ITER
EUROPEAN JOINT UNDERTAKING FOR ITER AND THE DEVELOPMENT OF FUSION ENERGY

Challenge
ITER is being constructed in Saint-Paul-Lès-Durance (France) to prove the scientific and technological feasibility of fusion as a future source of sustainable energy, which would be a major contribution to the EU's long-term goal of decarbonising the energy system.

The risk, costs, and long-term nature of a large research project such as ITER puts it beyond the reach of individual EU Member States, and calls for action at the EU level and beyond. A global framework has been established between seven international partners (Euratom, Russia, China, India, South Korea, and the USA) representing more than half of the world’s population to support ITER’s construction, which started in 2007. Euratom provides about 45% of all components through the European Joint Undertaking for ITER and the development of Fusion Energy (Fusion for Energy, F4E).

Mission
The general objective of the ITER-related EU action in the 2021-2027 MFF is to fully support the continuation of ITER’s construction to reach the first experimental operations by 2027 and to continue further installations and upgrades laying grounds for successful full power operation by 2035.

Europe’s support to ITER and to other activities related to ITER, such as the Broader Approach activities with Japan, contributes to the strategic agenda of the European Union for clean and secure energy. ITER is stimulating the European industrial investment in new advanced technologies for the components of the facility and in advanced civil engineering for its construction.

Objectives
The EU participation to ITER pursues four specific objectives:

- Secure continued EU leadership in the ITER project by ensuring timely delivery of EU components and active participation in ITER governance processes;
- Provide sufficient performance-based funding to ITER International Organisation for its operations, particularly the assembly of the installation from the components arriving from individual ITER members;
- Offer European high-tech industries and SMEs a valuable opportunity to innovate and develop ‘spin off’ products for exploitation outside fusion;
- Continue activities with Japan (Broader Approach) on the operation of the satellite tokamak JT60SA and on the development of a full scale material testing facility (IFMIF/DONES) to ensure that all technical and scientific elements needed for the design of a fusion-based power generation device for demonstration are in place.

Actions
The programme covers the European contribution to the ITER International Organisation in cash and in-kind for the construction of the ITER facility, which includes the procurement of equipment, installation, general technical and administrative support for the construction phase as well as the participation in commissioning and operations.

The programme also covers other ITER-related activities, such as the Broader Approach activities with Japan.

These contributions are delivered through Fusion for Energy (F4E), the European Domestic Agency, located in Barcelona (Spain).

Delivery mode
Indirect management entrusted to the Joint Undertaking Fusion for Energy (F4E).

Link to MFF 2014-2020
The programme is a continuation of its MFF 2014-2020 predecessor. The budget of the programme has almost doubled.

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 (Euratom) 2021/281
Period of Application 2021 - 2027

FINANCIAL PROGRAMMING
(EUR MILLION)
2014-2020: 2 926.4
2021: 864.0
2022: 710.1
2023: 1 019.8
2024: 806.3
2025: 690.1
2026: 856.3
2027: 667.3
Total programming: 5 614.0

EX-ANTE EVALUATION
The ex-ante evaluation of ITER was adopted on 7 June 2018 (SWD(2018) 325).

RELEVANT WEBSITE FOR MORE INFORMATION
http://fusionforenergy.europa.eu/
https://www.iter.org/
Performance Framework

To fully support the continuation of ITER construction and to reach the operation of ITER with First Plasma by 2025, to be followed by first experimental operations as well as further installations and upgrades until 2027 and beyond, laying grounds for successful full power operation (so called Deuterium-Tritium stage) by 2035.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Dimension</th>
<th>Type</th>
<th>Source</th>
<th>Data availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of completion of ITER construction</td>
<td>n/a</td>
<td>Result</td>
<td>ITER Organisation (IO)</td>
<td>First data in 2022; estimated lag 1 year; annually</td>
</tr>
<tr>
<td>Percentage of Euratom’s in kind obligations discharged by F4E</td>
<td>n/a</td>
<td>Result</td>
<td>ITER Organisation (IO)</td>
<td>First data in 2022; estimated lag 1 year; annually</td>
</tr>
</tbody>
</table>

Estimation of baselines and targets

Procurement Arrangements (PAs) represent the vast majority of ITER expenditure. These are contracts created and defined by the International ITER Organisation (IO), each of which represents specific work to be performed and delivered to IO.

To facilitate the procurements, an ITER “credits” system was introduced. When a PA is created, milestones are defined to mark the progress of its execution. Some of these milestones have ITER credits associated with them, which are released by IO to the Domestic Agency (DA) of each ITER Party on achievement. Obtaining all of the credits for a PA means that the DA has achieved all milestones and therefore fully discharged its obligations for that PA.

The ex-ante profile of credits for each year is known and may only change whenever there is a change of the baseline of the project (scope, budget, schedule). The ex-post assessment of the credits achieved by the seven DAs is known at the beginning of the following year. All values are provided and followed up through the ITER Document Management (IDM) system maintained by IO.

ITER expenditure is predominantly done through Procurement Arrangements (PAs), which are contracts created and defined by the International ITER Organisation (IO). Each of these represents specific work to be performed and delivered to IO.

As in case of ‘Percentage of completion of ITER construction’ indicator, the ITER ‘credits’ system is used (obtaining all of the credits for a PA means that F4E has achieved all milestones and therefore fully discharged its obligations for that PA). Some milestones, defined at the creation of a PA, have ITER credits associated with them; they are released by IO to European Domestic Agency (F4E) on achievement.

The ex-ante profile of credits for each year is known and may only change whenever there is a change of the baseline of the project (scope, budget, schedule). The ex-post assessment of the credits achieved by F4E is known at the beginning of the following year. All values are provided and followed up through the ITER Document Management (IDM) system maintained by IO.