column **Baseline** correspond to "Total credits initially planned to be achieved at the end of March 2024",

Figures in column **Achieved Credit** correspond to "Total achieved credits at the end of March 2024".

Figures in column **Released Credit** correspond to "Total released credits at the end of March 2024".

Figures in column **2025** correspond to the "Credits to be achieved in year 2025".

## WP2025 Executive summary

The work programme 2025 is mostly focused on the following activities (FP-relevant areas are shown):

- **Magnets (FP):** The Magnets Programme has delivered all its contribution to the ITER Project and the remaining activities consist in closing the contracts and handing over the ITER workshop (B55) to IO. In 2025, the Magnets Programme may finalise the remaining amendments and potential claims.
- **Vacuum Vessel (FP):** No major contracts remain to be signed and the manufacturing activities are finalizing completion. Sector 4 is currently scheduled to be completed in 2025. This date takes into account the need to repair its Field Joints after completion of all welding activities and FAT. Note that in order to ensure schedule adherence, contain costs, and minimize first-of-a-kind activities, F4E together with IO reached the agreement that only one side of Sector 4 will be machined at Walter Tosto while the other side will be repaired at IO. Commitments for the transportation of sectors to Cadarache and for the repairs of the field joints of Sector 9 will be signed with the main contractor. Furthermore, extensions, modifications or amendments to the existing contract and arrangements, including possible continuation of incentive schemes, may have to be signed. Also, Specific Contracts for support activities, like Inspectors, Documentation Support, Engineering and Analysis, Project Management support and Experts will continue to be issued depending on the project needs.
- **In-Vessel [Blanket System and Divertor]:**

### Blanket Systems

The WP2025 has been prepared considering the current information on the potential changes coming from ITER project baseline, mainly due to the change in the First Wall armour material from Be to W and acceleration actions for the components requested to be installed for the Augmented First Plasma. Impacts from the new ITER baseline are under analysis and may lead to modifications or additional commitments and are not yet included in this document.

For the Blanket First Wall, after the decision to discontinue the Be activities through a PA change notice in 2023, the signature of the specific contracts after first re-opening of competition is planned in 2025. Activities related to the manufacturing of non-Beryllium parts will be continued under current contractual configuration. Additional commitments related to the development and qualification of the new armor design may be executed in 2025 following the IO qualification plan.

For the Blanket Cooling Manifolds, 2025 will be focused on the finalization of the qualification and manufacturing activities of the 1st batch of pipe bundles under the Task 1 of the framework contract F4E-OMF-1080, material deliveries under Task 8, and start of the specific contract for the chimney pipes (Task 3). Task 5, upper ports, and Task 6, branch pipes and co-axial connectors, are planned to be signed in 2025.

### Divertor Systems:

For the Divertor Cassette Body (CB) project, the main activities will be devoted to the follow-up of the on-going manufacturing of the series fabrication (both for Stage 1 and Stage 2).

For the Divertor Inner Vertical Target (IVT) project, the main activities will be the progress of the IVT series first and second specific contracts.

For the Divertor Rails project, the PA is planned to be signed in 2025, after which activities will start for the launch of the procurement procedure for the components production.

No acceleration actions at an additional cost are included at this stage for the systems that may be requested for the ITER new scenarios for the Augmented First Plasma.

- **Remote Handling (partly FP):** Preliminary and final design activities will continue together with some manufacturing depending on the system. Divertor Remote Handling systems (DRHS) will further develop the final design by already running task orders and new contracts, supported in some areas by laboratory tests and prototyping. Cask & Plug RH systems (CPRHS) will continue final design development and manufacturing of FP components. Non-FP cask systems will continue preliminary design with existing and new contracts. Neutral Beam Remote Handling systems (NBRHS) FP components will continue final design development and moving towards manufacturing. For the remaining items of NBRHS, preliminary design will be the main area of activities through new and existing contracts, supported in some areas by laboratory tests. In-Vessel Viewing systems (IVVS) will focus on final design activities and moving towards manufacturing, by continuing and signing new task orders. Complementary RH technology activities will be implemented (design and tests) aiming at manufacturing of first components (e.g. rad hard cameras, electronics and manipulator arms) to be integrated in the RH systems.

- **Cryoplant and Fuel Cycle**

**For Vacuum Pumping (Partly FP)**, the last Torus and Cryostat Cryopump (TCCS) might be delivered in 2025 (if not completed in 2024).

For the **Front-end and Cryodistribution systems (FECDS)** the 3 Neutral Beam Cold Valve boxes will be manufactured and delivered, as well as the associated cryolines, cryojumpers and Johnston couplings. The I&C systems for the TCCS and FECDS will also be delivered in 2025.

For **Leak detection** the Final Design Review will be completed.

**Neutral Beam cryopumps** will work on definition of technical requirements and preparation of procurement arrangement amendment signature.

**For Tritium plant**, Isotope separation system and water detritiation system will focus on definition preliminary design, activities for de-risking and procurement arrangement and tender preparation.

**In the area of REMS (Radiation and Environmental Monitoring Systems)**, design, de-risking activities and procurement activities will continue.

In the area of Cryoplant (FP), commissioning of the remaining equipment of LN2 plant and auxiliary systems will continue.

- **Plasma Engineering and operations (partly FP):**

This action refers to activities in support to the future exploitation of the ITER experiment by the F4E member States and in support to F4E procurements. The main goals are the assessment of the impact of design changes on plasma performance, the verification of load specifications linked to the plasma and the preparation for the commissioning and operation of the ITER tokamak.

- **Heating and Current Drive (partly FP):**

(non-FP): For the Electron Cyclotron (EC) systems, commissioning, and site acceptance tests at site of the power supplies will proceed. The procurement of the EC Gyrotrons will focus mainly on the final design activities moving gradually towards manufacturing. For the EC control system, activities will be mainly devoted to completing the integrated commissioning of the system in view of supporting the acceptance tests of the first ITER gyrotrons. For the Heating Neutral Beam (HNB) mechanical components, the procurement activities for the Passive Magnetic Shield (PMS) and Acceleration, Correction and Compensation Coils (ACC Coils) will start. In parallel, design activities will proceed for the tooling of HNB assembly phase II up to final design review and manufacturing activities for the Neutral Beam Vessels will start upon successful closure of the Manufacturing Readiness Review. For the Drift Duct, tendering activities will progress towards contract signature. For the Absolute Valve, the feasibility studies and conceptual design will be finalized, allowing the tendering process to start. Meanwhile, assembly, factory testing and delivery of the last NB power supplies will proceed, in view of starting installation in 2026. Finally, for the Neutral Beam Test Facility (NBTF), F4E plans to complete the delivery of Beam Line Components

and the Beam Source, and continue the development of MITICA CODAS, Interlocks and Safety via dedicated specific tasks.

(FP): In the area of the Electron Cyclotron Launchers, the design activities for Ex-Vessel Waveguides and Upper Launcher System will be completed, followed by manufacturing design activities and qualification up to manufacturing readiness review.

- **Diagnostics** (partly FP): Manufacturing activities for several diagnostic components and systems will start and some others will continue and part of these will be delivered to IO. Design of all remaining Diagnostics systems will progress and some of these will complete their design activities, with approval of the final design review. Procurement activities will focus mainly on the preparation for, and tendering process of framework contracts with scope that includes manufacture of several systems or sub-systems needed for SRO, as well as on placement of task orders for manufacture of Start Researching Operations (SRO) components within existing framework contracts. Task orders will also be placed within existing framework contracts to support updates to the design integration for the ports, prior to preparation of specifications for tender of manufacture of the first port systems.

The preparation of the launch of the manufacturing and assembly contract for the port integration will be mainly focused in the SRO port (Equatorial Port #10).

- **Test Blanket Systems** (non-FP, non-in-kind contribution): The TBM activities will be impacted by the new 2024 baseline, it is therefore expected that 2025 will be a period of change for this programme. The activities will focus on the end of the preliminary design and the first step of the final design of the two TBM Sets, Ancillary Systems, Safety Studies, and Accidental Analyses. Analogously the activities aimed to prove the feasibility of the fabrication and assembly processes of the TBM-sets would continue as well as the needed EUROFER procurement. As in the previous years, support, and transversal activities such as the consultancy of an Agreed Notified Body, insourcing of external service providers, the storage, handling and, when needed, transportation of steel materials will proceed.

The codification of the database of EUROFER in RCC-MRx will continue. Some activities could be executed under the ITER TBM Project Team Funding scheme. The collaboration with EUROfusion will continue in the R&D area. The collaboration with Korean DA is expected to continue in the Helium Cooled TBM system.

- **Site, Buildings and Power Supplies:** The focus of the Buildings programme will be to increase cost and resource efficiency in some of its large works contracts, such as buildings services ones, and in the preparation of the Hot Cell Complex design and construction. Relevant works will be to complete the Tritium building (B14); to progress on the installation of the Cargo Lift in the Machinery Room on the Tokamak building (B11); to complete the installation the Cargo Lift Lobby Doors, to progress installing the Doors in Tritium Building (B14); to deliver the building services components (HVAC, piping, electrical, Instrumentation & Control) to IO for installation in the Tokamak Complex; to complete the NB High Voltage Power supply Building (B37), the Control building (B71 Non PIC part) and the NB Power supply building (B34). Construction and installation of Load Centers LC01, LC02, LC15, LC16 and the Medium Voltage MV04, MV05 & MV06 will progress. The Emergency Power Supply Buildings (B44, B46), Medium Voltage Distribution Buildings (B45, B47), the Load Centers LC04, LC09, will be operational (Ready for use). The Call for Tender for the Hot Cell Facility Buildings might be launched to cover the Design (as a minimum, following strategy alignment in 2024) of both IO and F4E scopes (DT1 phase). Design Works are required on functions due for pre-assembly phase and Start of Research Operations (SRO) phase.
- **Cash contribution:** The activities in 2025 will focus on the commitment of the agreed cash contribution for 2026.
- **Technical Support Activities** includes all Fusion Technology & Engineering unit domains activities: Mechanical Engineering, Project Engineering, CAD & Data Management, Materials, Manufacturing & Metrology, Engineering Analysis, Plasma Engineering & System Qualification,

Electrical Engineering – I&C, RAMI & Assembly, other Domestic Agencies' components Transportation. Technical Support Activities also includes Project Management and Control, Project Performance Management, Safety & Quality activities including Quality & Documentation Management and Occupational Health & Safety, Systems Integration and Performance, Supply Chain support services activities, insurances and digital transformation technology, facility contracts & services, missions, and legal support to operational activities, including legal support for alternative dispute settlements (e.g adjudications) and litigations.

Engineering procurement activities will aim:

- at providing technical resources and services to ITER and Broader Approach & Roadmap Projects based on Programmes' priorities through the establishment of a broad range of Framework Contracts and related specific contracts.
- at delivering the EU obligation for the Transportation of all ITER Components from the port/airport of entry to ITER site.

Project Support Activities provided by Systems Integration and Performance group will be devoted to the systematic assessment of the Project Change Requests (PCRs) on the F4E in-kind contributions (PAs) baselines while safeguarding EURATOM's investment in ITER as well as through the strengthen of configuration management processes inside the ITER Configuration Control Boards. The Systems Integration and Performance group will keep overseeing the coordination of technical activities across different Project Teams to ensure smooth integration of F4E in-kind contribution and to support clear understanding of project scope. Systems Integration and Performance activities include also the development and implementation of Systems Engineering practices, processes and tools and to support their correct deployment by the Project Teams.

- **Broader Approach (BA):** the EU activities are carried out in the frame of the Agreement, concluded between Euratom and Japan, consisting of activities which complement the ITER project and accelerate the realisation of fusion energy towards DEMO. Activities in 2025 will be based on the Project Plans agreed by the BA Steering Committee in spring 2024.
- **DONES:** the focus is on preparatory activities as well as early procurement of essential equipment. Further details will be available at a later stage.
- **Technology Development Programme (TDP):** F4E has triggered in 2024 a comprehensive set of tasks to conceptualize and prepare for initial implementation of a Technology Development Programme, in line with the F4E Industrial Policy (action 3) "Implementation of a Technology Development Program (TDP)" and F4E 2023 Vision (3rd Action Line: "We pave the way for a transition from the research to the industrial sector, and the creation of a competitive European industrial fusion sector").

The TDP is to act as an additional F4E programme in support of the tasks defined in the Council Decision for the Establishment of the European Joint Undertaking for ITER and the Development of Fusion Energy. As such, in addition to supporting ITER and Broader Approach research activities therein (Articles 3.1.(e) and 3.2.(c)), TDP shall contribute to the task of preparing and coordinating a programme of research and development activities in preparation of a demonstration fusion reactor and related facilities (Article 3.3).

In addition, amendments, indexation and release of options of existing contracts in all areas will need to take place. Quality control inspection services will be necessary for the majority of the areas through available framework contracts.

See details of the Work Programme 2025 in the annexes to Work Programme.



## Section V. Other information

### 1. Barcelona Office Building Policy

| #            | Building Name and type | Location  | SURFACE AREA (in m <sup>2</sup> ) |            |       | RENTAL CONTRACT |  |      |                     |  | Host country (grant or support) | Building present value (€) |
|--------------|------------------------|-----------|-----------------------------------|------------|-------|-----------------|--|------|---------------------|--|---------------------------------|----------------------------|
|              |                        |           | Office space                      | non-office | Total | RENT (€/year)   | Duration of the contract   | Type | Breakout clause Y/N | Conditions attached to the breakout clause (if applicable) |                                 |                            |
| 1            | TDL B3                 | Barcelona | 9000                              | 750        | 9750  | 0 € *           | Long term rent lease agreement until 2042<br><br>Short term rent lease agreements for additional space covered by the Host State as of 01/01/2022. |      | Y                   | no longer applicable                                       | Rent paid by Spain for 9750 m2  | N/A                        |
| <b>TOTAL</b> |                        |           |                                   |            |       | <b>0 €</b>      |  |      |                     |  |                                 |                            |

\* Community charges are imputed to F4E budget.

#### SPD\_table 10 . F4E building

In accordance with Article 7 of the Host Agreement signed between F4E and Spain (Host State), the latter shall provide F4E with permanent premises in Barcelona. Further to the negotiations to agree on such permanent solution the Spanish Government offered in April 2016 to establish F4E's permanent premises at its current location. This offer consisted of a long-term lease agreement for the current premises until the year 2042 including approximately 1 000m2 of additional space, for which the Host State would also cover the refurbishment costs. In May 2016, the long-term agreement was signed between Spain, the building owner, and F4E.

In 2021, Spain and

Following the mandate given by the GB to the Host State/F4E Working group in 2021, an agreement was reached on the terms of the refurbishment of F4E premises, which has been split into two phases:

a) the refurbishment of the additional office space allocated to F4E, which has been finished in 2023 and funded by the Host State;

b) to be followed by the refurbishment of all other floors assigned to F4E, including the ground floor. The cost of the refurbishment shall be borne by Spain (80%) and F4E (20%) as agreed at the December 2021 GB meeting.

As a result of the discussions of the Working Group, the Spanish authorities agreed to take charge of the rent (from 1 January 2022 and until the finalization of the refurbishment) of some additional office modules needed to secure space for the staff occupying the floors being refurbished.

During the year 2021 the CIEMAT (Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas) carried out the refurbishment of one of the floors as agreed.

Early 2024 the Spanish authorities expressed their will to resume the discussions about the refurbishment of F4E's premises to fine tune the scope of the works and to allow them earmarking the necessary funds to initiate the works as soon as possible.

## 2. Privileges and immunities

| Joint undertaking privileges   | Privileges granted to staff  |   |
|--|--|---|
|  | Protocol of privileges and immunities / diplomatic status  | Education / day care                                |
| As provided by the Host State, according to the Seat Agreement:<br>- VAT exemptions<br>- Building free of charge | Diplomatic status only for the Director, and the person appointed to replace him in his absence<br>- The Protocol of Privileges and Immunities (PPI) applies to all staff<br>- VAT reimbursements on goods and furniture during the first year.<br>- Purchase of one motor vehicle without taxes.<br>- Exemption of import tax registration for vehicles (if done through the Spanish Ministry of Foreign Affairs) | - No privilege granted regarding education/day care |

**SPD\_table 11 . Privileges and Immunities**

## 3. Environment management

Fusion for Energy shares the same headquarters building in Barcelona with several companies and as a leaseholder, therefore, its room for manoeuvre to reduce its environmental impact is limited from that point of view. However, after the Host State's decision to fix F4E's permanent premises at its current location, F4E has explored some options to increase the sustainability of our premises including assessing the feasibility of an EMAS certification. It should be noted that premises hosting F4E already benefit from a LEED (Leadership in Energy and Environmental Design) certification that demonstrates the high environmental quality of the building; F4E will continue to collaborate on a regular basis with the Building Management to maintain this certification and improve its overall environmental score.

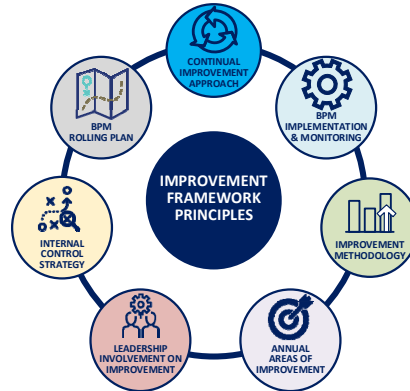
## 4. Strategy for achieving efficiency gains and synergies

### **F4E Improvement framework**

F4E is fully committed to continual improvement and manages its corporate improvement projects triggered by leadership involvement, which is then implemented through its various committees and networks.

The F4E Improvement framework defines the frame of activities to enhance performance and has seven principles: Continual Improvement approach; Business Process Management (implementation and monitoring), Improvement Methodology, Annual Focus on Areas of Improvement, Leadership Involvement on Improvement, Internal Control Strategy, and Continuous Improvement Action Plan (BPM Rolling Plan).

These principles ensure the standardisation of the system implemented to enhance performance in F4E, to ensure compliance with the Internal Control framework and overall maintenance of the Integrated Management System.



Continual improvement is achieved through the use of the Quality policy, the Business Process Management policy, audit results, data analysis, stakeholders’ feedback, continuous training, corrective and preventive actions and the review by leadership.

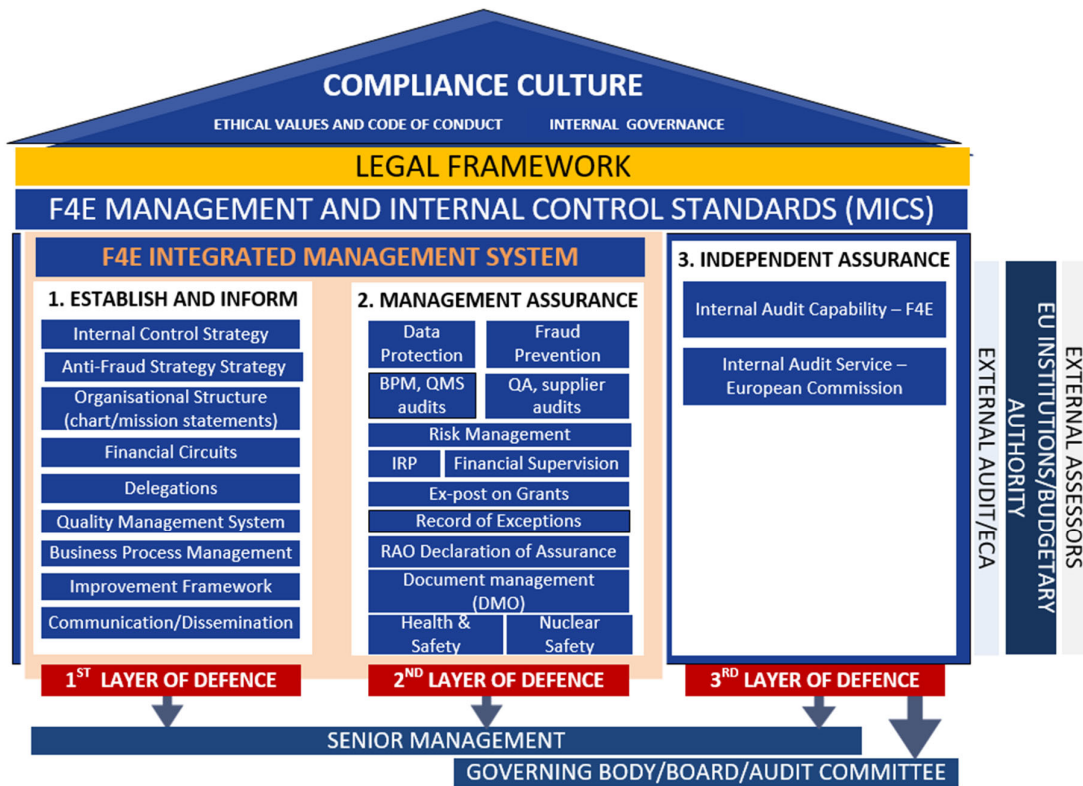
The Continual Improvement approach in F4E is based on six concepts: Improvement Inputs, Evidence-based decision, Activity Owner validation, Learning and Development Culture, Improvement is made in measurable projects and Results must be disseminated.

The Continual Improvement approach aims to nurture and facilitate improvements with a systematic methodology to deal with inputs on improvement areas and foster efficiency and effectiveness of processes and systems.



F4E, in the context of its reorganisation is setting up a new governance structure, focused on organisational excellence and is in parallel focusing on simplification of working procedures and documentation.

**Strategy for organisational management and internal control systems including their anti-fraud strategy**



The Internal Control System (ICS) comprising F4E’s Integrated Management System is based on the 3 layers of defence of the IIA (Institute of Internal Auditors) and combines the two control environments within which F4E operates - the ITER-wide quality system which is intended to ensure the performance of ITER and the compliance with the nuclear safety requirements, and the European Commission Internal Control Framework which is inspired on the internationally recognised COSO framework.

The F4E Management and Internal Control Standards (MICS) are central to the assessment of the effectiveness of this system. F4E makes an Annual Assessment, in line with the EC Internal Control Framework and methodology which determines the functioning of its F4E’s 20 MICS covering the five components: control environment, risk assessment, including risks of fraud, control activities, information and communication and monitoring activities.

F4E identifies deficiencies which affect the effective functioning of any of the MICS and adopts a corrective action plan to ensure follow-up.

- **1<sup>st</sup> LAYER (1<sup>st</sup> LINE OF DEFENCE) ESTABLISH AND INFORM:** Internal controls as defined by F4E’s Management for application by all F4E Staff and providing adequate training and raising awareness.
- **2<sup>nd</sup> LAYER (2<sup>nd</sup> LINE OF DEFENCE) MANAGEMENT ASSURANCE:** The Management (in its role of 1st line of defence) puts in place the 2nd layer of defence by establishing risk management and assurance functions to help build and/or monitor the first line-of-defence controls.

- **3<sup>rd</sup> LAYER (3rd LINE OF DEFENCE) INDEPENDENT ASSURANCE** The internal auditor (IAS) and the IAC, who provide the governance bodies and the senior management with risk-based and objective assurance, advice and insight and help the Joint Undertaking to accomplish its objectives by bringing a systematic, disciplined approach in order to evaluate and improve the effectiveness of risk management, control and governance processes.

The F4E Internal Control Strategy defines internal control roles and responsibilities, and outlines how the Internal Control System provides reasonable assurance of achieving the following objectives (based on Article 30 of the F4E FR):

- 1.1. effectiveness, efficiency and economy of operations;
- 1.2. reliability of reporting;
- 1.3. safeguarding of assets and information;
- 1.4. prevention, detection, correction and follow-up of fraud and irregularities;
- 1.5. adequate management of the risks relating to the legality and regularity of the underlying transactions, taking into account the multi-annual character of programmes as well as the nature of the payments concerned.

The Anti-Fraud (OLAF) and Ethics Officer promoted and coordinated the implementation of the F4E Anti-Fraud Strategy and the accompanying Anti-Fraud Action Plan. The current Strategy adopted last year runs for four years and following the new Commission 2023 revision of its Anti-Fraud Strategy Action Plan, includes actions to strengthen cooperation with OLAF and the Commission.

The Anti-Fraud and Ethics Officer monitors the execution of the actions foreseen in the Anti-Fraud Action Plan for the year under review by means of targeted communications, individual meetings with action owners as well as transversal compliance-oriented meetings and meetings of the Audit Committee.

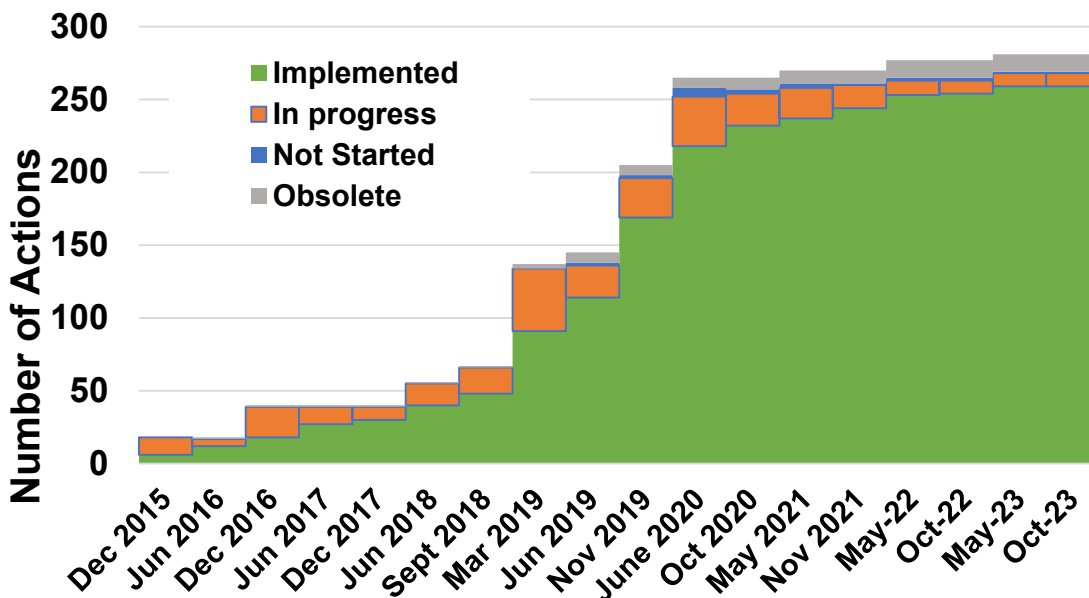
The implementation of actions arising from audit recommendations, corporate risk actions and other sources as well as the Anti-fraud Action Plan is systematically monitored through a dedicated database (RAPID) which details the scope of each action, the action owner, and the target date for its implementation .

## 5. Evaluations

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The Corporate Action Plans respond to recommendations from Annual Assessments and Ad-Hoc Groups of the Governing Bodies, Governing Board Actions and also own-initiative actions.

During the period until end-2023, the total number of actions remained constant at 281. The total percentage level of implemented actions was 96%.



SPD\_figure 16: Evolution of the implementation of F4E's corporate level actions

The April 2018 Council Conclusions on the reformed ITER project state that “the independent annual assessments of the progress of ITER have to be continued and intensified with a focus on the performance and project management, including cost containment, schedule project control as well as risk management”.

To meet the Council’s request for 2023, F4E’s Governing Board appointed a panel of three independent experts of recognized standing to conduct an assessment of F4E’s building programme.

The outcome of the assessment was presented to F4E’s Governing Board in July 2023 (final report delivered in September 2023) and endorsed an action plan that was prepared by F4E to address the 35 recommendations put in six main areas: benchmarking, programme management, suitability of FIDIC contract models, FIDIC contracting best practices, FIDIC contracting recommendations, further integration between IO and F4E.

At the F4E’s Governing Board meeting in December 2023, it was agreed that the European Commission interim evaluation of F4E would be in line with the scope of the annual assessment of F4E requested by the Council of the EU and should therefore be considered to constitute the 12th annual assessment of F4E to be conducted in 2024.

At the F4E’s Governing Board meeting in July 2024, it was emphasized that a mid-term evaluation of the progress of ITER is currently underway and that the conclusions of this evaluation are expected to be delivered by the end of 2024.

## 6. Strategy for cooperation with third countries and/or international organisations

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The F4E Statutes endow F4E with a prominent international role and all F4E's objectives have an international dimension:

### 1. International Cooperation Projects

#### a. ITER

F4E has been created with the main objective to provide Euratom's contribution to the ITER project in an international collaboration to demonstrate the scientific and technological feasibility of fusion energy for peaceful purposes. Euratom has formally designated F4E as the EU domestic agency for ITER under the ITER International Agreement.<sup>18</sup>

While Euratom is formally represented at the ITER Governance level by the European Commission (DG-ENER), the further implementation of Euratom's contribution to ITER is realised through F4E's cooperation with the ITER International Organization (IO) as well as with bodies nominated by the ITER parties, the domestic agencies of the other ITER partners, China, India, Japan, Korea, Russia and the United States.

#### b. Broader Approach

The second main objective the Statutes entrust to F4E is to carry out the Broader Approach activities <http://fusionforenergy.europa.eu/understandingfusion/broaderapproach.aspx> with Japan. The purpose of the Agreement between Euratom and Japan for the Joint Implementation of the Broader Approach Activities in the Field of Fusion Energy Research<sup>19</sup> is to provide a framework for activities aiming to complement the [ITER](#) project and accelerate the development of [fusion energy](#). F4E has been formally designated by Euratom as the implementing agency to discharge its commitments for the implementation of the Broader Approach Activities vis-à-vis Japan. In this capacity, F4E cooperates with Japan on 3 projects:

- a) IFMIF/EVEDA: The International Fusion Materials Irradiation Facility (IFMIF) is a fusion neutron source test facility to find and qualify new advanced materials for the plasma-facing components in future fusion reactors. The Engineering Design and Engineering Validation Activities (EVEDA) aim to produce an integrated engineering design of the IFMIF plant as well as the data necessary for decisions on the construction, operation, exploitation and decommissioning of the future Fusion Neutron Source.

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<sup>18</sup> Agreement on the Establishment of the ITER International Fusion Energy Organization for the Joint Implementation of the ITER Project, 21 November 2006.

<sup>19</sup> Cf. Council Decision 2007/614/Euratom of 30 January 2007 concerning the conclusion, by the Commission, of the Agreement between the European Atomic Energy Community and the Government of Japan for the Joint Implementation of the Broader Approach Activities in the Field of Fusion Energy Research.

- b) JT-60SA: The project comprises the upgrade of the JT-60 Tokamak experimental equipment owned by the Japanese Implementing Agency to an advanced superconducting Tokamak and its subsequent exploitation to support the operation of ITER as well as the investigation into how to optimise the operation of fusion power plants after ITER (DEMO; see Section 1.c. below) by addressing key physics issues;
- c) IFERC: The International Fusion Energy Research Centre supports the other joint fusion projects (ITER, IFMIF/EVEDA, JT60-SA) and contributes to the development of the next generation of fusion devices after ITER, such as DEMO.

The Broader Approach Steering Committee can authorise collaborations with third parties and BA Projects at research institution level following the domestic approval procedures of each party.

c. IFMIF (DONES) and DEMO.

The third main objective the Statutes entrust to F4E is to prepare and coordinate a programme of activities in preparation for the construction of a demonstration fusion reactor (DEMO) and related facilities including the international fusion materials irradiation facility (IFMIF).

The purpose of DEMO is to bring fusion energy research to the threshold of a prototype fusion reactor opening the way to its industrial and commercial exploitation. Currently, different conceptual DEMO projects are under consideration by all ITER Members (China, EU, India, Japan, Korea, Russia and, to a lesser extent, the United States).

The International Fusion Materials Irradiation Facility (IFMIF) is a projected materials test facility in which candidate materials for the use in an energy producing fusion reactor can be fully qualified. The IFMIF project was started in 1994 as an international scientific research program, carried out by Japan, the European Union, the United States and Russia, and managed by the International Energy Agency. Since 2007, it has been pursued by Japan and F4E under the Broader Approach Agreement in the field of fusion energy research (see Section 1.b above), through the IFMIF/EVEDA project, which conducts Engineering Validation and Engineering Design Activities for IFMIF. The IFMIF-DONES (Demo Oriented NEutron Source) facility is a simplified version of IFMIF with one particle accelerator instead of 2. Its construction phase has started on 16<sup>th</sup> March 2023 in Granada (Spain) with the establishment of the DONES Steering Committee. DONES programme will be framed in a multilateral collaboration with the participation of third countries, including Japan. Its primary goal is to test the materials to be qualified and to be used in future fusion power plants such as DEMO.

d. TBM

F4E's participation in the Test Breeding Modules (TBM) Programme falls under F4E's first statutory objective (see section 1.a above). The TBM Programme, however, has some particular features.

The Programme aims to test tritium breeding module concepts in the ITER reactor, so that future (DEMO) reactor could achieve tritium self-sufficiency, the extraction of high grade heat and electricity production. TBM are formally not part of the ITER facilities. The Programme is covered by the ITER Agreement as "*any other activities that are necessary to achieve its* [i.e. the ITER Organization's] *purpose*" (Article 3.1.d of the ITER Agreement).

European collaboration in the TBM Programme is based on the detailed TBM Arrangements signed between F4E and the ITER Organization. The implementation of the TBM activities involves F4E cooperation with the European fusion laboratories participating in the EUROfusion consortium.



F4E entered also into a long-term partnership with the Korean Domestic Agency (ITER Korea) for the joint supply of the Helium Cooled Ceramic Pebble (HCCP) Test Blanket Module System for the operation of the ITER machine. Following the signature of the partnership arrangement between F4E and ITER Korea, both parties concluded a trilateral TBM Arrangement with the ITER Organization.

e. Validation process

The objectives of F4E cooperation with third countries and international organisations are clearly defined in its Statutes as outlined above.<sup>20</sup> F4E cooperation with these international partners takes place within the boundaries set out in the F4E Statutes and is enshrined in international agreements and arrangements which translate the F4E objectives set out in its Statutes and define the details of cooperation with F4E's international partners.

All F4E collaboration international agreements and arrangements require the formal approval by the F4E Governing Board in accordance with Article 6(3)(n) of the F4E Statutes: *"The Governing Board shall ... approve the conclusion of agreements or arrangements regarding cooperation with third countries and with institutions, undertakings or persons of third countries or with international organisations with the exception of the procurement arrangements with the ITER IO."*<sup>21</sup>

The only exceptions are the so-called Procurement Arrangements, between F4E and the ITER IO for the ITER project, and between F4E and QST for BA projects, which spell out the details of the technical implementation of the Euratom contribution to the ITER Project and the Broader Approach Projects, as pre-defined in the ITER International Agreement and the Broader Approach Agreement respectively.

Furthermore, the F4E Governing Board confirmed the power of the F4E Director to conclude any arrangement on additional cash compensation with the ITER Organization, which modifies a Procurement Arrangement between the ITER Organization and Fusion for Energy. The power is subject to specific financial thresholds.

In all other cases, prior F4E Governing Board approval is mandatory before F4E enters into international obligations.

In this context, it should be kept in mind that Euratom has *"the right to make a reservation to a decision by the Governing Board, when it considers that that decision may be contrary to Community law, including notably its international commitments arising from the ITER International Agreement. Euratom shall give due legal justification to such reservation. In this case the decision shall be suspended and the matter referred to the Commission for a review of its legality, together with the view of the Governing Board, including representatives of Euratom, must be consulted."*

Consequently, the mechanism requiring prior Governing Board approval of international agreements and arrangements concluded by F4E constitutes a safeguard ensuring that F4E remains within the

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<sup>20</sup> Cf. Article 3 F4E Statutes annexed to the Decision of the Council of the EU Council Decision of 27 March 2007 establishing the European Joint Undertaking for ITER and the Development of Fusion Energy and conferring advantages upon it.

<sup>21</sup> The Governing Board delegated approval of the non-strategic international cooperation agreements to the Administration and Management Committee.

mandate and institutional framework defined in its Statutes and does not appear as representing the European Union beyond its statutory remit.

## *2. Switzerland as F4E Member*

In addition to Euratom and the EU Member States, Switzerland was a full F4E member based on a cooperation agreement in the field of controlled nuclear fusion. Switzerland ceased being an F4E member in December 2020, when the agreement expired. In 2022, F4E concluded an agreement with the Ecole Polytechnique Fédérale de Lausanne regarding scientific and technological co-operation.

## *3. Relations with the United Kingdom*

Following the United Kingdom's withdrawal from Euratom, the United Kingdom's membership in F4E was ended in 2020. UK decided not to get associated with the Euratom research and training programme in 2023. Therefore, the UK is currently not a member of F4E. F4E may enter into an agreement with UKAEA regarding scientific and technological co-operation.

## *4. Relations with the Russian Federation following the Russian aggression in Ukraine*

The EU has condemned the Russian Federation's military aggression of Ukraine in violation of international law and has responded with restrictive measures, severing most ties with the Russian Federation, including in the area of research and innovation.

Against this background, F4E is working in close cooperation with Euratom (represented by the Commission) to determine the course of action regarding the last of the remaining agreements with Russian entities, namely a trilateral, binding Memorandum of Understanding between the ITER Organization, Russian Domestic Agency and Fusion for Energy on Port Plug Test Facility. Equally, F4E is refraining from entering into any new agreements with Russian entities and from any direct contacts with representatives of the Russian administration.

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Broader Approach overall information  
Multiannual objectives for ITER Project, TBM project and Broader Approach  
Annual objectives  
Key Performance Indicators  
PAs, cash contributions, secondment agreements for Broader Approach

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## List of Acronyms

|                    |   |
|--------------------|---|
| ASN                | Autorité de Sûreté Nucléaire (French Nuclear Regulator) |
| BA                 | Broader Approach  |
| BAUA <sup>22</sup> | Broader Approach Unit of Account.                       |
| BA SC              | Broader Approach Steering Committee                     |
| C-O                | Close-Out   |
| CD                 | Current Drive   |
| CDR                | Conceptual Design Review                                |
| CQMS               | Common Quality Management System                        |
| COSO               | Internal Control standard                               |
| CXRS               | Core plasma charge-exchange Recombination Spectroscopy  |
| DA                 | Domestic Agency   |
| DEL                | Delivery  |
| DEMO               | Demonstration fusion reactor                            |
| DIV                | Divertor  |
| DT                 | Deuterium Tritium                                       |
| DWS                | Detailed Work Schedule                                  |
| EAC                | Estimate at Completion                                  |
| EB                 | Electron Beam   |
| EC                 | Electron Cyclotron                                      |
| EC UL              | Electron Cyclotron Upper Launcher                       |
| ECH                | Electron Cyclotron Heating                              |
| Euratom            | The European Atomic Energy Community                    |
| F4E                | Fusion for Energy                                       |
| FAT                | Factory Acceptance Test                                 |
| FDR                | Final Design Review                                     |
| FP                 | First Plasma  |
| FW                 | First Wall  |
| GB                 | Governing Board   |
| HCLL               | Helium Cooled Lithium-Lead                              |
| HCPB               | Helium Cooled Pebble Bed                                |
| H&CD               | Heating & Current Drive                                 |
| HHF                | High Heat Flux  |
| HV                 | High Voltage  |
| HVD                | High Voltage Deck                                       |
| IC                 | Ion Cyclotron or ITER Council                           |
| I&C                | Instrumentation and Control                             |
| ICH                | Ion Cyclotron Heating                                   |
| IFERC              | International Fusion Energy Research Center             |
| IFMIF              | International Fusion Materials Irradiation Facility     |

<sup>22</sup> 1,000 BAUA equal to EUR 678,000 (value 5 May 2005).

|                   |  |
|-------------------|--|
| INB               | Installation Nucleaire de Base   |
| IO                | ITER Organization  |
| IR                | Infra-Red  |
| IRS               | Internal Reporting system  |
| ISEPS             | Ion Source and Extraction Power Supplies   |
| ISS               | Isotope Separation System  |
| ITA               | ITER Task Agreement  |
| ITER              | International Thermonuclear Experimental Reactor   |
| IUA <sup>23</sup> | ITER Unit of Account.  |
| IVT               | Inner Vertical Target  |
| IVVS              | In-Vessel Viewing System   |
| KPI               | Key Performance Indicator  |
| LIPAc             | Linear IFMIF Prototype Accelerator   |
| MV                | Medium Voltage   |
| NB                | Neutral Beam   |
| NBI               | Neutral Beam Injector  |
| NBTF              | Neutral Beam Test Facility   |
| PA                | Procurement Arrangement  |
| PBS               | Product Breakdown Structure  |
| PCR               | Project Change Request   |
| PDR               | Preliminary Design Review  |
| PE                | Plasma Engineering   |
| PF                | Poloidal Field   |
| PIC               | Protection Important Components  |
| PM                | Project Management   |
| PP                | Project Plan   |
| QA                | Quality Assurance  |
| QC                | Quality Control  |
| QST               | Japanese Implementing Agency   |
| R&D               | Research & Development   |
| REC               | Remote Experimentation Centre  |
| REM               | Radiological Environmental Monitoring  |
| RF                | Radio Frequency  |
| RFCU              | Radio Frequency Control Unit   |
| RFE               | Ready For Equipment (when access is granted to IO)   |
| RFIOC             | Ready for IO Contractors   |
| RFOC              | Ready for other contractors (when civil work is complete enough to enable access to other contractors) |
| RH                | Remote Handling  |
| RWM               | Resistive Wall Mode  |
| SAT               | Site Acceptance Test   |

<sup>23</sup> In 2008, the IUA exchange rate approved by the ITER Council corresponded to EUR 1498.16.



|       |  |
|-------|--|
| SC    | Specific Contract                              |
| SR2FP | Straight Road to First Plasma                  |
| SRO   | Start Researching Operations                   |
| SS    | Steady State                                   |
| STP   | Satellite Tokamak Programme                    |
| STIK  | Short Term In-Kind                             |
| TBM   | Test Blanket Module (Tritium breeding blanket) |
| TDP   | Technology Development Programme               |
| TF    | Toroidal Field                                 |
| TFC   | Toroidal Field Coils                           |
| TO    | Technical Officer                              |
| VAR   | Variation                                      |
| VC    | Voluntarily Contribution                       |
| VCDIS | Voluntarily Contribution Design Institutions   |
| Vis   | Visible  |
| VV    | Vacuum Vessel                                  |
| WAVS  | Wide Angle Viewing System                      |
| WBS   | Work Breakdown Structure                       |
| WDS   | Water Detritiation System                      |
| WP    | Work Programme, Work Package or Winding Pack   |

SPD2025\_ANNEXES TO PROJECT PLAN

The ITER Procurement Arrangements and their status

This table shows the credit value that F4E should have earned up to end of March 2024 (baseline) against the credit that F4E has actually achieved and the credit that the IO has already released to F4E as acknowledgement of the achieved milestones F4E has formally declared as such to the IO. It provides all details per PA with the yearly forecast credit up to end 2029 and the cumulative value for the years beyond.

Once a CAS milestone is achieved, before F4E can formally declare its achievement to the IO, all necessary data, reports and other information has to be collected from the supplier and then submitted to the IO. This information is linked to the delivery by the supplier of all the necessary contractual deliverables that have to be formally approved by F4E before being sent to the IO. Then, it will be the turn of the IO to revise and validate the whole set of documents provided in order to confirm such achievement and release the credit through its SAP tool.

For this reason, the process can last some months.

| Action                      | PA   | Baseline to end March 2024 (kIUA) | Achieved Credit (kIUA) | Released Credit (kIUA) | 2025     | 2026     | 2027     | 2028     | 2029     | 2030+     |
|-----------------------------|--|-----------------------------------|------------------------|------------------------|----------|----------|----------|----------|----------|-----------|
|                             |  | 821.77233                         | 698.83100              | 589.86810              | 48.59279 | 21.77055 | 24.85542 | 33.25795 | 37.79320 | 142.83974 |
| Action 1 Magnets            | PA 1.1.P1A.EU.01 Procurement of Toroidal Field Magnets | 89.79600                          | 86.24200               | 73.02400               | 0.00000  | 0.00000  | 0.00000  | 0.00000  | 0.00000  | 0.00000   |
|                             | PA 1.1.P2A.EU.01 Pre Compression Rings                 | 0.60000                           | 0.60000                | 0.60000                | 0.00000  | 0.00000  | 0.00000  | 0.00000  | 0.00000  | 0.00000   |
|                             | PA 1.1.P3A-B.EU.01 Poloidal Field Magnets 2,3,4,5,6    | 40.86000                          | 36.46500               | 34.47000               | 0.00000  | 0.00000  | 0.00000  | 0.00000  | 0.00000  | 0.00000   |
|                             | PA 1.1.P6A.EU.01 Toroidal Field Conductors             | 43.39000                          | 43.39000               | 43.39000               | 0.00000  | 0.00000  | 0.00000  | 0.00000  | 0.00000  | 0.00000   |
|                             | PA 1.1.P6C.EU.01 Poloidal Field Conductors             | 11.22881                          | 11.22881               | 11.22881               | 0.00000  | 0.00000  | 0.00000  | 0.00000  | 0.00000  | 0.00000   |
| Action 2 Vacuum Vessel      | PA 1.5.P1A.EU.01 Vacuum Vessel - Main Vessel           | 86.26629                          | 70.03147               | 47.01400               | 3.75247  | 7.14288  | 0.00000  | 0.00000  | 0.00000  | 0.00000   |
| Action 3 In Vessel-Blanket  | PA 1.6.P1A.EU.01 Blanket First Wall                    | 0.70000                           | 0.10000                | 0.00000                | 0.10000  | 1.00000  | 5.50000  | 0.00000  | 10.90000 | 22.57568  |
|                             | PA 1.6.P6.EU.01 Blanket Manifolds                      | 0.40000                           | 0.40000                | 0.20000                | 0.35000  | 0.27000  | 0.10000  | 0.00000  | 0.82200  | 2.46701   |
| Action 4 In Vessel-Divertor | PA 1.7.P1.EU.01 Cassette Body                          | 0.56000                           | 0.56000                | 0.53000                | 0.00000  | 0.47000  | 0.83000  | 0.38000  | 0.00000  | 3.80000   |
|                             | PA 1.7.P2B.EU.01 Inner Vertical Target                 | 3.14000                           | 3.14000                | 3.09000                | 0.00000  | 0.00000  | 0.23500  | 1.14000  | 1.14000  | 13.96500  |
| Action 5 Remote Handling    | PA 2.3.P2.EU.01 Divertor Remote Handling System        | 2.60000                           | 1.60000                | 0.00000                | 0.60000  | 0.00000  | 0.00000  | 0.00000  | 0.00000  | 7.42000   |
|                             | PA 2.3.P3.EU.01 Cask and Plug Remote Handling System   | 6.30000                           | 0.80000                | 0.80000                | 4.10000  | 0.00000  | 0.80000  | 1.00000  | 0.60000  | 9.98768   |

|  |  |  |          |          |         |         |         |         |         |         |
|--|--|--|----------|----------|---------|---------|---------|---------|---------|---------|
|  | PA 2.3.P5.EU.01 Neutral Beam Remote Handling System  | 2.70974  | 0.62000  | 0.30000  | 0.00000 | 0.19000 | 0.00000 | 1.09000 | 0.00000 | 4.33974 |
|  | PA 5.7.P1.EU.01 In-Vessel Viewing System   | 5.08000  | 2.48000  | 1.80000  | 0.00000 | 0.30000 | 1.30000 | 0.40000 | 1.00000 | 1.27313 |
| Action 6 Cryoplant and Fuel Cycle                            | PA 3.1.P1.EU.03 Torus and Cryostat Cryopumps   | 4.80091  | 1.00000  | 1.00000  | 1.32200 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
|  | PA 3.1.P1.EU.04 Neutral Beam Cryopumps   | 1.20000  | 1.20000  | 1.20000  | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
|  | PA 3.1.P1.EU.01 Warm Regeneration Lines  | 0.20000  | 0.20000  | 0.20000  | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
|  | PA 3.1.P1.EU.02 Front End Cryopump Distribution Cold Valve Boxes and Warm Regeneration Box | 0.61199  | 0.61199  | 0.53539  | 0.00000 | 0.14069 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
|  | PA 3.1.P3.EU.01 Primary and Cryostat Leak Detection System                                 | 3.70000  | 0.70000  | 0.00000  | 0.70000 | 0.00000 | 0.00000 | 1.00000 | 1.30000 | 0.00000 |
|  | PA 3.1.P3.EU.01 Primary and Cryostat Leak Localisation System (phase II - 1st Amendment)   | 0.40000  | 0.30000  | 0.00000  | 0.05000 | 0.05000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
|  | PA 3.2.P5.EU.01 Water Detritiation System - Tanks  | 3.25200  | 3.25200  | 3.25200  | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
|  | PA 3.4.P1.EU.01 Liquid Nitrogen Plant and Auxiliary Systems                                | 25.98117   | 24.27610 | 22.98294 | 0.65757 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
|  | PA 6.4.P1.EU.01 for Design of REMS   | 0.83223  | 0.06000  | 0.00000  | 0.00000 | 0.30000 | 0.17223 | 0.30000 | 0.30000 | 0.30000 |
|  | Action 8 Heating & Current Drive   | PA 5.2.P1B.EU.02 Electron Cyclotron Upper Launcher | 7.17003  | 0.74740  | 0.74740 | 4.55279 | 1.79906 | 1.65750 | 3.16531 | 2.99742 |
| PA 5.2.P3.EU.01 Electron Cyclotron Gyrotrons                 |  | 1.25000  | 0.00000  | 0.00000  | 1.25000 | 0.00000 | 1.83502 | 2.03502 | 2.83507 | 0.00000 |
| PA 5.2.P4.EU.01 Electron Cyclotron High Voltage Power Supply |  | 11.18072   | 10.46500 | 10.46500 | 0.71572 | 0.00000 | 0.00000 | 1.16300 | 0.00000 | 0.00000 |
| PA 5.2.P1B.EU.01 Electron Cyclotron Control System           |  | 1.15000  | 1.10000  | 1.00000  | 0.00000 | 0.10000 | 0.10000 | 0.00000 | 0.00000 | 0.10000 |
| PA 5.3.P6.EU Neutral Beam Power Supply                       |  | 20.76000   | 19.06000 | 14.56000 | 1.00000 | 1.20000 | 2.93200 | 2.35000 | 0.00000 | 3.04371 |
| PA 5.3.P9.EU.01 Neutral Beam Test Facility Components        |  | 24.30000   | 18.66000 | 17.49000 | 1.80000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| Action 9 Diagnostics   | PA 5.5.P1.EU.02-16-17-19 Diagnostics - Magnetics   | 0.84168  | 0.88928  | 0.88928  | 0.00000 | 0.03145 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
|  | PA 5.5.P1.EU.03 Diagnostics - Bolometers   | 0.61951  | 0.11800  | 0.11800  | 0.59001 | 0.17700 | 0.14750 | 0.56051 | 0.97351 | 0.35374 |
|  | PA 5.5.P1.EU.07 Diagnostics - Pressure Gauges  | 0.38320  | 0.19160  | 0.19160  | 0.19160 | 0.00000 | 0.12454 | 0.43109 | 0.00000 | 0.01907 |
|  | PA 5.5.P1.EU.18 Diagnostics - Tokamak Services   | 1.65069  | 0.88298  | 0.73541  | 0.45352 | 0.15754 | 0.25136 | 0.31144 | 0.22263 | 0.00000 |
|  | PA 5.5.P1.EU.15 Diagnostics - Radial Neutron Camera/Gamma Spectrometer                     | 0.35406  | 0.27538  | 0.13769  | 0.07868 | 0.07868 | 0.00000 | 0.29506 | 0.00000 | 1.23927 |
|  | PA 5.5.P1.EU.08 Diagnostics - CPTS 55.C1   | 0.88840  | 0.00000  | 0.00000  | 0.00000 | 0.00000 | 0.00000 | 0.41509 | 1.63466 | 0.03555 |

|   |  |           |          |          |          |         |         |          |         |         |          |
|---|--|-----------|----------|----------|----------|---------|---------|----------|---------|---------|----------|
|   | PA 5.5.P1.EU.09 Diagnostics - Low Field Side Collective Thomson Scattering           | 0.49780   | 0.33499  | 0.33499  | 0.00000  | 0.00000 | 0.16281 | 0.21707  | 0.35817 | 0.02170 |          |
|   | PA 5.5.P1.EU.04 Diagnostics - Core-Plasma Charge Exchange Recombination Spectrometer | 0.82200   | 0.20550  | 0.00000  | 0.41100  | 0.20550 | 0.41100 | 0.00000  | 0.68499 | 1.50696 |          |
|   | PA 5.5.P1.EU.06 Diagnostics - Equatorial Visible/Infrared Wide-Angle Viewing System  | 1.02763   | 0.33794  | 0.11724  | 0.22070  | 0.55175 | 0.27588 | 0.49658  | 0.27588 | 0.60698 |          |
|   | PA 5.5.P1.EU.10-11-12-13-14-21 Diagnostics - Port Engineering Systems                | 2.88488   | 2.88488  | 1.38681  | 0.00000  | 0.00000 | 0.00000 | 0.00000  | 0.82513 | 5.30514 |          |
|   | PA 5.5.P1.EU.01 Diagnostics - Magnetics Electronics & Software                       | 0.81782   | 0.50000  | 0.84882  | 0.31782  | 0.10000 | 0.11200 | 0.00000  | 0.00000 | 0.00000 |          |
| Action 11 Site and Buildings and Power Supplies | MAIN MILESTONES  | 23.92000  | 23.92000 | 0.00000  | 0.00000  | 0.00000 | 0.00000 | 0.00000  | 0.00000 | 0.00000 |          |
|   | COMMON   | 62.61532  | 54.52865 | 54.34060 | 2.96527  | 2.10000 | 2.48304 | 2.10000  | 1.00000 | 5.33810 |          |
|   | TOKAMAK COMPLEX  | 112.83640 | 87.95022 | 72.97513 | 2.72400  | 2.20000 | 2.41554 | 14.40778 | 3.79454 | 5.25300 |          |
|   | AUX BUILDINGS TB03/TB04  | 62.00716  | 58.43916 | 58.43916 | 0.00000  | 0.00000 | 0.00000 | 0.00000  | 0.00000 | 0.00000 |          |
|   | AUX BUILDINGS D&B TB05 & TB22  | 15.25156  | 14.55000 | 14.30000 | 0.00000  | 0.00000 | 0.00000 | 0.00000  | 0.00000 | 0.00000 |          |
|   | AUX BUILDINGS D&B TB06   | 9.62922   | 9.61922  | 9.43000  | 0.00000  | 0.00000 | 0.00000 | 0.00000  | 0.00000 | 0.00000 |          |
|   | AUX BUILDINGS D&B TB07   | 6.74850   | 6.40850  | 6.03420  | 0.00000  | 0.00000 | 0.00000 | 0.00000  | 0.00000 | 0.00000 |          |
|   | ###AUX BUILDINGS TB09/TB10   | 0.00000   | 0.00000  | 0.00000  | 0.00000  | 0.00000 | 0.00000 | 0.00000  | 0.00000 | 6.06000 | 36.40250 |
|   | AUX BUILDINGS D&B TB12   | 23.06510  | 15.81058 | 8.60666  | 11.35453 | 0.00000 | 0.00000 | 0.00000  | 0.00000 | 0.00000 |          |
|   | AUX BUILDINGS D&B TB13   | 7.61000   | 0.00000  | 0.00000  | 4.60000  | 2.11000 | 0.00000 | 0.00000  | 0.00000 | 0.00000 |          |
|   | LOAD CENTERS   | 7.54300   | 4.30800  | 3.66800  | 3.21500  | 1.09600 | 0.00000 | 0.00000  | 0.00000 | 0.00000 | 5.26600  |
|   | INTERCONNECTING ACTIVITIES   | 22.62932  | 20.74635 | 10.79497 | 0.52011  | 0.00000 | 0.91000 | 0.00000  | 0.00000 | 0.00000 | 0.00000  |
|   | AUX BUILDINGS D&B TB17   | 0.06920   | 0.00000  | 0.00000  | 0.00000  | 0.00000 | 0.00000 | 0.00000  | 0.00000 | 0.06920 | 9.69000  |
|   | COMMON CONTRACTUAL ACTIVITIES  | 42.79000  | 42.79000 | 42.79000 | 0.00000  | 0.00000 | 2.10000 | 0.00000  | 0.00000 | 0.00000 | 0.00000  |
|   | PA 6.2.P2.EU.06 Headquarters Building  | 13.85000  | 13.85000 | 13.85000 | 0.00000  | 0.00000 | 0.00000 | 0.00000  | 0.00000 | 0.00000 | 0.00000  |

\* Action 7 Plasma Engineering & Operations, action 10 TBM, action 12 Cash Contributions, action 13 Technical Support Activities, action 15 DONES and action 16 Technology Development Programme are not listed in the above table since no KIUA are associated to these actions. Action 14 Broader Approach uses kBAUA instead of KIUA (see full table under PP\_table 8).

**PP\_table 1. Credits per Procurement Arrangement**

## BA Overall Information

### The Satellite Tokamak Programme (aka JT-60SA project)

The mission of the JT-60SA project is to contribute to the early realisation of fusion energy by supporting the exploitation of ITER and research towards DEMO by addressing key physics issues associated with these machines, in particular by designing, constructing and operating a device:

- capable of confining break-even equivalent class high-temperature deuterium plasmas lasting for a duration longer than the timescales characteristic of plasma processes;
- pursuing full non-inductive steady-state operation with high plasma beta close to and exceeding no-wall ideal stability limits;
- establishing ITER-relevant high density plasma regimes well above the H-mode power threshold.

The primary reference for the Satellite Tokamak Programme is the Project Plan for the next five-year-period revised and submitted for endorsement to the BA Steering Committee<sup>1</sup>.

During the first phase of integrated commissioning, on 9<sup>th</sup> March 2021, an incident occurred during the final energization test of the Equilibrium Field 1 (EF1) coil. The incident had serious consequences on the overall schedule of the project, as it was necessary to shut the machine down for disassembly, inspection and repair of many critical components.

The repair work continued during 2022 and the machine was again closed for Paschen testing in August 2022. During these tests, the machine was still found to be not Paschen tight, so a project decision was made to make a final round of repairs before proceeding with the integrated commissioning anyway. The final repairs were complete during the first quarter of 2023, after which the machine was prepared for the start of Integrated Commissioning during the second half of 2023.

Integral to this decision was the inclusion of an active protection system for the coils on the machine. F4E designed, manufactured and tested a set of Cold Cathode Gauges (CCGs), which were then distributed around the machine to monitor vacuum levels at all times during operation of the magnets. The intent of the system is to monitor small variations in vacuum level such that if there is any increase, the coils can be rapidly de-energised to minimize the risk of Paschen failures. In addition F4E designed, manufactured and tested a set of spark wires which were also installed to the machine adding another layer of protection to the magnet system. The system is not guaranteed to completely protect the machine and hence great care is required for every energization operation, however it was considered sufficient to be able to proceed to the end of the IC phase of operation.

For the power supplies, the opportunity was taken to implement some critical improvements in the time leading up to the restart of IC in the second half of 2023.

With this philosophy, it was possible to proceed to achieve first plasma in October 2023.

After completion of the Integrated Commissioning and Operation 1, the period from Dec 2023 until March 2028 includes the implementation of more repairs, the installation of many machine enhancements and a number of operational periods of the JT-60SA device. There are two important project decisions which may affect the plan over the next years. The first relates to how and when the central solenoid should be fixed, and the second relates to whether the carbon ACD should be installed or we should go directly to a tungsten ACD. On both of these points a decision is expected to be taken by the end of 2024.

The present plan for operation and machine enhancement phases is detailed in the latest version of the Project Plan, which has taken advantage of the establishment of the Experiment Team (the Experiment

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<sup>1</sup> The Project Plans for the BA Phase II (from 2025-2029) for all three projects were approved by the Broader Approach Steering Committee in April 2024.

Leaders and the Topical Group Leaders are appointed and operative) providing details of the scientific mission.

The research area will expand gradually together with some upgrades of the hardware such as plasma heating systems, diagnostics, control actuators, divertor and other in-vessel components, remote handling systems, power supplies, cryogenics etc. European contribution to machine enhancements, diagnostics, maintenance and spare parts and integrated commissioning/operation support are handled also with the collaboration of EUROfusion.

For the period up to March 2029 the total commitment for the EU amounts to 547.79 kBAUA. (From April 2020-March 2028 Phase II – 311.3 kBAUA).

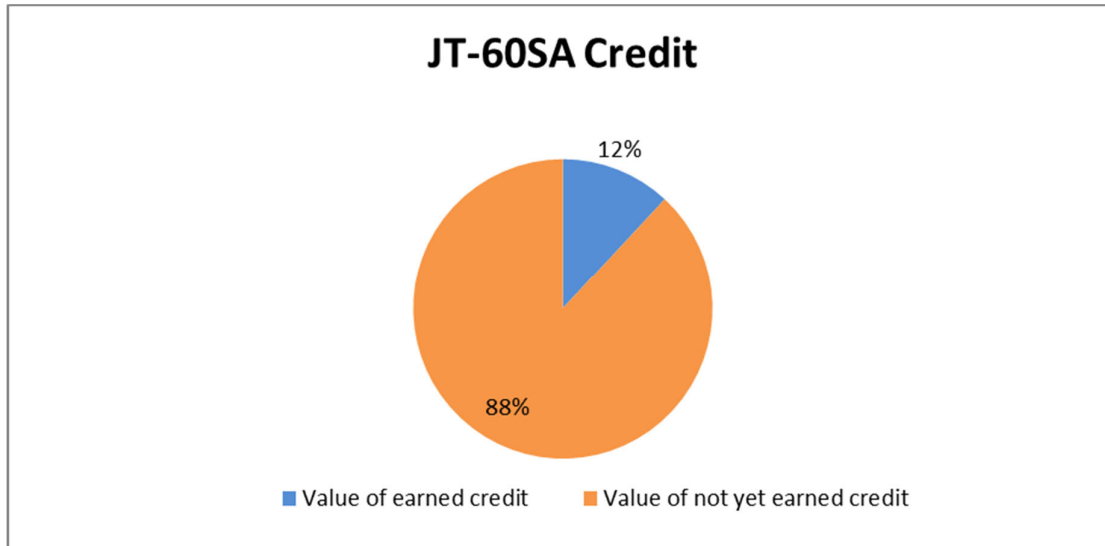
The sharing of activities with Japan, which leads to this associated total credited budget, was agreed by the BA Steering Committee in April 2024 in the form of endorsement of the document: 'Satellite Tokamak Programme Project Plan'. The latest version of the Project Plan considers that there may be significant schedule and scope modifications as a consequence of the two key project decisions described above.

In broad terms the F4E activities for this period will include the following machine enhancements (in-kind). Part of the scope hereinafter is designed and procured with support of EUROfusion):

- In-vessel Components (Actively Cooled Divertor, cryopumps).
- Heating & CD Systems (Electro Cyclotron Resonance Heating Power Supplies and Transmission Lines).
- Plasma Diagnostics (Thomson Scattering, Fast Ion Loss Detector, VUV).
- Cryogenic System (Cryoplant Enhancements, Spare parts and Nitrogen Storage).
- Magnet and Power Supply (Power Supply Enhancements, Spare parts, Error Field Correction Coil Power Supplies).
- Control System (Sensors and Tokamak Simulator Development).
- EU Personnel in support of Integrated Commissioning and Operation.
- Power Supplies Spare parts, industrial support and expertise.
- Remote Handling Equipment and tests

It is noted that in a limited number of cases, recent block of contracts established with Russian Federation entities will produce delays due to the necessity to find alternatives for procurement of critical components.

In addition, a share of the EU contribution is provided by F4E through cash transfer to a dedicated fund, primarily dedicated to consumables (electricity, helium, nitrogen etc.), IT infrastructures, maintenance & repair and support to EU on-site personnel on site.



**PP\_figure 1. JT-60SA: percentage of earned/not yet earned credits for BA Phase II<sup>2</sup>  
(Status April 2024)**

### The IFMIF/EVEDA

The IFMIF/EVEDA Project (Engineering Validation and Engineering Design Activities for IFMIF), started in June 2007, aims to provide a detailed, complete and fully integrated engineering design of the IFMIF facility and all data necessary for future decisions on the construction, commissioning, operation, maintenance, and decommissioning of such a fusion neutron source. In order to fulfill this commitment, the IFMIF/EVEDA project consists of two parallel mandates: the Engineering Design Activity (EDA) and the Engineering Validation Activity (EVA).

The IFMIF/EDA mandate delivered the Intermediate IFMIF Design by issuing the Intermediate IFMIF Engineering Design Report that was approved by the stakeholders in December 2013.

As for the EVA mandate, it deals with the three key technological demonstrators, namely:

- the Accelerator Facility (“LIPAc”),
- the Lithium Target Facility,
- the Test Facilities.

While the EVA phase of the Lithium Target Facility and the Test Facility was successfully completed in February 2017, the EVA phase of the LIPAc Facility is still on-going on Rokkasho site. LIPAc’s objective is to demonstrate that the IFMIF accelerator concept is feasible. The accelerator’s feasibility is tested through the design, manufacturing, installation, and commissioning of a 1:1-scale prototype accelerator until the first cryomodule. This is the most challenging part from a beam dynamic standpoint, for at higher energy the space charge repulsive forces that tend to disrupt the beam weakens as the beam gets relativistic.

The demonstration of the concept is made through a tiered approach with 4 configurations and 5 phases to validate the unprecedented accelerator performances. The first phase, referred to as phase A aimed to validate the injector performance, namely demonstrate that a 140-mA D+ beam with the required characteristics for RFQ injection could be produced. It was successfully completed in 2017. Phase B was meant to validate from a beam dynamics standpoint the RFQ, Medium Energy Beam Transport line (MEBT) and diagnostics. It was successfully achieved in August 2019. The following phase, referred to as phase B+, which is on-going, aims at demonstrating that the whole LIPAc except the SRF-Linac can be operated with a deuteron beam of 125 mA at 5 MeV, and at high duty cycles for at least 30 minutes. It consists of three main stages, whose first two are achieved: Stage 1 involves testing with proton and deuteron probe beams at low duty cycle and low intensity. It was completed in December 2021 and the results obtained

<sup>2</sup> The credits related to BA Phase I amounting to 236.413 kBAUA have all been awarded.

met expectations. Stage 2 escalates to using a 125 mA D+ beam at low duty cycle, specifically to validate the beam dynamics, and is as well implemented. Stage 3, which is on-going, employs a 125 mA D+ beam to validate all LIPAc subsystems at higher continuous power, except for the SRF Linac to be tested during phases C and D. The assembly of the latter started in early 2019 but had to be halted several times to address serious quality manufacturing issues in the focusing elements (superconducting solenoids). After numerous repair actions and tests, the assembly of the cryomodule resumed in April 2024. The integration of the SRF linac into the beam line and checkout tests are planned until mid 2026. Then the phases C and D will be carried out until the second semester of 2028. At that moment the IFMIF accelerator concept will have been fully validated. Next, an enhancement period will ensue until approximately 2030, focusing on demonstrating the accelerator reliability and availability. Finally, an optimization period will last until approximately 2033 to prepare for the commissioning and production phases of DONES. LIPAc should indeed be used to support the development of these projects. In that respect, LIPAc is not only the demonstrator of the IFMIF accelerator concept, but also the ideal platform to train physicists, engineers, technicians, and students who will be involved in these projects. Moreover, LIPAc offers a unique opportunity to develop and validate machine learning and artificial intelligence models, test new diagnostics, and explore the limits of its working domain, which would be risky to do with the DONES or A-FNS accelerators. LIPAc is also an ideal platform to test and rehearse operation and maintenance scenarios for DONES/A-FNS, as well as to prepare and optimize their commissioning and exploitation phases.

After the delivery in 2020 of the work plans to be implemented by both implementing agencies from 2021 to 2025, the corresponding procurement Arrangements for the Fusion Neutron Source engineering design activities and the Lithium Target Facility engineering validation activities covering the activities for 2021-2025 have been defined and implemented, in collaboration with Eurofusion. This theoretical and experimental work aims to provide an update of the Fusion Neutron Source Engineering Design report delivered in the framework of the BA phase I. The activities are devoted to the enhancement of the design of the Lithium loop and the update of the Fusion Neutron Source Design focusing on the design activities for safety and accidental scenarios. It is planned to continue these activities beyond the completion of the running procurement arrangements, namely beyond 2025, but the scope is yet to be defined by both implementing agencies, and will depend on the decisions that will be made for the DONES and A-FNS projects.

In addition to the above activities, F4E has contributed for the establishment and the start of the DONES Programme with the preparation of the necessary supporting documents for decision making and starting the IFMIF-DONES project construction phase (building a scaled down IFMIF plant with number of accelerators reduced from 2 to 1). The decision was taken on 16 March 2023, with the commencement of the construction phase.

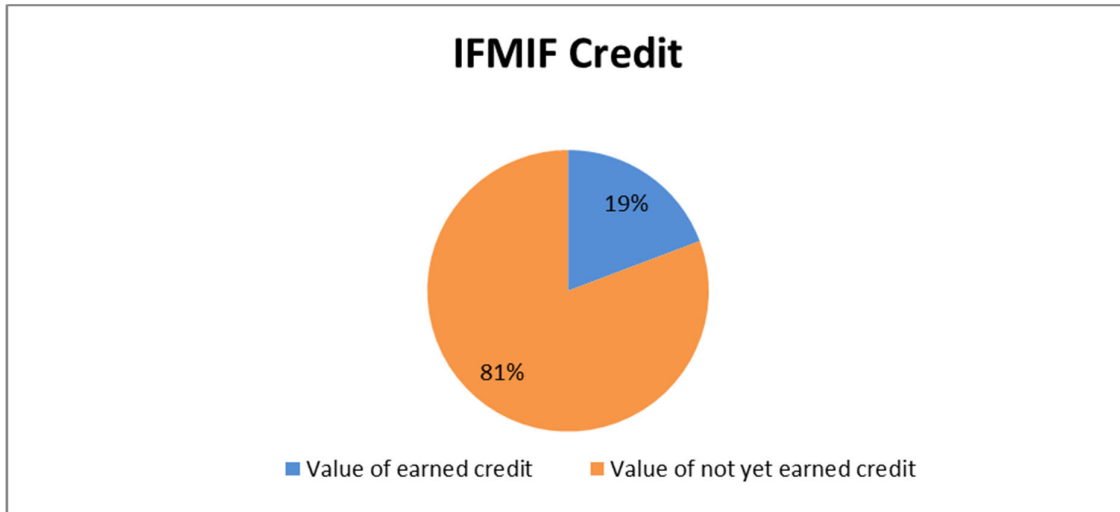
For the period up to March 2029 the total commitment for the EU corresponding amounts to 229.135 kBAUA. (From April 2020-March 2029-Phase II- 81.11 kBAUA).

The sharing of activities with Japan, which leads to this associated total credited budget, was agreed in April 2024 by the BA Steering Committee in the form of the document: "IFMIF/EVEDA Project Plan".

In broad terms, the F4E activities for this period will focus on achieving:

- The full performance of the LIPAc facility, though the completion of assembly of the superconducting LINAC, beam commissioning and operation, provision of expertise, enhancements, consumables as well as spare parts.
- Support the preparations for the IFMIF/DONES neutron source.





**PP\_figure 2. IFMIF/EVEDA: percentage of earned/not yet earned credits for BA (Phase II) (Status April 2024)<sup>3</sup>**

### The IFERC

While in BA phase I, a large part of the effort was to establish the IFERC as a research centre in Rokkasho and to initiate the various research collaborations, in BA phase II the work of IFERC has refocused to support the projects ITER, JT-60SA, and IFMIF/EVEDA.

The EU contribution DEMO Design work concentrates on five key areas, prioritised in terms of direct relevance to ITER and JT-60SA exploitation, and aiming to integrate lessons learned towards the construction of future machines.

The IFERC activities include three sub projects:

- DEMO Design and R&D activities,
- establishment and operation of a Computer Simulation Centre (CSC),
- establishment and operation of a Remote Experimentation Centre (REC)

In BA phase I, the DEMO R&D activities concentrated on materials for blankets in order to establish a common basis for a DEMO design. In BA phase II, the objective of activities in fusion reactors R&D is to contribute to the materials database and handbooks for future reactors and to continue to support ITER in issues related to Tritium retention in first wall materials.

Regarding the CSC activities, in BA phase I the EU procured and delivered the Helios supercomputer for the Rokkasho CSC. In BA phase II, the CSC activities include managing the HPC resources provided by Japan as host in order to advance high priority simulation studies for ITER, JT-60SA and fusion reactor in general (e.g. DEMO).

The Remote Experimentation Centre in Rokkasho aims to facilitate broad participation of scientists into ITER experiments. In BA phase I, the remote experimentation room was procured, and remote experimentation techniques were tested on existing machines, such as JT-60SA, JET and WEST. In BA phase II, the activities concentrate on collaborative activities with ITER, the IFMIF/EVEDA LIPAc accelerator, and JT-60SA. Most of the contribution to REC is provided by F4E.

<sup>3</sup> The credits related to BA Phase I amounting to 148.025 kBAUA have all been awarded.

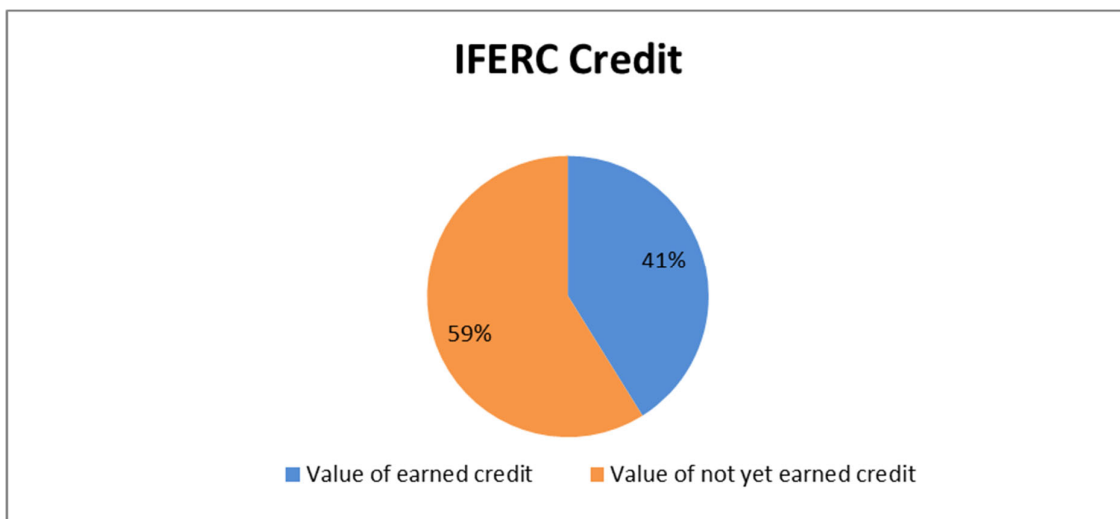
For the period up to March 2029 the total planned commitment for the EU corresponding amounts to 141.998 kBAUA. (From April 2020-March 2029-Phase II – 23.436 kBAUA).

The sharing of activities with Japan, which leads to this associated total credited budget, was agreed in April 2024 by the BA Steering Committee in the form of the document: ‘IFERC Project Plan’.

In broad terms, the F4E activities for this period will focus on supporting JT-60SA, LIPAc as well as ITER by:

- Developing remote experimentation/participation tools for the three projects (i.e. so called REC project),
- Maintaining the provision of high performance computer resources,

And furthering the consolidation of tokamak design and licensing through the DEMO activities carried out in collaboration with Eurofusion and QST.



**PP\_figure 3 . IFERC: percentage of earned/not yet credits for BA (Phase II) (Status April 2024)<sup>4</sup>**

## DONES

The DONES Construction phase started on 16 March 2023 with the holding of the first DONES Steering Committee.

The mission of the DONES Programme is to develop a database of fusion-like neutron irradiation effects in the materials required for the construction of fusion power reactors, and for benchmarking of radiation response of materials. To do so, a neutron source producing high-energy neutrons at sufficient intensity and irradiation volume must be built.

The main objectives of the DONES Programme are:

- a) to provide a neutron source producing fusion-like neutrons at sufficient intensity and irradiation volume;
- b) to generate materials irradiation test data for the design, licensing, construction and safe operation of a fusion demonstration power reactor;
- c) to set up a database for benchmarking of radiation responses of materials hand in hand with computational material science;

<sup>4</sup> The credits related to BA Phase I amounting to 115.55 kBAUA have all been awarded.

- d) to develop a complementary experiments' work programme relevant for other scientific and technological areas.

During 2023, and awaiting the nomination of the DONES Programme Manager, a Working Group, called Mobilisation Working Group (MWG), was established.

This DONES Mobilisation Working Group concluded its preliminary work in March 2024. It was chaired by an F4E representative and involved F4E staff, and representatives of interested Parties, with the mandate to:

- (i) prepare to take ownership, and consolidate the preparatory work for DONES,
- (ii) assess the proposed baseline,
- (iii) plan and prepare the initial steps of the Programme ramp-up, and
- (iv) define the selection procedure for the Programme Manager.

The DONES Mobilisation Working Group concluded its work and reported to the DONES Steering Committee at its 3<sup>rd</sup> meeting on 14 March 2024. The DONES Steering Committee nominated an interim Programme Manager responsible for implementing the overall programme and managing the Integrated Programme Team. The formal selection of the Programme Manager will take place once all the DONES contributors are defined.

At the DONES SC#02, the outcome of the review of the DONES Baseline (organized on 2 & 3 October 2023) was presented underlining the high level of readiness of the IFMIF-DONES Project in its construction phase. The recommendations of the review included considering the cost contingencies and the early implementation of the Programme Team.

The DONES SC#03, held on 14<sup>th</sup> March 2024 acknowledged the completion of the mission of the DONES MWG, agreed to implement the DONES Programme Team and appointed of an interim DONES Programme Manager.

In the meantime, F4E DONES Project Team is working on the development of the detailed Work Programme for the contribution to the DONES Programme and to setup in liaison with DG ENER the legal frame to allow the engagement of F4E at the next July 2024 F4E Governing Board meeting.

## Objectives and KPIs

### Multiannual objectives for the ITER Project

There are 3 multiannual objectives for the ITER Project:

| AREA                     | Objective   | Target  |
|--------------------------|---|---|
| GB/IC milestones         | Achieve the GB and IC milestones within "agreed quarters"   | Ensure that the Governing Board milestones are delivered before the end of the agreed quarters                                    |
| EVM-CAS SPI <sup>5</sup> | SPI above a defined value   | SPI ≥ 0.95  |
| Overall Costs            | Cost estimation for ITER + Broader Approach for period up to 2027 should be less than the total budget available for this period. | Cost estimation for ITER + Broader Approach for period up to 2027 should be less than the total budget available for this period. |

#### Focus on GB/IC milestones:

Since 2016, the ITER Council approves and monitors a set of high-level milestones to track the overall progress of the project. To supplement the ITER Council (IC) milestones, F4E's Governing Board (GB) approved additional ones. The list of milestones is updated each year with a rolling wave approach. These GB/IC milestones are ideal for the purpose of being used as technical objectives as they are not only critical path oriented but they cover a larger group of components at different stages of their development. Most of them are key to achieve FP, but some of them also relate to non-FP systems due to be delivered in later years. This is why F4E has decided that its technical objectives will be the achievement on time of the GB/IC milestones.

F4E regularly reports on the status of these milestones via monthly reports, tracks the risks of not achieving them and, where necessary, implements recovery actions to mitigate any forecasted delays.

In order to show the close link between the long-term (i.e. Project Plan) planning and the short-term (i.e. Work Programme) activities, F4E is tracking in the Work Programme some selected existing technical milestones leading to the GB/IC ones (i.e. the predecessors) and in the chain of all critical and near-critical paths. Therefore such milestones in the short-term will act as an alert against the increasing risk of missing any critical and near-critical path milestones in the longer term.

PP\_table 2 below shows these milestones (the First Plasma ones are in pale yellow).

The table includes all additional milestones selected up to end of March 2024 as well as all modifications of quarters of completions agreed by ITER Council/Governing Board until that date.

<sup>5</sup> This new EVM-CAS indicator will start being used as from 01.01.2025 relying on the "working baseline".

| IC/GB Reference | Programme                                       | Milestone  | Type of Milestone | Agreed Quarter | Forecast Date of Achievement | PA            | PA Deliverable   |
|-----------------|---|--|-------------------|----------------|------------------------------|---------------|--|
| IC02/GB00       | SITE, BUILDINGS AND POWER SUPPLIES PROJECT TEAM | Start of B1 civil works in Tokamak building  | IC                | Q1 2016        | Achieved                     | 6.2.P2.EU.05  | Building Construction  |
| IC04/GB01       | SITE, BUILDINGS AND POWER SUPPLIES PROJECT TEAM | Erection of Tokamak Main Cranes in Assembly Hall   | IC                | Q2 2016        | Achieved                     | 6.2.P2.EU.05  | Building Construction  |
| IC05/GB02       | MAGNETS UNIT                                    | Completion of first EU TF winding pack   | IC                | Q2 2016        | Achieved                     | 1.1.P1A.EU.01 | 10 Toroidal Field (TF) Magnet Windings   |
| IC09/GB03       | SITE, BUILDINGS AND POWER SUPPLIES PROJECT TEAM | Installation of WDS tanks in Tritium building  | IC                | Q2 2016        | Achieved                     | 6.2.P2.EU.05  | Building Construction  |
| IC13/GB04       | VACUUM VESSEL UNIT                              | First Sub Segment Assembly of VV Sector 5 completed  | IC                | Q4 2016        | Achieved                     | 1.5.P1A.EU.01 | Vacuum Vessel: 5 sectors   |
| IC14/GB05       | CRYOPLANT & FUEL CYCLE UNIT                     | First Liquid Nitrogen Refrigerator equipment Factory Acceptance Tests completed                                  | IC                | Q4 2016        | Achieved                     | 3.4.P1.EU.01  | Cryoplant system - LN2 Plant and Auxiliary Systems                               |
| IC19/GB06       | SITE, BUILDINGS AND POWER SUPPLIES PROJECT TEAM | Energisation of 400KV switch yard  | IC                | Q1 2017        | Achieved                     | 4.1.Pn.EU     | Steady-State Electrical Network and Pulsed Power Electrical Network Installation |
| IC21/GB07       | SITE, BUILDINGS AND POWER SUPPLIES PROJECT TEAM | Completion of RFE 1A (Assembly Hall)   | IC                | Q2 2017        | Achieved                     | 6.2.P2.EU.05  | Building Construction  |
| IC24/GB08       | SITE, BUILDINGS AND POWER SUPPLIES PROJECT TEAM | Tokamak Concrete crown civil works achieved  | IC                | Q3 2018        | Achieved                     | 6.2.P2.EU.05  | Building Construction  |
| IC25/GB09       | SITE, BUILDINGS AND POWER SUPPLIES PROJECT TEAM | Civil works and finishing performed in B2 level allowing TB04 installation to begin in tokamak building B2 level | IC                | Q4 2018        | Achieved                     | 6.2.P2.EU.05  | Building Construction  |
| IC30/GB10       | HEATING & CURRENT DRIVE UNIT                    | Neutral Beam Test Facility (NBTF): Start of integrated commissioning of SPIDER beam                              | IC                | Q1 2018        | Achieved                     | 5.3.P9.EU.01  | NB Test Facility Components  |

|           |   |  |    |         |            |                 |   |
|-----------|---|--|----|---------|------------|-----------------|---|
| IC33/GB11 | SITE, BUILDINGS AND POWER SUPPLIES PROJECT TEAM | Buildings: First limited access to Tokamak pit for installation without large crane availability (RFE 1B stage 1)                    | IC | Q2 2018 | Achieved   | 6.2.P2.EU.05    | Building Construction   |
| IC42/GB12 | MAGNETS UNIT                                    | PF Coil: EU PF 5 coil ready for cold test  | IC | Q1 2020 | Achieved   | 1.1.P3A-B.EU.01 | 5 Poloidal Field (PF) coils (PF2-PF6)   |
| IC50/GB13 | SITE, BUILDINGS AND POWER SUPPLIES PROJECT TEAM | Building: Limited crane access between Assembly Hall and Tokamak Building (RFE 1B stage 2)   | IC | Q1 2020 | Achieved   | 6.2.P2.EU.05    | Building Construction   |
| IC54/GB14 | MAGNETS UNIT                                    | PF Coil: Manufacturing complete for EU PF 6 Coil and delivery to site  | IC | Q2 2020 | Achieved   | 1.1.P3A-B.EU.01 | 5 Poloidal Field (PF) coils (PF2-PF6)   |
| IC53/GB15 | MAGNETS UNIT                                    | TF Coils: Complete FAT for PA work scope for first EU TF Coil  | IC | Q1 2020 | Achieved   | 1.1.P1A.EU.01   | 10 Toroidal Field (TF) Magnet Windings  |
| IC58/GB16 | VACUUM VESSEL UNIT                              | VV: First EU Vacuum Vessel Sector fabrication complete and delivered to IO site  | IC | Q4 2020 | 15/10/2024 | 1.5.P1A.EU.01   | Vacuum Vessel: 5 sectors  |
| IC76/GB18 | CRYOPLANT & FUEL CYCLE UNIT                     | Commissioning: Cryostat Leak Detection System delivery to site   | IC | Q3 2023 | 24/07/2028 | 3.1.P3.EU.01    | Leak detection and Localisation System  |
| GB19      | SITE, BUILDINGS AND POWER SUPPLIES PROJECT TEAM | Buildings: Cryoplant Compressor Building (51) RFE (RFE #8B)  | GB | Q1 2023 | Achieved   | 6.2.P2.EU.05    | Building Construction   |
| GB20      | IN VESSEL UNIT                                  | In-vessel: Delivery of the first all-Tungsten prototype test assembly of the Divertor Inner Vertical Target to the RF test facility. | GB | Q4 2018 | Achieved   | 1.7.P2B.EU.01   | Divertor inner vertical targets   |
| GB21      | SITE, BUILDINGS AND POWER SUPPLIES PROJECT TEAM | Buildings: Construction of Cryoplant Coldbox Building (52) Completed   | GB | Q1 2023 | 01/08/2024 | 6.2.P2.EU.05    | Building Construction   |
| GB22      | HEATING & CURRENT DRIVE UNIT                    | EC UL: Manufacturing of 1st batch of Diamond Disks for EC Upper Launcher 1 finished  | GB | Q3 2023 | Achieved   | 5.2.P1B.EU.02   | EC Upper Launchers (4 port plugs) and ex-vessel Waveguide system (32 for EC Upper Launcher and 24 for EC Equatorial Launcher) |
| GB23      | MAGNETS UNIT                                    | TF Coil: Seventh EU TF Coil delivery to site   | GB | Q1 2022 | Achieved   | 1.1.P1A.EU.01   | 10 Toroidal Field (TF) Magnet Windings  |

|             |   |   |    |         |            |               |   |
|-------------|---|---|----|---------|------------|---------------|---|
| IC64/GB24   | SITE, BUILDINGS AND POWER SUPPLIES PROJECT TEAM | Buildings: Medium Voltage distribution LC1A Ready for Equipment   | IC | Q4 2022 | 23/12/2025 | 6.2.P2.EU.05  | Building Construction & Steady-State Electrical Network and Pulsed Power Electrical Network Installation                      |
| GB25        | VACUUM VESSEL UNIT                              | VV: Delivery of Sector 9 by EU-DA to ITER Site  | GB | Q2 2021 | 27/02/2026 | 1.5.P1A.EU.01 | Vacuum Vessel: 5 sectors  |
| GB26        | SITE, BUILDINGS AND POWER SUPPLIES PROJECT TEAM | Buildings: Medium Voltage Distribution Building LC/2B (47) RFE (RFE #10)  | GB | Q3 2024 | 23/12/2025 | 6.2.P2.EU.05  | Building Construction   |
| GB27        | HEATING & CURRENT DRIVE UNIT                    | NB&PS: Start of Installation of Acceleration Grid Power Supplies - Converter System of Neutral Beam Injector-1 Q2                   | GB | Q3 2024 | 05/01/2026 | 5.3.P6.EU.01  | NB Power Supply   |
| GB28        | CRYOPLANT & FUEL CYCLE UNIT                     | Cryo&FC: Delivery of Torus and Cryostat Front-End Cryopump Distribution System and Cryojumpers 5-8 (4 no.) Batch 2 by EU-DA to Site | GB | Q3 2023 | Achieved   | 3.1.P1.EU.02  | Front-End Cryopump distribution   |
| GB29        | HEATING & CURRENT DRIVE UNIT                    | EC UL: Manufacturing of 1st batch of Waveguides for EC Upper Launcher 1 finished  | GB | Q1 2026 | 23/01/2029 | 5.2.P1B.EU.02 | EC Upper Launchers (4 port plugs) and ex-vessel Waveguide system (32 for EC Upper Launcher and 24 for EC Equatorial Launcher) |
| GB30        | HEATING & CURRENT DRIVE UNIT                    | NB&PS: Start of Installation of High Voltage Dec 1 of Neutral Beam Injector -1  | GB | Q2 2025 | 14/04/2026 | 5.3.P6.EU.01  | NB Power Supply   |
| GB32        | REMOTE HANDLING UNIT                            | Remote Handling: Task Order Signed for Manufacturing for Cask and Plug Remote Handling System (CPRHS)                               | GB | Q3 2022 | Achieved   | 2.3.P3.EU.01  | 15 Cask and Plug RH systems   |
| GB33        | CRYOPLANT & FUEL CYCLE UNIT                     | Cryo&FC: Delivery of First Torus & Cryostat   | GB | Q2 2023 | 15/05/2024 | 3.1.P1.EU.03  | Cryopumps: 6 Torus and 2 Cryostat Cryopumps   |
| IC90.2/GB34 | SITE, BUILDINGS AND POWER SUPPLIES PROJECT TEAM | Buildings: B71 North ready for IO Installation  | IC | Q2 2022 | Achieved   | 6.2.P2.EU.05  | Building Construction   |
| GB35        | CRYOPLANT & FUEL CYCLE UNIT                     | Cryo&FC : Delivery of Primary (VV) Leak Detection and Localisation by EU-DA to ITER Site for 1st Plasma                             | GB | Q4 2023 | 14/09/2029 | 3.1.P3.EU.01  | Leak detection and Localisation System  |

|      |                              |  |    |         |            |               |   |
|------|------------------------------|--|----|---------|------------|---------------|---|
| GB36 | DIAGNOSTICS UNIT             | Diagnostics: Delivery of In-V Elec Feedthroughs for Upper Ports Batch 2 by EU-DA to IO ITER Site                         | GB | Q4 2025 | 27/07/2027 | 5.5.P1.EU     | Diagnostics (roughly 25% of all diagnostic systems)   |
| GB37 | IN VESSEL UNIT               | In-Vessel: Completion of the qualification phase prior to start of Blanket First Wall series production                  | GB | Q3 2023 | Achieved   | 1.6.P1A.EU    | Blanket First Wall (215 panels)   |
| GB38 | IN VESSEL UNIT               | In-vessel: Completion of Stage I of the series production of Divertor Cassette Bodies.                                   | GB | Q2 2028 | 16/03/2028 | 1.7.P1.EU.01  | 54 Divertor cassette bodies   |
| GB39 | DIAGNOSTICS UNIT             | Diagnostics: Electronics and Software for Magnetics Delivered to ITER Site   | GB | Q3 2023 | Achieved   | 5.5.P1.EU     | Diagnostics (roughly 25% of all diagnostic systems)   |
| GB40 | REMOTE HANDLING UNIT         | Remote Handling :Equatorial Port Plug First Assembly Cask Delivered to ITER Site   | GB | Q4 2023 | 23/03/2026 | 2.3.P3.EU.01  | 15 Cask and Plug RH systems   |
| GB41 | REMOTE HANDLING UNIT         | Remote Handling: Upper Port Plug First Assembly Cask Delivered to ITER Site  | GB | Q4 2023 | 18/06/2026 | 2.3.P3.EU.01  | 15 Cask and Plug RH systems   |
| GB42 | REMOTE HANDLING UNIT         | Remote Handling :Monorail crane of Neutral Beam Remote Handling System and Delivered to ITER Site                        | GB | Q1 2024 | 02/05/2031 | 2.3.P5.EU.01  | 1 Neutral Beam RH system.   |
| GB43 | HEATING & CURRENT DRIVE UNIT | NB & PS: 8th Set of Main High Voltage Power Supplies & Body Power Supplies (MHVPS & BPS) Delivered to ITER Site by EU-DA | GB | Q2 2024 | Achieved   | 5.2.P4.EU.01  | 67% EC High Voltage Power Supplies  |
| GB44 | HEATING & CURRENT DRIVE UNIT | ECCS: EC Upper Launcher Control System ITER Site Acceptance completed  | GB | Q3 2024 | 15/01/2026 | 5.2.P1B.EU.01 | Electron Cyclotron (EC) Control System  |
| GB45 | IN VESSEL UNIT               | In-vessel: Completion of Stage I of the series production of Divertor Inner Vertical Target.                             | GB | Q4 2026 | 19/04/2028 | 1.7.P2B.EU.01 | Divertor inner vertical targets   |
| GB46 | HEATING & CURRENT DRIVE UNIT | EC UL: Delivery 1st EC Upper Launcher from EU-DA to IO   | GB | Q3 2027 | 23/05/2029 | 5.2.P1B.EU.02 | EC Upper Launchers (4 port plugs) and ex-vessel Waveguide system (32 for EC Upper Launcher and 24 for EC Equatorial Launcher) |
| GB47 | REMOTE HANDLING UNIT         | In Vessel Viewing System Unit #1 Delivered to ITER Site  | GB | Q2 2028 | 22/09/2031 | 5.7.P1.EU.01  | 6 In-Vessel Viewing systems   |



|             |   |  |    |         |            |               |   |
|-------------|---|--|----|---------|------------|---------------|---|
| GB48        | HEATING & CURRENT DRIVE UNIT                    | NB&PS: Delivery of 1st Set (1MW) of Gyrotrons Tubes by EU-DA to ITER Site  | GB | Q3 2027 | 13/09/2027 | 5.2.P3.EU     | 25% EC Gyrotron Sources                                 |
| GB49        | IN VESSEL UNIT                                  | In-vessel: Delivery of the Divertor Rails to the ITER Site.  | GB | Q4 2028 | 20/02/2030 | 1.7.P2E.EU.01 | Divertor rails  |
| GB50        | CRYOPLANT & FUEL CYCLE UNIT                     | Cryo&FC : Delivery of Heating Neutral Beam Cryopumps 1 from EU-DA to ITER Site   | GB | Q4 2030 | 22/05/2034 | 3.1.P1.EU.04  | Cryopumps for the Neutral Beam system (ITER and MITICA) |
| IC43/GB51   | SITE, BUILDINGS AND POWER SUPPLIES PROJECT TEAM | Building: Assembly building complete   | IC | Q4 2018 | Achieved   | 6.2.P2.EU.05  | Building Construction                                   |
| IC67/GB54   | MAGNETS UNIT                                    | TF coils: Complete FAT for PA work scope for 18 TF Coils   | IC | Q4 2021 | 22/04/2024 | 1.1.P1A.EU.01 | 10 Toroidal Field (TF) Magnet Windings                  |
| IC32/GB55   | SITE, BUILDINGS AND POWER SUPPLIES PROJECT TEAM | Cryostat: Cryostat support bearings full scale prototype delivery to site  | IC | Q2 2018 | Achieved   | 6.2.P2.EU.05  | Building Construction                                   |
| GB56        | HEATING & CURRENT DRIVE UNIT                    | NB & PS: 1st Set of Main High Voltage Power Supplies & Body Power Supplies (MHVPS & BPS) Delivered to ITER Site by EU-DA | GB | Q1 2020 | Achieved   | 5.2.P4.EU.01  | 67% EC High Voltage Power Supplies                      |
| IC90.1/GB57 | SITE, BUILDINGS AND POWER SUPPLIES PROJECT TEAM | Buildings: Cryoline Bridge available for installation of systems   | IC | Q2 2022 | Achieved   | 6.2.P2.EU.05  | Building Construction                                   |
| IC91.1/GB58 | SITE, BUILDINGS AND POWER SUPPLIES PROJECT TEAM | Buildings: Busbar Bridge available for installation of systems   | IC | Q4 2022 | 05/08/2024 | 6.2.P2.EU.05  | Building Construction                                   |
| IC59.1/GB59 | SITE, BUILDINGS AND POWER SUPPLIES PROJECT TEAM | Building: Tokamak Building access granted in L3  | IC | Q2 2020 | Achieved   | 6.2.P2.EU.05  | Building Construction                                   |
| IC59.2/GB60 | SITE, BUILDINGS AND POWER SUPPLIES PROJECT TEAM | LV and MV Load-centers for all First Plasma nonnuclear   | IC | Q2 2020 | Achieved   | 6.2.P2.EU.05  | Building Construction                                   |

**PP\_table 2. Multiannual objectives of the ITER project (IC-GB milestones) (as of 31<sup>st</sup> March 2024)**

### Multiannual objectives for the Test Blanket Module (TBM)

The work carried out on the Test Blanket Module (TBM) Systems is not covered by a standard Procurement Arrangement, but by specific TBM Arrangements (TBMA) signed with ITER Organization. Through a TBMA, F4E is committing to deliver a Test Blanket Systems – or a part of it (after delivery a new TBMA must be signed for the follow-up activities), in case of a collaboration with another DA (see below) – and the associated equipment/tools to the ITER Site according to an agreed schedule.

Initially two independent European TBM Systems were to be tested in ITER, a Helium-cooled Lead-Lithium (HCLL) and a Helium-cooled Pebble-Bed (HCPB). Two TBMA were signed with the IO in 2014 for that purpose.

In 2018, in line with a recommendation of the working group for the realignment of the TBM and DEMO Breeding Blanket programmes, F4E decided to replace the development of one of the two helium-cooled TBM System with a water-cooled lead-lithium (WCLL-TBS) one. An amendment to the HCLL-TBS TBMA was signed with IO, now constituting the WCLL-TBS TBMA. In addition, F4E has entered in a close collaboration with EUROfusion for the execution of its large TBM R&D program.

In 2020, as a follow-up action of the reduction of the number of TBM test ports in ITER, F4E and ITER Korea decided to join their effort to develop and deliver the helium-cooled Pebbled Bed TBM System. It was renamed the Helium-Cooled Ceramic Pebble (HCCP) TBM System. The former HCPB TBMA was terminated, and a tripartite F4E-ITER Korea-IO new TBMA was signed for the HCCP-TBS in 2023. Simultaneously, F4E and ITER Korea signed a Partnership Arrangement ruling their collaborative effort toward the IO. In this collaboration, F4E is responsible for delivering only 40% of the HCCP-TBS (and ITER Korea 60%).

The following milestones of the TBM programme complement the set of Technical Objectives for the ITER project.

| Reference | Action                 | Milestone  | Date          |
|-----------|------------------------|--|---------------|
| TBM01     | 10-Test Blanket Module | Initiation of the official process for changing one European TBM System and preparation of a new TBM Arrangement | 2018-Achieved |
| TBM02     | 10-Test Blanket Module | Signature of the WCLL TBM Arrangement  | 2020-Achieved |
| TBM03     | 10-Test Blanket Module | WCLL TBS Conceptual Design Review (CDR)  | 2020-Achieved |
| TBM04     | 10-Test Blanket Module | Signature of the HCCP TBM Arrangement and Partnership Arrangement  | 2023-Achieved |
| TBM05     | 10-Test Blanket Module | WCLL TBS and HCCP TBS Preliminary Design Review (PDR)  | Q1 2026       |
| TBM06     | 10-Test Blanket Module | Signature of FD and procurement of WCLL and HCCP ancillary systems   | Q1 2027       |
| TBM07     | 10-Test Blanket Module | WCLL TBS and HCCP TBS Final Design Review (FDR)  | Q3 2028       |
| TBM08     | 10-Test Blanket Module | Signature of procurement of WCLL TBM and HCCP TBM sets   | Q1 2029       |
| TBM09     | 10-Test Blanket Module | Delivery of WCLL and HCCP ancillary systems to ITER site   | 2035          |
| TBM10     | 10-Test Blanket Module | Delivery of WCLL and HCCP TBM sets to ITER site  | 2036          |

**PP\_table 3 . Multiannual objectives of the TBM project**

### Multiannual objectives for the Broader Approach

The technical objective for the European part of the BA projects for Phase II, as presently defined in the Project Plan approved by the BA Steering Committee, is the achievement on time of the milestones that are listed, project by project, in the tables below in which the achievements are shown in pale green.

These simplified tables are largely based on the grouping of the relevant project milestones, originally defined and valorized in the EU relevant Procurement Arrangements. The technical objectives are defined based on the Project Plans 2024-2029 for all three projects<sup>6</sup>.

| Related PA (BA)                              | Description   | Baseline<br>Baseline<br>Achievement<br>Date - Year | Credit<br>Credit<br>Allocation<br>(kBAUA) |
|--|---|--|---|
| Power Supplies Spare Parts – Part 1 (PSSP01) | Power Supplies Maintenance Support  | 2021   | 2.306                                     |
| EF Correction Coils (EFCC PS)                | Design and Procurement of the Error Field Correction Coils - Approval of First Design Report                          | 2021   | 1.074                                     |
| Thomson Scattering (TSCC)                    | Fabrication and Tests - Optical fibres  | 2021   | 2.420                                     |
| Thomson Scattering (TSCC)                    | Fabrication and Tests – delivery of all other hardware  | 2024   | 3.770                                     |
| ECRH PS Spare Parts (ECPSSP01)               | Electro Cyclotron Resonance Heating – Approval of First Design Report   | 2023   | 1.257                                     |
| ECRH PS Spare Parts (ECPSSP01)               | Electro Cyclotron Resonance Heating - Approval of Report on Factory Tests and Delivery to Site                        | 2024   | 2.514                                     |
| ECRH PS Spare Parts (ECPSSP01)               | Electro Cyclotron Resonance Heating –Acceptance Tests on Site   | 2025   | 0.419                                     |
| Pellet injector (PEINJ)*                     | Delivery of fueling source  | 2025   | 1.460                                     |
| Pellet injector (PEINJ)*                     | Delivery of Pacing Source, Delivery of Centrifuge and Drift Tube and Integrated Test in Europe and acceptance on site | 2025   | 4.380                                     |
| Cryopumps (CRPUM)                            | Divertor cryopumps - delivery on site – (10 units)  | 2024   | 1.370                                     |
| EF Correction Coils (EFCC PS)                | Design and Procurement of the Error Field Correction Coils – Approval of Report on Factory Tests                      | 2022   | 1.074                                     |
| EF Correction Coils (EFCC PS)                | Design and Procurement of the Error Field Correction Coils - Delivery to Site and Acceptance Tests on Site            | 2024   | 1.412                                     |
| ECRH Transmission (ECRHWG)                   | Electro Cyclotron Resonance Heating Transmission lines – Delivery of components subset-A                              | 2024   | 1.263                                     |
| Actively Cooled Divertor Part 1(DIV-1)       | High Heat Flux Elements 1 <sup>st</sup> stage   | 2024   | 2.720                                     |
| Actively Cooled Divertor Part 1(DIV-1)       | High Heat Flux Elements 2 <sup>nd</sup> stage   | 2025   | 9.030                                     |
| Actively Cooled Divertor Part 2 (DIV-2)      | Normal Heat Flux Elements and Cassettes   | 2025   | 16.586                                    |
| Actively Cooled Divertor Part 3 (DIV-3)*     | Integration of Cassettes, Normal and high Heat Flux Elements  | 2026   | 14.318                                    |
| ECRH PS (ECPSSP02)                           | Electro Cyclotron Resonance Heating – Procurement of 2 PS   | 2027   | 5.106                                     |
| Cryogenics (CR1)*                            | Cryogenic System Maintenance 2024-2029  | 2029   | 5.5                                       |

**PP\_table 4 . Multiannual objectives JT-60SA**

<sup>6</sup> The Project Plans were approved by the BA Steering Committee in April 2024.

| Related PA (BA)                | Description  | Baseline Achievement Date - Year | Credit Allocation (kBAUA) |
|--------------------------------|--|----------------------------------|---------------------------|
| Injector Spare parts (AF02-3)  | LIPAc injector upgrade – work plan   | 2025                             | 0.500                     |
| SRF Linac (AF4-2)              | SRF Linac – Assembly of the LIPAc cryomodule and supply of high sensitivity beam loss Monitors | 2025                             | 2.540                     |
| RF Power System (AF6-2)        | RF Power System – Refurbished PSYS (protection system)   | 2023                             | 1.330                     |
| RF Power System (AF6-3)        | RF Power System - Enhancement pre-series   | 2025                             | 3.370                     |
| RF Power System (AF6-4)        | RF Power System - Enhancement RFQ series   | 2027                             | 4.900                     |
| Control System (AF8-3)         | Control System – maintenance of hardware and software – year 2025                              | 2024                             | 0.990                     |
| Control System (AF8-3)         | Control System – maintenance of hardware and software – year 2026                              | 2025                             | 2.440                     |
| LF Enhancement (LF6-2)         | LF Enhancement: Li Loop, Purification System & Safety Part 1                                   | 2025                             | 3.800                     |
| LF Enhancement (LF6-2)         | LF Enhancement: Li Loop, Purification System & Safety – Part 2                                 | 2027                             | 0.800                     |
| FNS Engineering Design (ED6-2) | Technical reports Part 1   | 2025                             | 3.250                     |
| FNS Engineering Design (ED6-2) | Technical reports Part 2   | 2025                             | 0.800                     |

**PP\_table 5. Multiannual objectives IFMIF/EVEDA**

| Related PA (BA)                             | Description   | Baseline Achievement Date - Year | Credit Allocation (kBAUA) |
|---|---|----------------------------------|---------------------------|
| Demo Design Activities and DEMO R&D (5 PAs) | Complete planning with EUROfusion of DEMO design and DEMO R&D activities from 2021-2024 EU  | 2021                             | 1.279                     |
| CSC-EU                                      | Computer resources and joint simulation projects contribution 2020-2023   | 2023                             | 0.600                     |
| REC-EU                                      | Supply of the implementing plan for the ITER Remote Experimentation Centre  | 2021                             | 0.050                     |
| DEMO Design Activities                      | Summary report of activities  | 2025                             | 4.686                     |
| DEMO R&D                                    | Structure material development for in-vessel components   | 2025                             | 1.874                     |
| DEMO R&D                                    | Database for material corrosion   | 2025                             | 0.469                     |
| DEMO R&D                                    | Neutron irradiation experiment of breeding functional materials   | 2025                             | 1.405                     |
| DEMO R&D                                    | Tritium technology for collection and inventory evaluation  | 2025                             | 0.937                     |
| CSC-EU                                      | Computer resources and joint simulation projects contribution 2024  | 2024                             | 0.200                     |
| REC-EU                                      | Supply of the equipment for tests of remote experiment with ITER and the support of remote experiments for the ITER Remote Experimentation Centre | 2025                             | 1.150                     |

**PP\_table 6. Multiannual objectives IFCR**

### Multiannual objectives for DONES

Precise and detailed multiannual objectives will be defined for DONES once the formal involvement of F4E is decided and the content of the Procurement Arrangements is defined.

### Multiannual objectives for DEMO

No separate technical objectives are set for DEMO considering the current limited involvement of F4E in such activities.

### Annual Objectives

In addition to the multiannual objectives, annual objectives are identified and are constantly monitored by F4E and are reported upon. The PP\_table 7 below provides a list of these objectives.

| AREA                                    | Objective  | Target                           |
|---|--|----------------------------------|
| Annual M-SPI                            | Reach a minimum SPI value by end of the year   | SPI≥0.8                          |
| Annual commitment budget                | Implement a defined percentage of Commitment Appropriations by end of the year   | 90% implementation of commitment |
| Budgeted forecast of the Work Programme | Implement a defined percentage of allocated commitment appropriation to Work Programme Actions, without reserves, by end of year | 95% implementation of commitment |
| Annual payment budget                   | Implement a defined percentage of Payment Appropriations by end of the year  | 95% implementation of payment    |
| Quality – NCR closure time              | Ensure Nonconformity Reports (NCR) closure in due time   | KPI≥0.8                          |
| Quality – NCR closure rate              | Close a minimum percentage of NCR annually   | KPI≥0.95                         |
| Human Resources                         | Vacancy rate to be less than a defined value by end of the year  | Vacancy rate to be less than 4%  |

**PP\_table 7. Annual Objectives**

### Definition of the F4E Key Performance Indicators (KPIs) and their thresholds

#### **Multiannual KPI**

*Equation 1: GB milestones variance*

$$\text{GB milestone Achieved Date} - \text{GB milestone Foreseen Date}$$

*Equation 2: EVM-CAS SPI*

$$\frac{EV}{PV} = \frac{\text{Achieved Credit (Euros 2008)}}{\text{Baseline Credit to date (Euros 2008)}}$$

*Equation 3: Overall Costs*

$$\frac{\text{Cost estimation for "ITER + Broader Approach"}}{\text{Total budget available for "ITER + Broader Approach"}}$$

**Annual KPI:***Equation 4: Annual M-SPI*

$$\frac{\text{Number of milestones with Status = Completed}}{\text{Number of milestones with reference date} \leq \text{Current month}}$$

*Equation 5: Annual commitment budget*

$$\frac{\text{Actual commitment executed to date} + \text{remaining commitment planned to be executed between date and year's end}}{\text{Latest approved annual commitment budget}}$$

*Equation 6: Annual budgeted forecast of Work Programme*

$$\frac{\text{Actual commitment executed to date} + \text{remaining commitment planned to be executed between date and year's end}}{\text{Latest approved budgeted forecast of the Work Programme Actions}^7}$$

*Equation 7: Annual payment budget*

$$\frac{\text{Actual payment executed to date} + \text{remaining payment which is planned to be executed between date and year's end}}{\text{Latest approved payment appropriation for the year}}$$

*Equation 8: Quality - Closure time*

$$\frac{\text{Number of open NCR respecting the target date for NCR closure}}{\text{Number of open NCR}}$$

*Equation 9: Quality NCR - NCR closure rate*

$$\frac{\text{Number of NCRs closed during the year}}{\text{Number of NCR opened during the year}}$$

*Equation 10: Vacancy rate*

$$\frac{\text{Number of vacant posts}}{\text{Total authorised posts in the Establishment Plan (FO, TA and CA)}}$$

*Equation 11: Turnover rate*

$$\frac{\text{Number of departures}}{\text{Total authorised posts in the Establishment Plan (FO, TA and CA)}}$$

*Equation 12: Absenteeism rate*

$$\frac{\text{Cumulative number of days of sick leave of staff member in year N}}{\text{Total number of staff members in year N} * 365}$$

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<sup>7</sup> Excluding Reserves

**KPI Thresholds**

Each KPI has thresholds:

|       |   |
|-------|---|
| Green | The KPI is within the accepted range.                       |
| Amber | The KPI is at risk of moving outside of the accepted range. |
| Red   | The KPI is outside of the accepted range.                   |

A project manager may choose to flag a KPI as at risk whenever there is a risk that the KPI may move outside of the accepted range. This step should be reflected in the identification of specific risks in the risk log with a consequent tracking and mitigation actions.

The objective of the KPIs is to ensure that the project is proceeding in line with the overall plan so that:

1. The long-term project schedule and deliverables are on schedule.
2. The project costs are under control.
3. The project quality management process is functioning as planned.
4. The Establishment Plan is being utilized effectively.

**List of main KPIs monitored during the year and associated thresholds**

- GB Milestones

|       |  |
|-------|--|
| Blue  | Milestone completed  |
| Green | Forecast date more than one month before the end of target quarter                                       |
| Amber | Forecast date in the final month of target quarter (or Project Manager has flagged KPI as being at risk) |
| Red   | Forecast date later than end of target quarter   |

- EVM-CAS SPI

|       |                        |
|-------|------------------------|
| Green | $KPI \geq 0.95$        |
| Amber | $0.95 > KPI \geq 0.83$ |
| Red   | $KPI < 0.83$           |

- Overall costs

|       |                       |
|-------|-----------------------|
| Green | $KPI \geq 1.0$        |
| Amber | $1.0 > KPI \geq 0.95$ |
| Red   | $KPI < 0.95$          |

- Annual M-SPI

|       |                        |
|-------|------------------------|
| Green | $SPI \geq 0.80$        |
| Amber | $0.80 > KPI \geq 0.60$ |
| Red   | $KPI < 0.60$           |

- Annual Commitment Budget (overall at F4E Level)

|       |                               |
|-------|-------------------------------|
| Green | $0.90 \leq \text{KPI}$        |
| Amber | $0.70 \leq \text{KPI} < 0.90$ |
| Red   | $\text{KPI} < 0.70$           |

- Budgeted forecast of the Work Programme

|       |                               |
|-------|-------------------------------|
| Green | $0.95 \leq \text{KPI}$        |
| Amber | $0.90 \leq \text{KPI} < 0.95$ |
| Red   | $\text{KPI} < 0.90$           |

- Annual Payment Budget (overall at F4E Level)

|       |                               |
|-------|-------------------------------|
| Green | $0.95 \leq \text{KPI}$        |
| Amber | $0.90 \leq \text{KPI} < 0.95$ |
| Red   | $\text{KPI} < 0.90$           |

- Quality – NCR closure time

|       |                               |
|-------|-------------------------------|
| Green | $0.80 \leq \text{KPI}$        |
| Amber | $0.60 \leq \text{KPI} < 0.80$ |
| Red   | $\text{KPI} < 0.60$           |

- Quality – NCR closure rate

|       |                               |
|-------|-------------------------------|
| Green | $0.95 \leq \text{KPI}$        |
| Amber | $0.90 \leq \text{KPI} < 0.95$ |
| Red   | $\text{KPI} < 0.90$           |

- Vacancy rate

|       |                            |
|-------|----------------------------|
| Green | $\text{KPI} \leq 0.04$     |
| Amber | $0.04 < \text{KPI} < 0.07$ |
| Red   | $\text{KPI} \geq 0.07$     |



## Detailed break-down of credits for the period April 2020-March 2029 for Broader Approach

| Title  | BA EU Commitment<br>kBAUA |
|--|---------------------------|
| <b>Enhancements in-kind</b>                        |                           |
| In-vessel Components                               | 71.036                    |
| Heating & CD Systems                               | 38.380                    |
| Plasma Diagnostics                                 | 26.850                    |
| Cryogenic  | 11.400                    |
| Magnet and Power Supply                            | 19.420                    |
| Control System                                     | 0.000                     |
| Other Tokamak Systems                              | 38.300                    |
| EU on-site personnel                               | 6.200                     |
| <b>Operation / Maintenance / Assembly</b>          |                           |
| Consumables  | 57.602                    |
| EU on-site personnel support and Project Team Cost | 1.850                     |
| Maintenance & Assembly                             | 9.400                     |
| Replacement parts                                  | 12.800                    |
| IT infrastructure                                  | 7.540                     |
| Others   | 10.600                    |
| <b>JT-60SA (Total)</b>                             | <b>311.378</b>            |
| Engineering Design Optimisation                    | 5.200                     |
| Lithium Target Facility                            | 5.200                     |
| LIPAc-Injector                                     | 5.300                     |
| LIPAc-SRF Linac                                    | 3.700                     |
| LIPAc-RF Power System                              | 14.060                    |
| LIPAc-Control System                               | 2.950                     |
| Common Expenses                                    | 1.700                     |
| Common Fund  | 16.140                    |
| Maintenance and Control System Refurbishment       | 6.240                     |
| On site personnel (Europe)                         | 18.900                    |
| Computerized Maintenance Management System         | 0.810                     |
| <b>IFMIF/EVEDA (Total)</b>                         | <b>81.100</b>             |
| DEMO Design  | 10.005                    |
| DEMO R&D   | 10.013                    |
| CSC  | 2.000                     |
| REC  | 2.000                     |
| Project Team                                       | 2.430                     |
| <b>IFERC (Total)</b>                               | <b>26.448</b>             |

**PP\_table 8 . Detailed break-down of credits for the period April 2020-March 2029 for Broader Approach <sup>8</sup>**

<sup>8</sup> As not all PAs are signed, the PAs have been summed up based on topics, to show the total credit values planned up to March 2029.

| <b>Action number</b> | <b>Action name</b>               | <b>PMP delivery status</b>                     |
|----------------------|----------------------------------|--|
| Action 1             | Magnets                          | No PMP forecasted since Programme is finishing |
| Action 2             | Vacuum Vessel                    | Delivered                                      |
| Action 3 & 4         | In Vessel - Blanket and Divertor | Delivered                                      |
| Action 5             | Remote Handling                  | Delivered                                      |
| Action 6             | Cryoplant and Fuel Cycle         | Delivered                                      |
| Action 7             | Plasma Engineering & Operations  | On-hold  |
| Action 8             | Heating and Current Drive        | Delivered                                      |
| Action 9             | Diagnostics                      | Delivered                                      |
| Action 10            | Test Blanket Module              | Delivered                                      |

*PP\_table 9 . State of play on Project Management Plans preparation*

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## ANNEX TO SECTION III “RESOURCE ESTIMATES PLAN”

The REP for F4E Financial Resources includes the Estimate of Revenue and Expenditure for the following five years according to:

- Estimate of Revenue from the Contributors (EURATOM, ITER Host State and Members),
- Estimate of Expenditure in Commitments according to the corresponding Work Programme for the current year and estimates of needs until 2029,
- Estimates of expenditure in payments according to detailed Payment Forecasts for 2024 and 2025 and estimates based on commitment needs until 2029.

### Assumptions of the Resource Estimates Plan

The REP is based on the general assumptions introduced in the Single Programming Document 2025-2029 and on the following specific budget assumptions.

#### 1. Estimate of Revenue

The F4E revenue is made up of:

- EURATOM contribution,
- ITER Host State contribution,
- Other contributions
  - Membership contributions from members other than EURATOM
  - Possible Other contributions
- Additional Revenues, for tasks requested by ITER Organization, from Other Assigned Revenue (Japan/UP#10), and from recoveries,
- Unused commitment appropriations made available again,
- In kind contribution to F4E

##### 1.1. EURATOM contribution

The contribution from EURATOM constitutes the main source of revenue for F4E. This revenue is divided in contribution to F4E operational and administrative expenditure. The latter covers the main part of the F4E administrative costs.

The breakdown of the annual EURATOM contribution until 2027 is included in the Legislative Financial Statement<sup>1</sup> accompanying the Council Decision (2021) 281, which can be further adjusted during the

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<sup>1</sup> Legislative financial statement to Commission proposal COM (2013) 607 for a Council Decision amending Decision 2007/198/Euratom establishing the European Joint Undertaking for ITER and the Development of Fusion Energy and conferring advantages upon it

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annual budgetary procedures based on updated EC Statement of Estimates and final approval by EU budgetary Authority.

## 1.2. ITER Host State Contribution (IHS)

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The contribution from the ITER Host State constitutes the second source of revenue for F4E. France as the ITER Host State covers 9.09% of the total costs of the ITER construction phase, this is equivalent to 20% of the total European participation to the construction of ITER. It is calculated on the EURATOM contribution to F4E minus the domains of exclusion as agreed in the exchange of letter<sup>2</sup> and defined as follows:

- Administrative expenditure,
- Test Blanket Modules cost,
- DONES cost,
- Broader Approach cost,
- The Transportation cost.

Other activities of F4E not directly related to the construction phase of ITER may in the future be excluded from the scope of calculation by agreement between France and the Commission. Currently it is assumed that France will not contribute specifically to the Technology Development Programme, as it has the same nature as the other domains of exclusion.

## 1.3. Membership Contributions

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The Annual Membership Contributions are composed of:

- A minimum contribution of 0.1% of the total amount of annual membership contributions and,
- Additional contribution calculated in proportion to the EURATOM financial participation (excluding JET) in the Member's expenditure in the framework of the Community Fusion Research Programme in year N-2.

The contributions are established and adopted annually within the F4E budget. The calculations correspond to 10% of the F4E draft administrative budget prepared in year N-2.

The revenue from the Membership contributions is not assigned. As from 2016 onwards, the breakdown by Member is established by EURATOM based on the figures provided by EUROfusion, in compliance with the frame defined in F4E statutes.

## 1.4. Other contributions

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Revenue resulting from the annual contributions from third countries to F4E budget and ITER project received from EURATOM based on their cooperation agreements with the European Commission.

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<sup>2</sup> Contribution financière française à la construction d'ITER : Lettre du Haut Représentant Français pour ITER (formal exchange of letters on 17 June 2022 and 29 July 2022 between France and the European Commission).

## 1.5. Additional Revenues (Revenue from ITER Organization, Other Revenue and Recoveries)

The revenue from the ITER Organization (IO)<sup>3</sup> is covering the tasks implemented by F4E at IO request:

- For the implementation of the Project Change Requests originating from IO that have been introduced after 5 March 2015 according to the terms of reference of IO Reserve Fund,
- In the frame of resolution of non-conformities on request of IO DG,
- For tasks requested by IO DG for the general interest of the project, considering the capacity of F4E suppliers.

The Other Assigned Revenue is revenue coming from Other Domestic Agencies covering the transfer of specific tasks to be implemented by F4E.

Miscellaneous revenue according to F4E financial Regulation includes liquidity damages or administrative fees.

The Recoveries include revenues from undue payments which are returned to the budget.

## 1.6. Implementation of unused commitment appropriations

The F4E Financial Regulation foresees the possibility to make the unused appropriations<sup>4</sup> available again as revenue in subsequent budgetary years according to the F4E operational needs. This financial mechanism does not apply to the assigned revenue received from ITER Host State (France) and from ITER Organization and to F4E administrative expenditure as they follow specific rules. The table below gives the global overview of the commitment appropriations cancelled and made available again since 2007.

| Commitment Appropriations<br>Current Value MEUR      | 2007-2013<br>FP VII | B-2014<br>Executed | B-2015<br>Executed | B-2016<br>Executed | B-2017<br>Executed | B-2018<br>Executed | B-2019<br>Executed | B-2020<br>Executed<br>Estimate (*) |
|--|---------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|------------------------------------|
| Cancelled  | 529.231             | 292.77             | 85.803             | 6.346              | 37.927             | 5.577              | 15.377             | 77.109                             |
| Made available again                                 | 9.760               |                    |                    |                    | 96.000             | 120.007            | 149.170            | 390.697                            |
| <b>Total CA still to be made<br/>available again</b> | <b>519.471</b>      | <b>812.238</b>     | <b>898.041</b>     | <b>904.387</b>     | <b>846.314</b>     | <b>731.884</b>     | <b>598.091</b>     | <b>284.503</b>                     |

| Commitment Appropriations<br>Current Value MEUR      | B-2021<br>Executed | B-2022<br>Executed | B-2023<br>Executed | B-2024<br>Budget AM2 | B-2025<br>Budget | B-2026<br>Estimation | B-2027<br>Estimation | TOTAL            |
|--|--------------------|--------------------|--------------------|----------------------|------------------|----------------------|----------------------|------------------|
| Cancelled  | 84.061             | 187.402            | 164.947            |                      |                  |                      |                      | <b>1 486.547</b> |
| Made available again                                 | -                  | -                  | -                  | 155.193              | 444.064          | 3.124                | 118.533              | <b>1 486.547</b> |
| <b>Total CA still to be made<br/>available again</b> | <b>368.565</b>     | <b>555.967</b>     | <b>720.914</b>     | <b>565.722</b>       | <b>121.657</b>   | <b>118.533</b>       | <b>- 0.000</b>       | <b>- 0.000</b>   |

(\*) Estimated Status taking into consideration a forecasted decommitment of 15 Meur on the contract for first wall panels for the ITER Blanket System

### **Financial\_ table 1 Implementation and forecast of unused commitment appropriations**

<sup>3</sup> Article 6e and Article 20 of F4E Financial Regulation in accordance with art. 4(2) and art. 12 (1e) of the F4E Council Decision and Statutes

<sup>4</sup> according to Chapter 2 of F4E Financial Regulation (Principle of annuality), the unused appropriations at the end of each year are cancelled, as well as the de-commitments (cancellation of budgetary commitments).

By the end of September 2024, the cancelled appropriations amount to EUR 705.9 million. The projected figure by the end of 2025 expected to be EUR 106.7 million. However, these figures are indicative and subject to change due to potential decommitments. Currently, a forecasted decommitment of EUR 15 million is expected to materialize, which would increase the cancelled appropriations to EUR 720.9 million. Consequently, the projected figure for the end of 2025 would increase to EUR 121.7 million.

These cancelled appropriations resulting from decommitments will provide additional capacity for further commitments, particularly towards the EU cash contribution 2028 due to ITER Organization and expected to be partially committed in December 2027.

### 1.7. In kind contribution to F4E

There is no in-kind contribution to the F4E Budget, except for the premises hosting the F4E seat in Barcelona. The office building used by F4E is provided free of charge by the Host Country (Spain).

For year 2022 this service in-kind amounts to EUR 2.9 million.

## 2. Estimate of Expenditure

The F4E expenditure is divided in:

- Administrative expenditure covering the staff and operating costs
- Operational expenditure covering the needs of F4E projects

### 2.1. Administrative Expenditure

The F4E administrative expenditure is composed of F4E staff and operating costs, mainly related to staff remuneration and building's infrastructure.

### 2.2. Operational Expenditure

The operational expenditure corresponds to F4E tasks discharging EURATOM obligations with regard to:

- A. EURATOM contribution to ITER Organization (IO), in accordance with the ITER Agreement<sup>5</sup>,
- B. EURATOM contribution to the Broader Approach (BA) activities, in accordance with the BA Agreement with Japan<sup>6</sup>,
- C. Coordination of a programme of activities in preparation of the construction of a demonstration fusion reactor (DEMO).

The F4E activities are grouped under two headings (projects):

1. ITER project that represents the main activity of F4E and consists of:

<sup>5</sup> Final Report of Negotiations on ITER Implementation, 1 April 2006 (Attachment 2\_C)

<sup>6</sup> Broader Approach Agreement F4E\_D\_22FTK5

- (a) Tasks related to the ITER construction phase according to the Procurement Arrangements and ITER Tasks Arrangements signed with IO,
  - (b) Contribution in cash to ITER Organization to ensure the financing for its management, the research and development and for the participation to the ITER fund,
  - (c) Contribution in cash to Japan within the frame of the transfer of procurement responsibilities from EURATOM to Japan,
  - (d) ITER site support activities.
2. Technology projects that cluster the R&D activities necessary for ITER and Broader Approach:
- (a) Technology for ITER and DEMO, to allow extra R&D activities, in particular related to the completion of specification for ITER and the preparation of DEMO,
  - (b) Technology for BA corresponding to the EURATOM contribution managed by F4E for IFMIF-EVEDA, the IFERC at Rokkasho and the JT-60SA Tokamak,
  - (c) Technology for DONES/IFMIF construction.

Additional Earmarked operational expenditure are dedicated to:

- 1. Tasks executed on request of ITER Organization, mainly amendment to existing contracts related to Project Change Requests initiated by IO and approved for financing from the IO Reserve Fund and other tasks requested and financed from IO Budget.
- 2. Other appropriations accrued from Third parties to specific items of expenditure, other than ITER Organization, in accordance with Article 4 (2) of F4E Constituent Decision, Article 12 (1) (e) of the F4E Statutes, mainly activities with other Domestic Agencies within the ITER project.



### 2.3. Monitoring of implementation of Expenditure in Commitment Appropriations (current value)

The table below shows the expenditure for the period 2007-2029. The figures provided beyond 2020 are based on the last amendment to F4E Constituent act<sup>7</sup> from 2021 and last EC Statement of Estimate from June 2023.

| Current Value MEUR        |                                 | < 2007<br>Final<br>Execution | Total<br>2007-2013 | 2014<br>Executed | 2015<br>Executed | 2016<br>Executed | 2017<br>Executed | 2018<br>Executed | 2019<br>Executed | 2020<br>Executed | Total<br>2014-2020 | Total<br>2007-2020 |
|---------------------------|---------------------------------|------------------------------|--------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|--------------------|--------------------|
| Commitment Appropriations | ITER Construction               | 42.129                       | 2 977.556          | 548.068          | 318.687          | 382.396          | 458.145          | 604.171          | 611.870          | 716.150          | 3 639.489          | 6 617.045          |
|                           | Technology                      |                              | 48.092             | 16.007           | 14.007           | 12.901           | 14.391           | 11.516           | 5.607            | 19.526           | 93.954             | 142.046            |
|                           | Technology for ITER             |                              | 27.499             | 9.521            | 6.739            | 6.694            | 4.445            | 7.951            | 1.433            | 0.777            | 37.561             | 65.060             |
|                           | Technology for Broader Approach |                              | 20.592             | 6.486            | 7.268            | 6.207            | 9.946            | 3.565            | 4.174            | 18.748           | 56.393             | 76.986             |
|                           | Technology for DONES            |                              | -                  | -                | -                | -                | -                | -                | -                | -                | -                  | -                  |
|                           | Other Expenditure               |                              | 5.051              | 1.518            | 2.340            | 1.867            | 4.108            | 5.923            | 12.765           | 14.519           | 43.040             | 48.091             |
|                           | F4E Administration              |                              | 183.982            | 42.625           | 44.028           | 47.668           | 51.873           | 55.388           | 56.530           | 58.801           | 356.914            | 540.896            |
|                           | F4E Total Budget                | 42.129                       | 3 214.681          | 608.219          | 379.062          | 444.832          | 528.517          | 676.998          | 686.772          | 808.996          | 4 133.397          | 7 348.078          |
|                           | Tasks from ITER Organization    |                              | -                  | -                | 1.078            | 13.422           | 1.403            | 3.158            | 18.390           | 9.935            | 47.386             | 47.386             |
|                           | Other Earmarked expenditure     |                              | -                  | -                | -                | -                | -                | -                | -                | -                | -                  | -                  |
| F4E Total Expenditure     | 42.129                          | 3 214.681                    | 608.219            | 380.140          | 458.254          | 529.920          | 680.157          | 705.162          | 818.931          | 4 180.783        | 7 395.464          |                    |

| Current Value MEUR        |                                 | 2021<br>Executed | 2022<br>Executed | 2023<br>Executed | 2024<br>Budget<br>AM2 | 2025<br>Budget | 2026<br>Planned<br>needs | 2027<br>Planned<br>needs | Total<br>2021-2027 | 2028<br>Planned<br>needs | 2029<br>Planned<br>needs | Total<br>2028-2029 | Total<br><2007-2029 |
|---------------------------|---------------------------------|------------------|------------------|------------------|-----------------------|----------------|--------------------------|--------------------------|--------------------|--------------------------|--------------------------|--------------------|---------------------|
| Commitment Appropriations | ITER Construction               | 862.671          | 521.129          | 436.097          | 595.365               | 817.514        | 838.124                  | 740.702                  | 4 811.602          | 1 282.837                | 1 124.710                | 2 407.547          | 13 878.324          |
|                           | Technology                      | 15.308           | 20.340           | 36.699           | 32.900                | 84.733         | 70.539                   | 50.250                   | 310.768            | 97.499                   | 141.066                  | 238.565            | 691.378             |
|                           | Technology for ITER             | 5.373            | 3.497            | 3.900            | 7.500                 | 17.138         | 13.339                   | 16.550                   | 67.297             | 22.499                   | 35.966                   | 58.465             | 190.822             |
|                           | Technology for Broader Approach | 9.934            | 16.842           | 32.799           | 23.400                | 56.319         | 23.500                   | 10.300                   | 173.095            | 43.100                   | 65.500                   | 108.600            | 358.681             |
|                           | Technology for DONES            |                  |                  | -                | 2.000                 | 11.276         | 33.700                   | 23.400                   | 70.376             | 31.900                   | 39.600                   | 71.500             | 141.876             |
|                           | Other Expenditure               | 19.646           | 38.156           | 25.795           | 35.000                | 25.711         | 28.000                   | 28.000                   | 200.309            | 28.500                   | 28.500                   | 57.000             | 305.400             |
|                           | F4E Administration              | 61.260           | 76.615           | 73.144           | 81.954                | 82.742         | 89.291                   | 90.714                   | 555.719            | 93.571                   | 96.497                   | 190.068            | 1 286.684           |
|                           | F4E Total Budget                | 958.885          | 656.239          | 571.735          | 745.219               | 1 010.701      | 1 025.954                | 909.666                  | 5 878.399          | 1 502.407                | 1 390.773                | 2 893.180          | 16 161.786          |
|                           | Tasks from ITER Organization    | 4.701            | 23.871           | 14.443           | 56.865                | -              | -                        | -                        | 99.881             | -                        | -                        | -                  | 147.267             |
|                           | Other Earmarked expenditure     | 1.400            |                  |                  |                       |                |                          |                          | 1.400              |                          |                          |                    | 1.400               |
| F4E Total Expenditure     | 964.986                         | 680.110          | 586.178          | 802.084          | 1 010.701             | 1 025.954      | 909.666                  | 5 979.679                | 1 502.407          | 1 390.773                | 2 893.180                | 16 310.452         |                     |

Note 1: The past executed figures in this REP can differ from the figures in previous REP due to the impact of de-commitments and recoveries, accounted in the year of origin of the initial commitment.

#### Financial table 2 Annual Expenditure in Commitment Appropriations (current value)

<sup>7</sup> COUNCIL DECISION (Euratom) 2021/281 of 22 February 2021 amending Decision 2007/198/Euratom establishing the European Joint Undertaking for ITER and the Development of Fusion Energy and conferring advantages upon it (OJ L62/41 of 23.2.2021)

### 3. Additional information

#### Budget outturn and cancellation of appropriation

The budget outturn<sup>8</sup> for 2023 amounts to EUR 1.497 million

| Budget outturn  | 2021                | 2022                | 2023                |
|---|---------------------|---------------------|---------------------|
| Revenue actually received (+)   | 749 680 274.96      | 830 998 712.60      | 554 248 551.71      |
| Payments made (-)   | 742 421 341.74      | 761 886 274.22      | 592 105 732.66      |
| Carry-over of appropriations (-)  | 13 254 482.16       | 77 350 912.48       | 32 396 853.72       |
| Cancellation of appropriations carried over (+)                                     | 708 926.68          | 950 730.26          | 1 307 602.47        |
| Adjustment for carry over of assigned revenue appropriations from previous year (+) | 11 643 308.35       | 8 468 314.19        | 70 439 373.81       |
| Exchange rate differences (+/-)   | 17 886.33           | 5 675.67            | 3 869.95            |
| Adjustment for negative balance from previous year (-)                              | -                   | -                   | -                   |
| <b>Total</b>  | <b>6 374 572.42</b> | <b>1 186 246.02</b> | <b>1 496 811.56</b> |

*Financial\_table 3 Budget outturns for the years 2021, 2022 and 2023*

<sup>8</sup> The budget outturn for year N-1 shall be return back to EURATOM and reintroduced with budget for year N+1. It is calculated as the total revenue actually cashed deducted by the total payments incurred during the year and further deducted by the appropriations carried over to the following year. It is made of the unused payment appropriations, cancelled at the year-end.

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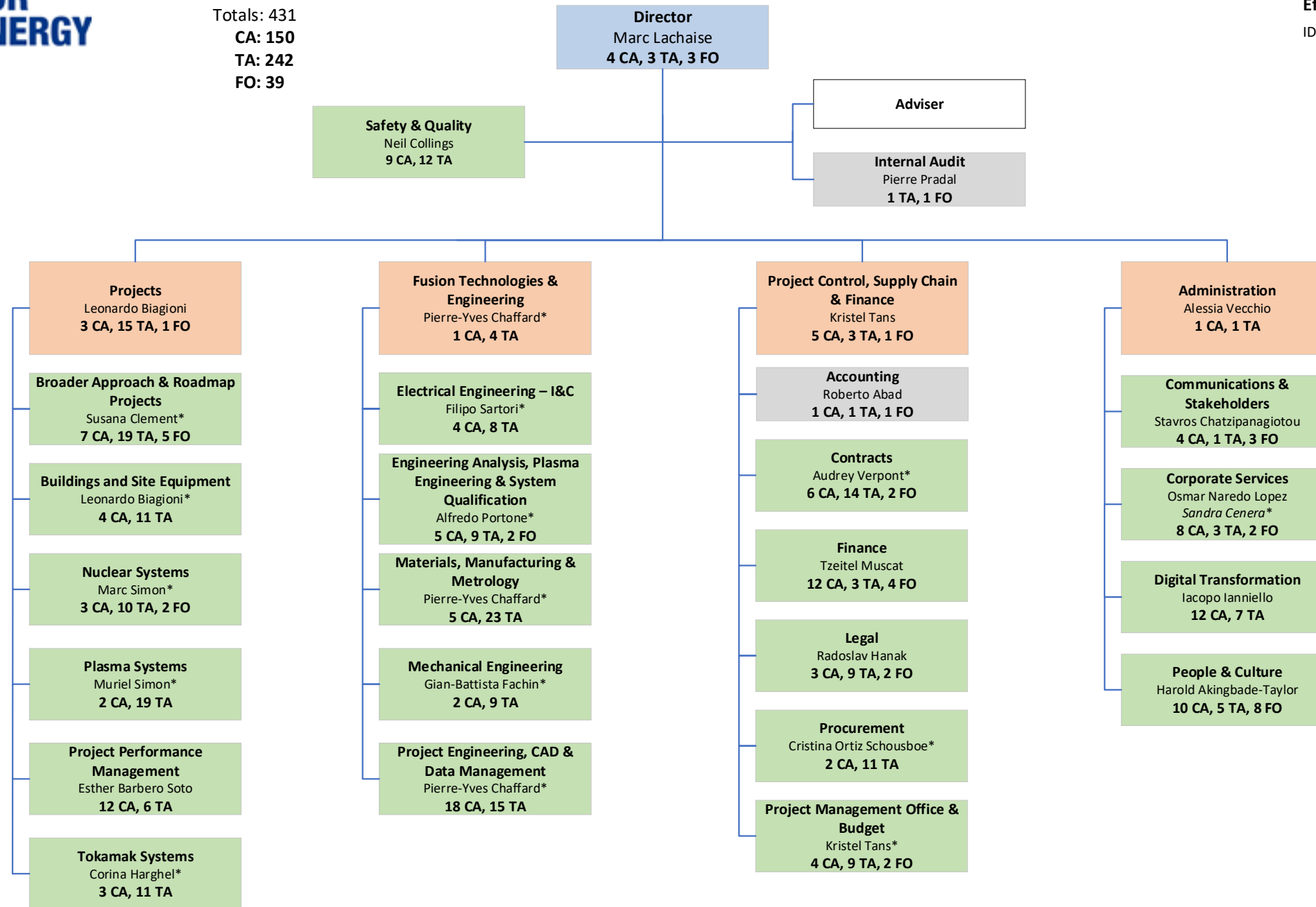
SPD2024\_ANNEXES TO HR REP

1. Organization chart



Totals: 431  
CA: 150  
TA: 242  
FO: 39

**Organisational Chart**  
Effective from 1 October 2024  
IDM Ref. F4E\_D\_2PCCXS



Legend



## 2. Human Resources per action 2025-2029

The allocation of the F4E staff varies according to the needs of the project and depends on the nature of the work, its complexity and the required expertise.

The allocation of staff in the forthcoming year will be made with a rolling wave approach and therefore the staff figures may vary depending on change of requirements in each programme.

The staff reduction in 2027 reflects the return of 15 posts that F4E had obtained as part of the agreement reached with the Commission in March 2022. The return of these posts to the Commission may be done by a non-renewal of employment contracts of the staff employed on short term positions. In practice, this means that the ramp down for some of these posts will be sooner than 2027.

| Action #  | Action                                | 2024         |              |                          | 2025         |              |                          | 2026         |              |                           | 2027         |              |                           | 2028         |              |                           | 2029         |              |                           |
|---|---------------------------------------|--------------|--------------|--------------------------|--------------|--------------|--------------------------|--------------|--------------|---------------------------|--------------|--------------|---------------------------|--------------|--------------|---------------------------|--------------|--------------|---------------------------|
|   |                                       | FO/TA        | CA/SNE       | Total Resource allocated | FO/TA        | CA/SNE       | Total Resource allocated | FO/TA        | CA/SNE       | Estimate Budget allocated | FO/TA        | CA/SNE       | Estimate Budget allocated | FO/TA        | CA/SNE       | Estimate Budget allocated | FO/TA        | CA/SNE       | Estimate Budget allocated |
| 1   | Magnets                               | 4.5          | 0.8          | € 250 028                | 4.4          | 0.5          | € 1 000 000              | 3.0          | 0.4          | € -                       | 3.0          | 0.3          | € -                       | 3.1          | 0.4          | € -                       | 3.1          | 0.4          | € -                       |
| 2,3,4,10*   | Main Vessel                           | 77.6         | 38.1         | € 138 514 585            | 77.6         | 38.1         | € 89 393 870             | 77.3         | 37.9         | € 148 395 000             | 71.7         | 35.4         | € 141 465 000             | 65.1         | 34.6         | € 41 913 000              | 66.2         | 35.2         | € 60 074 000              |
| 5   | Remote Handling                       | 30.8         | 13.1         | € 9 700 942              | 30.8         | 13.1         | € 7 790 832              | 32.8         | 13.9         | € 20 947 000              | 32.3         | 13.4         | € 22 644 000              | 35.5         | 14.8         | € 103 621 000             | 38.8         | 15.1         | € 52 538 000              |
| 6   | Cryoplant & Fuel Cycle                | 20.3         | 14.8         | € 4 669 146              | 20.4         | 15.1         | € 3 378 385              | 20.3         | 15.0         | € 8 033 000               | 19.9         | 14.5         | € 72 140 000              | 20.7         | 14.7         | € 63 605 000              | 20.5         | 14.8         | € 63 359 000              |
| 7   | Plasma Engineering & Operations       |              |              | € -                      |              |              | € -                      |              |              |                           |              |              |                           |              |              |                           |              |              |                           |
| 8   | Heating and Current Drive             | 50.6         | 28.7         | € 29 536 377             | 50.6         | 28.7         | € 102 728 970            | 52.4         | 29.7         | € 40 726 000              | 51.4         | 28.6         | € 18 488 000              | 52.7         | 29.0         | € 68 104 000              | 53.1         | 29.7         | € 43 724 000              |
| 9   | Diagnostics                           | 27.7         | 19.9         | € 6 940 914              | 27.7         | 20.0         | € 18 207 485             | 26.9         | 19.4         | € 19 180 000              | 26.9         | 19.3         | € 148 501 000             | 25.5         | 18.2         | € 8 781 000               | 25.1         | 18.2         | € 13 375 000              |
| 11  | Site and Buildings and Power Supplies | 34.9         | 24.0         | € 146 774 213            | 34.8         | 23.7         | € 137 566 584            | 34.0         | 23.4         | € 153 429 000             | 33.4         | 22.5         | € 85 713 000              | 32.9         | 22.2         | € 215 875 000             | 28.8         | 21.5         | € 182 444 000             |
| 12  | Cash Contributions                    | 0.9          | 1.5          | € 275 652 131            | 0.9          | 1.5          | € 465 954 620            | 0.9          | 1.5          | € 449 000 000             | 0.8          | 1.4          | € 256 972 490             | 0.8          | 1.4          | € 778 433 000             | 0.8          | 1.5          | € 706 850 000             |
| 13  | Technical Support Activities          | 17.8         | 7.9          | € 32 636 150             | 17.8         | 8.0          | € 32 827 074             | 17.5         | 7.8          | € 31 747 000              | 17.1         | 7.5          | € 24 299 000              | 17.7         | 7.8          | € 33 946 000              | 17.5         | 7.8          | € 26 779 000              |
| 14  | Broader Approach                      | 28.1         | 19.6         | € 24 090 704             | 28.1         | 19.7         | € 56 669 282             | 27.5         | 19.3         | € 23 512 000              | 27.0         | 18.6         | € 10 342 000              | 27.3         | 18.6         | € 43 140 000              | 26.5         | 17.3         | € 65 484 000              |
| 15  | DONES                                 | 3.0          | 1.6          | € 2 342 912              | 3.0          | 1.6          | € 11 449 621             | 3.2          | 1.7          | € 33 694 000              | 3.3          | 1.8          | € 23 387 000              | 3.8          | 2.0          | € 31 918 000              | 3.9          | 2.1          | € 39 649 000              |
| 16  | Technology Development Programme      | 0.9          | 0.0          | € -                      | 0.9          | 0.0          | € 6 550 000              | 1.3          | 0.0          | € 8 000 000               | 2.0          | 0.0          | € 15 000 000              | 3.1          | 0.0          | € 19 500 000              | 4.3          | 0.0          | € 25 000 000              |
| <b>Sub-total Resource allocation per activity</b>   |                                       | <b>297.0</b> | <b>170.0</b> | <b>€ 671 108 103</b>     | <b>297.0</b> | <b>170.0</b> | <b>€ 933 516 723</b>     | <b>297.0</b> | <b>170.0</b> | <b>€ 936 663 000</b>      | <b>288.7</b> | <b>163.3</b> | <b>€ 818 951 490</b>      | <b>288.3</b> | <b>163.7</b> | <b>€ 1 408 836 000</b>    | <b>288.6</b> | <b>163.4</b> | <b>€ 1 279 276 000</b>    |
| Reserve stemming from appropriations corresponding to external assigned revenue from ITER IO as per Art.12.2.4.b FR |                                       |              |              | <b>€ 49 022 219</b>      |              |              |                          |              |              |                           |              |              |                           |              |              |                           |              |              |                           |
| <b>Total Budget</b>   |                                       | <b>297.0</b> | <b>170.0</b> | <b>720 130 322</b>       | <b>297.0</b> | <b>170.0</b> | <b>933 516 723</b>       | <b>297.0</b> | <b>170.0</b> | <b>936 663 000</b>        | <b>288.7</b> | <b>163.3</b> | <b>818 951 490</b>        | <b>288.3</b> | <b>163.7</b> | <b>1 408 836 000</b>      | <b>288.6</b> | <b>163.4</b> | <b>1 279 276 000</b>      |

Notes/assumptions:

- \* The sub-Actions of Vacuum Vessel, In-Vessel Blanket, In-Vessel Divertor and Test Blanket Module are presented merged in one single line due to commercial sensitive information.
- 1 2024 and 2025 figures corresponds to the budget allocated for the Work Programme
- 2 2025-2029: the budgets and the future financial and staffing needs will be subject to the outcome of the ITER Council decisions, respective budgetary procedures as well as discussions on the next MFF
- 3 Figures are limited to operational budget (administrative expenditure are excluded). All figures in other parts of the SPD regarding the Work programme contain exclusively operational budget and thus can be reconciled with the resource table figures.
- 4 9 TA posts and 6 CA posts are to be returned in 2027  
7 SNE post during the whole period  
A minimum capacity of operational staff and administrative support is envisaged in Magnets and Vacuum Vessel at the end of their manufacturing phases

**HR\_table 1. Resources allocation per activity 2024-2029**

3. HR Quantitative

3.1. Statutory staff, SNE and other staff

| Human Resources                           | Year 2023                |                                      |                                       | Year 2024              | Year 2025            | Year 2026            | Year 2027 <sup>(1)</sup>           | Year 2028            | Year 2029            |
|---|--------------------------|--------------------------------------|---------------------------------------|------------------------|----------------------|----------------------|------------------------------------|----------------------|----------------------|
|   | Authorised Budget        | Filled as of 31/12/2023              | Occupancy rate (%)                    | Requested staff        | Envisaged staff      | Envisaged staff      | Envisaged staff                    | Envisaged staff      | Envisaged staff      |
| <b>ESTABLISHMENT PLAN POSTS</b>           |                          |                                      |                                       |                        |                      |                      |                                    |                      |                      |
| Administrators (AD)                       | 256                      | 230                                  | 90%                                   | 256                    | 257                  | 257                  | 254                                | 254                  | 254                  |
| Assistants (AST)                          | 49                       | 42                                   | 86%                                   | 49                     | 48                   | 48                   | 42                                 | 42                   | 42                   |
| Assistants/Secretaries (AST/SC)           | -                        | -                                    | -                                     | -                      | -                    | -                    | -                                  | -                    | -                    |
| <b>TOTAL ESTABLISHMENT PLAN POSTS</b>     | <b>305</b>               | <b>272</b>                           | <b>89.2%</b>                          | <b>305</b>             | <b>305</b>           | <b>305</b>           | <b>296</b>                         | <b>296</b>           | <b>296</b>           |
| <b>EXTERNAL STAFF</b>                     | <b>Authorised Budget</b> | <b>Executed FTE as of 31/12/2023</b> | <b>Execution Rate %<sup>(2)</sup></b> | <b>Requested staff</b> | <b>Envisaged FTE</b> | <b>Envisaged FTE</b> | <b>Envisaged FTE<sup>(2)</sup></b> | <b>Envisaged FTE</b> | <b>Envisaged FTE</b> |
| Contract Agents (CA)                      | 155                      | 158.9                                | 103%                                  | 155                    | 155                  | 155                  | 149                                | 149                  | 149                  |
| Seconded National Experts (SNE)           | 7                        | 3.9                                  | 56%                                   | 7                      | 7                    | 7                    | 7                                  | 7                    | 7                    |
| <b>TOTAL EXTERNAL STAFF</b>               | <b>162</b>               | <b>163</b>                           | <b>101%</b>                           | <b>162</b>             | <b>162</b>           | <b>162</b>           | <b>156</b>                         | <b>156</b>           | <b>156</b>           |
| <b>TOTAL STAFF</b>                        | <b>467</b>               | <b>435</b>                           | <b>93%</b>                            | <b>467</b>             | <b>467</b>           | <b>467</b>           | <b>452</b>                         | <b>452</b>           | <b>452</b>           |
| <b>OTHER HUMAN RESOURCES</b>              |                          | <b>In place as of 31/12/2023</b>     | <b>Total FTE</b>                      |                        |                      |                      |                                    |                      |                      |
| External Service Providers <sup>(3)</sup> |                          | 361                                  |                                       |                        |                      |                      |                                    |                      |                      |
| Interim staff                             |                          |                                      | 9                                     |                        |                      |                      |                                    |                      |                      |

<sup>(1)</sup> Return of 9 TA and 6 CA posts. The number of AD and AST posts to be returned is indicative  
<sup>(2)</sup> The occupancy rate >100% in the Contract Agents is due to the fact that some posts are to be converted into TA posts following the staff reinforcement in 2023  
<sup>(3)</sup> F4E Figures available as of 31/12/2023. In line with The F4E policy on External Support for F4E Tasks only Contractor staff having being granted access to F4E internal information systems either remotely or on-premise (including login access) are considered to be ESPs in the strict sense.  
 ESPs on the Cadarache site (131 on 28/02/2024) are not included in the figure since they don't have access to F4E tools (but they have access to ITER-IO systems and F4E systems)

**HR\_table 2. Statutory staff, SNE and other staff**

3.2. Multiannual staff policy plan Year N+1, Year N+2, Year N+3, Year N+4, Year N+5

A. Staff in Establishment Plan

| Function group and grade | Year 2023         |             |                                |             | Year 2024                        |             | Year 2025                |             | Year 2026                |             | Year 2027                |             | Year 2028                |             | Year 2029                |             |
|--------------------------|-------------------|-------------|--------------------------------|-------------|----------------------------------|-------------|--------------------------|-------------|--------------------------|-------------|--------------------------|-------------|--------------------------|-------------|--------------------------|-------------|
|                          | Authorised Budget |             | Actually filled as of 30/12/23 |             | Authorised Budget <sup>(1)</sup> |             | Requested <sup>(2)</sup> |             | Envisaged <sup>(3)</sup> |             | Envisaged <sup>(4)</sup> |             | Envisaged <sup>(5)</sup> |             | Envisaged <sup>(6)</sup> |             |
|                          | Perm. Posts       | Temp. posts | Perm. Posts                    | Temp. posts | Perm. Posts                      | Temp. posts | Perm. Posts              | Temp. posts | Perm. Posts              | Temp. posts | Perm. Posts              | Temp. posts | Perm. Posts              | Temp. posts | Perm. Posts              | Temp. posts |
| AD 16                    |                   |             |                                |             |                                  |             |                          |             |                          |             |                          |             |                          |             |                          |             |
| AD 15                    |                   | 1           |                                |             |                                  |             |                          |             |                          |             |                          |             |                          |             |                          |             |
| AD 14                    | 4                 | 3           | 2                              | 1           | 4                                | 4           | 4                        | 4           | 4                        | 5           | 5                        | 7           | 6                        | 9           | 7                        | 11          |
| AD 13                    | 7                 | 9           | 4                              | 2           | 6                                | 7           | 5                        | 9           | 5                        | 12          | 4                        | 14          | 4                        | 17          | 4                        | 20          |
| AD 12                    | 11                | 24          | 11                             | 24          | 9                                | 26          | 7                        | 27          | 8                        | 30          | 8                        | 34          | 7                        | 39          | 8                        | 46          |
| AD 11                    | 3                 | 24          | 1                              | 19          | 1                                | 28          | 4                        | 34          | 5                        | 41          | 6                        | 47          | 6                        | 50          | 4                        | 50          |
| AD 10                    | 3                 | 49          | 8                              | 52          | 8                                | 53          | 5                        | 54          | 3                        | 52          | 1                        | 48          |                          | 44          |                          | 41          |
| AD 9                     | 4                 | 50          | 2                              | 41          | 1                                | 42          |                          | 41          |                          | 37          |                          | 35          |                          | 33          | 1                        | 30          |
| AD 8                     |                   | 24          |                                | 23          |                                  | 29          | 1                        | 22          | 2                        | 19          | 2                        | 17          | 2                        | 18          | 1                        | 20          |
| AD 7                     | 1                 | 20          | 1                              | 15          | 2                                | 16          | 1                        | 13          |                          | 18          |                          | 20          |                          | 19          |                          | 11          |
| AD 6                     |                   | 19          |                                | 24          |                                  | 20          |                          | 26          |                          | 16          |                          | 6           |                          | 0           |                          | 0           |
| AD 5                     |                   |             |                                |             |                                  |             |                          |             |                          |             |                          |             |                          |             |                          |             |
| AD TOTAL                 | 33                | 223         | 29                             | 201         | 31                               | 225         | 27                       | 230         | 27                       | 230         | 26                       | 228         | 25                       | 229         | 25                       | 229         |
| AST 11                   | 2                 |             | 1                              |             | 2                                |             |                          |             | 1                        |             |                          |             |                          |             |                          |             |
| AST 10                   | 2                 |             | 1                              |             | 1                                |             | 2                        |             | 3                        |             | 3                        |             | 3                        |             | 3                        |             |
| AST 9                    | 2                 | 1           | 4                              |             | 3                                | 1           | 2                        | 1           | 2                        | 2           | 3                        | 2           | 4                        | 1           | 5                        |             |
| AST 8                    | 1                 | 3           |                                | 1           | 1                                | 1           | 1                        | 2           |                          | 3           |                          | 4           | 1                        | 5           | 2                        | 6           |
| AST 7                    | 1                 | 7           |                                | 4           | 1                                | 10          |                          | 9           | 1                        | 9           | 2                        | 9           | 2                        | 9           | 1                        | 9           |
| AST 6                    |                   | 9           | 2                              | 8           | 2                                | 8           | 2                        | 8           | 2                        | 8           | 2                        | 8           | 1                        | 7           | 1                        | 8           |
| AST 5                    | 3                 | 11          | 3                              | 6           | 2                                | 8           | 1                        | 5           | 1                        | 6           |                          | 7           |                          | 8           |                          | 6           |
| AST 4                    | 1                 |             | 1                              | 4           |                                  | 3           |                          | 6           |                          | 5           |                          |             |                          |             |                          |             |
| AST 3                    |                   | 6           |                                | 7           |                                  | 6           |                          | 7           |                          | 5           |                          | 2           |                          |             |                          |             |
| AST 2                    |                   |             |                                |             |                                  |             |                          |             |                          |             |                          |             |                          |             |                          |             |
| AST 1                    |                   |             |                                |             |                                  |             |                          |             |                          |             |                          |             |                          |             |                          |             |
| AST TOTAL                | 12                | 37          | 12                             | 30          | 12                               | 37          | 10                       | 38          | 10                       | 38          | 9                        | 33          | 9                        | 33          | 8                        | 34          |
| AST/SC 6                 | -                 | -           | -                              | -           | -                                | -           | -                        | -           | -                        | -           | -                        | -           | -                        | -           | -                        | -           |
| AST/SC 5                 | -                 | -           | -                              | -           | -                                | -           | -                        | -           | -                        | -           | -                        | -           | -                        | -           | -                        | -           |
| AST/SC 4                 | -                 | -           | -                              | -           | -                                | -           | -                        | -           | -                        | -           | -                        | -           | -                        | -           | -                        | -           |
| AST/SC 3                 | -                 | -           | -                              | -           | -                                | -           | -                        | -           | -                        | -           | -                        | -           | -                        | -           | -                        | -           |
| AST/SC 2                 | -                 | -           | -                              | -           | -                                | -           | -                        | -           | -                        | -           | -                        | -           | -                        | -           | -                        | -           |
| AST/SC 1                 | -                 | -           | -                              | -           | -                                | -           | -                        | -           | -                        | -           | -                        | -           | -                        | -           | -                        | -           |
| AST/SC TOTAL             | 0                 | 0           | 0                              | 0           | 0                                | 0           | 0                        | 0           | 0                        | 0           | 0                        | 0           | 0                        | 0           | 0                        | 0           |
| TOTAL                    | 45                | 260         | 41                             | 231         | 43                               | 262         | 37                       | 268         | 37                       | 268         | 35                       | 261         | 34                       | 262         | 33                       | 263         |
| GRAND TOTAL              |                   | 305         |                                | 272         |                                  | 305         |                          | 305         |                          | 305         |                          | 296         |                          | 296         |                          | 296         |

<sup>(1)</sup> Conversion of 2 FO AD posts into 2 TA AD posts following the departure of two officials  
<sup>(2)</sup> Conversion of 4 FO AD and 2 FO AST posts respectively into 5 TA AD and 1 TA AST posts in view of the departure of six officials  
<sup>(3)</sup> Conversion of 1 FO AST post into 1 TA AST post in view of the departure of one official  
<sup>(4)</sup> Return of 9 TA posts (indicatively 3 AD and 6 AST) as part of the agreement with the Commission services for the staff reinforcement from 2023.  
<sup>(5)</sup> Conversion of 1 FO AD and 1 FO AST posts respectively into 1 TA AD and 1 TA AST posts in view of the departure of two officials  
<sup>(6)</sup> Conversion of 1 FO AD post into 1 TA AD in view of the departure of one official  
<sup>(6)</sup> Conversion of 1 FO AST post into 1 TA AST in view of the departure of one official  
The staff numbers indicated for the years 2025-2029 are subject to the outcome of the respective budgetary procedures as well as the outcome of the discussions on the next Multiannual Financial Framework

**HR\_table 3. Multi-annual staff policy Plan 2025-2029 – Staff in Establishment Plan**



B. External personnel

| Contract agents    | Authorised Budget 2023 | Executed FTE as of 31/12/2023 | Headcount as of 31/12/2023 <sup>(1)</sup> | FTE requested for 2024 | FTE corresponding to the authorised budget 2025 | FTE corresponding to the authorised budget 2026 | FTE corresponding to the authorised budget 2027 <sup>(2)</sup> | FTE corresponding to the authorised budget 2028 | FTE corresponding to the authorised budget 2029 |
|--------------------|------------------------|-------------------------------|---|------------------------|---|---|--|---|---|
| Function Group IV  | 88                     | 94.7                          | 94  | 88                     | 88  | 88  | 85   | 85  | 85  |
| Function Group III | 49                     | 51.7                          | 51  | 49                     | 49  | 49  | 48   | 48  | 48  |
| Function Group II  | 18                     | 12.5                          | 12  | 18                     | 18  | 18  | 16   | 16  | 16  |
| Function Group I   | -                      | -                             | -   | -                      | -   | -   | -  | -   | -   |
| <b>TOTAL</b>       | <b>155</b>             | <b>158.9</b>                  | <b>157.0</b>                              | <b>155</b>             | <b>155</b>                                      | <b>155</b>                                      | <b>149</b>   | <b>149</b>                                      | <b>149</b>                                      |

| Seconded National Experts | Authorised Budget 2023 | Executed FTE as of 31/12/2023 | Headcount as of 31/12/2023 | FTE requested for 2024 | FTE corresponding to the authorised budget 2025 | FTE corresponding to the authorised budget 2026 | FTE corresponding to the authorised budget 2027 | FTE corresponding to the authorised budget 2028 | FTE corresponding to the authorised budget 2029 |
|---------------------------|------------------------|-------------------------------|----------------------------|------------------------|---|---|---|---|---|
| <b>TOTAL</b>              | <b>7</b>               | <b>3.9</b>                    | <b>5.0</b>                 | <b>7</b>               | <b>7</b>  | <b>7</b>  | <b>7</b>  | <b>7</b>  | <b>7</b>  |

<sup>(1)</sup> Staff in place only. It may differ from the recruited/filled in figure reported in table 2.2. External Staff of the FIF1 as it does not include job offers

<sup>(2)</sup> Return of 6 CA posts as per agreement with the Commission services in March 2022. The number of returned FGII, FGIII and FGIV is only indicative.

**HR\_table 4. Multi-annual staff policy Plan 2025-2029 – External personnel**

C. Additional external staff expected to be financed from grant, contribution or service-level agreements

| Human Resources                 | Year N          | Year N+1        | Year N+2        | Year N+3        | Year N+4        | Year N+5        |
|---------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|                                 | Envisaged staff | Envisaged staff | Envisaged staff | Envisaged staff | Envisaged staff | Envisaged staff |
| Contract Agents (CA)            | -               | -               | -               | -               | -               | -               |
| Seconded National Experts (SNE) | -               | -               | -               | -               | -               | -               |
| <b>TOTAL</b>                    | <b>0</b>        | <b>0</b>        | <b>0</b>        | <b>0</b>        | <b>0</b>        | <b>0</b>        |

**HR\_table 5. Staff financed from grant, contribution or SLA**

D. Selection procedures

F4E applies the General Implementing Provisions (GIP) on the Procedure governing the Engagement and use of Temporary Agents and those specific to Contract Agents. For the selection and use of EU Officials, F4E follows the rules applied by the Commission, by analogy. In agreement with the Commission and following a verification exercise by the European Personnel Selection Office (EPSO) of the F4E selection procedures, F4E has been selecting staff on the basis of both interviews and written tests since April 1st, 2013 for all long-term employment contracts.

Vacancy announcements have typically been advertised on the career opportunities section of F4E’s website. Various other job portals and specialized media are also used to attract applicants from as wide a geographical basis as possible. The increased reliance on social media is part of a sourcing strategy emphasizing a more tailored approach to filling vacancies.

1. Selection of Established Officials

Vacant permanent posts intended to be occupied by already established Officials and/or candidates on reserve lists, are filled in conformity with the Staff Regulations. Interviews are conducted by a Panel (composed by a representative of the administration and a representative of the concerned department) using pre-defined criteria stipulated in the corresponding vacancy notice and a standard evaluation grid based on the aforementioned criteria.

Since 2007, F4E has launched 64 publications for FO positions. However, in an effort to harmonize its workforce structure and in keeping with the time limited mandate of F4E, a decision was taken to stop expanding the F4E FO staff complement. This decision was taken in 2015 and provides that whenever FO positions become vacant, they shall be replaced by equivalent or lesser graded TA positions.

2. Selection of Temporary Agents

These are typically organized on the basis of the following grade brackets:

- AST3 – AST4 for Assistant (technical and administrative) positions;
- AD5 – AD12 for Administrators (technical and administrative) profiles;
- AD9 – AD14 for Middle Management positions;
- AD12 – AD14 for Middle Management (Heads of Department<sup>1</sup>) positions.
- AD14 for the F4E Director.

E. Recruitment forecasts 2025 following retirement/mobility

Below are the selections expected for 2025 according to the information available.

| Job title in the Agency | Type of contract<br>(Official, TA or CA) |  | TA/Official<br>Function group/grade of |                         | CA  |
|-------------------------|--|--|--|-------------------------|---|
|                         | Due to foreseen retirement/mobility      | New post requested due to additional tasks | Internal (brackets)                    | External (single grade) | Recruitment Function Group (I, II, III or IV) |
| Technical Officer       | FO/TA                                    | -  | AD 5-12                                | 6                       | -   |
| Project Manager         | FO/TA                                    | -  | AD 5-12                                | 6                       | -   |
| Technical Assistant     | FO/TA                                    | -  | AST 1-9                                | 3                       | -   |
| Technical Officer       | FO/TA                                    | -  | AD 5-12                                | 6                       | -   |
| Head of Unit            | FO/TA                                    | -  | AD 9-14                                | 9                       | -   |
| Head of Unit            | FO/TA                                    | -  | AD 9-14                                | 9                       | -   |
| Senior Budget Assistant | FO/TA                                    | -  | AST 10-11                              | 4                       | -   |

**HR\_table 6. Recruitment forecast**

<sup>1</sup> While the model Implementing Rule on middle management applicable to agencies only considers management to be senior as of grade AD14, F4E considers the role of Head of Department as an intermediate step between the Director (senior management) and the Heads of Unit.

## 4. HR Qualitative

### 4.1. Implementing Rules on recruitment policy

| Implementing rules in place |                            | Yes | No | If no, which other implementing rules are in place |   |
|-----------------------------|----------------------------|-----|----|--|---|
| Engagement of CA            | Model Decision C(2019)3016 | X   |    |  | Decision of the Administration and Management Committee on the use and engagement of contractual agents (15 November 2019)<br><a href="https://f4enet.f4eda.local/sectionMyF4E/HR/About_us/Documents/decision_final_use%20and%20engagement%20of%20CA%20with%20annexes_signed.pdf">https://f4enet.f4eda.local/sectionMyF4E/HR/About_us/Documents/decision_final_use%20and%20engagement%20of%20CA%20with%20annexes_signed.pdf</a> |
| Engagement of TA            | Model Decision C(2015)1509 | X   |    |  | Decision of Administrative and Management Committee of F4E on general implementing provisions governing the engagement and use of temporary staff under Article 2(f) of the CEOS (15 October 2015).<br><a href="https://f4enet.f4eda.local/sectionMyF4E/HR/Staff_regulations/Documents/Article_2f.pdf">https://f4enet.f4eda.local/sectionMyF4E/HR/Staff_regulations/Documents/Article_2f.pdf</a>                                |
| Middle management           | Model decision C(2018)2542 | X   |    |  | Decision of the Administration and Management Committee of F4E on middle management staff (13 June 2018).<br><a href="https://f4enet13.f4eda.local/ourorganisation/SiteAssets/Pages/OurOrg/AMC%20middle%20management_signe.pdf">https://f4enet13.f4eda.local/ourorganisation/SiteAssets/Pages/OurOrg/AMC%20middle%20management_signe.pdf</a>  |
| Type of posts               | Model Decision C(2018)8800 | X   |    |  | Decision of the Administration and Management Committee on types of post and post titles (14 June 2019).<br><a href="https://f4enet.f4eda.local/sectionMyF4E/HR/career/my_contract/Documents/AMC%20decision%20type%20of%20post%20final%20signed.pdf">https://f4enet.f4eda.local/sectionMyF4E/HR/career/my_contract/Documents/AMC%20decision%20type%20of%20post%20final%20signed.pdf</a>   |

**HR\_table 7. Adopted Implementing Rules**

### 4.2. Appraisal and reclassification/promotion

#### A. Performance management

Staff performance is assessed annually and serves the purpose of managing the organisational performance as well as ensure that any skills gap are identified and mitigated in a timely fashion. The key constituent parts of the mechanism are:

1. Establishment of agreed performance objectives.
2. Self-assessment by the staff member.
3. Performance review and dialogue with the line manager.
4. Definition of career development and training objectives addressing agreed areas of improvement and career aspirations. The assessment period coincides with the calendar year and runs from January 1st to December 31st. In keeping with the Staff Regulations, the appraisal assesses three main areas of competence as follows: efficiency, ability and conduct in the service. The use of languages and the level of responsibility exercised are two additional constituent components of the merit rating. F4E has a competency model which details desirable and non-desirable behaviours for the soft skills encompassed in 'efficiency' and 'conduct in the service'.

Looking ahead, and in keeping with its project nature, F4E will continue improving and optimizing the way it manages performance with a view of enhancing the effectiveness of its matrix organisation. Illustratively, one such area with potential for enhancement is the manner with which dual reporting feedback is captured. Another objective is to better cascade the corporate objectives down to individual objectives and to implement mid-year performance reviews.

In terms of implementing performance rewards, F4E mainly relies on promotions and reclassifications. Such career advancement is for officials, temporary agents and contract agents who have completed a minimum of two years in their grade.

Promotion/reclassification takes place on the 1 January of the year of the exercise (N) (or on the first day of the month following that in which the 2 years seniority are acquired). In recognition of the need to be in alignment with the promotion rates foreseen in the staff regulations and relevant implementing rules, F4E will endeavour to align its rate of promotion/reclassification to the average duration grades foreseen in the applicable legal framework.

The Tables below provide an overview of the number of promotions awarded in each grade during the last exercise.

B. Implementing Rules in place

| Implementing rules in place |                            | Yes | No | If no, which other implementing rules are in place |  |
|-----------------------------|----------------------------|-----|----|--|--|
| Reclassification of TA      | Model Decision C(2015)9560 | X   |    |  | Decision of Fusion for Energy Administration and Management Committee laying down general implementing provisions regarding Article 54 of the Conditions of Employment of Other Servants of the European Union (reclassification of <a href="https://f4enet.f4eda.local/ourorganisation/SiteAssets/Pages/OurOrg/54.pdf">https://f4enet.f4eda.local/ourorganisation/SiteAssets/Pages/OurOrg/54.pdf</a> )              |
| Reclassification of CA      | Model Decision C(2015)9561 | X   |    |  | Decision of Fusion for Energy Administration and Management Committee on general implementing provisions regarding Article 87(3) of the Conditions of Employment of Other Servants of the European Union (reclassification of Contract Agents, 9 <a href="https://f4enet.f4eda.local/ourorganisation/SiteAssets/Pages/OurOrg/87.pdf">https://f4enet.f4eda.local/ourorganisation/SiteAssets/Pages/OurOrg/87.pdf</a> ) |

**HR\_table 8. Adopted Implementing Rules**

C. Reclassification of TA / promotion of officials

| Reclassification of Temporary Agents / Promotion of Officials |           |           |           |           |           |                             |                                    |
|---|-----------|-----------|-----------|-----------|-----------|-----------------------------|------------------------------------|
| Grades  | Year 2019 | Year 2020 | Year 2021 | Year 2022 | Year 2023 | Actual average over 5 years | Average over 5 years (Annex IB SR) |
| AD 05   |           |           |           |           |           |                             | 2.8                                |
| AD 06   | 2.7       | 3.2       | 3.3       | 3.5       | 5.0       | 3.5                         | 2.8                                |
| AD 07   | 2.6       | 2.5       | 2.3       | 2.8       | 3.0       | 2.6                         | 2.8                                |
| AD 08   | 3.1       | 2.9       | 3.1       | 3.0       | 3.1       | 3.0                         | 3                                  |
| AD 09   | 4.0       | 3.4       | 4.4       | 4.0       | 4.0       | 4.0                         | 4                                  |
| AD 10   | 3.9       | 3.9       | 3.7       | 3.7       | 4.0       | 3.8                         | 4                                  |
| AD 11   | 4.3       | 4.0       | 4.8       | 5.3       | 4.0       | 4.5                         | 4                                  |
| AD 12   |           | 11.8      | 11.0      |           |           | 11.4                        | 6.7                                |
| AD 13   | 8.0       | 10.0      | 9.0       |           |           | 9.0                         | 6.7                                |
|   |           |           |           |           |           |                             |                                    |
| AST 01  |           |           |           |           |           |                             | 3                                  |
| AST 02  | 3.0       |           |           |           |           |                             | 3                                  |
| AST 03  | 2.5       | 3.0       | 3.2       | 4.1       | 4.1       | 3.4                         | 3                                  |
| AST 04  | 4.0       | 4.3       | 3.9       | 3.0       | 3.3       | 3.7                         | 3                                  |
| AST 05  | 3.2       | 3.4       | 3.7       | 4.0       | 4.0       | 3.6                         | 4                                  |
| AST 06  |           | 3.5       |           |           | 4.0       | 3.8                         | 4                                  |
| AST 07  | 3.0       |           |           | 4.0       |           | 3.5                         | 4                                  |
| AST 08  | 4.0       |           |           |           | 4.0       | 4.0                         | 4                                  |
| AST 09  |           |           |           |           |           |                             | N/A                                |
| AST 10  | 7.0       |           |           |           |           | 7.0                         | 5                                  |

*HR\_table 9. Reclassification of TA / promotion of officials*

## D. Reclassification of contract agents

| Reclassification of Contract staff |       |                                 |  |   |  |
|------------------------------------|-------|---------------------------------|--|---|--|
| Function Group                     | Grade | Staff in activity at 01.01.2022 | How many staff members were reclassified in 2023 | Average number of years in grade reclassified staff members in 2023 | Average number of years in grade of reclassified staff members according to decision C(2015)9561 |
| CA FGIV                            | 17    | 8                               | 1  | 6.0   | Between 6 and 10 years   |
|                                    | 16    | 24                              | 5  | 5.0   | Between 5 and 7 years  |
|                                    | 15    | 39                              | 10   | 4.0   | Between 4 and 6 years  |
|                                    | 14    | 28                              | 1  | 3.0   | Between 3 and 5 years  |
|                                    | 13    | 1                               | 1  | 3.8   | Between 3 and 5 years  |
| CA III                             | 12    | 5                               |  |   |  |
|                                    | 11    | 16                              | 4  | 6.0   | Between 6 and 10 years   |
|                                    | 10    | 20                              | 3  | 5.2   | Between 5 and 7 years  |
|                                    | 9     | 11                              | 1  | 4.0   | Between 4 and 6 years  |
|                                    | 8     |                                 |  |   | Between 3 and 5 years  |
| CA II                              | 7     | 2                               |  |   |  |
|                                    | 6     | 7                               | 2  | 6.5   | Between 6 and 10 years   |
|                                    | 5     | 4                               |  |   | Between 5 and 7 years  |
|                                    | 4     | 1                               |  |   | Between 3 and 5 years  |
| CA I                               | 3     |                                 |  |   |  |
|                                    | 2     |                                 |  |   |  |
|                                    | 1     |                                 |  |   |  |

*HR\_table 10 . Reclassification of contract staff*

### 4.3. Gender representation

The figures are consistent with workforce statistics in the industry sectors related to the core tasks of the Agency and show a predominance of male colleagues in the technical functions. Conversely female colleagues are predominantly represented in administrative and support roles. F4E will continue to address the issue to increase the representation of female staff. Special efforts will be made for the managerial functions.

#### A. Statutory staff (only officials, AT and AC)

| Staff distribution per type of contract, category and gender at 31.12.2023 |                     |           |              |                  |              |                 |              |             |              |
|--|---------------------|-----------|--------------|------------------|--------------|-----------------|--------------|-------------|--------------|
|  |                     | Officials |              | Temporary Agents |              | Contract Agents |              | Grand Total |              |
|  |                     | Staff     | %            | Staff            | %            | Staff           | %            | Staff       | %            |
| <b>Female</b>  | Administrator       | 9         | 22.0%        | 52               | 22.5%        |                 |              | 61          | 14.0%        |
|  | Assistant           | 7         | 17.1%        | 8                | 3.5%         |                 |              | 15          | 3.6%         |
|  | GFII, FGIII, FGIV   |           |              |                  |              | 86              | 54.8%        | 86          | 20.4%        |
|  | <b>Total female</b> | <b>16</b> | <b>39.0%</b> | <b>60</b>        | <b>26.0%</b> | <b>86</b>       | <b>54.8%</b> | <b>162</b>  | <b>38.0%</b> |
| <b>Male</b>  | Administrator       | 20        | 48.8%        | 149              | 64.5%        |                 |              | 169         | 39.4%        |
|  | Assistant           | 5         | 12.2%        | 22               | 9.5%         |                 |              | 27          | 5.7%         |
|  | GFII, FGIII, FGIV   |           |              |                  |              | 71              | 45.2%        | 71          | 16.9%        |
|  | <b>Total male</b>   | <b>25</b> | <b>61.0%</b> | <b>171</b>       | <b>74.0%</b> | <b>71</b>       | <b>45.2%</b> | <b>267</b>  | <b>62.0%</b> |
| <b>Grand Total</b>   |                     | <b>41</b> | 100.0%       | <b>231</b>       | 100.0%       | <b>157</b>      | 100.0%       | <b>429</b>  | 100.0%       |

HR\_table 11. Gender representation Officials, AT and AC on 31/12/2023

#### B. Evolution over 5 years of the Middle and Senior management

|                        | 2018   |      | 2022   |      | 2023*  |      |
|------------------------|--------|------|--------|------|--------|------|
|                        | Number | %    | Number | %    | Number | %    |
| <b>Female Managers</b> | 4      | 13%  | 6      | 19%  | 6      | 24%  |
| <b>Male Managers</b>   | 28     | 88%  | 25     | 81%  | 19     | 76%  |
| <b>Total</b>           | 32     | 100% | 31     | 100% | 25     | 100% |

|                               | 2018   |      | 2022   |       | 2023*  |       |
|-------------------------------|--------|------|--------|-------|--------|-------|
|                               | Number | %    | Number | %     | Number | %     |
| <b>Female Senior Managers</b> | 0      | 0%   | 1      | 3.2%  | 1      | 4.0%  |
| <b>Female Middle Managers</b> | 4      | 13%  | 5      | 16.1% | 5      | 20.0% |
| <b>Male Senior Managers</b>   | 7      | 22%  | 3      | 9.7%  | 2      | 8.0%  |
| <b>Male Middle Managers</b>   | 21     | 66%  | 22     | 71.0% | 17     | 68.0% |
| <b>Total</b>                  | 32     | 100% | 31     | 100%  | 25     | 100%  |

\*Acting managers are not counted from 2023 in line with the approach of the European Commission

HR\_table 12. Gender evolution of Senior and Middle management

#### 4.4. Geographical balance

The table below provides the geographical distribution as at 31.12.2023 based upon the filled in posts on 31.12.2023 (accepted job offers are included).

The over representation of Spanish nationals follows from the Agency being headquartered in Spain and from the large proportion of short-term non-renewable positions which typically do not entice non-Spaniards to apply. A diversity policy is being developed to address the imbalance. Looking forward F4E will continue to strike a balance between ensuring a broad geographical distribution of staff and the non-discrimination principle enshrined in its selection and recruitment policies.

##### A. Statutory staff per nationality

|                | AD + CA FGIV |  | AST/SC - AST + CA FGI / FGII / FGIII |  | TOTAL      |                  |
|----------------|--------------|--|--------------------------------------|--|------------|------------------|
|                | Number       | % of total staff members in AD and FGIV categories | Number                               | % of total staff members in AST/SC, AST and FGI, II and III categories | Number     | % of total staff |
| Belgium        | 8            | 2.5%   | 9                                    | 8.6%   | 17         | 4.0%             |
| Bulgaria       | 3            | 0.9%   | 1                                    | 1.0%   | 4          | 0.9%             |
| Croatia        | 1            | 0.3%   | 0                                    | 0.0%   | 1          | 0.2%             |
| Czechia        | 2            | 0.6%   | 2                                    | 1.9%   | 4          | 0.9%             |
| Estonia        | 1            | 0.3%   | 0                                    | 0.0%   | 1          | 0.2%             |
| Finland        | 4            | 1.2%   | 1                                    | 1.0%   | 5          | 1.2%             |
| France         | 65           | 20.1%  | 17                                   | 16.2%  | 82         | 19.1%            |
| Germany        | 7            | 2.2%   | 6                                    | 5.7%   | 13         | 3.0%             |
| Greece         | 6            | 1.9%   | 3                                    | 2.9%   | 9          | 2.1%             |
| Hungary        | 6            | 1.9%   | 0                                    | 0.0%   | 6          | 1.4%             |
| Ireland        | 6            | 1.9%   | 2                                    | 1.9%   | 8          | 1.9%             |
| Italy          | 56           | 17.3%  | 20                                   | 19.0%  | 76         | 17.7%            |
| Lithuania      | 0            | 0.0%   | 3                                    | 2.9%   | 3          | 0.7%             |
| Malta          | 1            | 0.3%   | 0                                    | 0.0%   | 1          | 0.2%             |
| Netherlands    | 4            | 1.2%   | 0                                    | 0.0%   | 4          | 0.9%             |
| Poland         | 5            | 1.5%   | 0                                    | 0.0%   | 5          | 1.2%             |
| Portugal       | 10           | 3.1%   | 1                                    | 1.0%   | 11         | 2.6%             |
| Romania        | 8            | 2.5%   | 1                                    | 1.0%   | 9          | 2.1%             |
| Slovakia       | 1            | 0.3%   | 0                                    | 0.0%   | 1          | 0.2%             |
| Slovenia       | 1            | 0.3%   | 0                                    | 0.0%   | 1          | 0.2%             |
| Spain          | 118          | 36.4%  | 36                                   | 34.3%  | 154        | 35.9%            |
| Sweden         | 4            | 1.2%   | 0                                    | 0.0%   | 4          | 0.9%             |
| United Kingdom | 7            | 2.2%   | 3                                    | 2.9%   | 10         | 2.3%             |
|                | <b>324</b>   | <b>100%</b>  | <b>105</b>                           | <b>100%</b>  | <b>429</b> | <b>100%</b>      |

*HR\_table 13. Nationalities of staff*



## B. Evolution over 5 years of the most represented nationality

| Most represented nationalities | 2018       |       | Most represented nationalities | 2023       |     |
|--------------------------------|------------|-------|--------------------------------|------------|-----|
|                                | Number     | %     |                                | Number     | %   |
| Spain                          | 141        | 32.0% | Spain                          | 154        | 36% |
| Italy                          | 87         | 19.7% | France                         | 82         | 19% |
| France                         | 83         | 18.8% | Italy                          | 76         | 18% |
| Belgium                        | 20         | 4.5%  | Belgium                        | 17         | 4%  |
| Germany                        | 19         | 4.3%  | Germany                        | 13         | 3%  |
| United Kingdom                 | 13         | 2.9%  | Portugal                       | 10         | 2%  |
| <b>TOTAL F4E</b>               | <b>441</b> |       | <b>TOTAL F4E</b>               | <b>421</b> |     |

HR\_table 14. Evolution over 5 years of the most represented nationalities

## 4.5. Staff mobility

## A. Internal mobility

Increased career mobility consistently features as the foremost concern of staff. In recognition of this wish, the agency adopted an internal mobility policy in June 2015 foreseeing that all vacancies are subject to internal selections prior to opening them externally. The policy only provides for horizontal mobility and complements vertical mobility, which is only possible through external selection procedures and/or promotion/reclassification decisions.

In keeping with its project nature and matrix organization, F4E will also seek to increase the effectiveness of its workforce management through increased flexibility and transience of project assignments. As part of this endeavor F4E will seek to progressively 'flatten' its structure and reduce the number of vertical levels currently in place. In parallel F4E will increase the number of clearly visible project manager roles thereby creating more attractive internal development paths.

## B. Inter-agency job Market

It will predominantly concern support and administrative profiles rather than operational and technical staff. Where necessary and deemed useful F4E will use the Interagency Job Market to publish its vacancy notices.

## 4.6. Schooling

In the absence of a European School in F4E's Barcelona and Cadarache work sites, the Agency established Service Level Agreements with a number of international schools located in and around these two sites. Under these agreements, F4E staff enjoys easier access to school registration and enrolment for their dependent children. The agreements also provide a framework for the direct settlement of school fees by the Agency. The number of international schools making up the F4E schooling offer has gradually grown over the years and is currently a prominent part of F4E's employee value proposition. In addition, F4E continues to be involved in the governance of the International School of Manosque where it is part of the international Advisory Council and where it strives to uphold the interests of its staff with dependent children in that establishment. While, F4E does not currently envisage any further actions at this time, it will endeavor to maintain its appeal in this domain for both existing and prospective staff members.

Taken together, Service Level Agreements have been established with 24 international schools of which 21 in the area of Barcelona and 4 in Cadarache (France).

| Agreement(s) in place with School(s)                                   |     |  |    |   |
|--|-----|--|----|---|
| Contribution agreements signed with the EC on type I European schools  | Yes |  | No | X |
| Contribution agreements signed with the EC on type II European schools | Yes |  | No | X |
| Number of service contracts in place with international schools:       | 25  |  |    |   |
|  |     |  |    |   |

***HR\_table 15. Service Level Agreements with International schools***

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| SPD2025_ANNEXES WORK PROGRAMME 2025 |
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## 1. DEFINITIONS, ASSUMPTIONS AND SUPPORTING INFORMATION TO WP2025

The 2025 Work Programme takes into account to the extent possible the European Commission's guidelines for the Programming document as requested by the Financial Regulation. It comprises a general overview of the progress of work and the procurement activities that will be committed during 2025, detailed objectives, expected results, and targets for each WP Action.

### Main assumptions

The following assumptions are considered as the basis of the Work Programme 2025:

- The F4E schedule used for the preparation of this document is the one submitted to IO at the end of March 2024.
- The F4E schedule takes into account:
  - ✓ The latest input and developments of the schedules from the F4E suppliers, taking into account the agreed fabrication routes and showing the real development of the work.
  - ✓ The most realistic assumption of Procurement Arrangement (PA) signature dates based on the current status of the design of components and on the forecasted dates of the required design reviews prior to the PA signature.
  - ✓ The available manpower in F4E, taking into account bottlenecks in specific areas where staffing is not sufficient to grant a prompt process of the work. In specific cases, F4E foresees to satisfy its manpower needs by using external contractors.
  - ✓ The most realistic assumptions on the input data availability from IO to take into account the existing delays and the agreed dates of data delivery.
  - ✓ The information provided by the other DAs through their monthly Detailed Work Schedule to take into account any possible delay in the delivery of items to F4E that can cause delays to the EU in-kind procurements.
- The budget figures are based on the MFF 2021-2027 approved by the Council on 22/02/2021 plus ITER Host State and Membership contributions. The budget summary table of Work Programme 2025 (WP\_table 1) reflects the current status of the draft budget for the 2025 financing decision.
- In order to achieve an improvement of the quality of the PAs that need still to be signed, a common F4E/IO effort is still in progress to better identify the requirements that are linked to the specific procurement.
- Technically and commercially complex procurements will be implemented whenever appropriate through the competitive dialogue procedure or through the negotiated procedure, in order to improve the alignment of supply chain response to F4E needs and to proactively adopt cost containment measures. This will be done in compliance with F4E's Financial Regulation.
- Grants related to recurring and sequential R&D activities, with a well-defined development path eventually leading to an EU procurement package, will be implemented whenever appropriate, through Framework Partnership Agreements (FPA), in order to streamline and channel R&D funding, improve its effectiveness, and decrease the administrative burden to beneficiaries and F4E alike.
- Procurements which require a very close coordination between F4E and other entities will be implemented, whenever appropriate, through the Joint Procurement procedure.
- All the activities described in the overview of each Action and the list of contracts in WP\_Table 3 are intended as credited by PA or ITA. If an Action is not credited, then it is explicitly mentioned in the overview. This is not applicable for the Action "Broader Approach" (i.e. not credited).

- F4E endorsement of the Japanese Procurement Arrangement that foresees an EU financial contribution will be preceded by a budgetary commitment for the entire amount of the F4E contribution.
- Changes originated by IO, or other DA's, will be fully compensated by the IO Reserve Fund.
- The Art. 5 of the F4E Statutes states that the Joint Undertaking may award grants and prizes in accordance with the rules of its financial regulation. In this regard, Essential selection, award criteria and Upper funding limits are defined in these annexes.
- Article 74 (2) of F4E's financial regulation in conjunction with Article 1(5) of Annex III to the F4E Statutes provides for the possibility to make use of annual instalments for actions extending over more than one financial year. An annual instalment consists in breaking down a budgetary commitment into annual instalments. Annual instalments can be implemented according to the forecast of annual payment due, the forecast of progress in the implementation of the contract, or annual budget availability.

### Definitions and supporting information

1. "Action" for the purposes of Work Programme means "a coherent area of action with objectives and resources". The list of the Actions and their definition is defined in the main text of the SPD.

2. Each Action of WP2025 comprises:

(a) **General overview** that is split into two parts. The "Progress of Work" part aims at providing the information concerning the activities foreseen during 2025 in that area. The "Procurement Activities" part instead focuses on the legal commitments foreseen during the year and to be covered by the financial decision and to be financed under the budget 2025. Furthermore, it includes (even if not explicitly mentioned):

i. Provisions for urgent general support tasks as cost/risk analysis, engineering support/analysis, I&C develop and support, experts, quality assurance and quality control, nuclear safety, CE marking analysis, transportation, storage, material characterization and qualification activities, resolution of non-conformities (in line with the mechanism agreed at ITER level), metrology, low value purchase orders and external legal support, cost of legal proceedings and alternative dispute settlement, including arbitration, as needed<sup>1</sup>. These tasks will be mainly implemented through specific contracts under existing framework contracts.

ii. Provisions for payment of liquidated damages, late payment interests, cost escalation, claims, release of options, indexation and other financial compensations that F4E may be obliged to pay under its contracts.

iii. Provisions for amendments to ongoing contracts covered by a previous financing decision(s) in accordance with the Implementing Rules.

iv. Provisions for BREXIT-related contractual modifications.

v. Provisions for Covid 19 related contract modifications and Covid 19 related new contracts for ITER and Broader Approach

vi. Provisions for new contracts and contractual modifications related to expiry of Switzerland co-operation agreement

vii. Provisions for specific cash compensations to IO required in case of transfer of activities from F4E to IO approved by the ITER Management Advisory Committee.

viii. Provisions for contract modifications and new contracts linked to the new ITER baseline.

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<sup>1</sup> In accordance to F4E WBS implementation rules, whenever a procurement activity is in support of a specific WBS L3, the related procurement should be implemented under the mentioned WBS L3. This is not the case for general technical support activities to multiple WBSs (e.g. external resource to support overall risk management, etc.). In this case, they are included under Action 13

- (b) **Annual objectives** defined as the achievement on time of the following milestones:
- i. ITER Council/Governing Board (IC/GB) milestones in 2025;
  - ii. Milestones that will lead to the achievement of the future IC/GB milestones from the following years (defined as predecessor of future IC/GB milestones (if applicable)).
  - iii. Key milestones marking significant schedule progress (only in the event that none of the above are applicable).
  - iv. Link with the ITER Project multi-annual objectives (defined as the whole set of IC/GB milestones): when a WP annual objective is a predecessor of a multi-annual objective (IC/GB milestones), it is clearly identified to which milestone is linked in the column “type of milestone”.
- (c) The **expected results** define the main outcomes of the Actions.
- (d) The **target** is defined as the annual M-SPI reaching a minimum value.<sup>2</sup>
- (e) **Human resources** (see HR\_Table 1 of annexes to HR REP annexes). The table shows an indicative estimate of the Full Time Equivalent (FTE) staff assigned to the specific Action to cover all the activities carried out in 2025. Per each Action it is identified the “core” team and the additional staff (i.e. legal, financial, contractual, project management) assigned to the action according to the F4E matrix structure. Remaining staff from the Commercial Dept., Admin. Dept. and Office of the Director is instead allocated per action on a pro-rata basis.
- (f) **Procurement plan:**
- i. Main Procurement Initiatives (see WP\_Table 3 of these annexes): these are, per Action, the list of the foreseen main contracts with value higher than 143,000 Euros<sup>3</sup>. Amendments, claims, reimbursement, indexation, late interest and budget reserve are grouped together due to the sensitivity of this information. The list is based on the current information at the time of writing the Work Programme. During the implementation of the Work Programme activities, F4E may identify the need for new calls, group more activities in a single call or split one activity in more calls. This will in any case be performed preserving the scope and objective presented in WP2025. Contracts that do not fulfill the Work Programme scope identified for each Action are not covered by this financial decision and therefore will not be authorized. A change to this list shall be considered as a non-substantial for the purposes of the Article 32 point 4 of the F4E Financial Regulations if not affecting the available budget for 2025 within the limit of the flexibility rule and if any related changes to the scope of the annual Work Programme do not have significant impact on the nature of the Actions or on the achievement of objectives of the multiannual Project Plan.
  - ii. Value per Action: WP\_Table 2 presents an indicative value of financial resources corresponding to each Action. F4E has evaluated the level of commitments planned for the Actions in 2025 by taking into account the progress of the project and the available manpower. A good implementation of the annual commitment is one of the objectives for F4E (see PP\_Table 7 in Annexes to Project Plan). Any additional budget required and exceeding the currently available one will consist of unused appropriations adjusted to match the final needs.
  - iii. Indicative timeframe for launching the procurement and type of procedure/contract: the foreseen time of publication of calls and type of contracts is shown in WP\_Table 5 of these annexes. The dates are indicative only and based on the present understanding of the project development. For specific contracts and specific grants or use of Joint Procurements the foreseen time of publication of calls is not included as no formal publication will take place (the signature date is used to give anyway an indication of time). Publication of the call for tender is intended as the date of publication on the Industry Portal (for open procedures/call for proposals) and the date of the Invitation letter to be sent out to the Suppliers (for negotiated procedures). For restricted procedures and competitive dialogues this milestone refers to the date of the call for expression of interest (first phase of the procedure).
  - iv. The plan may cover some activities moved from previous years into WP2025 due to changes in the overall planning and priorities.

<sup>2</sup> For Action 12 Cash Contributions and Action 13 Technical Support Activities Annual M-SPI is not applicable.

<sup>3</sup> The threshold has been selected so to be in line with the FR.

v. The plan does not (and cannot) include the consequences for the Action of PCRs and deviations approved by the IO Director General or his delegates in the frame of Reserve Fund Management Plan. As a result, these will be implemented under the budget line 3.6. For information, F4E will present to the final meeting of the GB each year, in an amendment to the Work Programme, a summary of the PCRs agreed within the year and the activities that the PCRs (including those agreed in previous years) have funded.

vi. Grants and specific Grants are clearly identified and information is provided to fulfill art.58 of the Financial Regulation (see WP\_Table 4 of these annexes).

vii. Framework Partnership Agreements (FPA) or Framework Contracts (FWC) are included in the year of signature for clarification purposes only and do not constitute part of the financing decision.

3. Some of the Work Programme activities refer to provision for recurrent activities with the same ultimate objective of supporting the final achievement either of the design (e.g. CAD support, engineering analyses, etc.), the manufacturing process (e.g. QA/QC Inspectors, engineering support for deviations analyses, CE marking, etc.) as requested in ITAs/PAs, or the site support services (access control and security, Facility Management Services, etc.). Therefore the description in terms of the financing decision does not change significantly from one year to the next.

## 2. OBJECTIVES AND KEY PERFORMANCE INDICATORS

### Work Programme objectives

The Work Programme objectives are the achievement on time of a selected number of milestones. A minimum of 4 objectives is provided per Action as described in below section 3.

There is a close link between the long-term planning (i.e. Project Plan) and the short-term activities (i.e. work programme). In the Work programme, F4E is tracking as Work Programme objectives some selected existing milestones leading to the IC/GB ones (i.e. the predecessors) and in the chain of all critical and near-critical paths. Therefore such milestones in the short-term will act as an alert against the increasing risk of missing any critical and near-critical path milestones in the longer term.

### Annual objectives

From the full list of Annual objectives described in the Project Plan, the following ones apply directly to the Work Programme:

| AREA                                    | Objective   |
|---|---|
| Annual M-SPI                            | SPI above defined value   |
| Annual commitment budget                | Implement a defined percentage of commitment appropriations by end of the year  |
| Budgeted forecast of the Work Programme | Implement a defined percentage of allocated commitment appropriations the Work Programme Actions without reserves, by the end of the year |

### Key Performance Indicators

From the full list of Key Performance Indicators described in the Project Plan, the following ones apply directly to the Work Programme:

#### Annual M-SPI

$$\frac{\text{Number of milestones with Status = Completed}}{\text{Number of milestones with reference date} \leq \text{Current month}}$$

#### Annual commitment budget

$$\frac{\text{Actual commitment executed to date} + \text{remaining commitment planned to be executed between date and year's end}}{\text{Latest approved annual commitment budget}}$$

#### Annual budgeted forecast of Work Programme

$$\frac{\text{Actual commitment executed to date} + \text{remaining commitment planned to be executed between date and year's end}}{\text{Latest approved budgeted forecast of the Work Programme Actions}^4}$$

<sup>4</sup> Excluding Reserves



### 3. LIST OF WP2025 ACTIONS

#### Action 1. Magnets

| Action 1   |                   | Magnets                   |                   |        |
|--|-------------------|---------------------------|-------------------|--------|
| <b>Progress of works</b>   |                   |                           |                   |        |
| The Magnets Programme has delivered its contribution to the ITER Project and may finalise the remaining amendments and potential claims. |                   |                           |                   |        |
| <b>Procurement Activities</b>  |                   |                           |                   |        |
| Finalisation of amendments and closure of potential claims.  |                   |                           |                   |        |
| <b>WORK PROGRAMME OBJECTIVES</b>   |                   |                           |                   |        |
| Milestone ID   | Scope description | Forecast Achievement Date | Type of Milestone | PA/ITA |
| Not applicable   |                   |                           |                   |        |
| <b>EXPECTED RESULTS</b>  |                   |                           |                   |        |
| The main expected results for this action are:   |                   |                           |                   |        |
| 1-Finalisation of amendments and closure of potential claims   |                   |                           |                   |        |
| <b>TARGET</b>  |                   |                           |                   |        |
| Not applicable   |                   |                           |                   |        |

#### Action 2. Vacuum Vessel

| Action 2   | Vacuum Vessel |
|--|---------------|
| <b>Main Vessel</b>   |               |
| <u>Progress of Work</u>  |               |
| The manufacturing of the Vacuum Vessel will continue during 2025. Sector 4 is scheduled to be completed and delivered to Cadarache. This date takes into account the need to repair its Field Joints after completion of all welding activities and the Hydraulic Factory Acceptance Tests. Also, Sector 9 will be fully welded, and the Field Joint repairs will have started. Sector 3 and Sector 2 will be in their final assembly phase. |               |
| <u>Procurement Activities</u>  |               |
| Provisions will be made for the transportation of the sectors to the ITER site, resolution of non-conformities if required (including, but not limited to possible out of tolerances), possible continuation of incentive schemes and/or other actions for schedule stabilization, inspectors,   |               |

additional ANB support and the possibility to add specialized resources to the project. Contractual options for the Main VV contract may be released, as needed.

Specific Contracts for support activities, like on-site Inspectors, Documentation Support, Engineering and Analysis, Project Management support and Experts will continue to be issued depending on the project needs.

### WORK PROGRAMME OBJECTIVES

| Milestone ID    | Scope Description                                     | Forecast achievement date | Type of milestone   | PA   |
|-----------------|---|---------------------------|---------------------|--|
| EU15.1A.10500   | IPL > Delivery of Sector 4 by EU-DA to ITER Site      | Q2 2025                   | WP25 objective      | PA 1.5.P1A.EU.01<br>Vacuum Vessel -<br>Main Vessel |
| EU15.1A.16180   | S9 - Hydraulic Factory Acceptance Test completed      | Q3 2025                   | Predecessor of GB25 | PA 1.5.P1A.EU.01<br>Vacuum Vessel -<br>Main Vessel |
| EU15.1A.3105700 | S9 - All welds completed and conform                  | Q3 2025                   | Predecessor of GB25 | PA 1.5.P1A.EU.01<br>Vacuum Vessel -<br>Main Vessel |
| EU15.1A.3117493 | S3 Repairs of Splice T-Ribs and Inner Shell completed | Q1 2025                   | WP25 objective      | PA 1.5.P1A.EU.01<br>Vacuum Vessel -<br>Main Vessel |

### EXPECTED RESULTS

The main expected results for this action are:

1. Sector 4 Delivery to Cadarache
2. Sector 9 FAT completed (excluding Field Joints repair)
3. Sector 3 Inner shell welding completed; Outer Shell welding ongoing
4. Sector 2 Inner shell welding completed; Outer Shell welding ongoing

### TARGET

The target for 2025 is "Annual M-SPI  $\geq$  0.8"

## Action 3. In Vessel – Blanket

| Action 3   | In Vessel - Blanket |
|--|---------------------|
| <p><b>Blanket First Wall project</b></p> <p><u>Progress of Work</u></p> <p>For the Blanket First Wall (FW), after the decision to discontinue the Be activities through a PA change notice in 2023, the signature of the specific contract after the first re-opening of competition is planned in 2025. Activities related to the manufacturing of the FW panel structure (i.e. the panel without the Beryllium parts) will be continued under current contractual configuration. Additional commitments related to the development and qualification of the new armour design, based on tungsten, may be executed in 2025, in accordance with the ITER qualification plan.</p> <p>In 2025, both contractors of the Blanket First Wall Series (F4E-OMF-900) will continue the manufacturing activities of the first wall panel structures. The procurement of main raw materials (i.e. CuCrZr) will continue to be implemented through task orders. These materials are being provided as free issued items to the Suppliers in charge of the FW panels manufacturing. In support of the main procedure F4E-OMF-900, material characterisation activities will be carried out through task orders of the F4E-OMF-1082. Since the F4E-OMF-900 is a cost-plus-fee type of contract, financial audits will be performed under the F4E-OFC-1094. In 2025, the manufacturing readiness review for the Task 3 (i.e. manufacturing of alumina coating) of the standard parts (F4E-OPE-1138) is planned.</p> <p>The planned progress of work is subject to the availability of internal resources.</p> <p><u>Procurement Activities</u></p> <p>In 2025, the main procurement activities foreseen as part of the FW series manufacturing are related to the first re-opening of competition of the Blanket First Wall series contracts. This will lead to the signature of next task orders for the series manufacturing of First Wall Panels (F4E-OMF-900) at the end of 2025. In parallel, new task orders will be signed for the procurement of the CuCrZr, needed as raw material. A new task order for material characterization and related options in support to the F4E-OMF-900 will be signed. In addition, specific task orders for audit services of the cost-plus fee type of contract F4E-OMF-900 are planned. Commitments following the approval of PCR-1241 (additional spares for Blanket First Wall panels) may be implemented. External support needed for the follow-up of the FW panels production will be sourced through specific contracts under existing framework contracts.</p> <p>Additional procurement activities related to the development and qualification of the new armor design may be executed in 2025 following the IO qualification plan. The planned procurement activities are subject to the requested allocation of internal resources.</p> <p><b>Blanket Cooling Manifolds project</b></p> <p><u>Progress of Work</u></p> <p>In 2025, the main activity will be the qualification phase and of the manufacturing of the first pipe bundles of three 10-degree sectors (Task 1 of OMF-1080, two suppliers). Moreover,</p> |                     |

activities under Task Order 8 will continue delivering the 316L ITER grade raw material to the manufacturing workshops (as free issued). Additional activities for design and testing of alternative support will continue. Re-opening of competition for the upper ports manifolds is also planned for 2025.

Procurement Activities

In 2025, the main procurement activity is the signature of Task Order 5 and Task Order 6 of the Framework Contract F4E-OMF-1080, corresponding to the procurement of upper ports, and procurement of branch pipes and co-axial connectors, respectively. Task Order 3 of F4E-OMF-1080, procurement of chimney pipes, is planned to be signed in 2024. However, it may be finally signed in 2025, should negotiations take longer than planned. Additional activities for design and testing of alternative support are planned to be signed.

External support needed for the follow-up of the FW panels production will be sourced through specific contracts under existing framework contracts.

The planned progress of work is subject to the availability of internal resources.

**WORK PROGRAMME OBJECTIVES**

| Milestone ID    | Scope description  | Forecast Achievement Date | Type of Milestone | PA/ITA                              |
|-----------------|--|---------------------------|-------------------|-------------------------------------|
| EU15.2A.101000  | Start of Task 1B: Qualification of 1st Inboard and Outboard Inlet Bundles - Contractor #03       | Q2 2025                   | WP25 objective    | PA 1.6.P6.EU.01 Blanket Manifolds   |
| EU15.2A.12140   | Start of Task 1B: Qualification of 1st Inboard and Outboard Inlet Bundles - Contractor #02       | Q2 2025                   | WP25 objective    | PA 1.6.P6.EU.01 Blanket Manifolds   |
| EU.16.01.100400 | MS#3 Pre-Production Readiness Review Documentation   | Q3 2025                   | WP25 objective    | PA 1.6.P1A.EU.01 Blanket First Wall |
| EU.16.01.101005 | Signature of TASK 3.XX for FW Series Fabrication (Manufacturing of Series Panels) - Reopening #1 | Q3 2025                   | WP25 objective    | PA 1.6.P1A.EU.01 Blanket First Wall |
| EU16.01.228210  | Task Order Signed for Procurement of CuCrZr (Series) (TO#03)                                     | Q4 2025                   | WP25 objective    | PA 1.6.P1A.EU.01 Blanket First Wall |
| EU16.02.204580  | MS#5.3 Batch 1: ADP ready for delivery or storage  | Q2 2025                   | WP25 objective    | PA 1.6.P6.EU.01 Blanket Manifolds   |

**EXPECTED RESULTS**

The main expected results for this action are:

- Blanket First Wall: Pre-Production Readiness Review Documentation #3 for the Blanket (F4E-OMF-900)
- Blanket First Wall: signature of the specific contracts after reopening of competition #1 of OMF-900 First Wall series manufacturing
- Blanket First Wall: signature of Task Order 03 for the procurement of CuCrZr
- Blanket Cooling Manifolds: start of Task 1B, qualification of 1st inboard and outboard inlet bundles
- Blanket Cooling Manifolds: materials under first batch ready for delivery to the manufacturing sites or storage

**TARGET**

The target for 2025 is "Annual M-SPI ≥ 0.8"

## Action 4. In Vessel – Divertor

| Action 4  | In Vessel – Divertor |
|---|----------------------|
| <p><b>Cassette Body project</b></p> <p><u>Progress of Work</u></p> <p>In 2025, both contractors of the Divertor Cassette Body (CB) Series will continue the manufacturing activities. The delivery of the remote handling flanges is planned, which will culminate the manufacturing activities of the contract 1036. Concerning the contract OPE-1112 of Ancillary Items of Pins, Sleeves and Links of the CB Series, the engineering phase and procurement of materials will progress as well.</p> <p>The planned progress of work is subject to the requested allocation of internal resources.</p> <p><u>Procurement Activities</u></p> <p>In 2025, the main commercial activities foreseen will be the indexation related to the CB series fabrication, TCWS &amp; RH Flanges, and Ancillary Items of Pins, Sleeves and Links. Additional external support (resident inspectors, metrology support, welding, etc.) will be provided through task orders under existing framework contracts. Commitments for transportation of Cassette Bodies to the ITER site may be needed.</p> <p><b>Vertical Target project</b></p> <p><u>Progress of Work</u></p> <p>In 2025, the IVT Series production activities will continue, after the signature of the specific contracts for the series manufacturing. Focus will be on engineering, construction of the production lines, and procurement of materials.</p> <p>The planned progress of work is subject to the requested allocation of internal resources.</p> <p><u>Procurement Activities</u></p> <p>In 2025, the main commercial activities foreseen is the release of options and indexations related to the IVT Series.</p> <p>Given the current geopolitical situation, alternative solutions may have to be put in place by F4E, should HHF testing in Russia be not possible in the timeframe compatible with the IVT Series procurement schedule.</p> <p>External support will be needed to closely follow-up the fabrication of the IVT series contracts. These needs are planned to be provided through task orders under existing framework contracts.</p> <p><b>Divertor Rails project</b></p> <p><u>Progress of Work</u></p> <p>The PA will be signed in 2025. In addition, activities will proceed for the launch of the contract for the components manufacturing, which is planned to be signed in 2026.</p> <p>It shall be noted that the 2025 progress will depend on the timely availability of the Procurement Arrangement documentation and signature of the PA.</p> |                      |

The planned progress of work is subject to the requested allocation of internal resources.

Procurement Activities

No commitment is planned in 2025 for the main manufacturing contract. External support maybe required in preparation of the PA signature.

**WORK PROGRAMME OBJECTIVES**

| Milestone ID    | Scope description  | Forecast Achievement Date | Type of Milestone | PA/ITA                                 |
|-----------------|--|---------------------------|-------------------|--|
| EU17.01.1022200 | HP - Send of the Visual examination and Hydraulic Pressure Tests (M_CB-02 (CB#17)_S23) | Q4 2025                   | WP25 objective    | PA 1.7.P1.EU.01 Cassette Body          |
| EU17.2B.981800  | Manufacturing approved for the IVT Series Integration by MRR panel (OMF-1139-01-01)    | Q2 2025                   | WP25 objective    | PA 1.7.P2B.EU.01 Inner Vertical Target |
| EU17.2B.982720  | QA Plan approved for OMF-1139-02-01  | Q1 2025                   | WP25 objective    | PA 1.7.P2B.EU.01 Inner Vertical Target |
| EU17.01.1022200 | HP - Send of the Visual examination and Hydraulic Pressure Tests (M_CB-02 (CB#17)_S23) | Q4 2025                   | WP25 objective    | PA 1.7.P1.EU.01 Cassette Body          |

**EXPECTED RESULTS**

The main expected results for this action are:

1. Visual examination and Hydraulic Pressure Tests (Cassette Body#17)
2. Delivery of remote handling flanges (F4E-OPE-1036)
3. Manufacturing approved for the IVT Series Integration by MRR Panel (F4E-OMF-1139, Specific Contract #1)
4. PQMP approved (F4E-OMF-1139, Specific Contract #2)

**TARGET**

The target for 2025 is "Annual M-SPI ≥ 0.8"

Action 5. Remote Handling

| Action 5  | Remote Handling |
|---|-----------------|
| <b>Divertor Remote Handling System (DRHS)</b>   |                 |
| <u>Progress of Work</u>   |                 |
| <p>The focus will be given to the Final Design activities via two main development lines that will run in parallel: one for the Cassette Multifunctional Mover (CMM) and the other one for the Cassette Toroidal Mover (CTM). Final design activities will be accompanied with prototyping and laboratory test in some areas.</p> |                 |
| <u>Procurement Activities</u>   |                 |

For both of the main development areas and the complementary activities, specific contracts will be launched through Remote Handling (RH) and Engineering Unit framework contracts. Contracts are also planned to be signed for final design and manufacturing.

### **Cask and Plug Remote Handling System (CPRHS)**

#### Progress of Work

Activities are organized in two parallel development lines. One focuses on the assembly casks that are first plasma components, the other one focuses on the nuclear grade cask variants. Focus will be given to the manufacturing of the full scope of the first plasma systems. Final design activities will be accompanied with prototyping in some areas. Non-first plasma nuclear grade casks will be continuing on the preliminary and final design development.

#### Procurement Activities

For both of the main development areas and the complementary activities, specific contracts will be launched through Remote Handling (RH) and Engineering Unit framework contracts.

### **Neutral Beam Remote Handling System (NBRHS)**

#### Progress of Work

Activities are organized by subsystems and prioritized by their delivery needs for the different assembly stages. Main focus is given to the Monorail crane system that is first plasma item. Final design development and preparation for manufacturing of the Monorail crane system will continue, other non-first plasma systems will continue preliminary design developments towards design review. Final design activities will be accompanied with prototyping and laboratory test in some areas.

#### Procurement Activities

For the different development areas and the complementary activities, specific contracts will be launched through Remote Handling (RH) and Engineering Unit framework contracts. Contracts are also planned to be signed for final design and manufacturing.

### **In-vessel viewing system (IVVS)**

#### Progress of Work

Main focus will be given to the final design development to move towards the design review and preparation for the manufacturing. Final design activities will be prepared/accompanied by prototyping and testing in some areas.

#### Procurement Activities

For the different development areas and the complementary activities, specific contracts will be launched through Remote Handling (RH) and Engineering Unit framework contracts.

### **Common activities (transversal)**

#### Progress of Work

Engineering support and expert activities will be performed for the four main operational activities, where needed. Complementary RH technology related design activities, qualification and prototyping will be carried out with a great focus on the field of control system, radiation hard technologies like electronics and cameras. Activities will be implemented (design and tests) aiming at manufacturing of first components (e.g. rad hard cameras and electronics) to be integrated in the RH systems.

Procurement Activities

Specific contracts will be launched through Remote Handling (RH) and Engineering Unit framework contracts in order to carry out supporting activities for the four main operational procurement and for complementary RH technology related design activities, qualification and prototyping. Contracts are also planned to be signed in some areas.

**WORK PROGRAMME OBJECTIVES**

| Milestone ID     | Scope Description  | Forecast achievement date | Type of milestone   | PA   |
|------------------|--|---------------------------|---------------------|--|
| EU23.03.14078120 | DDL-117 D4.1.01 Material Certificates for CTS (new) approved | Q2 2025                   | Predecessor of GB40 | PA 2.3.P3.EU.01 Cask and Plug Remote Handling System |
| EU23.03.71740    | 577-02-02 EU CPRHS PDR meeting completed MA items            | Q1 2025                   | Predecessor of GB41 | PA 2.3.P3.EU.01 Cask and Plug Remote Handling System |
| EU23.05.4282420  | Final ADP approved for TO (OMF-1023-01-12)                   | Q2 2025                   | Predecessor of GB42 | PA 2.3.P5.EU.01 Neutral Beam Remote Handling System  |
| EU57.01.14062980 | [M15] Deployment System FDR datapack ready                   | Q4 2025                   | Predecessor of GB47 | PA 5.7.P1.EU.01 In-Vessel Viewing System             |

**EXPECTED RESULTS**

The main expected results for this action are:

1. Signature of 1st plasma FwC (OMF-1609) for Design, Manufacturing of RH systems
2. Preparation for the preliminary design review meeting of CPRHS non 1st plasma system
3. Final design development of NBRHS first plasma system
4. Final design development and prototyping of IVVS Measurement and deployment system

**TARGET**

The target for 2025 is "Annual M-SPI ≥ 0.8"



## Action 6. Cryoplant and Fuel Cycle

| Action 6  | Cryoplant and Fuel Cycle |
|---|--------------------------|
| <p><b>Fuel cycle</b></p> <p><u>Progress of Work</u></p> <p>The type A radwaste treatment and storage system is expected to be transferred to IO.</p> <p>In the frame of the PA for REMS (Radiological and Environmental Monitoring Systems), the contract for design and manufacturing of individual monitoring system and environmental monitoring system needed for 1st plasma will focus on adjusting the scope to the current baseline (removal of Beryllium). Scope not impacted by the re-baseline will continue. Task Orders related to Design and risk mitigation activities of REMs for Tokamak complex will continue and additional Preparation activities for specific Framework contract for REMS Tokamak are planned.</p> <p><u>Tritium plant:</u></p> <p>For Isotope separation system, the work of the integrated team will focus on preliminary design, de-risking activities (prototyping) and preparation of procurement arrangement and tendering.</p> <p>For water detritiation system, the work of the integrated team will focus on preliminary design, de-risking activities and preparation of procurement arrangement. Transfer of scope related to final design of reception and purification system is considered.</p> <p>For <u>vacuum pumping:</u></p> <p>For Torus and Cryostat Cryopump system (TCCS), activities will focus on the completion of the last CryoPumps in case they are not all completed by the end of 2024 (depending on the progress of series manufacturing).</p> <p>For Neutral beam cryopumps system, activities will focus on definition of technical requirements, final design review (if not completed in 2024) and preparation of procurement arrangement signature.</p> <p>For Front-end and Cryodistribution systems (FECDS) the 3 Neutral Beam Cold Valve boxes will be manufactured, tested, and delivered. Manufacturing of the associated cryolines, cryojumpers and Johnston couplings will be completed. The I&amp;C systems for the TCCS and FECDS (wall mounted enclosures, local control cabinets, etc.) will also be fully delivered in 2025.</p> <p>In parallel, some new scope transferred from Buildings might be implemented in this project for the manufacturing and delivery of a Liquid Nitrogen vacuum insulated transfer line.</p> <p>For Leak Detection, after a full re-baselining of the project (moving from an already signed turnkey contract to a split strategy with completion of the Final Design and later call for tender for manufacturing and assembly), the scope in 2025 will be focused in completing the Final Design Review, complete the qualification scope for the remaining components, signing a contract for components/materials (long lead items) and starting the call for tender for the new manufacturing and assembly contract.</p> <p>Qualification and manufacturing of leak Detection and localization systems will continue.</p> |                          |

Procurement Activities fuel cycle

- Possible contract signature for manufacturing design, manufacturing and delivery of DN25 Liquid Nitrogen line (uncertainty in input data that could lead to change in contract strategy).
- Contract signature for Leak Detection procurement of components and/or materials (this could also be done through existing FwC Task Orders)<sup>5</sup>.
- Specific contracts for I&C of Leak Detection.
- Scope transfer to IO or internally in F4E for Water Leak Localization (if PA amendment is approved and if not completed in 2024).
- Scope transfer to IO or internally in F4E for Assembly Tooling for spot leak detection (if PA amendment is approved).
- Contract signature for manufacturing of Neutral Beam Cold Valve Boxes instrumentation and control (via amendment to an existing contract or new contract)<sup>6</sup>
- Scope transfer to IO for cabling procurement for Neutral Beam Front end Cryopump system<sup>7</sup>
- Specific contracts for design of Radiological end environmental monitoring system
- Amendment to existing contracts may be signed
- Specific Contracts for support activities like Inspectors, Documentation Support, Engineering and Analysis, I&C support and other activities, Project Management support etc, will continue to be issued depending on the project needs.
- Contracts or Specific contracts may be signed for studies and de-risking activities for Isotope separation system and water dtritiation system

**Cryoplant**Progress of Work

Commissioning of the remaining equipment of LN2 plant and auxiliary systems will continue, completing the Operational Acceptance Test of the 80K loop 1 and potentially also the warm tests, among other activities.

Procurement Activities cryoplant

- Amendments to existing contracts may be signed.
- Specific Contracts for support activities like Inspectors, Documentation Support, Engineering and Analysis, Project Management support etc. will continue to be issued depending on the project needs.

**WORK PROGRAMME OBJECTIVES**

<sup>5</sup> At the time of writing the Work Programme, there is a possibility that this commitment is signed in 2025 or in 2026 depending on the final strategy agreed and the type of contract used. The budget is currently allocated to 2026.

<sup>6</sup> At the time of writing the Work Programme, there is a possibility that this commitment is signed in in 2024 if it is done via amendment to an existing contract and in 2025 if it is signed as a new contract. The budget is currently allocated to 2024.

<sup>7</sup> At the time of writing the Work Programme, there is a possibility that this commitment is anticipated to 2024. The budget is nevertheless allocated to 2025.

| Milestone ID  | Scope Description  | Forecast achievement date | Type of milestone   | PA   |
|---|--|---------------------------|---------------------|--|
| EU31.01.11367   | PA data package completed (without Annex B) for PA Amendment 3.1.P1.EU.04 for NB Cryopumps | Q3 2025                   | Predecessor of GB50 | PA 3.1.P1.EU.04 Neutral Beam Cryopumps   |
| EU31.01.8184180   | M_A15 Neutral Beam Cold Valve Boxes 1,2,3 FAT approved                                     | Q4 2025                   | WP25 objective      | PA 3.1.P1.EU.02 Front End Cryopump Distribution Cold Valve Boxes and Warm Regeneration Box |
| EU31.03.25760   | M.20 - FDR approved by Steering Committee for Primary & Cryostat Leak Detection System     | Q4 2025                   | Predecessor of GB18 | PA 3.1.P3.EU.01 Primary and Cryostat Leak Detection System                                 |
| EU31.03.43400   | Final Design Analysis report completed for Primary Leak Detection Systems                  | Q2 2025                   | Predecessor of GB35 | PA 3.1.P3.EU.01 Primary and Cryostat Leak Detection System                                 |
| <b>EXPECTED RESULTS</b>   |  |                           |                     |  |
| <p>The main expected results for this action are:</p> <ol style="list-style-type: none"> <li>1. LN2 Operational Acceptance Test of the 80K loop 1.</li> <li>2. Delivery of Neutral Beam Cold Valve Boxes cryolines, cryojumpers and Johnston couplings.</li> <li>3. Delivery of last Torus and Cryostat Cryopump (if not delivered in 2024).</li> <li>4. Start preparation of Call for Tender for manufacturing and assembly contract for Leak Detection.</li> <li>5. Radiological and environmental monitoring system: design basis completed.</li> <li>6. Neutral Beam cryopumping system: Final Design review and chits closed to be able to proceed with Procurement Arrangement amendment preparation.</li> <li>7. Water detritiation system: Procurement Arrangement staged approach clarified and endorsed.</li> <li>8. Isotope separation system: first draft of preliminary design available to be able to start preparation of Tenders</li> </ol> |  |                           |                     |  |
| <b>TARGET</b>   |  |                           |                     |  |
| The target for 2025 is "Annual M-SPI ≥ 0.8"   |  |                           |                     |  |

Action 7. Plasma Engineering & Operations

|                 |  |
|-----------------|--|
| <b>Action 7</b> | <b>Plasma Engineering &amp; Operations</b> |
|-----------------|--|

|  |
|--|
| <p><b>ITER Operations</b></p> <p>The activities preparation of ITER operation will focus on preparation for longer term actions (for ITER integrated commissioning and operation) as well as some short-term actions (for system commissioning and assembly phases)</p> <p>The preparation of the F4E contribution to the organization of ITER Operation (collaboration framework with IO and the ITER parties, EU representation) includes contributing to the definition of the EU position in the definition of the ITER Operation organisation as well as setting up in F4E of framework for personnel assignment and of F4E coordinating mechanisms</p> |
|--|

| <p><b>Procurement Activities</b></p> <p>Not applicable</p> <p><b>Plasma Engineering</b></p> <p>A relevant part of the PE activity responds to (often urgent) requests and hence it is difficult to plan in advance.<br/>This will include support on scenario preparation for first plasma and specific simulations and code development as needed, support to the development of the ITER Tokamak Monitoring System.<br/>Transversal support to F4E procurement remains in the Plasma Engineering scope.</p> <p><b>Procurement Activities</b></p> <p>Not applicable</p> |                   |                           |                   |        |
|--|-------------------|---------------------------|-------------------|--------|
| <b>WORK PROGRAMME OBJECTIVES</b>   |                   |                           |                   |        |
| Milestone ID   | Scope Description | Forecast achievement date | Type of milestone | ITA/PA |
| Not applicable   |                   |                           |                   |        |
| <b>EXPECTED RESULTS</b>  |                   |                           |                   |        |
| <p>The main expected results for this action are:</p> <p>1. Provide support to ITER preparation for integrated commissioning.</p>  |                   |                           |                   |        |
| <b>TARGET</b>  |                   |                           |                   |        |
| Not applicable   |                   |                           |                   |        |

Action 8. Heating & Current Drive

|   |                                    |
|---|------------------------------------|
| <b>Action 8</b>   | <b>Heating &amp; Current Drive</b> |
| <p><b>Electron Cyclotron (EC) System Gyrotrons, Power Sources and Power Supplies (PS), EC Upper Launcher and EC Control System</b></p> <p><b><i>Progress of Work :</i></b><br/><u>Electron Cyclotron Power Supplies</u></p> <ul style="list-style-type: none"> <li>• Commissioning of EC Power Supplies sets will continue.</li> <li>• Site acceptance test of 52HV05 will be completed.</li> <li>• Technical support of the EC Power Supplies will continue.</li> </ul> <p><u>Electron Cyclotron Gyrotrons</u></p> |                                    |

- Design activities for EU Gyrotrons (Radiofrequency Sources) will progress towards Final Design Review.
- Preparation activities for the second specific contract for the procurement of the Control System for the EU Gyrotrons will be finalized.
- Design activities for the Control System of the EU Gyrotrons will progress towards Final Design Review.

#### Electron Cyclotron Launchers

- The contractor will proceed with the design of Ex-Vessel Waveguides and Upper Launcher (UL) Systems towards Final Design Review and Manufacturing Readiness Review(s).
- Procurement of long lead materials for series production will continue.
- Optical testing of diamond disks will be completed.
- The design and qualification of the EC isolation valves will continue.

#### Electron Cyclotron Control System

- Activities in 2025 will be mainly devoted to completing the integrated commissioning of the system in view to support the acceptance tests of the first ITER gyrotrons scheduled for the end of the year. The EC Plant Controller (ECPC) will also be upgraded to stage 2.1 to include the possibility to operate multiple gyrotrons simultaneously.

#### **Procurement Activities**

##### Common activities:

- Specific contracts will be signed under the framework for engineering support services for EC projects.
- Other contracts are foreseen to support these main activities (e.g., engineering, design, analyses, resources, inspectors, prototyping), most of them specific contracts under existing frameworks.

##### Electron Cyclotron (EC) Power Supplies:

- Supporting activities for site support and interfaces are foreseen.

##### Electron Cyclotron (EC) Gyrotrons:

- The specific contract for the procurement of the Control System of the EU Gyrotrons will be signed.

##### Electron Cyclotron (EC) Launchers:

- Specific Contracts covering the manufacturing and assembly of the Ex-Vessel Systems and the manufacturing of the remaining Upper Launcher Sub-systems will be

signed under the Framework Contract for Design Finalization and Supply of the Electron Cyclotron Upper Launchers and Ex-Vessel Waveguides for ITER.

- Additional options under the relevant Framework Contract for the Design Finalization and Supply of the Electron Cyclotron Upper Launchers and Ex-Vessel Waveguides for ITER will be signed, covering part of the remaining scope.

#### Electron Cyclotron Control System:

- Task orders under existing Framework Contracts for the preparation of the FDR will be signed.
- Task orders under existing Framework Contracts for HW prototypes will be signed.

#### **Neutral Beam Test Facility, Padua:**

##### **Progress of Work**

- MITICA Beam Source will be delivered to the NBTF.
- MITICA Diagnostics – fabrication and assembly will be completed.
- MITICA Beam Line Components – Delivery of Electrostatic Residual Ion Dump (ERID) and Calorimeter (CAL) to NBTF will be completed.
- NBTF Assembly - MITICA cryopump installation will be completed.

NBTF Control System (CODAS) - MITICA instrumentation (Interlock and Safety System) installation will start, and contractual activities will progress for the remaining instrumentation.

##### **Procurement Activities**

- MITICA Beam Line Component and Beam Source: supporting tasks for the final acceptance tests and delivery to RFX PRIMA site will be implemented.
- Other contracts are foreseen to support these main activities (resources, inspectors), most of them specific contracts under existing frameworks.

#### **Neutral Beam for ITER - Cadarache:**

##### **Progress of Work**

- NB Assembly and Testing: Design activities on the NB Tooling (Batch 1) will start subject to contract signature. The cost assessment for the general assembly phase II and phase III will be further refined in view of the centralization of scope by IO.
- HNB Beam Sources and Beam Line Components – Pre-procurement and pre-PA activities will progress.
- HNB Vessels: Manufacturing readiness will be reached upon successful closure of the MRR meeting and manufacturing activities will start.
- HNB Drift-Ducts: Procurement procedure to manufacture two Drift Ducts for ITER will proceed up to the contract signature.
- NB Absolute Valve: Joint IO/F4E procurement will progress upon successful completion of the feasibility study by IO.
- NB Magnetic Shielding: Pre-Procurement activities related to PA 53.05 will be implemented in anticipation of the corresponding PA signature, subject to timely IO FDR completion and agreement on adopted procurement strategy.

- NB Power Supplies: Detailed design activities for ISEPS will progress towards FDR, delivery of Acceleration Grid Power Supply – Conversion System (AGPS-CS) and Ground Related Power Supplies (GRPS) will be completed, and installation will start subject to building availability. Delivery of the High Voltage Deck (HVD) and High Voltage Bushing will be completed. Engineering activities for ITER Heating Neutral Beam (IHNB) control system will progress.

**Procurement Activities**

- Some Engineering Studies and Engineering Support activities might be performed, including ITAs.
- Specific Contracts under existing Framework Contracts will be signed for insourcing and technical follow-up of the HNB components.
- NB Assembly & Testing: The first task order for structural analysis support for the Assembly Tooling will be signed. Other specific contracts under existing Framework Contracts are foreseen to support the execution of the NB Tooling contract (e.g. CAD support)
- NB Vessels: Task orders related to quality inspection services or production support will be signed to reinforce the NB Vessels manufacturing activities.
- NB Drift-Duct: The contract for the manufacturing design, manufacturing and delivery will be signed.
- NB Power Supplies: Specific tasks and options will be released, in accordance with the contract implementation status.

**Ion Cyclotron Antenna**

No activities are foreseen in 2025.

Following agreement between F4E and IO, the IC antenna procurement scope was transferred through a Level-0 PCR (#1271) from the original share of F4E, without contractual impact, since the PA had not yet been signed.

**WORK PROGRAMME OBJECTIVES**

| Milestone ID    | Scope Description   | Forecast achievement date | Type of milestone   | PA  |
|-----------------|---|---------------------------|---------------------|---|
| EU52.01.4007740 | [M40] UL FDR Kick of Meeting  | Q2 2025                   | Predecessor of GB46 | PA 5.2.P1B.EU.02<br>Electron Cyclotron Upper Launcher           |
| EU52.03.21570   | F4E- OMF-1108 - MS-09 Participation to the FDR Meeting of the ITER RF Sources | Q2 2025                   | Predecessor of GB48 | PA 5.2.P3.EU.01<br>Electron Cyclotron Gyrotrons                 |
| EU52.03.227120  | SCP-52HV05 - SAT Completed (M3.1.5)   | Q2 2025                   | WP25 objective      | PA 5.2.P4.EU.01<br>Electron Cyclotron High Voltage Power Supply |

|   |  |         |                     |   |
|---|--|---------|---------------------|---|
| EU53.04.01440   | OPE-1180 - NB Vessels Manufacturing Readiness Review Closure           | Q2 2025 | WP25 objective      | PA 5.3.P4B1.EU.01 Heating Neutral Beam Vessel         |
| EU53.06.09160   | IPL > Delivery of EU-HVD1 & EU-Bushing of IHNB-1 to ITER Site by EU-DA | Q4 2025 | Predecessor of GB30 | PA 5.3.P6.EU Neutral Beam Power Supply                |
| EU53.TF.15690   | Delivery of MITICA Beam Source by EU-DA to PRIMA Site                  | Q3 2025 | WP25 objective      | PA 5.3.P9.EU.01 Neutral Beam Test Facility Components |
| EU53.TF.4447660   | Delivery On-Site Completed (M97) - MITICA Calorimeter                  | Q3 2025 | WP25 objective      | PA 5.3.P9.EU.01 Neutral Beam Test Facility Components |
| <b>EXPECTED RESULTS</b>   |  |         |                     |   |
| <p>The main expected results for this action are:</p> <ol style="list-style-type: none"> <li>1. F4E-OMF-1120 TO1 Option 3 for the Manufacturing &amp; Assembly of the Launcher Body will be released.</li> <li>2. The MRRs for the EC Launchers BSM and Mirrors will be held.</li> <li>3. Final Design review for the EC Gyrotrons control system completed.</li> <li>4. F4E-OPE-1203 End of preliminary design and 3D models tools for Phase II (Batch 1,2 &amp; 3)</li> <li>5. Pre-procurement activities for NB magnetic Shielding started.</li> <li>6. Acceleration Grid Power Supply – Conversion System (AGPS-CS) second delivery to ITER site</li> <li>7. Ground Related Power Supply (GRPS) second delivery to ITER site</li> <li>8. Delivery of MITICA Electrostatic Residual Ion Dump</li> <li>9. Delivery of MITICA Interlock and Safety System</li> </ol> |  |         |                     |   |
| <b>TARGET</b>   |  |         |                     |   |
| The target for 2025 is “Annual M-SPI ≥ 0.8”   |  |         |                     |   |

Action 9. Diagnostics

| Action 9   | Diagnostics |
|--|-------------|
| <p><i>Progress of Work</i></p> <p>During 2025 the Diagnostics Programme will continue with, or begin, the manufacture of several components or systems for delivery to ITER. These include in-vessel supports, vacuum vessel electrical feedthroughs, final batches of in-vessel cables, port plug components of the visible/IR wide-angle viewing system in equatorial port 12, fission chambers and port plug components of the radial neutron camera. Some of these will be delivered within the year.</p> <p>Several Diagnostic systems and subsystems will complete their design activities with approval of the final design review, including the port plug bolometer cameras and sensors, port plug components of the core plasma charge exchange recombination spectrometer, port plug components of the visible/IR wide-angle viewing system in equatorial port 12, and the sensor head and electronics for diagnostic pressure gauges.</p> <p>The design of all remaining Diagnostics Programme systems and subsystems will also progress; under on-going contracts (e.g. in-divertor electrical services) and specific contracts within existing design framework contracts (e.g. core plasma Thomson scattering system, ex-vessel components of the core plasma charge exchange recombination spectrometer, and vacuum vessel and divertor bolometer cameras), as well as under specific grants of framework partnership agreements (e.g. ex-vessel components of the radial neutron camera) and under the design grant (e.g. visible/IR wide-angle viewing system in equatorial ports 3, 9 and 17)</p> |             |



For integration of systems into ITER ports under F4E responsibility, works will continue to address changes to tenant interfaces with respect to the approved FDR design (ITER Baseline), consistent with associated PCRs.

### Procurement Activities

Procurement activities will focus mainly on the manufacture of the diagnostics components that have passed their final design review, either by placement of framework contracts or specific contracts within existing framework contracts, and on any activities necessary for completion of designs.

The tendering process for port engineering system of six diagnostics ports will be as well on going.

These activities will be complemented with contracts and specific contracts for the production and testing of prototypes, specific contracts for the provision of industrial expertise and for engineering analysis, as well as amendments of on-going grants and contracts (including specific contracts) as necessary. In-sourcing of personnel is foreseen to support the Diagnostics Programme during 2025, as is the use of Inspectors for manufacturing contracts and Experts in specialist areas, including in support of design reviews.

A cash transfer to IO is also foreseen, associated with transfer of scope related to support of the commissioning activity for the Magnetics electronics diagnostic.

## WORK PROGRAMME OBJECTIVES

| Milestone ID   | Scope Description   | Forecast achievement date | Type of milestone   | PA   |
|----------------|---|---------------------------|---------------------|--|
| EU55.04.108185 | < Approval of Joint Final Design Review for Sensor Head and Electronics   | Q2 2025                   | WP25 objective      | PA 5.5.P1.EU.07 Diagnostics - Pressure Gauges  |
| EU55.06.683180 | MRR Meeting for Feethroughs   | Q2 2025                   | Predecessor of GB36 | PA 5.5.P1.EU.18 Diagnostics - Tokamak Services                                       |
| EU55.06.697120 | IPL > Delivery of In-vessel clips, clamps and junction boxes for VV Sector 3 (Batch 7) by EU-DA to IO ITER site | Q3 2025                   | WP25 objective      | PA 5.5.P1.EU.18 Diagnostics - Tokamak Services                                       |
| EU55.07.19160  | Task Order Signed for Radial Neutron Camera Port Plug Components Manufacture                                    | Q2 2025                   | WP25 objective      | PA 5.5.P1.EU.15 Diagnostics - Radial Neutron Camera/Gamma Spectrometer               |
| EU55.11.209930 | PDR approved by Steering Committee for CXRS Fibres and Ex-Vessel Optical/Mechanical                             | Q2 2025                   | WP25 objective      | PA 5.5.P1.EU.04 Diagnostics - Core-Plasma Charge Exchange Recombination Spectrometer |
| EU55.13.102960 | FDR approved by Steering Committee for Eq. Vis/IR WAVS Port Plug Components EQ12                                | Q1 2025                   | WP25 objective      | PA 5.5.P1.EU.06 Diagnostics - Equatorial Visible/Infrared Wide-Angle Viewing System  |

## EXPECTED RESULTS

|  |
|--|
| <p>The main expected results for this action are:</p> <ol style="list-style-type: none"> <li>1. Completion of final design for the pressure gauges sensor head and electronics.</li> <li>2. Completion of preliminary design for the core plasma charge exchange recombination spectrometer ex-vessel components.</li> <li>3. Completion of final design for equatorial visible/IR wide-angle viewing system port plug components.</li> <li>4. Deliveries of tokamak services in-vessel supports and final batches of in-vessel cables.</li> </ol> |
| <b>TARGET</b>  |
| <p>The target for 2025 is “Annual M-SPI <math>\geq</math> 0.8”</p>   |

Action 10. Test Blanket Module

| Action 10   | Test Blanket Module |
|---|---------------------|
| <p><u>Progress of Work</u></p> <p>The Design and Safety Analysis activities for the TBM Sets and Ancillary Systems will continue for the completion of the preliminary design and the first step of the final design.</p> <p>The consultancy of an Agreed Notified Body will continue as well as the handling and storage of EUROFER and other steel products.</p> <p>The activities for the development of the TBM sets Industrial Feasibility and Fabrication Technologies will continue, as well as for the EUROFER semi-finished product.</p> <p>The collaboration with EUROfusion and EFLs will continue.</p> <p>The definition and codification of EUROFER design limits in RCC-MRx design and construction code will continue.</p> <p><u>Procurement Activities</u></p> <p>It is planned to launch/conclude procurement procedures for the start or the continuation of the following activities among others:</p> <ul style="list-style-type: none"> <li>- Completion of the preliminary design of the TBM sets, of Ancillary Systems and of the related Safety Analyses and studies.</li> <li>- Final design of the TBM sets and of the related safety analyses and studies.</li> <li>- Final design and manufacturing of the Ancillary systems.</li> <li>- Consultancy of an Agreed Notified Body.</li> <li>- Proof of the TBM-sets fabrication and assembly processes feasibility.</li> <li>- EUROFER semi-finished products.</li> <li>- Handling and Storage of EUROFER and steel materials.</li> <li>- Definition and codification of EUROFER design limits in RCC-MRx.</li> <li>- The transport of EUROFER and other materials/products to and from the storage facility.</li> </ul> <p>In addition, specific contracts for support activities like engineering and analysis, experts, project management support, system engineering management and in-sourced staff may be issued depending on the project needs.</p> |                     |

Moreover, if requested and approved by the TBM-Project Team Steering Committee, a cash contribution will be transferred to IO in order to execute TBM-PT activities common to several ITER Members.

The Test Blanket Module Systems procurement plan is not in response to PA or ITA but to the TBM Arrangements (TBMs).

No activities are credited.

| WORK PROGRAMME OBJECTIVES  |   |                           |                   |    |
|--|---|---------------------------|-------------------|----|
| Milestone ID   | Scope Description   | Forecast achievement date | Type of milestone | PA |
| EU56.01.1242965  | F4E-OFC-1497 TO-02 Signed for EUROFER design limits codification in RCC-MRx                               | Q3 2025                   | WP25 objective    | NA |
| EU56.01.1260055  | F4E-OFC-1350-01 Task Order 03 Signed for Safety Studies in support of TBSs PD & FD                        | Q2 2025                   | WP25 objective    | NA |
| EU56.01.89510  | F4E-OFC-1017 TO-09 Signed for ANB Consultancy   | Q1 2025                   | WP25 objective    | NA |
| EU56.02.1240470  | F4E-OFC-1063-01 TO-05 Signed for Handling, Cutting Storage Serv for Steel Products related to the EU TBMs | Q2 2025                   | WP25 objective    | NA |
| EXPECTED RESULTS   |   |                           |                   |    |
| <p>The main expected results for this action are:</p> <ol style="list-style-type: none"> <li>1. Completion of the Preliminary design activities for WCLL TBS and the start-up of Final design phase.</li> <li>2. Completion of the Preliminary design activities for HCCP TBS in collaboration with KO-DA and the start-up of Final design phase.</li> <li>3. Transmission to IO of the consolidated set of data in view of the update of the ITER Preliminary safety Report.</li> </ol> |   |                           |                   |    |
| TARGET   |   |                           |                   |    |
| The target for 2024 is "Annual M-SPI $\geq$ 0.8"   |   |                           |                   |    |

Action 11. Site and Buildings and Power Supplies

| Action 11   | Site and Buildings and Power Supplies |
|---|---------------------------------------|
| <p><u>Progress of Work</u></p> <p>The focus of the Buildings works will be to complete the Tritium building (B14); to progress on the installation of the Cargo Lift in the Machinery Room on the Tokamak building (B11); to complete the installation the Cargo Lift Lobby Doors, to progress installing the Doors in Tritium Building (B14); to deliver the building services components (HVAC, piping, electrical,</p> |                                       |

Instrumentation & Control) to IO for installation in the Tokamak Complex; to complete the NB High Voltage Power supply Building (B37), the Control building (B71 Non PIC part) and the NB Power supply building (B34).

Construction and installation of Load Centers LC01, LC02, LC15, LC16 and the Medium Voltage MV04, MV05 & MV06 will progress. The Emergency Power Supply Buildings (B44, B46), Medium Voltage Distribution Buildings (B45, B47), the Load Centers LC04, LC09, will be operational (Ready for use).

The Call for Tender for the Hot Cell Facility Buildings might be launched to cover the Design (as a minimum, following strategy alignment in 2024) of both IO and F4E scopes (DT1 phase). Design Works are required on functions due for pre-assembly phase and AFP operation phase.

The Emergency Power Supply Buildings (B44, B46), Medium Voltage Distribution Buildings (B45, B47), the Load Centers LC01, LC02, LC08, LC09, LC15 & LC16 and the Medium Voltage MV04, MV05 & MV06, construction will continue progressing.

Procurement Activities

Contracts to be signed by 2025 include:

- TB25 – Site Infrastructure and remaining Building services in the auxiliary buildings (Q2-Q3 2025)
- Provision of Mandatory Health and Safety Advisory Services for the Worksite (HSPC) (joint call with IO) (Q1 2025)
- Legal Inspection (LI) (potential joint call with IO, to be confirmed) (Q4 2025)

TB24 – IP Electrical Diesel Generators and buildings 59 & 60 procurement start on Q1 2025 (Signature expected Q2 2026)

Specific contracts will be signed under ongoing framework support services and works contracts. This includes, for example, Task Orders, Structural analysis, Building HMI Development, Engineering and Contract Management Consultancy Services (with special respect to cost and schedule assessment) and consultancy for advice on interpretation of French Regulatory Law 2012.

Changes and exercise of options to the ongoing services and construction contracts in relation with PCRs, input data delays, and re-allocation of scope between contracts, will be implemented through amendments to the ongoing contracts in line with the provisions of the Financial Regulation.

Cash contribution will cover the ITER site host agreement and the ITER Site Services Agreement.

Specific cash compensation to IO as required in case of transfer of some activities from F4E to IO.

**WORK PROGRAMME OBJECTIVES**

| Milestone ID | Scope Description | Forecast achieve | Type of milestone | PA |
|--------------|-------------------|------------------|-------------------|----|
|--------------|-------------------|------------------|-------------------|----|

|   |   | ment date |                |                 |
|---|---|-----------|----------------|-----------------|
| EU62.05.235   | IPL > NB Power Supply Building (34) RFE (RFE #9)                    | Q1 2025   | WP25 objective | MAIN MILESTONES |
| EU62.05.275   | IPL > NB High Voltage Power Supply Building (37) RFE (RFE #9)       | Q1 2025   | WP25 objective | MAIN MILESTONES |
| EU62.05.390   | IPL > Medium Voltage Distribution Building LC/1A (46) RFE (RFE #16) | Q4 2025   | GB24           | MAIN MILESTONES |
| EU62.05.410   | IPL > Medium Voltage Distribution Building LC/2B (47) RFE (RFE #10) | Q4 2025   | GB26           | MAIN MILESTONES |
| EU62.05.580   | IPL > Construction of Control Building (71 non PIC part) Completed  | Q1 2025   | WP25 objective | MAIN MILESTONES |
| <b>EXPECTED RESULTS</b>   |   |           |                |                 |
| <p>The main expected results for this action are:</p> <ol style="list-style-type: none"> <li>1. To deliver the Neutral Beam Power Supply Building to the IO for its suppliers works (ready for equipment - RFE)</li> <li>2. To deliver the Neutral Beam High Voltage Power Supply Building to the IO for its suppliers works (ready for equipment - RFE)</li> <li>3. To deliver the Load Center 1A (B46) to the IO for its suppliers works (ready for equipment - RFE)</li> <li>4. To deliver the Load Center 2B (B47) to the IO for its suppliers works (ready for equipment - RFE)</li> <li>5. Construction completed of the control Building (71 non PIC part).</li> </ol> |   |           |                |                 |
| <b>TARGET</b>   |   |           |                |                 |
| <p>The target for 2025 is "Annual M-SPI ≥ 0.8"</p>  |   |           |                |                 |

Action 12. Cash Contributions

| <b>Action 12</b>   | <b>Cash Contributions</b> |
|--|---------------------------|
| <b>Cash contribution to IO</b>   |                           |
| <p>This action covers the EURATOM in-cash contribution that F4E<sup>8</sup> shall deliver to ITER International Organisation (IO) in cash together with its contribution in-kind for the ITER project in accordance with ITER Agreement<sup>9</sup>.</p> |                           |

<sup>8</sup> F4E is the European Domestic Agency that manages the EURATOM contribution to the ITER project.

<sup>9</sup> Article 8 "Resources of ITER Organization" (ITER Agreement 2006)

The present Work Programme includes the cash contributions to IO due by F4E for the following year N+1. The whole amount is committed in advance based on estimates of the IO draft budget N+1 and under the terms approved by ITER Council<sup>10</sup>.

**Cash Contribution to Japan**

The action also covers the transfer of procurement responsibility from EURATOM to Japan under the supervision of the ITER Organization in accordance with ITER Agreement. This is financed through a cash contribution from EU to Japan paid by F4E. An update of the schedule of payments is provided by the Japanese Domestic Agency (JA DA) twice a year.

**WORK PROGRAMME OBJECTIVES**

| Milestone   | Scope Description                            | Forecast achievement date | Type of milestone | PA                                      |
|-------------|--|---------------------------|-------------------|---|
| EUCC.01.300 | Cash Contributions to ITER Organization 2026 | Q4 2025                   | WP25 objective    | Cash Contributions to ITER Organization |

**EXPECTED RESULTS**

The expected result for this Action is to pay the cash contributions to ITER Organization as agreed by the ITER Council and to Japan as defined in the schedule for the relevant credits assigned to JA DA for those components transferred by the EU to them.

The target for 2025 is to commit the cash contribution to IO for 2026 according to the decisions due to be taken by the ITER Council in November 2025.

As far as the cash to Japan is concerned, the target for 2025 is to reinforce the commitment for the escalation revision PA 3.2.PA.JA.01<sup>11</sup> and to reinforce the commitment linked to the Settlement Agreement for offsetting of Upper Port #10<sup>12</sup>.

Annual M-SPI NA

Action 13. Technical Support Activities

| Action 13  | Technical Support Activities |
|--|------------------------------|
| <p>The procurement of the supporting activities is mainly performed through Framework contracts and specific contracts.</p> <p><b>Technical Support to In-Kind Procurement</b></p> |                              |

<sup>10</sup> According to Article 9 of ITER Agreement, the ITER Project Resource Management Regulations (PRMR Regulations) shall govern the administration of the resources of the ITER Organization. It provides a detailed description of the applicable rules for contributions in kind, cash income, commitments and payments for the ITER Organization. The final figures are approved or modified by the ITER Council.

<sup>11</sup> As per LGA-2021-A-55 Addendum#1

<sup>12</sup> Implementing Arrangement on Additional Cash Contribution between F4E and QST signed 10 December 2020

## **Engineering Support activities**

### Progress of Work:

The Engineering Unit during 2025 will continue supporting the ITER Departments Programmes including BA department by providing them technical expertise in the key domains of engineering and fusion technologies.

The unit will provide technical expertise in the following areas:

Design office activities, Technical Data Management, System Design, Mechanical Engineering, Analysis: Mechanical, Structural Dynamics, Civil engineering, Fluid Dynamics, Electro Magnetism, Nuclear Analyses; Plasma Engineering, Design Codes and Standards; Electrical Engineering; Instrumentation and Control; CODAC; Metrology, Material and Fabrication and Assembly Integration and Validation (AIV) and testing facility (FALCON).

### Procurement Activities:

Beyond the preparation of task orders, the procurement activities in the Engineering Unit will be mainly focused on signing contracts, renewing Framework Contracts for adapting the level of support to the needs of the Programmes. Grants may also be signed for various activities.

## **Safety & Quality**

### Progress of Work

The scope of Nuclear Safety includes the oversight of the implementation of all nuclear safety requirements by F4E and its contractors. The Nuclear Safety activities also provide support to the project teams involved in PIC/PIA (Protection Important Components/Activities) to ensure compliance with the necessary regulation. This includes support to nuclear safety management, identification of optimum positions for key nuclear safety issues, review of relevant documentation and nuclear safety inspections in F4E suppliers' premises. Nuclear Safety also includes CE marking support to F4E Project Teams in assessments and reviews, for each PBS, of the compliance with CE marking directives and regulations (mainly Pressure Equipment Directive, Machinery Directive, Low Voltage Directive, Electromagnetic Compatibility Directive, Explosion Protection and Construction Product Regulation). The Nuclear Safety group also organizes workshops, seminars and other activities to raise and re-enforce the nuclear safety awareness within F4E.

The scope of Quality Assurance includes the support to project teams to ensure that the F4E quality requirements are correctly implemented and managed for the F4E contribution to ITER. In particular, support is provided in both domains of Quality Assurance (QA) and Quality Control (QC). As for QA, support aims at ensuring that F4E's QA processes are properly followed in the development of the different ITER projects and in line with the F4E Quality Management Policy. As for QC, the support to the projects will be provided in the follow-up and control of the activities performed by F4E's contractors.

The scope of Quality Management & Documentation Management includes the support the operational departments and the project teams to ensure that the Quality Management System (including its processes) and the Documentation Management System are maintained and improved, with focus on reporting, digitalisation and simplification.

Safety & Quality also includes the support activities for Occupational Health & Safety.

Another stream of support that might be needed is the activity of alignment of the Quality Management System with the ISO19443.

#### Procurement Activities

Task Orders and contractual Options of Task Orders already in force, Purchase Orders and Procurement Procedures for Direct Service Contracts will be issued to continue to support the Project Teams at F4E's or at suppliers' premises. F4E will be also supported by experts on Nuclear Safety expertise, funded by F4E through expert contracts.

### **Systems Integration and Performance**

#### Progress of Work

System Integration and performance supports the Head of Projects Department with respect to the scope of the EU in-kind components for ITER, in representing F4E towards the ITER Organisation and to the scope of Broader Approach and Roadmap projects. Among the main tasks are: the interaction with IO on the project technical baseline, including change control, and participation to the Configuration Control Boards, the management of transversal technical issues impacting several PTs, the coordination of F4E participation to ITER Independent Reviews and working groups focused on technical matters and the assurance of consistency, adequacy and maturity in relevant Design Reviews. The scope includes also the development and implementation of Systems Engineering practices, processes and tools and to support their correct deployment by the Project Teams. To cover this scope, external manpower is contracted across several areas, including Requirements Management and Verification (RMV) with emphasis on Verification, Design and Manufacturing Readiness Reviews, Interface Management, and other Systems Engineering topics.

#### Procurement Activities

Task Orders, contractual Options of Task Orders already in force and Procurement Procedures for Direct Service Contracts will be issued to continue to support the F4E Project Teams and to complement the in-house Configuration Management, Technical Integration and Issues Management capabilities with expert support from specialized companies.

### **Project Performance Management**

#### Progress of Work

The Project Performance Management (PPM) Unit contributes to the delivery of project results by providing project management expertise and qualified project management professionals in the key areas of project management, namely schedule, cost, and risk management. PPM unit is responsible for developing project baselines, identifying risks, issues, and deviations from project baseline, and proposing preventive/corrective actions. It performs the activities of schedule management, risk plan, EAC (maintaining EAC data in the systems) with an independent role for schedule forecast, cost estimation and risk assessment in the programmes/projects, following the Head of Projects' delegation. The unit also coordinates and prepares the performance monitoring and reporting during project execution and drive project decisions ensuring proper consideration of schedule, cost and risk aspects. The preparation and update of the project teams actions as part of the annual and multi-annual programme planning documents is also included.



| <u>Procurement Activities</u>  |  |                           |                   |     |
|--|--|---------------------------|-------------------|-----|
| Task Orders and contractual Options of Task Orders already in force will be issued to continue to ensure the maintenance and update of the cost, schedule, risk information in the specific tools.   |  |                           |                   |     |
| WORK PROGRAMME OBJECTIVES  |  |                           |                   |     |
| Milestone ID   | Scope Description  | Forecast achievement date | Type of milestone | PA  |
| EU.ES.01.110360  | Contract Signed for Engineering Support Contract LOT 1   | Q3 2025                   | WP25 objective    | All |
| EU.ES.03.63580   | Contract Signed for I&C integration services   | Q3 2025                   | WP25 objective    | All |
| EU.PM.3052100  | Framework Contract signed for System Engineering Support Services (continuation of F4E-OMF-1127) | Q4 2025                   | WP25 objective    | All |
| EXPECTED RESULTS   |  |                           |                   |     |
| <p>The main expected results for this action are:</p> <ol style="list-style-type: none"> <li>1. Continuation of Implementation of the framework contracts which will allow Fusion for Energy to get external support in the field of NDT Testing of Materials, Seismic Analysis, I&amp;C Control, Engineering Support.</li> <li>2. Signature of a new Framework Contract to continue to provide support services in the area of Systems Engineering.</li> <li>3. On time signature of the required Task Orders in order to support the F4E Project Teams.</li> <li>4. Provide high quality Project Performance Management services to F4E and all Project Teams.</li> <li>5. Provide the requested support to F4E and all Project Teams on the matters described in the Scope of Work. In general, the target for 2025 is to keep safeguarding the EURATOM's investment in ITER while achieving the cumulative credit forecasted for each action in this WP2025 thanks to the support granted to the work under each specific action.</li> </ol> |  |                           |                   |     |
| Transportation   |  |                           |                   |     |
| <p><b>Transportation</b></p> <p><u>Progress of work:</u></p> <p>During 2025, Engineering Unit/Transportation will be in charge of the management, on the F4E side, of technical aspects of the joint procurement with IO for the transportation of ITER components to the site in Cadarache. The scope includes the transportation of all ITER Components from the port/airport of entry (Fos or Marignane) to ITER site.</p>  |  |                           |                   |     |

During 2025, this activity will mainly cover transportation of NON EU loads between Fos and Cadarache (EU-leg). The main cost driver is for Highly Exceptional Loads (HEL) that follow the dedicated ITER itinerary.

Procurement activities:

Task Orders for Transportation of Highly Exceptional Loads between Maritime Port of Marseille and ITER site. Gendarmerie Task Orders to escort the HEL convoys and Task Orders for Management fees and for component transportation with contractor Daher will be signed.

**WORK PROGRAMME OBJECTIVES**

| Milestone ID  | Scope Description  | Forecast achievement date | Type of milestone | PA  |
|---------------|--|---------------------------|-------------------|-----|
| EU.TR.3028480 | Task Order Signed for TO 22 for Convention 4 for Real Convoys for Gendarmerie Services | Q2 2025                   | WP25 objective    | All |
| EU.TR.3028600 | Task Order Signed for TO 23 for Convention 4 for Real Convoys for Gendarmerie Services | Q4 2025                   | WP25 objective    | All |

**EXPECTED RESULTS**

1. Transportation of Highly Exceptional Loads amongst others, VV-sector between Maritime Port of Marseille and ITER site.
2. Gendarmerie Task Orders to escort the HEL convoys and Task Orders for Management fees and for component transportation with contractor Daher will be signed.

**Other Technical Support Activities**

**Project Management Office**

Progress of Work

The main focus of Project Management Office is on performance oversight and reporting, preparation of the annual and multi-annual programme planning documents, scheduling support, change control, the maintenance and update of the cost situation, the continuous integration of risk management into every aspect of the organisation, ensuring that all decisions and processes are aligned with F4E's objectives and risk tolerance, increased standardization of reporting within the organization, the implementation of the Internal Compliance Programme for export control. Overall project management support and support to the use and maintenance of specific tools to support project and program management are also included.

Procurement ActivitiesU

Task Orders and contractual Options of Task Orders already in force, Purchase Orders and Procurement Procedures for Direct Service Contracts will be issued to continue to support the F4E Project Management Office and F4E Project Teams.

**Technical Support Activities of administrative nature provided by DTU, LSU, CSU and Finance Unit**

Progress of Work

A general provision is foreseen for technical support activities, including operational consultancy, legal, logistics and assurance services. The action also includes operational meetings, missions as well as hardware and software tools used for the direct benefit of the operational projects.

Procurement Activities

The above scope will be implemented mainly by issuing Task Orders under existing/new framework contracts.

**Contracts and Procurements (including insurance)**

Progress of Work

A general provision is foreseen for operational support to F4E Project Teams in Pre-procurement (this covers Business Intelligence & Market Analysis), Commercial Reporting, Procurement areas and Commercial contract management.

This part also includes insurances related to risk occurring during construction activities on the ITER Site such as All Risk Insurance, Third Party liability, Faulty Design insurance. It does not include Decennial insurance, Third Party liability related to the escort of convoys of component transport to ITER Site.

Procurement Activities

The above scope will be implemented mainly by issuing Task Orders under existing/new framework contracts.

Insurances will be mainly implemented via reimbursement of IO according to the Agreement on provision of insurance services signed 20/07/2020 and its renewal/ extension. For insurances not falling in the scope of this scheme, such as decennial insurance for buildings, complement to F4E Third Party Liability, they are procured or renewed by F4E directly.

**WORK PROGRAMME OBJECTIVES**

| Milestone ID  | Scope Description   | Forecast achievement date | Type of milestone | PA  |
|---------------|---|---------------------------|-------------------|-----|
| EU.PM.3076540 | Framework Contract signed for Project Management Systems Support (continuation of F4E-OMF-1147) | Q4 2025                   | WP25 objective    | All |
| EU.PM.3159400 | Framework Contract F4E-OMF-1751 signed for Cost estimation consultancy services                 | Q1 2025                   | WP25 objective    | All |

**EXPECTED RESULTS**

1. On time signature of the required Task Orders in order to support the F4E Project Teams and Project Management areas.
2. Provide high quality Project Management Support Services to F4E and all Project Teams.
3. Signature of a new Framework Contract to provide support services in the area of Cost Estimation Support.
4. Signature of a new Framework Contract to continue to provide support services in the area of Project Management Systems Support.
5. Provide the requested support to F4E and all Project Teams on the matters described in the Scope of Work. In general, the target for 2025 is to keep safeguarding the EURATOM's investment in ITER while achieving the cumulative credit forecasted for each action in this WP2025 thanks to the support granted to the work under each specific action.

Annual M-SPI NA

### Action 14. Broader Approach

| Action 14   | Broader Approach |
|---|------------------|
| <p><b>JT-60SA</b></p> <p><u>Progress of Work</u></p> <p>The year 2025 is dedicated to the maintenance and enhancement phase preparing for Operation 2. This period includes the procurement of critical spare parts and engineering services for EU already supplied systems and components, and selected machine enhancements and diagnostics in collaboration with EUROfusion (including maintenance and assistance to on-site assembly and commissioning). F4E is expected to take part in the installation of additional equipment necessary for the Operation 2 phase, and in actions related to the repair of certain components.</p> <p>Two critical decisions about the future work will be made towards the end of 2024. The first relates to the repair work on the Central Solenoid, and the second relates to the potential removal of the carbon actively cooled divertor. Both of these decisions will affect F4E's contracting requirements for the year 2025.</p> <p>Regardless of the decision about the actively cooled divertor, the first components of the actively cooled divertor will be manufactured, and the integration contract of these components into fully assembled divertor units will start. These activities are carried out through a portfolio of industrial contracts across Europe. F4E follows these contracts directly with the support of EUROfusion for specific scientific tasks, like high heat flux testing and material testing. Also the development of CS repair techniques will be finalized in the early months of 2025.</p> <p><u>Procurement Activities</u></p> <p>In year 2025 several contracts for the maintenance and spare parts are planned to be launched. These contracts cover all components supplied by the EU including the cryopant and magnet power supplies. Further contracts for additional diagnostics are also planned. There will be some changes to the actively cooled divertor contracts depending on the project's decision on whether to go directly to a tungsten variant or to maintain the current carbon design. In addition, there may be additional contracting activities related to the central solenoid repair.</p> |                  |

In the frame of capital protection activities and safety, a new PA will be signed for a development of the monitoring system for the cryostat insulation vacuum and a series of contracts will be placed to proceed with this development.

The activities under the responsibility of F4E are carried out through task orders of existing/new framework contracts or existing/new supply and service contracts. F4E will be continuously supported by experts, and on-site health and safety services to ensure safe operations, funded respectively by F4E through expert contracts and specific contracts. Specific contracts for support activities like engineering, inspections and analysis will be issued depending on the project needs.

Beyond the cash contributions yearly transferred on the basis of the STP Work Programme on specific QST call for fund (covering EU Contribution to operation, maintenance and assembly) additional cash transfers for partial funding of machine insulation repair activities (i.e. central solenoid extraction and repair) and electron cyclotron plant upgrade will also be made.

## **IFMIF/EVEDA**

### Progress of Work

In 2025, the LIPAc (Linear IFMIF Prototype Accelerator) activities at Rokkasho will be centered on integrating the superconducting Linac, also referred to as the cryomodule, into the accelerator's beamline. This phase will follow the relocation of the cryomodule to the accelerator vault within the LIPAc building for the final assembly steps. Subsequent stages include its integration into the beamline followed by comprehensive checkout tests. Upon completion, the LIPAc accelerator will reach its final configuration, ready for the last phases of the beam operation campaigns to start the following year. These campaigns aim to demonstrate the nominal performance of the LIPAc accelerator and validate the feasibility of the IFMIF accelerator concept.

Concurrently, enhancement activities for the LIPAc injector, Control System, and RF Power system of the RFQ will be conducted to improve their maintainability, reliability, and availability. Notably, efforts will begin on an enhanced injector design including the LIPAc operational feedback, alongside the manufacturing of a new series of solid-state RF power amplifiers, following the prototype's factory acceptance tests in 2024. The deployment of the enhanced subsystems is scheduled to occur after achieving LIPAc's primary objective, namely the full-scale demonstration of the IFMIF accelerator concept. This entails the acceleration and transport of a 9-MeV, 125-mA deuteron beam in continuous waves, meeting the beam characteristics requirements for a fusion neutron source. The aforementioned enhancement will also aim to prove the reliability and availability necessary for the future Fusion Neutron Source. Furthermore, to augment LIPAc's availability, a study focusing on obsolescence management and spare parts provisioning is expected to be implemented starting from 2025.

### Procurement Activities

Additional contracts will have to be placed for the enhancement of key LIPAc subsystems and components such as the injector, the RF power system, and the control systems, as well as for demonstrating the operation and for optimizing the maintainability of the accelerator and subsequently the beam availability. Further contracts cover procurement of spare parts and services necessary for maintenance and obsolescence management. Activities for the preparation of the LIPAc accelerator in its final configuration for the forthcoming operation phases will continue in 2025. F4E will be continuously supported by experts, and on-site health and safety services to ensure safe operations, funded respectively by F4E through expert contracts, specific contracts, Agreements of Collaboration with European Institutes, and a multi

annual programme plan signed with EUROfusion. Cash contributions as contribution to Common Fund and Common Expenses will also be made.

## IFERC

### Progress of Work

The IFERC project comprises three activities, CSC (Computer Simulation Centre), REC (Remote experimentation Centre) and DEMO design and R&D:

The CSC objective is to provide high power computer (HPC) resources for JA and EU scientists in order to advance simulation studies for ITER, JT-60SA and fusion reactors in general (e.g. DEMO). CSC fosters collaboration research projects between JA and EU by sharing computer resources and by further jointly developing state-of-the art models. In 2025 two HPC (one in EU, one in JA) will be upgraded. A collaboration with ITER for high priority simulation projects will continue.

REC activities focus on the implementation of the remote collaboration tools agreed with JT-60SA, ITER, and the IFMIF-EVEDA LIPAc accelerator. The collaboration under the ITER BA agreement continues to advance test technologies for remote experiments and data transfer, including remote CODAC application testing, remote data access, live data viewing for ITER, fast data transfer, and secure remote connection.

In the DEMO design activities, priority is given to activities relevant for ITER and JT-60SA exploitation, such as plasma scenario development, divertor and power exhaust. TBM and breeding blanket issues (tritium extraction and removal) will also take priority. The objective of activities in fusion materials R&D is to continue to support ITER in issues related to Tritium retention in first wall materials, and to contribute to the materials databases and handbooks for future reactors. All activities are performed in collaboration with EUROfusion.

### Procurement Activities

There are contracts to be placed for preparation of remote participation rooms for tests with BA Projects and ITER, and testing activities. F4E will be supported by experts, funded by F4E through expert contracts and specific contracts. Cash contribution will also be made as EU contribution to the Project Team.

## WORK PROGRAMME OBJECTIVES

| Milestone ID   | Scope Description   | Forecast achievement date | Type of milestone | PA                           |
|----------------|---|---------------------------|-------------------|------------------------------|
| EU.BA.01.23360 | Placement of the contract for the Injector upgrade            | Q1 2025                   | WP25 objective    | LIPAc Enhancement - Injector |
| EU.BA.01.27610 | Completion of the SRF Linac assembly in the accelerator vault | Q1 2025                   | WP25 objective    | LIPAc Activities             |
| EU.BA.01.31350 | Delivery at Naka of ECRF PS                                   | Q2 2025                   | WP25 objective    | ECRH Power Supplies          |
| EU.BA.01.32230 | On-site acceptance tests of Diamond windows                   | Q4 2025                   | WP25 objective    | ECRH Transmission            |

|                |   |         |                |  |
|----------------|---|---------|----------------|--|
| EU.BA.01.38810 | Supply of equipment or services for tests with BA Projects and ITER           | Q4 2025 | WP25 objective | Collaborative activities with JT-60SA, ITER, and the IFMIF/EVEDA LIPAc accelerator |
| EU.BA.01.38880 | Delivery of the centrifuge accelerator for JT60SA pellet launching system     | Q2 2025 | WP25 objective | Pellet Injector  |
| EU.BA.01.38970 | Detailed design of the new PSYS (Protection SYStem) for LIPAc RF power system | Q1 2025 | WP25 objective | LIPAc Enhancement - RF Power System  |

**EXPECTED RESULTS**

The main expected results for this action are:

J T-60SA:

1. Delivery of the 2<sup>nd</sup> set of the dummy loads for the transmission lines
2. Completion of delivery of first 20 cassette frames
3. Delivery of the first high temperature superconducting current lead

IFMIF/EVEDA

1. Completion of the integration of the cryomodule into the LIPAc beam line
2. Delivery of the technical report on the experimental results obtained in the Ga-In-Sn loop
3. Delivery of the technical Report on validation of Neutronics calculations at LIPAc

IFERC

1. Functional tests on the Unified Data Access (UDA) system in REC for transferred data files under the collaboration REC-IO (Remote data access to ITER Database)
2. End of Neutron Irradiation Phase for Post-Irradiation Experiments (PIEs) in BR2 reactor and start of the preparation of transportation of the irradiated PIEs samples to KIT on the Neutron Irradiation experiments of Breeding Functional Materials for the DEMO R&D
3. Report on the T analysis of JET-ILW 3 tiles and dusts by using 2 analytical approaches: (i) depth profiling of T in bulk W by a dissolution method; (ii) T removal and re-saturation of co-deposited layers on bulk beryllium for the analysis of plasma wall interaction using JET DT samples for Evaluation of Tritium inventory and Tritium recovery.
4. Update of specification and definition of actuator R&D needs for Engineering Design Activities (EDA for DEMO Design activities (Plasma Scenario Development)
5. Supply of high-performance computer resources and analysis and support of simulation projects
4. Signature of the Procurement Arrangement (PA) or of the amendment to the PA for DEMO Design Activities (DDA) and DEMO R&D Task 1, 2 and 4 to extend the work beyond March 2025.

**TARGET**

The target for 2025 is "Annual M-SPI ≥ 0.8".

Action 15. DONES

|  |              |
|--|--------------|
| <b>Action 15</b>   | <b>DONES</b> |
| <u>Progress of Work</u>  |              |
| <p>After the approval of the F4E Work Programme for the contribution to the DONES Programme, the plan for 2025 is to start with the procurement of the equipment for the IFMIF-DONES Facility, the procurement of the raw material and to provide manpower to the DONES Programme Team either by F4E own resources or by external support to be contracted.</p> <p>Considering the DONES mitigation plan with respect to the ongoing IFMIF/EVEDA Engineering Validation Activities, it is expected to start in 2025 with the tendering process of the accelerator equipment and its ancillaries for the configuration @ 5 MeV.</p> |              |

In meantime, the activities initiated in 2024 with respect to the early contribution, being seen as a risk mitigation considering the F4E contribution, will continue with the manufacturing of the key components for the DONES accelerator.

Procurement Activities

Taking into account the possible F4E contribution to the DONES Programme, it is expected to continue with early procurements of essential equipment for DONES and raw material for cost saving.

The activities are carried out through task orders of existing/new framework contracts or existing/new supply and service contracts. F4E will be continuously supported by experts funded respectively by F4E through expert contracts and specific contracts.

Cash contributions will also be provided for the Project Team and reserve funds.

| WORK PROGRAMME OBJECTIVES  |  |                           |                   |   |
|--|--|---------------------------|-------------------|---|
| Milestone ID   | Scope Description  | Forecast achievement date | Type of milestone | PA  |
| EU.DO.00450  | Placement of the contract for the RFQ for DONES                            | Q4 2025                   | WP25 objective    | PA DONES - RFQ                                  |
| EU.DO.01030  | Placement of the contract of the RF Power System for DONES                 | Q4 2025                   | WP25 objective    | PA DONES - RF Power system                      |
| EU.DO.01260  | Placement of the engineering support contract for DONES Project Management | Q1 2025                   | WP25 objective    | Programme Team and System Integrated Management |
| EU.DO.01280  | Placement of the contract for the procurement of Lithium raw material      | Q3 2025                   | WP25 objective    | Lithium   |
| EXPECTED RESULTS   |  |                           |                   |   |
| The main expected results for this action are: <ol style="list-style-type: none"> <li>1. System Engineering and Project Integrated Management set up</li> <li>2. First In-Kind Contribution to the DONES Programme</li> <li>3. Industrialization of LIPAc Prototype for DONES</li> </ol> |  |                           |                   |   |
| TARGET   |  |                           |                   |   |
| The target for 2025 is "Annual M-SPI ≥ 0.8".   |  |                           |                   |   |

Action 16. Technology Development Programme

| Action 16   | Technology Development Programme |
|---|----------------------------------|
| <u>Progress of Work</u>   |                                  |
| The procurement of the two TDP Pilots will be finalized with the signature of several contracts for each Pilot, as required by per Pre-Commercial Procurement (PCP) instrument to assure competition and reduce risks on R&D efforts. The scope of the pilot actions will be limited to two different technology development actions. |                                  |
| <ol style="list-style-type: none"> <li>1. Characterization of Gradient joints on Tungsten/CuCrZr materials</li> <li>2. Real-time personal monitor for Tritiated water vapor in air</li> </ol>   |                                  |



In order to build up a competitive European fusion supply chain, a call for proposals will be launched both internally (F4E Programmes) and externally to European Industry via ILOs in order to capture a list of key enabling technologies for fusion. An assessment will be performed to select the best initiatives, based on which F4E will launch the tendering of the annual TDP set of R&D actions corresponding to a first full program. The lessons learned during the execution of the two pilots will be fed into the implementation tools for the new set of TDP actions.

Procurement Activities

A brief description of the two Pilot contracts that will be signed:

TDP Pilot Action 1:

Subject: Characterization of Gradient joints on Tungsten/CuCrZr materials

Scope: R&D effort to specify, manufacture and test a series of Tungsten gradient joints samples for a systematic material properties characterization..

TDP Pilot Action 2:

Subject: Real-time personal monitor for Tritiated water vapor in air.

Scope: R&D effort to develop the design of a real time personal monitor for Tritium vapor. Prototyping and testing of such a design. Redesign and further prototyping and testing as needed.

**WORK PROGRAMME OBJECTIVES**

| Milestone ID | Scope Description   | Forecast achievement date | Type of milestone | PA                             |
|--------------|---|---------------------------|-------------------|--------------------------------|
| EUTD.100430  | Contract Signed for Real-time personal monitor for tritiated water vapour in air 2025 | Q1 2025                   | WP25 objective    | Technology Development Program |
| EUTD.100450  | Contract Signed for Gradient joints on Tungsten CuCrZr materials                      | Q1 2025                   | WP25 objective    | Technology Development Program |

**EXPECTED RESULTS**

The main expected results for this action are:

1. Contracting of two TDP Pilot Actions in 2025.
2. Launching of a call for Fusion Key Enabling Technologies Proposals.
3. Assessment and selection of the 2025 TDP Initiatives.
4. Preparation of the tender for 2025 TDP selected Initiatives.

**TARGET**

The target for 2025 is "Annual M-SPI ≥ 0.8".

## WP\_TABLE 1 WORK PROGRAMME 2025 BUDGET SUMMARY

## Budget Summary of the 2025 Work Programme

| Budget article  |   | Work Programme<br>Commitment appropriations (EUR) |
|---|---|---|
| 3 1   | ITER construction including site preparation        | 738,741,547.00                                    |
| 3 2   | Technology for ITER                                 | 17,137,970.00                                     |
| 3 3   | Technology for Broader Approach & DEMO              | 56,319,280.00                                     |
| 3 4   | Technology for DONES                                | 11,275,850.00                                     |
| 3 5   | External Support Activities                         | 19,611,450.00                                     |
| 3 6   | Other Operational expenditure                       | 6,100,000.00                                      |
| <b>Total Title III of the Budget</b>                          |   | <b>849,186,097.00</b>                             |
| 4 1   | ITER construction from ITER host state contribution | 78,772,936.00                                     |
| 4 2   | Activities linked to ITER Organization              | p.m.  |
| 4 3   | Other earmarked expenditure                         |   |
| <b>Total Title IV of the Budget</b>                           |   | <b>78,772,936.00</b>                              |
| <b>Total amount available for the operational expenditure</b> |   | <b>927,959,033.00</b>                             |

| Work Programme  |   | Work Programme<br>Commitment appropriations (EUR) |                       |                       |
|---|---|---|-----------------------|-----------------------|
|   |   | Grants  | Procurement           | Cash                  |
| 3 1 + 4 1 + 4 2<br>+ 4 3                                  | Expenditure in support of ITER Construction     |   | 350,416,705.00        | 467,097,778.00        |
| <b>Sub total ITER construction + RF</b>                   |   |   | <b>817,514,483.00</b> |                       |
| 3 2   | Design and R&D in support of ITER, not credited |   | 17,137,970.00         |                       |
| <b>Sub total technology for ITER</b>                      |   |   | <b>17,137,970.00</b>  |                       |
| 3 3   | Expenditure in support of Broader Approach      |   | 40,789,280.00         | 15,530,000.00         |
| <b>Sub total Technology for Broader Approach and DEMO</b> |   |   | <b>56,319,280.00</b>  |                       |
| 3 4   | Technology for DONES                            |   | 8,500,000.00          | 2,775,850.00          |
| <b>Sub total Technology for DONES</b>                     |   |   | <b>11,275,850.00</b>  |                       |
| 3 5   | External Support Activities                     |   | 19,611,450.00         |                       |
| <b>Sub total External Support Activities</b>              |   |   | <b>19,611,450.00</b>  |                       |
| 3 6   | Other Expenditure                               |   | 6,100,000.00          |                       |
| <b>Sub total Other Expenditure</b>                        |   |   | <b>6,100,000.00</b>   |                       |
| <b>Totals Operational Expenditure</b>                     |   | <b>0.00</b>                                       | <b>442,555,405.00</b> | <b>485,403,628.00</b> |
|   |   |   | <b>927,959,033.00</b> |                       |

## WP\_Table 1 . Work Programme Budget Summary

WP\_TABLE 2 - INDICATIVE VALUE OF FINANCIAL RESOURCES FOR THE ACTIONS IN WP2025

| Action #  | Action                                | WP2025                   |                             |                           |
|-----------|---------------------------------------|--------------------------|-----------------------------|---------------------------|
|           |                                       | Budgeted forecast WP2025 |                             | Total Resources allocated |
|           |                                       | Original Budget          | Reserve Fund expenditure ** |                           |
| 1         | Magnets                               | 1,000,000                |                             | 1,000,000                 |
| 2,3,4,10* | Main Vessel*                          | 85,293,870               | 4,100,000                   | 89,393,870                |
| 5         | Remote Handling                       | 7,790,832                |                             | 7,790,832                 |
| 6         | Cryoplant & Fuel Cycle                | 3,378,385                |                             | 3,378,385                 |
| 7         | Plasma Engineering & Operations       |                          |                             |                           |
| 8         | Heating & current drive               | 102,728,970              |                             | 102,728,970               |
| 9         | Diagnostics                           | 18,207,485               |                             | 18,207,485                |
| 11        | Site and Buildings and Power Supplies | 136,108,894              | 1,457,690                   | 137,566,584               |
| 12        | Cash Contributions                    | 465,954,620              |                             | 465,954,620               |
| 13        | Technical Support Activities          | 32,827,074               |                             | 32,827,074                |
| 14        | Broader Approach                      | 56,669,282               |                             | 56,669,282                |
| 15        | Dones                                 | 11,449,621               |                             | 11,449,621                |
| 16        | Technology Development Programme      | 6,550,000                |                             | 6,550,000                 |
|           | <b>Sub-Totals</b>                     | <b>927,959,033</b>       | <b>5,557,690</b>            | <b>933,516,723</b>        |

\*The Sub-actions Actions of Vacuum Vessel, In-Vessel Blanket, In-Vessel Divertor and Test Blanket Module are presented merged in one single line due to commercial sensitive information.

\*\* The Original Budget for assigned revenue from ITER IO is declared as p.m. The allocated amount of 5.6 Meur will be covered by the appropriation carried over from 2024 to 2025 which has to be determined after the end of the budgetary year.

**WP\_Table 2 . Financial Resources per action**

WP\_TABLE 3 - 2025 MAIN PROCUREMENT ACTIVITIES (PER ACTION)

| Action  |   | Type of contract | Signature |
|---|---|------------------|-----------|
| <b>Magnets</b>  |   |                  |           |
| Provision for amendments, claims, reimbursement, indexation and late interest |   | N/A              | N/A       |
| <b>Vacuum Vessel</b>  |   |                  |           |
| CA15017   | Task Orders for Engineering activities 2025   | SC-PServ         | Q4        |
| CA15377   | TOXX for review of PAUT files 2026 (cont of OMF-1082-01-12)   | SC-PServ         | Q2        |
| CA14368   | Commitment and Task Order Signed - F4E-OMF-1321-MGR-C25 for 1 VV Resident Inspector & CP support    | SC-PServ         | Q3        |
| CA14126   | Commitment and Task Order Signed - F4E-OMF-1544-WTO-A25 for 1 VV Resident Inspectors                | SC-PServ         | Q3        |
| CA14129   | Commitment and Task Order Signed - F4E-OMF-1544-WTO-B25 for 1 VV Resident Inspectors                | SC-PServ         | Q3        |
| CA14132   | Commitment and Task Order Signed - F4E-OMF-1544-MGR-A25 for 1 VV Resident Inspector & CP support    | SC-PServ         | Q2        |
| CA14137   | Commitment and Task Order Signed - F4E-OMF-1544-MGR-B25 for 1 VV Resident Inspector & CP support    | SC-PServ         | Q2        |
| Provision for amendments, claims, reimbursement, indexation and late interest |   | N/A              | N/A       |
| <b>In Vessel- Blanket</b>   |   |                  |           |
| CA09286   | TASK 3.X for FW Series Fabrication (Manufacturing of Series Panels) - Reopening #1                  | PSupply          | Q3        |
| CA06535   | TO 5 for FwC BCM (OMF-1080)- Upper Ports  | SC-PSupply       | Q4        |
| CA06536   | TO 6 for FwC BCM (OMF-1080) - Branch Pipes and Co-Axial Connectors                                  | SC-PSupply       | Q4        |
| CA11609   | TO 03 Procurement of CuCrZr   | SC-PSupply       | Q4        |
| CA07882   | Task Order for Inspectors QA Inspector #3 #4 (2026-2027) Cantabria / Tarbes                         | SC-PServ         | Q2        |
| CA07883   | Task Order for Inspectors QA inspector #2 (2026-2027) [1st continuation TO 24 OMF-1321-01] - Tarbes | SC-PServ         | Q4        |
| CA08363   | TO 03 Material Characterization (Series)  | SC-PServ         | Q3        |
| CA15141   | Option 1 Task Order #1 for Inspector of Manufacturing for BCM                                       | SC-PServ         | Q3        |
| CA13490   | Task Order Resources - Docs Management #2 25/26 (previously 22/23)                                  | SC-PServ         | Q1        |

|   |  |            |     |
|---|--|------------|-----|
| CA12454   | Task Order for Auditors TO#06 - LOT 1  | SC-PServ   | Q1  |
| Provision for amendments, claims, reimbursement, indexation and late interest |  | N/A        | N/A |
| <b>In Vessel- Divertor</b>  |  |            |     |
| CA11556   | TO-XY.01 OMF-1327-01 signed for Metrology Support for IVT Series                                       | SC-PServ   | Q4  |
| CA12829   | Task Order WW.01 OMF-1321 Signed for Resident Inspector at Monoblocks' Supplier for IVT Series (Japan) | SC-PServ   | Q4  |
| CA14199   | TO-XX OMF-319-01 signed for HHF Tests for Stage 2 Prototypes -IVT                                      | SC-PServ   | Q2  |
| CA09568   | TO-01.01 OMF-1327-01 signed for Metrology Support for CB Series - Action I                             | SC-PServ   | Q2  |
| CA09569   | TO-02.01 OMF-1327-01 signed for Metrology Support for CB Series - Action II                            | SC-PServ   | Q2  |
| CA13023   | Task Order XY.02 OMF-1321-01 Signed for Resident Inspector #1 at Supplier LOT-1 for IVT Series (DGL)   | SC-PServ   | Q3  |
| CA12952   | Task Order ZY OMF-1321-01 Signed for Resident Inspector #2 at Supplier LOT-2 for IVT Series (TBD)      | SC-PServ   | Q4  |
| CA13024   | Task Order ZZ.01 OMF-1321-01 Signed for Resident Inspector #1 at Supplier LOT-2 for IVT Series (NRS)   | SC-PServ   | Q3  |
| CA07957   | Task Order XX.01 OMF-1321-01 Signed for Resident Inspector #2 at Supplier LOT-1 for IVT Series (JPA)   | SC-PServ   | Q2  |
| CA15257   | Task Order 07.01 OMF-1321-01 Signed for Resident Inspector for CSC-Welding                             | SC-PServ   | Q3  |
| Provision for amendments, claims, reimbursement, indexation and late interest |  | N/A        | N/A |
| <b>Remote Handling</b>  |  |            |     |
| CA10459   | Task Order 1 (OFC-1546) for Development Tasks on Show Room Telbot                                      | SC-PSupply | Q1  |
| CA11584   | TO (Alter tech OFC 1087-01) CTM and CMM 1st assembly Control System + Master Arm Development           | SC-PSupply | Q2  |
| CA11594   | TO for Engineering Insourcing Contract Control Sys 2025  | SC-PServ   | Q2  |
| CA11778   | Task Order for Engineering Insourcing Contract NBRHS 2025 - S. Acosta, JL Fernandez, N. Martins        | SC-PServ   | Q1  |
| CA11729   | Task Order for Engineering Insourcing Contract (D. Guerra, O. Safak, MS-1) CPRHS 2025                  | SC-PServ   | Q2  |
| CA11761   | Task Order for Engineering Insourcing Contract DRHS 2025 - TS-1 + C. Peregrin + TS-3                   | SC-PServ   | Q1  |
| CA14380   | Task Order Signed for WMR tests and Pin tool Manufacturing   | SC-PSupply | Q1  |
| CA10457   | Task Order Signed (989 or 1087-01) for 2023 NBRHS MCS CS Software Readiness for FDR and MRR            | SC-PSupply | Q1  |
| CA11724   | Task Order for Engineering Insourcing Contract for IVVS 2025   | SC-PServ   | Q1  |

|   |  |            |     |
|---|--|------------|-----|
| CA11589   | Purchase order for F4E Lab and VR License Maintenance 2025   | SC-PServ   | Q1  |
| Provision for amendments, claims, reimbursement, indexation and late interest |  | N/A        | N/A |
| <b>Cryoplant and Fuel Cycle</b>   |  |            |     |
| CA15246   | OPE-1592 Contract Signed for Manuf. Delivery and installation of A53-B11 DN25 Line                       | PSupply    | Q3  |
| CA13597   | REMS TKM: TO Update Preliminary design   | SC-PSupply | Q3  |
| Provision for amendments, claims, reimbursement, indexation and late interest |  | N/A        | N/A |
| <b>Plasma Engineering &amp; Operations</b>                                    |  |            |     |
| Provision for amendments, claims, reimbursement, indexation and late interest |  | N/A        | N/A |
| <b>Heating and Current Drive</b>  |  |            |     |
| CA10966   | OMF-1120 TOXX Signed for Manufacturing & Assembly of the EW Systems                                      | SC-PSupply | Q2  |
| CA15170   | OMF-1120 TOXX Signed for Manufacturing the Remaining UL Systems ( EW IW-WG/M3-M4/Cooling System)         | SC-PSupply | Q2  |
| CA06569   | OPE-1578: Contract Signed for HNB-1&2 Drift Duct   | PSupply    | Q4  |
| CA10206   | OMF-0989: Task Order Signed for Procurement of the EC Gyrotrons Control System                           | SC-PSupply | Q1  |
| CA08971   | OFC-1007: Commitment for Technical Support of Neutral Beam Components for 2026 -27                       | SC-PServ   | Q4  |
| CA15372   | OMF-0989 TOXX signed for FDR preparation for ECPC & EC-UL-SCU  | SC-PServ   | Q4  |
| CA04489   | OMF-989 TOXX signed for HNB Control – ITER site support for the I&C Engineering 2025                     | SC-PServ   | Q1  |
| Provision for amendments, claims, reimbursement, indexation and late interest |  | N/A        | N/A |
| <b>Diagnostics</b>  |  |            |     |
| CA11216   | Task Order Signed for Front-End components (Waveguides, Mirrors & Horns)                                 | SC-PSupply | Q1  |
| CA06777   | Task Order Signed for Radial Neutron Camera Port Plug Components Manufacture                             | SC-PSupply | Q2  |
| CA11886   | Compound uncertainty related to include four projects in one framework contract (OMF-1126)               | SC-PSupply | Q3  |
| CA10816   | Commitment for in-souce activities 2025 and part of 2026   | SC-PServ   | Q3  |
| CA11177   | Task Order signed for DPG Manufacture + Calibration of PG sensor Framework contract for SP Manufacturing | SC-PSupply | Q4  |
| CA11178   | Task Order signed for DPG Electronics and Power Supplies and Coding, FAT & Integration under OFC-1087    | SC-PSupply | Q2  |

|   |  |            |     |
|---|--|------------|-----|
| CA12556   | Task Order signed for Final Design and Manufacturing of Bolometer bespoke electronics                              | SC-PServ   | Q3  |
| CA09238   | Task Order Signed for Mfg Specs for Eq. Vis/IR WAVS EP03,09,17   | SC-PSupply | Q4  |
| CA11732   | Commissioning support of Entire Magnetic Diagnostics (without Plasma) - Cash transfer to IO                        | PServ      | Q2  |
| CA05664   | Task Order Signed for Development of Mfg Specs for RNC port-interspace/cell components                             | SC-PServ   | Q2  |
| Provision for amendments, claims, reimbursement, indexation and late interest |  | N/A        | N/A |
| <b>Test Blanket Module</b>  |  |            |     |
| CA10945   | TO#03 for Safety Studies in support of TBSs PD & FD  | SC-PServ   | Q2  |
| CA10940   | TO#02 for WCLL TBM Set PD & FD   | SC-PServ   | Q3  |
| CA09805   | TO 04 for Proof of the TBM-sets fabrication and assembly processes feasibility                                     | SC-PServ   | Q4  |
| CA06879   | TO1 of HCCP TBM set (box + pipes as per WP sharing with ITER Korea)  | SC-PServ   | Q4  |
| CA10947   | TO#02 for EUROFER Codification Database  | SC-PServ   | Q3  |
| CA15338   | F4E-OFC-0950-02-06 HCPB Ancillary System PD (chit resolution)  | SC-PServ   | Q1  |
| CA07114   | TO 09 signed for ANB Consultancy (AS + TBM Set) - YPN  | SC-PServ   | Q1  |
| CA15346   | ESP - F4E-OMF-OMF-1159-01-XX for Engineering Support for TBM - Nuclear Safety Engineer - ADN                       | SC-PServ   | Q1  |
| CA11794   | TO 11 signed for ANB Consultancy (TBM Set) - YPN   | SC-PServ   | Q4  |
| CA08946   | TO 08 signed for ANB Consultancy TBM box Qualification - MZ  | SC-PServ   | Q4  |
| Provision for amendments, claims, reimbursement, indexation and late interest |  | N/A        | N/A |
| <b>Site and Buildings and Power Supplies</b>                                  |  |            |     |
| CA12854   | TB21 - TO#XX Commitment for B11/B74 Re-allotment partial omission of Tokamak Options 1 & 2 from (TB04)             | SC-PSupply | Q1  |
| CA11154   | TB21 - TO#03 Commitment for Multi-trade contracts for the Tokamak Complex. (Missing items SDB/Cables)              | SC-PSupply | Q1  |
| CA13293   | TB21 - TO#XX B11/B74 Re-allotment partial omission of Tokamak Options 1 & 2 from (TB04) (Increase of Raw Material) | SC-PSupply | Q1  |
| CA12404   | TB22 - Commitment for Primary structural works - TO#03 Lot A   | SC-PSupply | Q3  |
| CA11244   | Future activities to cover BIPS provision for Engineering Services WP2025 TSS                                      | SC-PServ   | Q4  |
| CA12415   | TB22 - Commitment for Roofing, Cladding - TO#03 Lot D  | SC-PSupply | Q4  |

|   |   |            |     |
|---|---|------------|-----|
| CA14916   | TB25 - Commitment for Works for 2025  | PSupply    | Q2  |
| CA13292   | TB21 - TO#03 Multi-trade contracts for the Tokamak Complex. (Missing items SDB/Cables) (Increase of Raw Material) | SC-PSupply | Q1  |
| CA12413   | TB22 - Commitment for Roofing, Cladding - TO#01 Lot D   | SC-PSupply | Q3  |
| CA12414   | TB22 - Commitment for Roofing, Cladding - TO#02 Lot D   | SC-PSupply | Q4  |
| Provision for amendments, claims, reimbursement, indexation and late interest |   | N/A        | N/A |
| <b>Supporting Activities</b>  |   |            |     |
| CA15394   | Commitment 2025 for Technology Development Programme  | SC-PServ   | Q3  |
| CA15305   | NIS Basis commitment 2025-2030 (Buildings erection + Insurance Building in use 1 year)                            | PServ      | Q1  |
| CA08980   | 2025 Commitments and Budget Reserves for Legal Services charged against Operational Budget                        | SC-PServ   | Q4  |
| CA06504   | Commitment 2025 - Global transportation of HEL NON-EU ITER components   | SC-PServ   | Q4  |
| CA09711   | Commitment 2025 for Operational Missions  | PServ      | Q4  |
| CA15237   | TO for IRIS 2025  | SC-PServ   | Q3  |
| CA06037   | TO for Embedded Control Data Access and Communication 2025  | SC-PServ   | Q4  |
| CA15215   | Commitments 2025 for Software Maintenance   | SC-PServ   | Q4  |
| CA13538   | TO 103 for KO DA 1 HEL VV sector #07  | SC-PServ   | Q1  |
| CA06467   | TO for Management fees 2026   | SC-PServ   | Q4  |
| Provision for amendments, claims, reimbursement, indexation and late interest |   | N/A        | N/A |
| <b>Broader Approach</b>   |   |            |     |
| CA14443   | Contract for Additional Diagnostics and Spares parts of Diagnostics 2025  | PSupply    | Q2  |
| CA14455   | Magnets active protection systems   | PSupply    | Q2  |
| CA10699   | Pellet launching system 2025  | PSupply    | Q1  |
| CA14162   | TO02 for LIPAc injector enhancement   | SC-PSupply | Q4  |
| CA10379   | TO for Spare Parts for PS Additional Heating and maintenance 2025   | SC-PSupply | Q1  |
| CA11810   | On site LIPAc Control System support TOXX   | SC-PServ   | Q1  |



|   |   |            |     |
|---|---|------------|-----|
| CA10366   | TO for Spare parts for Cryoplant and maintenance and repair 2025                  | SC-PSupply | Q1  |
| CA14164   | TO for Spare Parts and maintenance of Magnets PS                                  | SC-PSupply | Q1  |
| CA14157   | In Cryostat Helium Cryopumps  | PSupply    | Q4  |
| CA15340   | TO01 Lot1 F4E-OFC-1650 for the Maintenance and Optimization of RFPS of LIPAc      | SC-PSupply | Q1  |
| Provision for amendments, claims, reimbursement, indexation and late interest |   | N/A        | N/A |
| <b>DONES</b>  |   |            |     |
| CA15456   | Placement of the contract of the RF Power System for DONES                        | PSupply    | Q4  |
| CA15457   | Placement of the contract for the procurement of Lithium raw material             | PSupply    | Q3  |
| CA14353   | Placement of the contract for the RFQ for DONES                                   | PSupply    | Q4  |
| CA14170   | Prototype components SRF Linac Coupler 2025                                       | PSupply    | Q1  |
| Provision for amendments, claims, reimbursement, indexation and late interest |   | N/A        | N/A |
| <b>Technology Development Programme</b>                                       |   |            |     |
| CA15394   | Contracts 2025 for Technology Development Programme                               | PServ      | Q4  |
| CA15427   | OPE-TBD for Gradient joints on Tungsten CuCrZr materials                          | PServ      | Q1  |
| CA15575   | CON OPE-TBD for Real-time personal monitor for tritiated water vapour in air 2025 | PServ      | Q1  |
| Provision for amendments, claims, reimbursement, indexation and late interest |   | N/A        | N/A |

**Table 3 . Main procurement activities per action**

## WP\_TABLE 4 – PLAN FOR GRANTS

## 2025 GRANTS

No grants foreseen in 2025

ON-GOING GRANTS<sup>13</sup>

| Grant Agreements Reference | Date of Signature | Commitment Value (Euros) | Duration (In months) | Counterpart (Leader Company)        | Short description  |
|----------------------------|-------------------|--------------------------|----------------------|-------------------------------------|--|
| F4E-FPA-327 (PMS-DG)-07    | 20/02/2020        | €2,100,941.00            | 68                   | AGENZIA NAZIONALE PER LE NUOVE TECN | Development of the Final Design and Prototyping  |
| F4E-FPA-364-06             | 22/10/2018        | €1,485,307.76            | 68                   | MAX-PLANCK-GESELLSCHAFT ZUR FORDERU | Development of the Design and Critical Prototyping   |
| F4E-FPA-384 (DG)-05        | 30/07/2018        | €2,661,530.56            | 74                   | MAX-PLANCK-GESELLSCHAFT ZUR FORDERU | Development of the Design and Prototyping  |
| F4E-GRT-0901-01            | 09/03/2018        | €2,024,913.50            | 76                   | TEKNOLOGIAN TUTKIMUSKESKUS VTT OY*T | Development and integration of 3D Machine Vision, HLCS modules and GENROBOT at DTP2  |
| F4E-GRT-1146-01            | 25/07/2021        | €2,346,561.37            | 48                   | COMMISSARIAT A L ENERGIE ATOMIQUE   | Completion of the design of Equatorial Wide Angle Viewing System (EP-WAVS) in EP12 and post-design technical support           |
| F4E-GRT-553                | 09/07/2014        | €2,562,993.00            | 88                   | ECOLE POLYTECHNIQUE FEDERALE DE LAU | DESIGN, DEVELOPMENT AND VALIDATION OF THE EUROPEAN GYROTRON  |
| F4E-GRT-1446-01            | 06/10/2023        | €3,099,974.00            | 64                   | COMMISSARIAT A L ENERGIE ATOMIQUE   | Completion of the design of Equatorial Wide Angle Viewing System (EP-WAVS) in EP#3, 9 and 17 and post-design technical support |
| F4E-GRT-1530-01            | 13/12/2023        | €75,670.00               | 13                   | C.R.E.A.T.E. CONSORZIO DI RICERCA P | Design, manufacture and experiment of a benchmark problem set up for the validation of electromagnetic codes                   |
| <b>Total</b>               |                   | <b>€16,357,891.19</b>    |                      |                                     |  |

WP\_Table 4. Plan for grants<sup>14</sup>

<sup>13</sup> Any 2024 Grant that was included in the original WP2024 but was not signed by the cut-off date of 31<sup>st</sup> March 2024 is not reflected in this table. Grants that were not known when the original WP2024 was drafted and that would be signed following a related WP2024 amendment are not listed neither.

<sup>14</sup> The Commission guidelines require to produce two additional tables covering Service Level agreement and Contribution Agreements. These are not displayed since F4E has no Service Level agreement nor Contribution Agreements under operational expenditure.

**WP\_TABLE 5 TIME OF CALL FOR THE PROCUREMENT PLAN**

**Indicative number, type of contract and timeframe for launching the procurement procedures.**

| Procurement Procedures       | Q3 2024 | Q4 2024 | Q1 2025 | Q2 2025 | Q3 2025 | Q4 2025 |
|------------------------------|---------|---------|---------|---------|---------|---------|
| P Serv - Contract            | 3       | 9       | 2       | 2       | 4       | 4       |
| P Supply - Contract          | 1       | 9       | 2       | 4       | 3       | 4       |
| Pserv - Specific Contracts   | 16      | 44      | 20      | 16      | 17      | 35      |
| PSupply - Specific Contracts | 6       | 5       | 16      | 7       | 5       | 10      |

***WP\_Table 5 . Indicative number and type of contracts per quarter***

NB:

- During the implementation of the Work Programme activities, F4E may identify the need for new calls, group more activities in a single call or split one activity in more calls. This will in any case be performed preserving the scope and objective presented in WP2025.
- When a call for tender is not defined yet, the call is indicatively assigned to 6 months before the signature of the contract.
- For the specific contract, as they do not have call for tender, the table refers to its signature date.

## ESSENTIAL SELECTION, AWARD CRITERIA AND UPPER FUNDING LIMITS FOR GRANTS

With regard to grant actions referred to in this Work Programme, the essential selection and award criteria are:

### Essential Selection Criteria

- The applicants' technical and operational capacity: professional, scientific and/or technological competencies, qualifications and relevant experience required to complete the action.
- The applicants' financial capacity: stable and sufficient sources of funding in order to maintain the activity throughout the action.

### Essential Award Criteria

- Relevance and quality of the proposal with regard to the objectives and priorities set out in this Work Programme and in the relevant call for proposals.
- Effectiveness of the implementation as well as of the management structure and procedures in relation to the proposed action.
- Cost-effectiveness and sound financial management, specifically with regard to F4E's needs and objectives and the expected results.

With regard to the specific action, more details will be provided in the call for proposals. Thresholds and weighting for the essential and additional award criteria will also be indicated in the call for proposals.

A proposal which does not fulfill the conditions set out in the Work Programme or in the call for proposals shall not be selected. Such a proposal may be excluded from the evaluation procedure at any time.

The timetable and indicative aggregated amounts for the actions are defined in this Work Programme.

### Upper funding Criteria

With the entry into force of the recast F4E Financial Regulation and Implementing Rules on 1<sup>st</sup> January 2016, the following upper funding limits apply for grants:

|  |      |
|--|------|
| 1. Research, technological development and demonstration activities  | 40%  |
| 2. Purchase/manufacturing of durable equipment or assets and of ancillary services approved by the Joint Undertaking as necessary to carry out such activities | 100% |
| 3. Coordination and support actions, including studies   | 100% |
| 4. Management activities, including certificates on the financial statements, and other activities not covered by paragraphs 1 and 2                           | 100% |

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