Luxembourg, 13 June 2019

EFSI Operation Scoreboard[1]

PROJECT PRESENTATION	
Project name	ENEA - DIVERTOR TOKAMAK TEST FACILITY
Promoter or financial intermediary	AGENZIA NAZIONALE PER LE NUOVE TECNOLOGIE L'ENERGIA E LO SVILUPPO ECONOMICO SOSTENIBILE
Country of implementation	Italy
Summary project description	Nuclear fusion is the process that powers the sun and the stars. Scientists have proven that a combination of the nuclei of two very light atoms (tritium and deuterium — both heavier isotopes of hydrogen) discharges enormous amounts of energy. The scale of energy that can be produced by fusion can be illustrated by the fact that the amount of deuterium contained in 0.5 litre of ordinary water can provide enough energy for a single family house in Europe for a year, when properly fused with tritium in a fusion reactor. Nuclear fusion has been a topic of great interest and intensive research since the 1920's. The quest for fusion power today is driven by the need for large-scale sustainable and predictable low-carbon electricity generation, in a likely future environment where the global electricity demand has greatly increased. It is expected that, in the long-term, fusion can make a relevant contribution worldwide to meet the growing demand. Today, Europe is a leader in fusion research and development, and can aim to be a key player in the fusion market. In 2014, fusion research bodies from European Union member states and Switzerland created EUROfusion, the European Consortium for Development of Fusion Energy to facilitate European collaboration on fusion research. EUROfusion supports, manages and funds fusion research activities on behalf of the European Commission's EURATOM programme. The "European Research Roadmap to the Realization of Fusion Energy" (the "Roadmap") sets out a strategic vision toward the generation of electrical power by a Demonstration Fusion Power Plant ("DEMO") by 2050. In this Roadmap two important milestones are clearly identified. The international tokamak experiment ("ITER") presently under construction in the south of France, should solve all the remaining open physics problems and identify a well-defined reactor plasma regime feasible at a scale approaching a power plant (500 MW for 400 seconds). Immediately after ITER, the DEMO experiment should verify the technologies needed to operate a fusion reactor, generate hundreds of MW of electricity for at least several hours at a time, operating with

[1] This Scoreboard of indicators reflects the information presented to the EFSI Investment Committee (IC) for its decision on the use of the EU guarantee for this operation. Therefore, the document does not take into account possible developments that could have occurred after this decision.
Parts of this document that fall under the exceptions for disclosure defined by the EIB Group Transparency Policy, notably under the articles 5.5 (protection of commercial interests) and 5.6 (protection of the Bank's internal decision-making process), have been replaced by the symbol […].

	a closed fuel cycle and having other features that could be extrapolated to early commercial fusion power plants. The Roadmap sets up eight strategic objectives to tackle the main challenges in achieving this overall goal. One of them, identified as a potential showstopper on the fusion roadmap, deals with the issue to exhaust the huge amount of heat flowing into the divertor, the main component of the system for the disposal of the plasma thermal power in a fusion plant. In order to mitigate the risk that the conventional divertor solution to be tested in ITER may not extrapolate to DEMO, a specific project - Divertor Tokamak Test facility ("DTT" or the "Project") - has been launched, within the Roadmap, to investigate alternative power exhaust solutions suitable for DEMO reactor. The DTT will test the physics and technology of various alternative divertor concepts under plasma conditions that can be confidently extrapolated to DEMO, hence bridging the gap between today's proof-of-principle experiments and DEMO. The DTT project includes the design and construction of a tokamak, which is a doughnut-shape device (major radius 2.15 m, minor radius 0.7 m), where a set of magnetic fields confine the hydrogen isotopes mix, brought at 150 million degrees in the form of plasma, keeping it away from the wall of the plasma chamber. The divertor is the region of the tokamak, where the magnetic field lines are diverted in order to realise a 'channel' where plasma thermal power is exhausted.

PROJECT PILLAR ASSESSMENT

Pillar 1

Contribution to EU policy	High
Cross-cutting objectives	
Climate Action	100.00%
EFSI	
Contribution to EFSI	100.00%
EFSI: Research, development and innovation	100.00%
Demonstration projects and programmes as well as deployment of related infrastructures, technologies and processes	100.00%

Pillar 2

Quality and soundness of the project	Good
1. Growth	[...]
2. Promoter capabilities	[...]
3. Sustainability	[...]
4. Employment	[...]

This pillar evaluates the quality and soundness of the operation. This pillar is composed of up to four indicators which include:

(i) "Growth" i.e. for example and where relevant the economic rate of return ('ERR'), which considers the project's socioeconomic costs and benefits, including its spillover effects;
(ii) "Promoter capabilities" i.e. the capacity of the promoter/intermediary to implement the project and create the expected impact at the [final] beneficiary level;
(iii) "Sustainability" i.e. environmental and social sustainability[2];
(iv) "Employment" i.e. the project's direct employment effect;
(v) "Increasing access to finance and improving financing conditions including for final beneficiaries".

Pillar 3

EIB Technical and financial contribution to the project	Significant
1. Financial contribution	[...]
2. Financial facilitation	[...]
3. Advice	[...]

This pillar measures the EIB's particular contribution to the project and its financing scheme in the form of financial and non-financial benefits which go beyond what commercial players would normally be able to offer. This dimension of value added is assessed through up to three indicators:

(i) "Financial Contribution" i.e. improving the counterpart's funding terms compared to market sources of finance (interest rate reduction and/or longer lending tenor);
(ii) "Financial Facilitation" i.e. helping to attract private financiers (for example through positive signaling effects), promoting synergies in co-financing with other public sources of funds including National Promotional Banks or EU financial instruments;
(iii) "Technical Contribution and Advice" i.e. providing advice with a view to optimizing the financing package (financial structuring), or technical advisory services in the form of expert input / knowledge transfer – provided in-house by the EIB or in the form of assignments to external consultants – to facilitate the preparation or implementation of a project.

[2] For additional information on the EIB's assessment of the project's environmental and social aspects, please refer to the project's Environmental and Social Data Sheet (ESDS) published on the EIB website.

Pillar 4 – Complementary indicators

Additionality

In line with the EFSI objective of supporting research, development and innovation (RDI) in the field of technological development and innovation of low-carbon power and heat generation, the operation will allow the promoter to develop a strategic research infrastructure for a commercial nuclear fusion power reactor. The project contributes towards the EU energy and climate change objectives under the framework of the European Research Roadmap to the Realization of Fusion Energy (the EUROfusion Roadmap) by 2050 and as such, it contributes in full to the EIB Climate Action objective. Moreover, the operation will enable the promoter to retain its leading knowledge and long-term competitiveness in the sector and thereby contribute to Italy's and Europe's industrial R&D competitiveness and economic growth, as well as to maintaining highly skilled staff engaged in R&D activities in Europe.

The financing of this project supports RDI activities, which generate significant positive knowledge and technology externalities in the field of sustainable low-carbon energy generation, through the creation of innovative processes, skills development and upgrading as well knowledge sharing through the collaboration with industrial partners, universities and research institutes across the EU.

The promoter does not have access to capital markets. The promoter cannot obtain long-term financing from commercial banks to cover the investment needs due to the significant size of the investments, the inherent risks of R&D activities, the uncertainty of the global economic environment and the increasing competitiveness in the market. The promoter is thus facing a sub-optimal investment situation.

The project is expected to be classified under the EIB Special Activities category, in particular due to the long tenor of the unsecured loan and the uncertainty of outcomes of the R&D investments. As such, the EIB would not be able to provide such type of unsecured long-term financing support during the period in which the EU guarantee can be used, or not to the same extent, without EFSI.

The financing provided by the EIB with the support of EFSI is expected to result in a quality stamp on the operation. Therefore, the EIB operation is expected to crowd-in public and private sector financing and to increase the commercial banks confidence in the promoter's long-term sustainability and its future investment plans.

The EFSI support to the project is complementary with national and EU grants. The operation will be the first for the EIB with the promoter.

Set of indicators related to the macroeconomic environment

Italy - Economic environment

Economic Performance

	IT 2017	EU 2017	US 2017	IT 2001-2007
GDP per capita (EUR, PPS)	28,814	29,996	43,470	31,530
GDP growth (%)	1.6	2.4	2.2	1.2
Potential GDP growth (%)	0.25	1.6	2.0	1.0
Output gap (% of potential GDP)	-0.98	0.08	0.04	1.5
Unemployment Rate (%)	10.9	7.3	4.1	7.6
Unemployment Rate (%) - Y/Y change (% points)	-0.8	-0.9	-0.6	-0.44
Bank-interest rates to non-financial corporations (%)	1.1	1.3	2.4	3.8
Bank-interest rates to non-financial corporations (%) - Y/Y change (% points)	0.05	-0.04	0.4	0.02
Investment rate (GFCF as % of GDP) - Total	17.6	20.2	20.5	21.1
Investment rate (GFCF as % of GDP) - Public	2.0	2.7	3.3	2.9
Investment rate (GFCF as % of GDP) - Private	15.7	17.4	17.2	18.2

General Sector Indicators

	2013	2014	2015	2016	EU (latest available)
Value added in Scientific research and development (% of total)	--	--	--	--	0.5
Employment in Scientific research and development (% of total)	--	--	--	--	--

Research, development and innovation

	2013	2014	2015	2016	EU (latest available)
Gross domestic expenditure on R&D (GERD) (% of GDP)	1.3	1.4	1.3	--	2.0
Gross domestic expenditure on R&D (GERD) distance to EU 2020 target (% of GDP)	0.22	0.15	0.2	--	0.97
Research and development expenditure - Government (% of GDP)	0.18	0.18	0.18	--	0.24
Research and development expenditure - Higher education (% of GDP)	0.37	0.39	0.38	--	0.47
Research and development expenditure - Business (% of GDP)	0.72	0.76	0.74	--	1.3
Research and development expenditure - Private non-profit sector (% of GDP)	0.04	0.04	0.04	--	0.02
Eco-innovation index (EU =100)	95.0	99.0	106.0	--	100.0

- Country average for "GDP per capita (EUR, PPS)" is calculated in real terms
- EU value for "Bank-interest rates to non-financial corporations" corresponds to Euro Area average; Country average is the simple average between 2003 and 2007
- The EU value is displayed as the value in the year that corresponds to the latest value of the indicator in a particular country

Other indicators[3]

Key project characteristics

	Expected at PCR
Start of works	01.01.2018
End of works	31.12.2025
Project investment cost	626.00 MEUR
EIB/EFSI eligible investment mobilised	531.00 MEUR
External EFSI multiplier	2.12
External EIB (non-EFSI) multiplier	
Amount of private financing	60.00 MEUR
Quick start (% of expenditure during 2015-2018)	
Co-financing with national promotional banks	0.00 MEUR
Co-financing with structural funds (ESIF)	0.00 MEUR
Co-financing with other EU instruments (i.e. Horizon 2020, Connecting Europe Facility, etc)	
Energy efficiencies realised	0.00 MWh/a
Climate Action indicator	100.00% Mitigation - RDI (transversal)
Employment during construction - temporary jobs	3,600 person years
Employment during operation - new permanent jobs	50 FTE

[3] For additional information on the EIB's assessment of the project's environmental and social aspects, please refer to the project's Environmental and Social Data Sheet (ESDS) published on the EIB website. The abbreviation PCR stands for Project Completion Report. If applicable, a difference between the amount of Project investment costs and EIB/EFSI eligible investment mobilized might derive from the fluctuation of the underlying exchange rate.