Welcome! We will start shortly

FUSION FOR ENERGY
SUPPLY CHAIN DAYS

VIRTUAL MEETING GUIDELINES

Your microphone is disabled by default

Raise your hand if you want to speak

The session will be recorded

Use Q&A for questions

Turn your camera on to react

Mute yourself

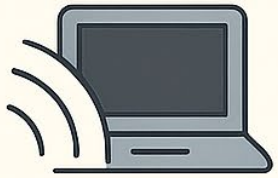
Welcome! We will start shortly

FUSION FOR ENERGY
SUPPLY CHAIN DAYS

IN-PERSON MEETING GUIDELINES

Be on time

Don't connect your laptop



Take calls outside

Enable microphone

Introduce yourself

Keep to the time

Mute when finished

FUSION FOR ENERGY

SUPPLY CHAIN DAYS

30 Sept – 2 Oct 2025

DAY THREE

F4E SME DAY

2 OCTOBER 2025

FUSION FOR ENERGY

SUPPLY CHAIN DAYS

30 Sept – 2 Oct 2025

09:25 – 09:30

Mindfulness Exercise


Stop & Breathe
make time for yourself

FUSION FOR ENERGY

SUPPLY CHAIN DAYS

30 Sept – 2 Oct 2025

09:30 – 09:45

Opening Remarks

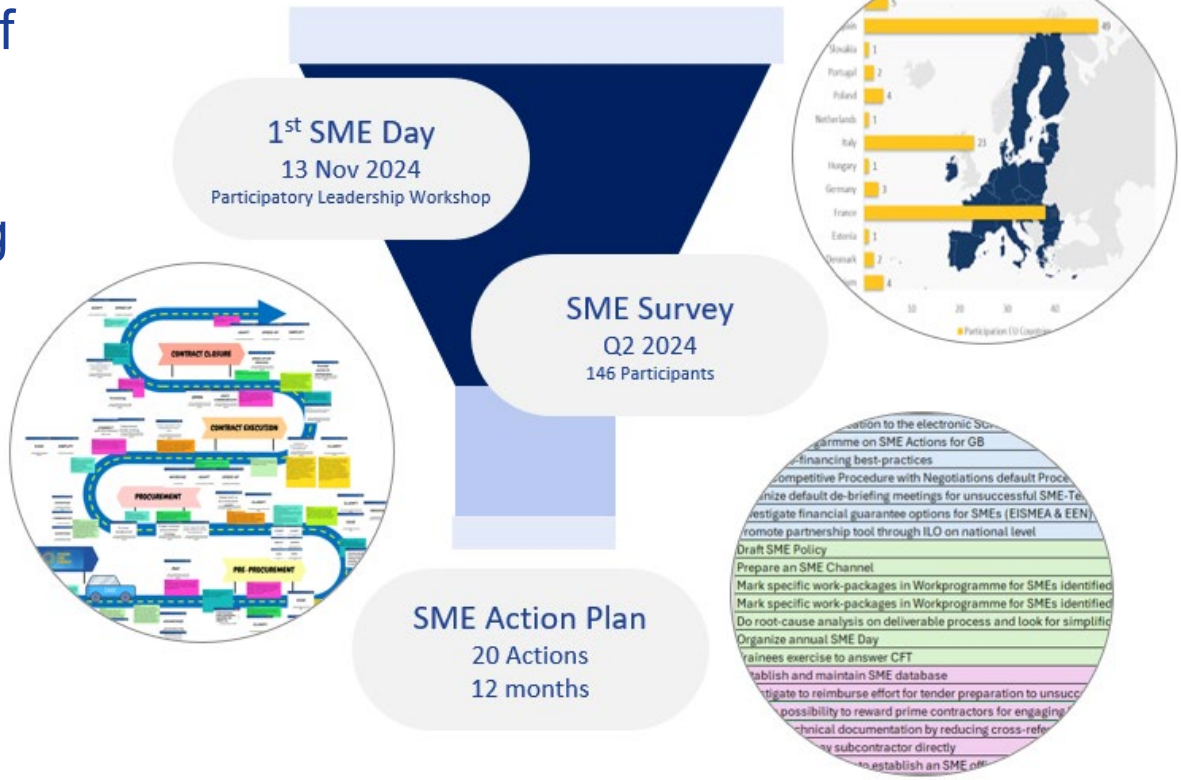
Kristel Tans, F4E

Introduction

FUSION FOR ENERGY SUPPLY CHAIN DAYS

Welcome to 2nd SME Day

- Building on the success of our **first SME Day** on 13 November 2024
- Your valuable input during the **Participatory Leadership Workshop** helped shape our **SME Action Plan**
- We are pleased to share that most actions have been implemented since then.

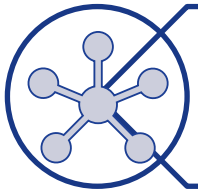


Today's Objectives

FUSION FOR ENERGY SUPPLY CHAIN DAYS

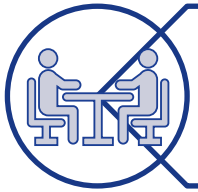
Discover the impact of implemented actions in lowering barriers to SME participation in F4E activities

Learn from three successful SMEs – best practices and lessons learned



Hear from ILOs – your gateway to F4E tenders and collaboration opportunities

Get insights into upcoming business opportunities



Benefit from 1:1 meetings with Procurement Officers and Contract Managers

Introduction

In one word what do you expect from today's Agenda?

https://app.sli.do/event/w7AiVv6tXKvjtYxMUN8n5q

Join at

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FUSION FOR ENERGY

SUPPLY CHAIN DAYS

30 Sept – 2 Oct 2025

09:45 – 10:45

Presentation: SME Action Plan: Status of Implementation, Key Initiatives and Challenges Addressed

Julie Abou Yehia, F4E

Anne-Kathrin Preis, F4E

Overview SME Action Plan

FUSION FOR ENERGY
SUPPLY CHAIN DAYS

Capacity Building & Support

- Review Pre-financing best-practices
- Investigate financial guarantee options for SMEs (EISMEA & EEN)
- Investigate to mark reserved activities in WP for SMEs
- Investigate reimbursement of tender preparation effort for unsuccessful SMEs
- Investigate possibility to pay SME subcontractor directly

SME-friendly Procurement Practices

- Allow alternative payment scheme in competitive procedures to allow better cashflow
- Organize default de-briefing meetings for unsuccessful SME-Tenderers
- Promote Partnership Tool through ILOs
- Make Information Days mandatory prior to launching a call
- Publish SME Opportunity List
- Explore possibility to reward prime contractors for engaging SMEs

Operational Efficiency & Process Improvement

- Simplify technical documentation by reducing cross-references to applicable documents
- Do root-cause analysis and simplify deliverable approval process
- Launch Dummy call to understand process shortcomings

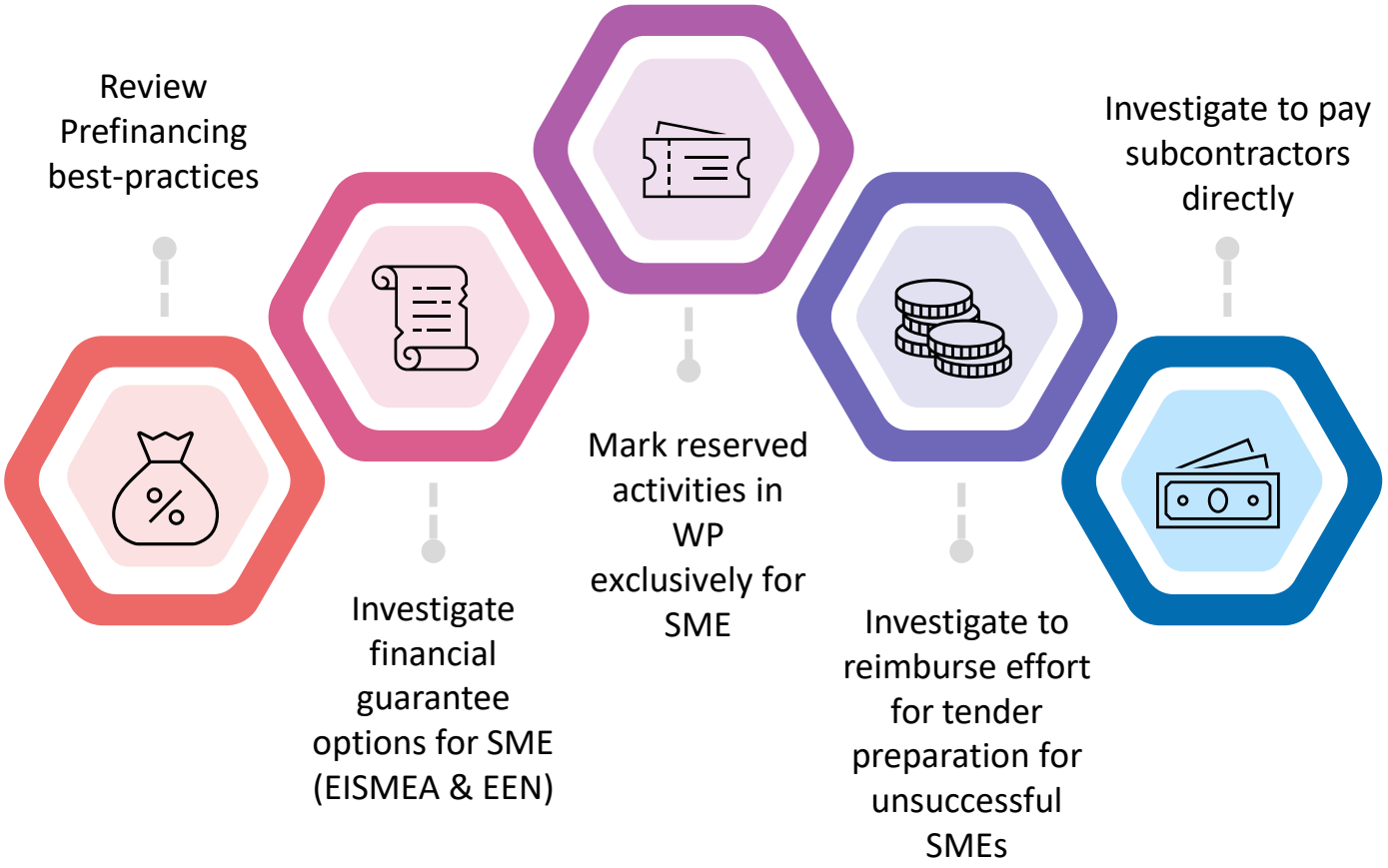
Engagement & Communication

- Prepare SME Channel
- Organize regular SME Days
- Investigate possibility to establish an SME office

Strategy & Policy Development

- Draft SME Policy
- Establish and maintain a SME Database
- Draft Workprogramme on SME Actions

Capacity Building & Support



Capacity Building & Support

Review PF Best Practices & Financial Guarantee Options

FUSION FOR ENERGY SUPPLY CHAIN DAYS

F4E is re-viewing pre-financing best-practices &
Investigating financial guarantee options for SMEs

Structuring PF levels proportional to project startup efforts → reducing the need for upfront capital.

Implementing regular and timely interim payments, aligned with deliverables and milestones → reduce financial strain during contract implementation.

Under internal review:

- max % of PF payable

&

- Max amount of PF without PF-guarantee

&

- F4E reached out to financial institutions, e.g. EIB Group to facilitate access for SMEs

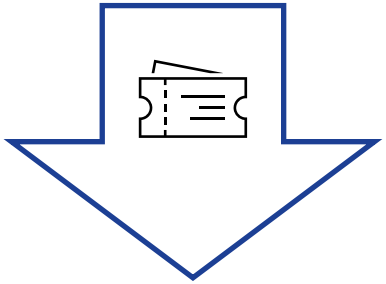
Capacity Building & Support
Reserved Activities in WP

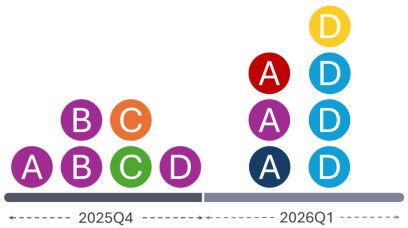
FUSION FOR ENERGY SUPPLY CHAIN DAYS

Mark reserved activities in WP exclusively for SME currently not possible

BUT

F4E will





Breakdown big work packages into several smaller ones (as much as possible) to facilitate SME's participation

Inform SME on upcoming business opportunities through the SME Channel

Keep negotiating with CEC for future GFR reviews

Capacity Building & Support
Reimbursement of tender preparation

FUSION FOR ENERGY SUPPLY CHAIN DAYS

Reimbursement of effort for tender preparation for unsuccessful SMEs currently not possible

BUT

F4E will

Promote Partnerships through MAG and ILO

More info on *Partnership Tool* in the afternoon session ***"Assisting SMEs in Engaging with F4E Supply Chain"***

Organize regular information days to ensure SME understanding of requirements and successful participation to F4E calls

Simplify and standardize procurement documents to lower SME effort to participate to F4E Call-for-Tenders and increase compliance

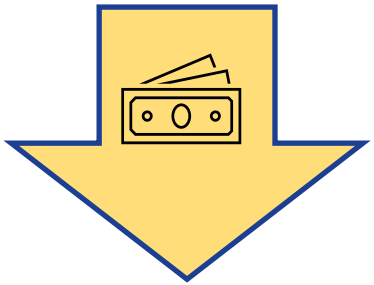
Capacity Building & Support
Paying Subcontractor directly

FUSION FOR ENERGY SUPPLY CHAIN DAYS

Paying SME Subcontractor directly currently not possible

BUT

F4E will



Work on updating Model Contract/Toolbox (*Subcontracting Clause*) to encourage Prime contractors to mirror F4E Terms (deadline to pay)

SME-friendly Procurement Practices

FUSION FOR ENERGY SUPPLY CHAIN DAYS

Cashflow

Allow alternative Payment Scheme for open/restricted procedure to improve SME cashflow

De-briefing

Organize default de-briefings for unsuccessful SME to help them improve in future tenders.

Partnerships

Promote partnerships through ILOs and Industry Portal

SME Opportunity List

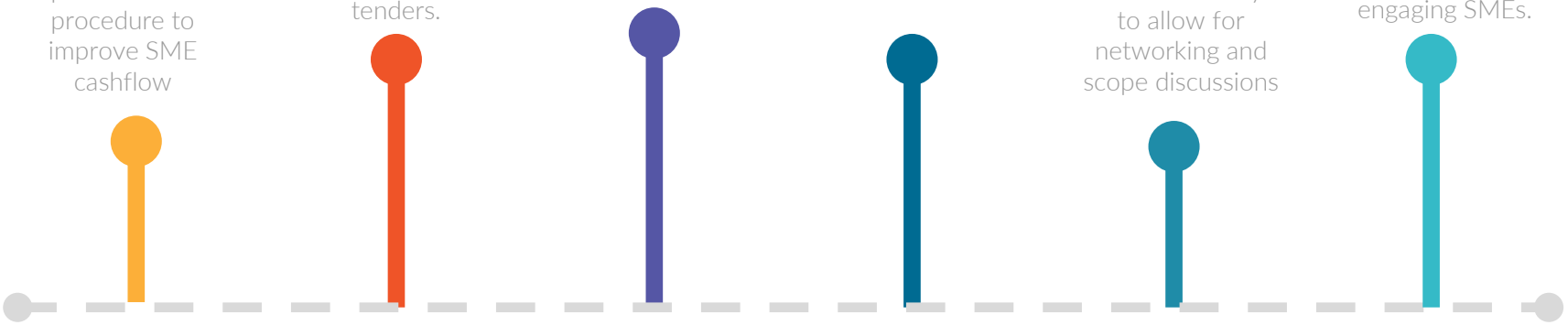
Publish specific business opportunities for SME

Information Days

Organize information days to allow for networking and scope discussions

Prime Contractor Rewards

Explore possibility to reward prime contractors for engaging SMEs.



SME-friendly Procurement Practices

Alternative Payment Scheme

FUSION FOR ENERGY SUPPLY CHAIN DAYS

Purpose:

Allow better/adapted **cash-flows** for SMEs

Action:

For open/restricted procedures, tenderers may propose alternative payment schemes within specified boundaries

Updated wording in *Invitation to Tender*:

The tenderer is allowed to submit an alternative payment scheme which fit is cashflow within the specific boundaries specified below:

Pre-financing	Maximum % up to which it can be made (if >300k, guarantee)
Interim payments	Always linked to deliverables and either: -to specific, identified deliverables or -periodic (e.g. every 4 months for deliverables completed and accepted)
Balance payment	Min. % to be reserved for balance payment

This alternative payment scheme proposal if within the boundaries will be implemented in the final contract in case the tenderer is successful in the procurement procedure.

The alternative payment scheme proposal is limited to the submission of an alternative proposal and that fits the specified boundaries and will not lead to negotiations, iteration etc. regarding the scheme proposed by the tenderer.

SME-friendly Procurement Practices
De-briefing Meetings

De-briefing Meetings for unsuccessful SMEs

Organize short dedicated F4E-Supplier meetings to review strengths and weaknesses of unsuccessful Tender → **enabling SME to learn for future business opportunities**

Involve F4E staff participation from different areas: TECH, QA, PO

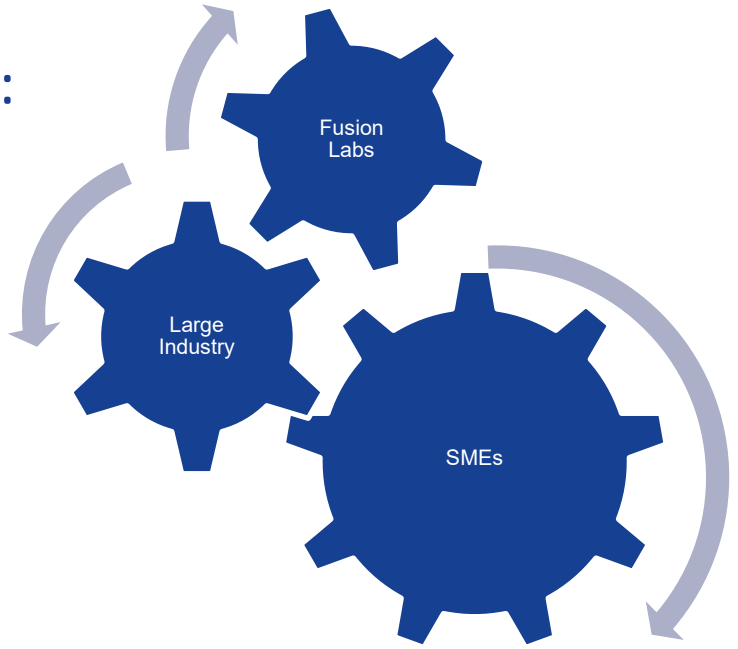
Disseminate material provided during the meeting for future reference.

SME-friendly Procurement Practices

Promote Partnerships

Promote Partnerships through:

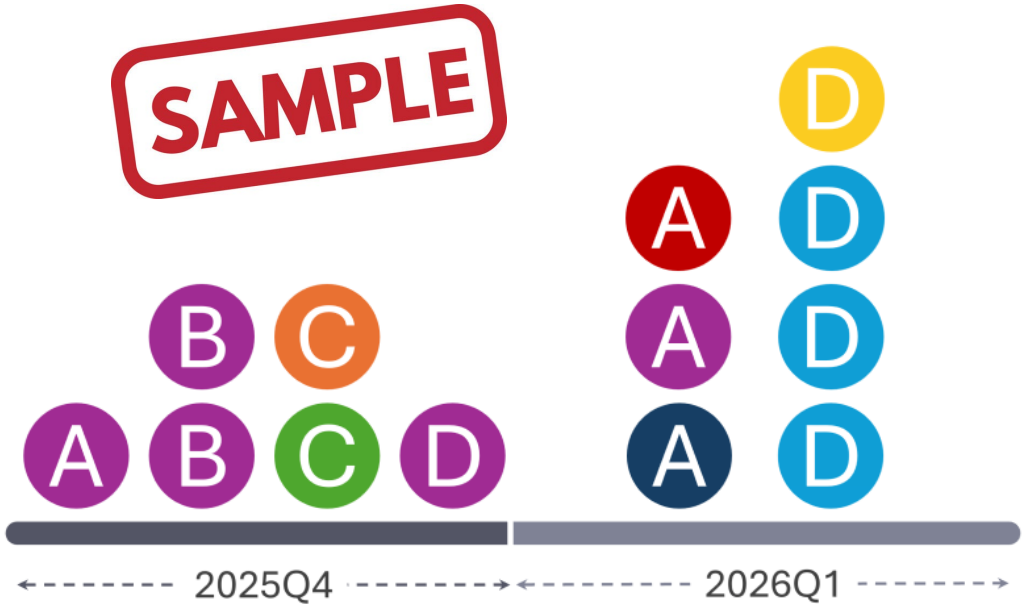
- Industry Portal
- ILOs
- Information Days
- Market Surveys



SME-friendly Procurement Practices

SME Opportunity List

FUSION FOR ENERGY SUPPLY CHAIN DAYS



- Systems Engineering Support Services
- Broader Approach
- Neutral Beam Heating
- Buildings & Site Equipment
- Cryoplant & Fuel Cycle
- Diagnostics
- Nuclear Safety

Estimated Value Range

- A Less than 2M
- B Between 2M and 5M
- C Between 5M and 10M
- D Above 10M

- On SME Channel
- Published twice a year (May & October)

More info on *SME Opportunity List* in the afternoon session ***"Assisting SMEs in Engaging with F4E Supply Chain"***

SME-friendly Procurement Practices
Information Days

Information Days will be organized (by default) immediately after launching a call-for-tender to:

- Clarify Scope and Technical/Quality Requirements
- Explain Evaluation Methodology
- Promote Partnerships
- Allow for active Q&A

→ Save time to study procurement documents and allows for immediate feedback and networking

SME-friendly Procurement Practices

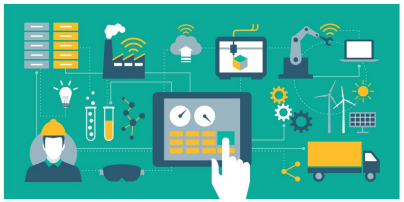
Reward Prime Contractor

FUSION FOR ENERGY SUPPLY CHAIN DAYS

Reward Prime Contractor just for engaging SMEs in Supply Chain currently not possible

BUT

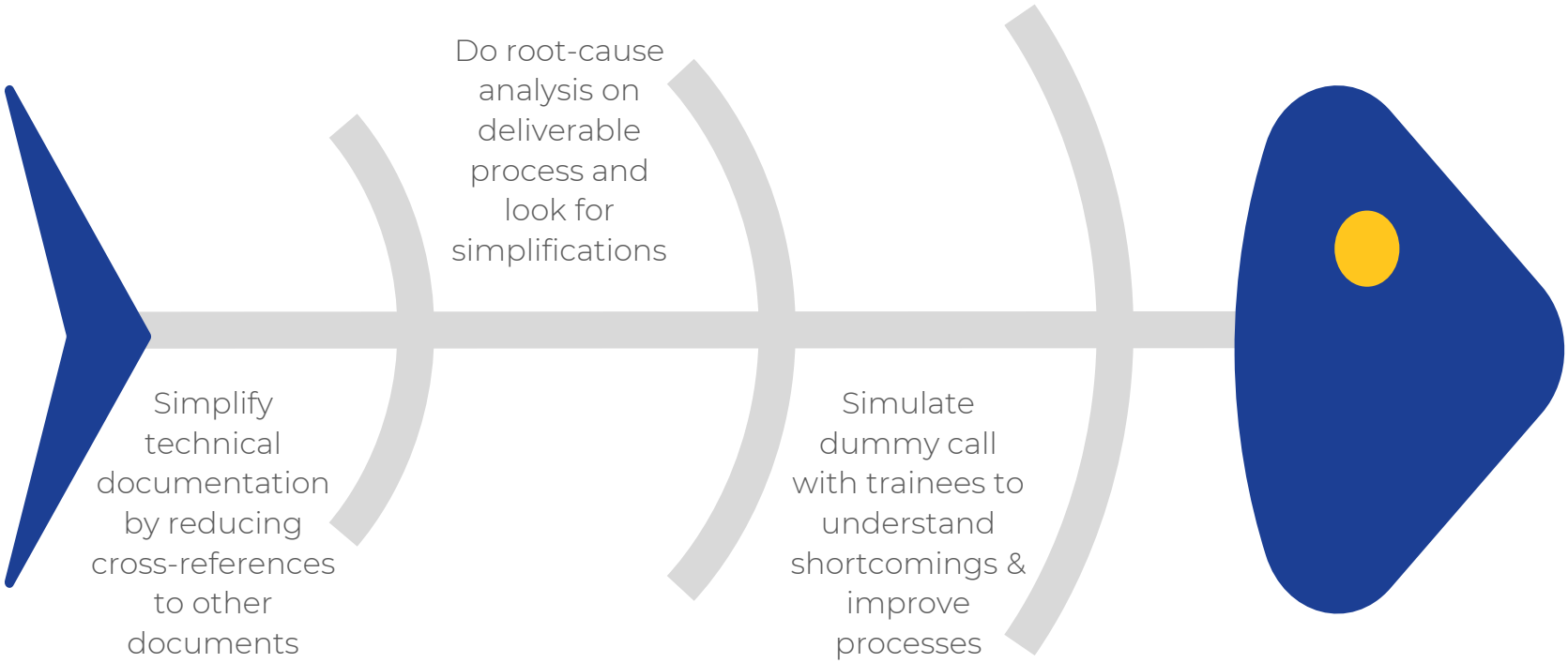
F4E will



Take *Merit of Supply Chain* into consideration in Technical Award Criteria to encourage prime contractors to build on the competitiveness and agility of SMEs

Operational Efficiency & Process Improvement

FUSION FOR ENERGY SUPPLY CHAIN DAYS



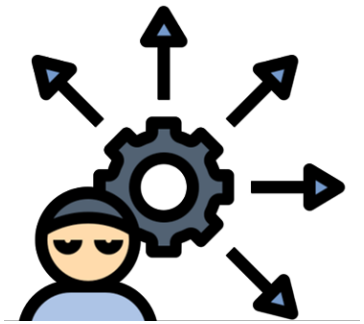
Operational Efficiency & Process Improvement

Outcome Dummy Call to find shortcomings

FUSION FOR ENERGY SUPPLY CHAIN DAYS

Set-Up:
F4E Trainees acted as a mock Economic Operator responding to a fictional call-for-tender for Nuclear Analysis Services.
Roles assigned within Trainee Team: Technical Experts, QA Officer, Nuclear Safety Officer, Procurement Officer, Legal Advisor.
Aim: Experience tender preparation, identify barriers for SMEs, and suggest improvements.

Main Outcome:
Effort Barrier: Preparing a compliant tender required near full-time work from several team members → huge effort for SMEs.
Document Complexity: Tender documents were often unclear, nested across multiple annexes, and lacked centralized guidance, especially cumbersome is PQMP and QA-115
Language Barrier: ambiguous language/complex concepts on supplier roles (joint submission, third parties) in Invitation to Tender



Key Recommendations:

- Simplify and consolidate documentation
- Provide a simplified PQMP template or reduce its tender-phase burden via compliance matrices
- Improve Industry Portal usability

Note:

- no questions were asked during the 'submission phase'.
- **Findings and recommendations very similar to feedback from SMEs** (Survey and 1st SME Day)

Operational Efficiency & Process Improvement

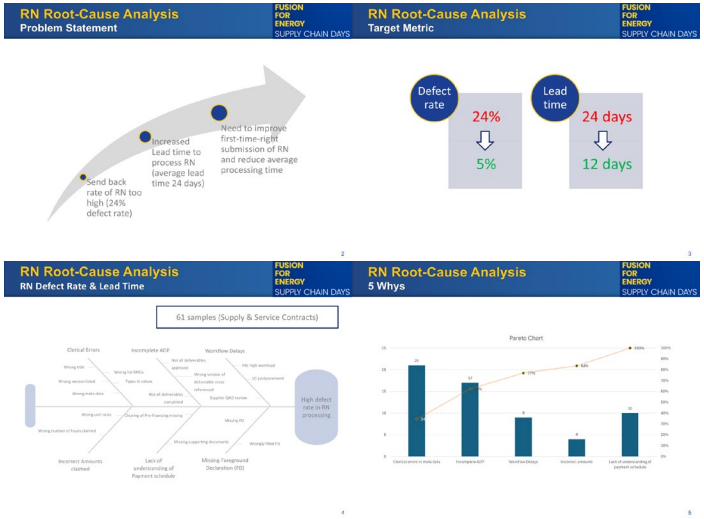
Reduce cross-reference in technical documentation

- Process to draft **Annex B** updated: System Engineer to review and **optimize cross-references to reference and applicable documents** to ensure:
  - →Relevance for contract implementation
  - →In line with complexity of contract

- Ongoing simplification of **Quality Documentation** including:
  - Consolidation of QA-115 and QA-113
  - Streamlining of Annex A and QA templates for tendering
  - Integration of Nuclear Safety Inspections and Quality Audit during contract implementation
  - → New versions expected to be published during 2026

Operational Efficiency & Process Improvement

Root-cause analysis deliverable process



Main Root causes are:

1. Clerical errors in meta data
2. Incomplete ADP
3. Workflow delays
4. Incorrect amounts
5. Lack of understanding of payment schedule

Ongoing actions to reduce defect rate and improve lead time:

a. Streamline data entry step (1,2,4,5)
b. Simplify Documentation List template (2)
c. Review eRN with supplier during progress meetings (1,2,3,4,5)
d. Merge eRN with internal deliverable clearance and payment process (3-in-1) (3)

Engagement & Communication

FUSION FOR ENERGY SUPPLY CHAIN DAYS

A **SME Channel**
Prepare an SME Channel for knowledge transfer, networking and business opportunities

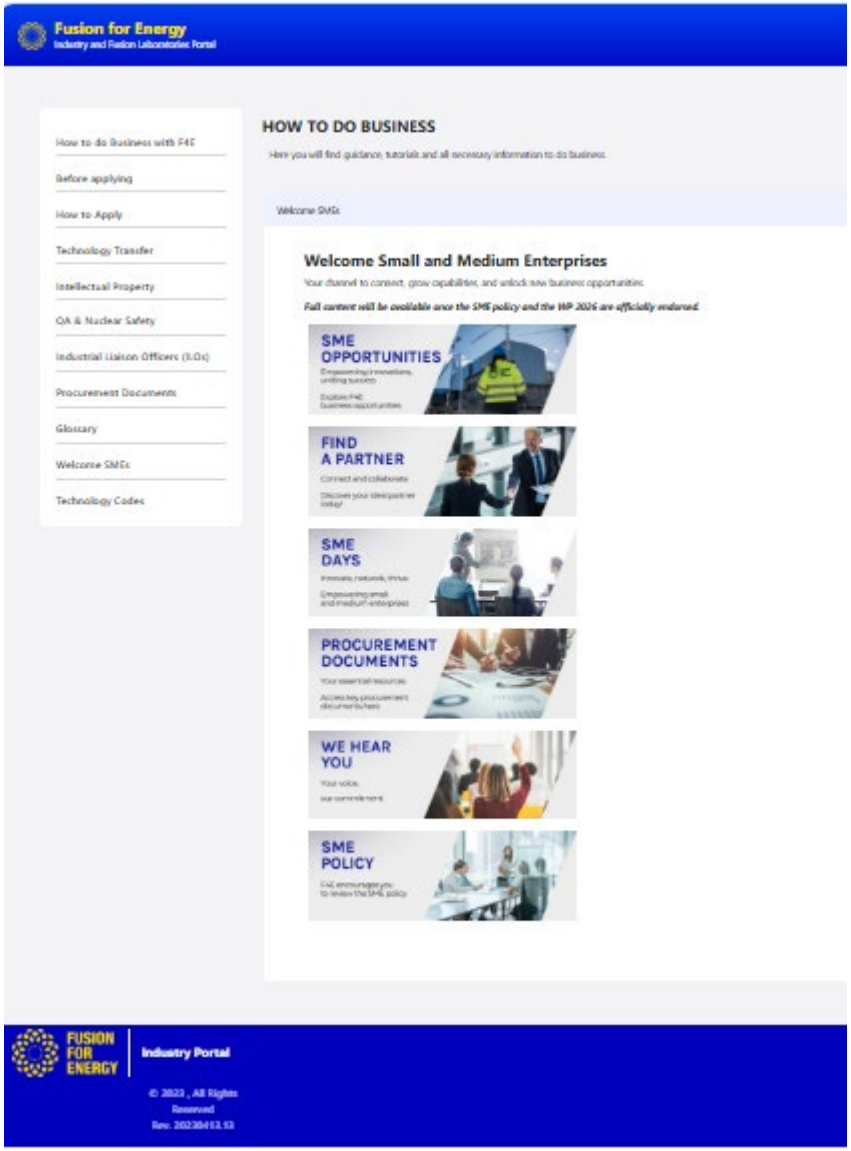
B **SME Day**
Organize regular SME Days For knowledge transfer and networking

C **SME Office**
Investigate possibility to establish an SME office

Engagement & Communication

SME Channel

FUSION FOR ENERGY SUPPLY CHAIN DAYS



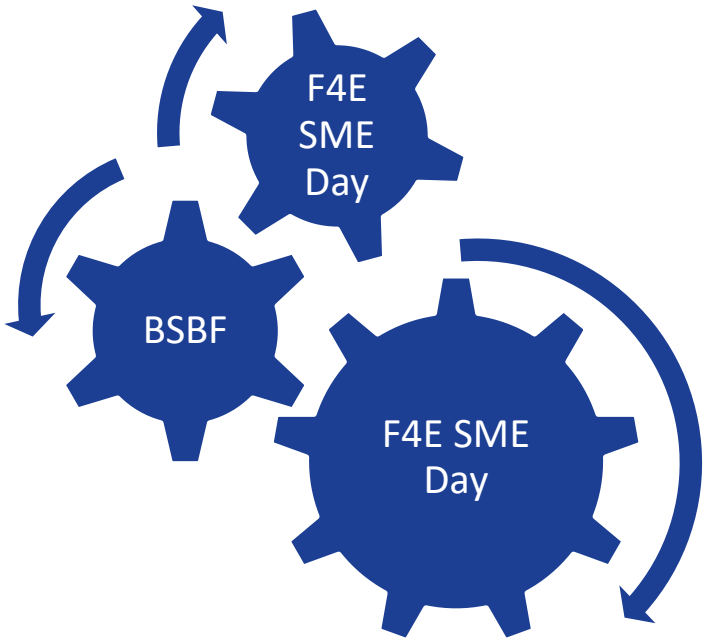
The SME Channel is a direct access for SMEs to:

- Find SME relevant business opportunities
- Find partners
- Find information on SME Days
- Find reference documents to facilitate participation in procurement activities
- Find SME Policy
- Communicate directly with F4E SME Team

More info on SME Channel in the afternoon session ***"Assisting SMEs in Engaging with F4E Supply Chain"***

Engagement & Communication
SME Days

FUSION FOR ENERGY
SUPPLY CHAIN DAYS



→ F4E intends to organize *Supply Chain Days* on a yearly basis
→ SME relevant topics will remain a priority on F4E's agenda and will promote SME relevant topics also at the BSBF

Engagement & Communication

SME Office – Activity NOT Started

FUSION FOR ENERGY SUPPLY CHAIN DAYS

SME Office tasks in the future could include:

- Facilitation of networking opportunities for SME
- Organization of Training events
- Helpdesk for General Procurement and Contract Implementation Questions
- Organization of SME events
- Monitoring of SME Policy Implementation
- Flagging of SME in F4E Supply Chain

Strategy & Policy Development

SME Policy

Draft SME Policy

SME Database

Establish & Maintain SME Database for reporting purposes and to facilitate partnerships

SME Workprogramme

Draft SME Workprogramme

Strategy & Policy Development
SME Policy

FUSION FOR ENERGY SUPPLY CHAIN DAYS

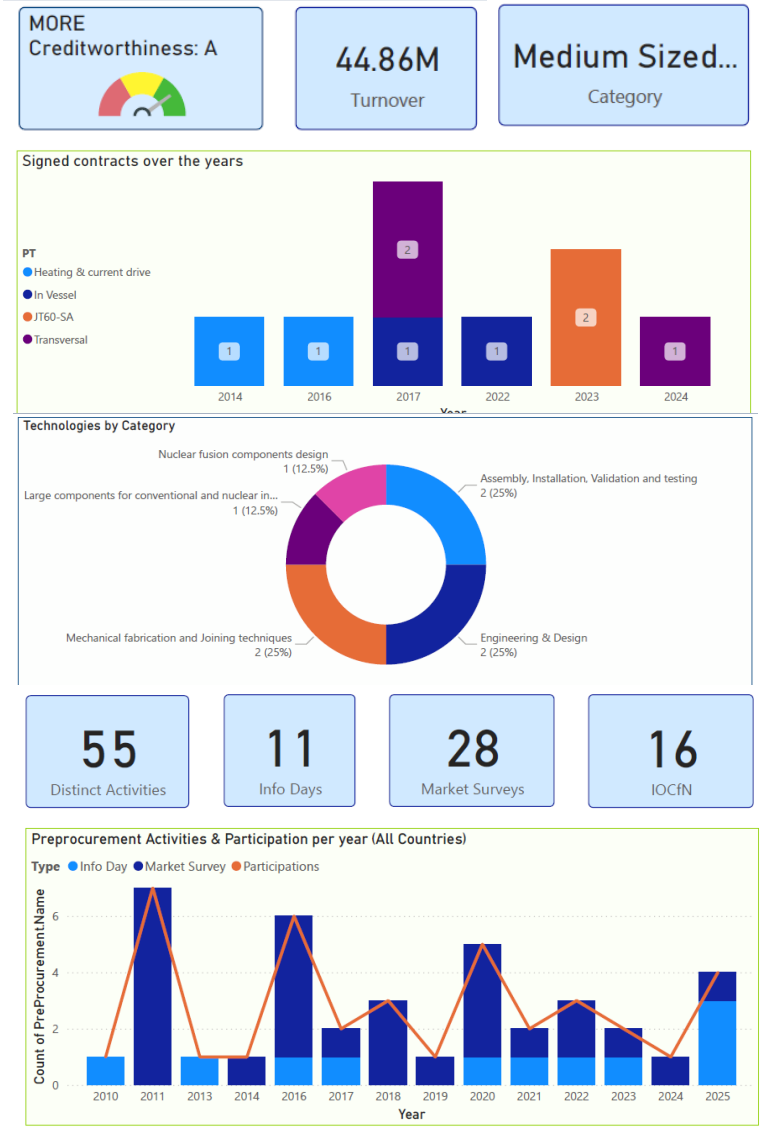
- Following *Targeted Measures* as developed by Working Group mandated by 53rd GB meeting held on 10/12/2021 aimed at enhancing SME participation, competitiveness, and long-term engagement in fusion market.

- SME Policy (as part of F4E Industry Policy) to help:
  a. Alleviating financial constraints that inhibit SME participation in F4E contracting.
  b. Establishing structured platforms for collaboration between SMEs, large industry, and fusion laboratories.
  c. Streamlining administrative procedures to lower the burden of entry and compliance.
  d. Equipping SMEs with knowledge and tools to increase their competitiveness and bidding success.

Strategy & Policy Development
SME Database

FUSION FOR ENERGY SUPPLY CHAIN DAYS

F4E Internal Information



- API with commercial database and F4E reporting tool to flag SME in F4E Supply Chain
- Existing consistent third-party data on turnover
- Covers all SMEs engaged with F4E incl. participants to market survey, unsuccessful candidates, etc.
- Changes from SME to mid-caps will be automatically tracked
- Can be used for procurement strategy, negotiation preparation, amendments

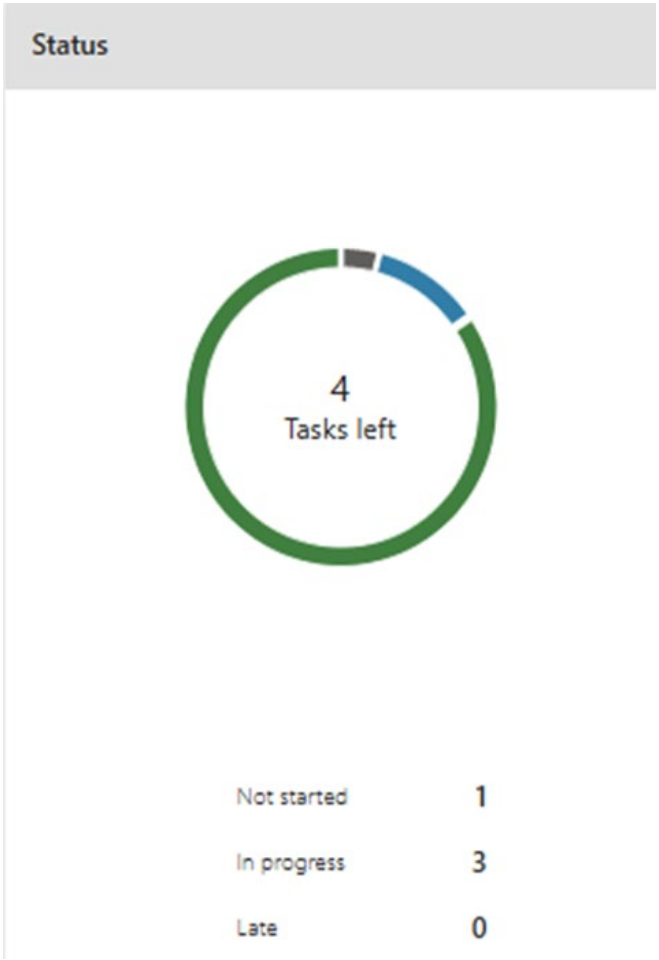
Strategy & Policy Development

SME Workprogramme (Action Plan)

FUSION FOR ENERGY SUPPLY CHAIN DAYS

Action	Tern	Category
Draft Workprogarmme on SME Actions for GB	Short	Strategy & Policy Development
Review Pre-financing best-practices	Short	Capacity Building & Support
Allow Alternative Payment Scheme for open/restricted procedure to improve SME cashflow	Short	Participation in Procurement
Organize default de-briefing meetings for unsuccessful SME-Tenderers	Short	Participation in Procurement
Make information days mandatory prior to launching a call	Short	Participation in Procurement
Investigate financial guarantee options for SMEs (EISMEA & EEN)	Short	Capacity Building & Support
Promote partnership tool through ILO on national level	Short	Participation in Procurement
Draft SME Policy	Medium	Strategy & Policy Development
Prepare an SME Channel	Medium	Engagement & Communication
Publish business opportunities with activities apt for SME	Medium	Participation in Procurement
Mark specific work-packages in Workprogramme for SMEs identified as exclusive tenderers (derogation to rules)	Medium	Participation in Procurement
Do root-cause analysis on deliverable process and look for simplifications(lean 6 sygma)	Medium	Operational Efficiency & Process Improvement
Organize annual SME Day	Medium	Engagement & Communication
Trainees exercise to answer CFT	Medium	Capacity Building & Support
Establish and maintain SME database (Flag SME in Supply chain - API with Moodys)	Long	Monitoring & Reporting
Investigate to reimburse effort for tender preparation to unsuccessful SMEs	Long	Capacity Building & Support
Explore possibility to reward prime contractors for engaging SMEs (modify F4E Implementing Rules)	Long	Participation in Procurement
Simplify technical documentation by reducing cross-refernces to other documents	Long	Operational Efficiency & Process Improvement
Investigate to pay subcontractor directly	Long	Capacity Building & Support
Investigate possibility to establish an SME office	Long	Strategy & Policy Development

- SME Action Plan and SME Policy to be presented to AMC in November 2025 for endorsement
- Actions in progress expected to be closed by end 2025/Q1 2026
- SME Office action on hold until further resources available.



FUSION FOR ENERGY

SUPPLY CHAIN DAYS

30 Sept – 2 Oct 2025

10:45 – 11:15

Coffee Break & Networking

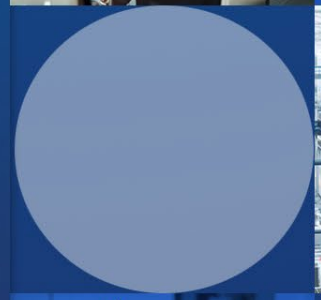
FUSION FOR ENERGY

SUPPLY CHAIN DAYS

30 Sept – 2 Oct 2025

11:15 – 11:45

ILO Corner



Søren Bang Korsholm
Chair of the F4E Industrial Liaison Officer Network
Senior Scientist, PhD

The state of play of fusion in the EU Member States

Overview

- The role of the European Fusion Industrial Liaison Officers
- Meet the Fusion Industrial Liaison Officers
- The evolving fusion landscape seen from the supply chain
- Q&A

The F4E Industrial Liaison Officers

- Each F4E member country can nominate an ILO (via GB)

- ILOs are intermediaries between F4E+ITER and the national industry, i.e., both:
  - Working to secure contracts for companies from own country

  and
  - Working with F4E and ITER helping to identify relevant companies – as well as giving feedback for F4E to be an attractive business partner

- The F4E ILO network was established in 2007 and have a great cohesion and collaboration.
  - 19 ILOs + observer (CH)
  - Joint inputs to F4E and ITER Org
  - Identification of potential consortium partners
  - Supporting national and international events (e.g., BSBF and IBF)

Note that member countries have varying implementation of the ILO role – if any

Denmark

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ILO for Denmark
Senior Scientist
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Web: www.bigscience.dk

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Spain

Ana Belén del Cerro
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- Instrumentation and control
- High precision components
- Cryogenics and ultra-high vacuum
- Power supplies
- Plasma heating systems
- Diagnostics
- Remote handling and robotics….

Germany

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https://pt.desy.de/clio/index_ger.html

Christine Jobert
FILO Germany
French office
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Support of the German Fusion Industry:

- Supply Chain
  Manufacturers, suppliers, engineering/design experts, service providers, RTOs and their subcontractors for ITER/IO, F4E, IFMIF/DONES, DA's and startups in all fusion technology areas
- Startups
  Supporting German startup eco-system within MCF, ICF and VNS
- Connections and networking
  ITER, nat'l & int. fusion projects, Go4Fusion
- Activities
  Participation & organization of events, e.g. Forum Fusion Germany

France

Eve-Mary RIÈS

ILO for France

Head of Iter Industrial Committee

CEA - Commissariat à l'énergie atomique et aux énergies alternatives

Mail: eve-mary.ries@cea.fr

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Web: https://comite-industriel-iter.fr/ (C2I)

https://www.cea.fr

Contact us to be referenced **C2I** with our aim to inform, promote industrial competences, network and organize events such as **IBF**.

IBF/25 ITER BUSINESS FORUM

INTERNATIONAL ITER BUSINESS FORUM

23 TO 25 APRIL 2025 ◂▸ CONGRESS CENTER MARSEILLE ◂▸ FRANCE

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- Buildings
- Vacuum Vessel
- Cryogenics
- In Vessel Components
- CODAC
- Remote Handling and maintenance
- Power Supply
- Diagnostics & Optics
- Auxiliary Systems
- Plasma Heating Systems
- Nuclear Systems

Poland

Sylwia Wójtowicz
ILO for Poland
Head of Science and Technology Park
National Centre of Nuclear Research
Mail: Sylwia.wojtowicz@ncbj.gov.pl
Phone: +48 518 366 001
Web: www.wielkanauka.pl

Contact our companies in Big Science:

- Altrad Babcock – altradbabcock.pl
- BimoTech - www.bimotech.pl
- S2Innovation – www.s2innovation.com
- Egkenn Vacuum - www.egkenn.eu
- Zpue – www.zpue.pl
- Amazemet - www.amazemet.com
- SecoWarwick - www.secowarwick.com
- Spacive – www.spacive.pl

…and many more in engineering, control systems, machining, electronics…

Contact us at National Centre for Nuclear Research and find your business partner!

Sweden

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ILO for Sweden
Senior Researcher
Lund University, Faculty of Engineering

Mail: max.collins@bigsciencesweden.se
Phone: +46 709 10 20 95
Web: https://www.bigsciencesweden.se/

Download our brochure the Swedish Guide – Selected Suppliers & Partners

Big Science Sweden is the Swedish Industrial Liaison Office, connecting large-scale research infrastructures with Swedish industry, universities, and research institutes.

We have a network of more than 300 firms covering a broad spectrum of capabilities for Big Science facilities – including additive manufacturing, advanced materials, AI, magnets, power electronics, radiation hard electronics, remote handling, and more.

Belgium

.AGORIA

.TECH BELGIUM
Big Science

Christian Dierick
ILO for Belgium (ITER, ESO)
Big Science TECH Belgium leader
AGORIA

Mail: Christian.dierick@agoria.be
Phone: +32 485 91 46 75
Web: https://www.agoria.be/en/tech-belgium/big-science/big-science-tech-belgium

- Big Science TECH Belgium counts a few hundreds of companies varying from

- civil engineering and construction works (incl. lifting, transport, etc.)
- Engineering methodologies, mechanical design, and tools
- Electrical, electro-mechanical, and RF systems
- Manufacturing technology (incl. high precision; 3D; large components)
- Metal working industry; assembly technologies
- Aerospace and Nuclear technologies (rad. protection, dosimetry, etc.)
- Remote handling (incl. for hazardous environments such as nuclear)
- Diagnostics and detectors (incl. mirrors and telescopes for Cosmology)
- Cryogenic and cooling technology
- Vacuum Technology and leak detection, incl. extreme sealing solutions
- Instrumentation and CODAC (Control; Data Access and Comm)
- Servicing and contracting work (repair, maintenance, testing)
- Safety Systems, licensing, etc.
- Protection of hazardous installations, access control, fire and gas detection
- Digital industries: IT, Big Data, and (tele)communication technologies

Portugal

José Cardoso
ILO for Portugal
Industrial Liaison Officer
ANI – Agência Nacional de Inovação

Mail: jose.cardoso@ani.pt
Phone: +351 910 595 680
Web: www.ani.pt/big-science/

Portuguese companies' most important contributions to the Big Science market are in the areas of, but not limited to:

- Diagnostic and control systems
- Quality control and testing
- High precision machining
- Engineering

Standout companies and institutes:

- ISQ – Instituto de Soldadura e Qualidade
- Critical Software
- Active Space Technologies
- IPFN - IST

Finland

Megumi Asano-Ulmonen
ILO for Finland
Quality & Development
FinNuclear Association

Mail: megumi.asano-ulmonen@finnuclear.fi
Phone: +358 44 7102061
Web: finnuclear.fi/ilo

FinNuclear Directory presents companies working in nuclear fission and fusion directory.finnuclear.fi

Finnish Nuclear Science & Technology Symposium 21-22 October 2025 Espoo, Finland ats-fns.fi/syp2025/

Meet us at the Nordic pavilion of World Nuclear Exhibition 2025 Paris Villepinte Booth M063+L064

Nordic Nuclear Forum, 26-27 May 2026 Stockholm, Sweden nordicnuclearforum.fi

Italy

Antonino Pietropaolo
ILO for Italy
Senior Researcher
ENEA – Nuclear Department

Mail: antonino.pietropaolo@enea.it
Phone: +39 06 94005013

Big as well as SME in Italy operates in different fields such as:

1- Mechanical engineering
2- Electronics
3- Vacuum
4- High precision manufacturing
5- Material science
6- Superconductors

Malta

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ILO for Malta
R&I Executive
Xjenza Malta

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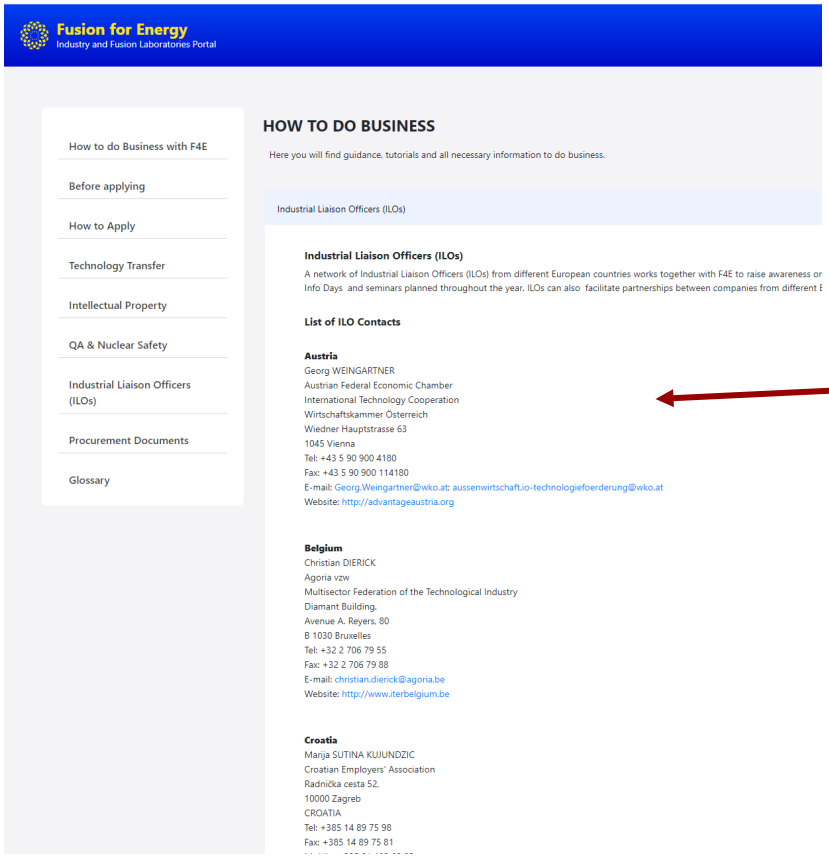
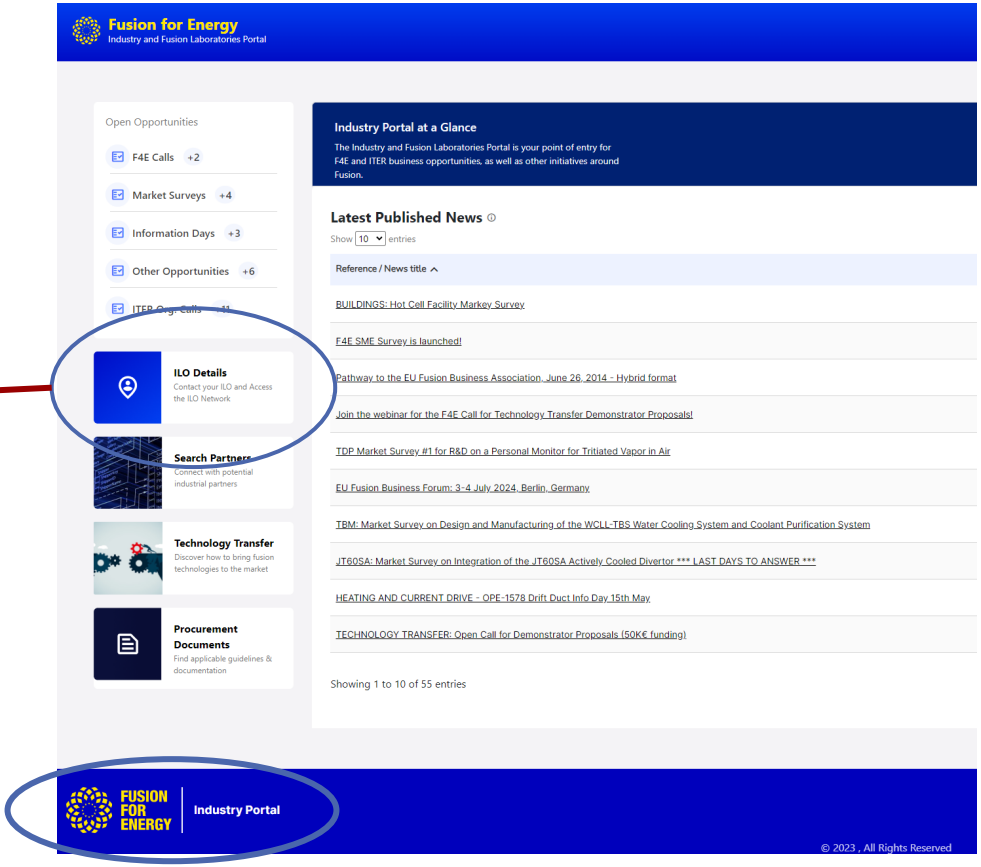
Phone: +356 23602198
Web: https://xjenzamalta.mt

Xjenza Malta (Science Malta) is the Malta Government Agency acting as the national R&D and Space-funding agency, and the policy development and implementation body in the area of Research, Innovation and Space. Science Malta is entrusted with the updating of the national R&I and Space policy frameworks, overseeing and coordinating R&I and Space-strategy implementation through programming efforts, including the direct management of the national public budgetary allocation for Research, Innovation and Space.

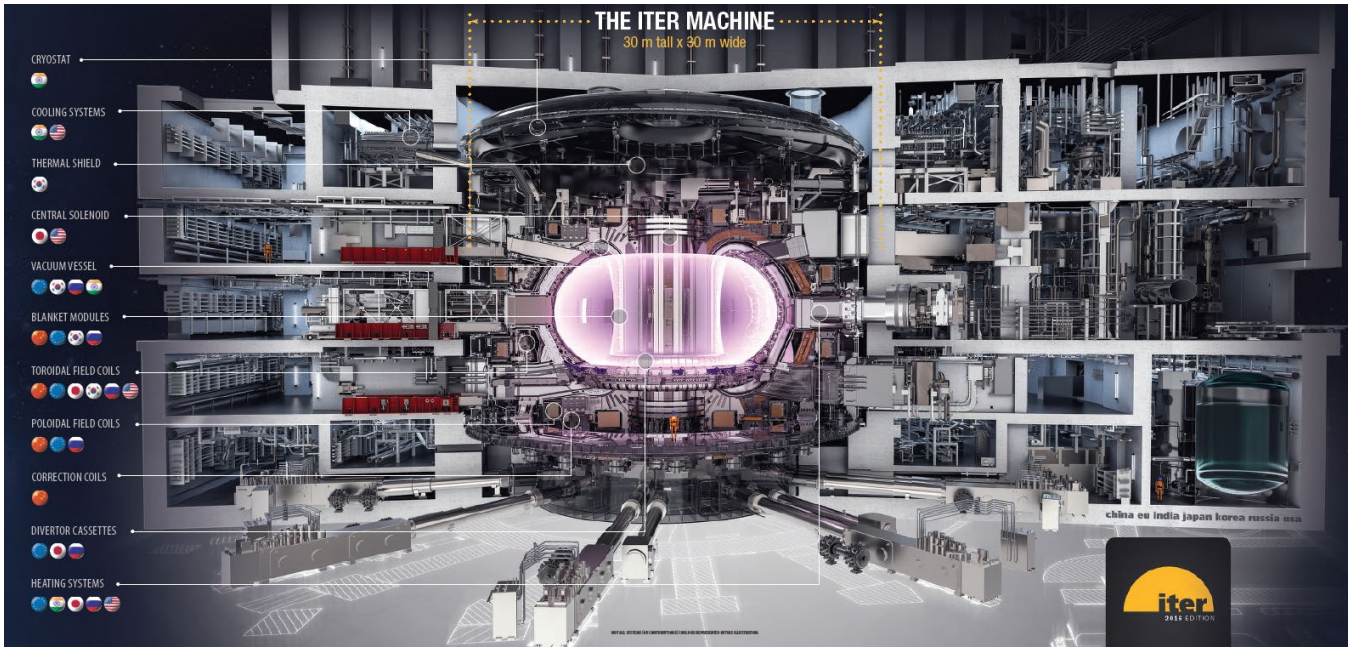
ILO meetings with F4E and ITER Organization on June 28-29 2023

Find your ILO





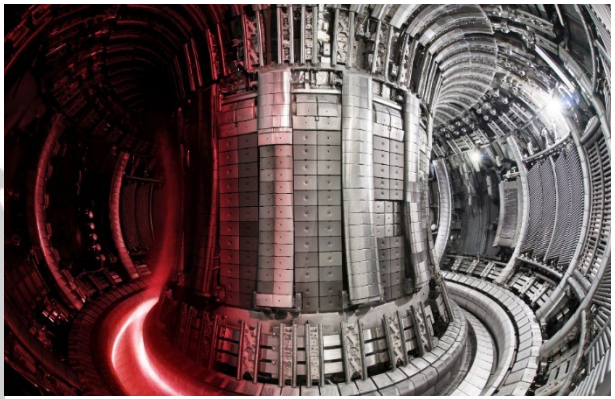
ITER – the primary fusion device in the World

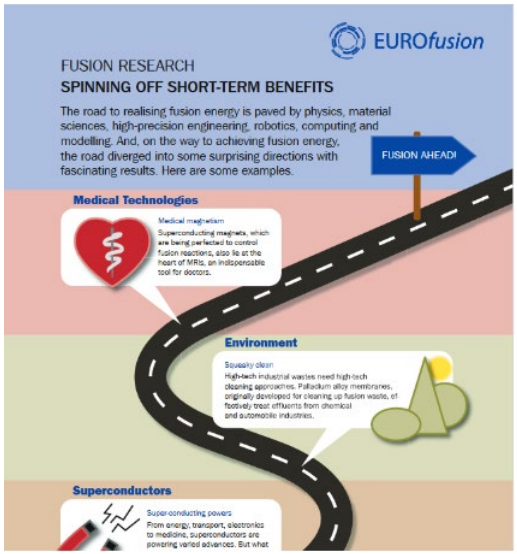


- ~45% tendered by F4E targeting European companies
- Over 50% of the tenders from the ITER International Organization are won by European companies

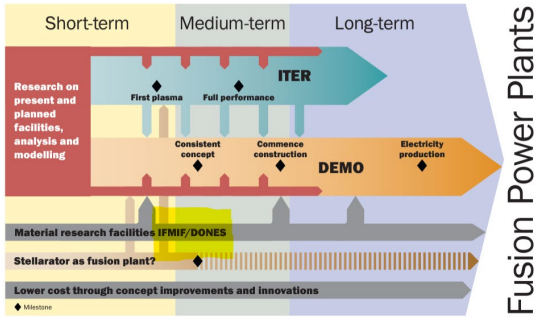
EUROfusion

- Consortium of the European fusion research laboratories and universities
- Scientific fusion research in multiple disciplines
- Education and training programmes and collaboratic (see also FuseNet)
- Technology development programme aimed at ITER and beyond –> DEMO (with involvement of industry)
- Contact your national EUROfusion beneficiary

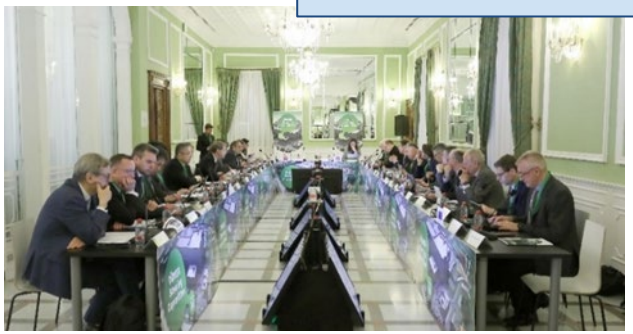




The fusion-like neutrons source required for fusion materials and technologies qualification



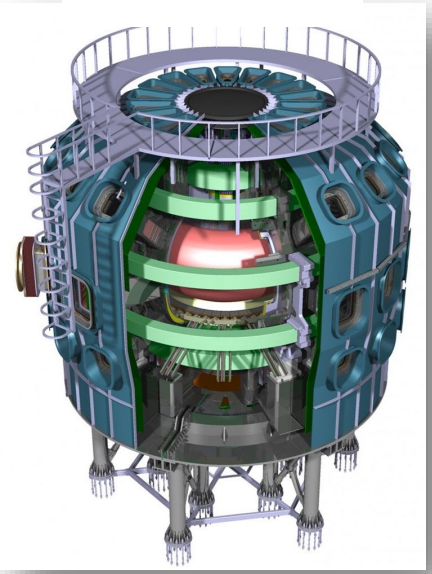
IFMIF-DONES Construction Phase started in March 23



DONES Steering Committee Meeting

Significant contracts on-going and foreseen

- VATIAC & VATIST protos
- Several engineering support
- Design and construction main building



Scope

The DTT goal is the identification of a reliable solution for the extraction of the heat generated by the fusion process. DTT will investigate innovative solutions for the heat extraction based on advanced divertor configurations and new materials such as liquid metals in conditions relevant to a fusion power plant. The construction has started with the goal of having DTT in operation during this decade.

Costs

The construction costs amount to 614 M€ and are secured by ENEA through specific agreements with the Ministry of University and Research and the Ministry for Ecologic Transition, with Regione Lazio and with the EUROfusion Consortium plus a loan from the European Investment Bank.
ENEA will remain the final owner of the facility. Operating costs (mainly for the design of the components) amount to 130 M€ and are provided pro rata by all the Consortium members.

Members

ENEA, CREATE, Eni, Consorzio RFX, INFN, Università degli Studi della Tuscia, Università degli Studi di Milano-Bicocca, Università degli Studi di Roma Tor Vergata, Politecnico di Torino, Italian National Research Council, CETMA

New fusion landscape

- F4E Fusion Observatory identifies 77 fusion companies – 42 in the US
- Many different approaches
  - Inertial
  - Magnetic
  - Others…
- Several with close links to academia or public research centers

Funding of private fusion companies

- Private fusion funding of ~9 billion Euro
- 85% of this funding is concentrated in the US and China
- Primarily funding from: venture capital, pension funds, benefactors etc.
- Best funded company:

  Commonwealth Fusion Systems (out of MIT): ~3 billion USD

  - similar to the US governments contribution to ITER over 25 years
  - raised in about 5 years

Note:
investors may have (realistic) expectations of financial return from spin-off markets

European fusion start-ups

- Novatron (S)
- Gauss Fusion (D)
- Renaissance Fusion (F)
- Marvel Fusion (D)
- Deutelio (CH)
- Focused Energy (D)
- Proxima Fusion (D)
- Gallileo Fusion (PL)
- … and who is next?

Supply chain effects

- FIA survey: ”in 2024, 22 start-ups reported a total combined spend of over $434 million on their supply chain. Anticipated to grow by another 25% in 2025.”
- The future fusion supply chain is being formed now and is expected to grow significantly
- FIA 2023: ”data (…) suggests that the ultimate value of fusion supply chain spending could also be in the trillions by the time the industry is fully mature.”

- See also: Michael Dennis, “Nuclear fusion market could achieve a $40 trillion valuation” Bloomberg Intelligence December 28, 2021 https://www.bloomberg.com/professional/blog/nuclear-fusion-market-could-achieve-a-40-trillion-valuation/

The fusion ILOs is assisting the European fusion ecosystem

- The fusion ILOs is connected to F4E and ITER, as well as other public projects. The ILOs are also in close contact with the Go4Fusion PPP-initiative and with most of the private fusion startups.

- ILOs can
  - help you get in contact with the right people
  - inform you of upcoming and current tenders
  - assist your efforts to find collaboration partners or subsuppliers

- The ILOs support the creation of a strong European fusion ecosystem

ILO’s corner Q&A

ILO’s corner Q&A

JOIN US ON SLIDO

www.slido.com

#2395891

FUSION FOR ENERGY

SUPPLY CHAIN DAYS

30 Sept – 2 Oct 2025

11:45 – 12:45

Success Stories & Lessons Learned

- **Marotta**
- **R. Kind**
- **AVS**

COMPANY PROFILE

Since 1957, we are specialized in the design and precision mechanical processing for:

- *Aeronautics*
- *Defence*
- *Fusion*
- *Space*

Web Site:
www.marottasrl.it

CONTRACTS SIGNED WITH F4E

La Marotta participated in the contract F4E-OPE-1418 for the manufacturing of BOLOMETER CABLE INSTALLATION TEMPLATES, essential for the diagnostic systems of the ITER project.

Contract ID	F4E-OPE-1418
Client	Fusion for Energy (F4E)
Activity	Manufacturing of installation tooling
Scope	ITER Diagnostics – Bolometer Cable Routing
Year	2022
Status	Delivered

COLLABORATION WITH F4E

- ✓ Clear and structured technical requirements
- ✓ High-level collaboration and responsiveness from F4E teams
- ✓ Efficient communication channels throughout all project phases
- ✓ Access to cutting-edge fusion-related specifications
- ✓ Opportunities to demonstrate our engineering and manufacturing capabilities
- ✓ Positive visibility gained in the European fusion supply chain

Working with F4E allowed us to strengthen our technical processes and grow our presence in the high-technology nuclear sector.

IMPROVEMENT AREAS COLLABORATION

- Simplify administrative and contractual procedures for SMEs
- Improve visibility of upcoming opportunities at earlier stages
- Define main participation criteria to enable early go/no-go decisions
- Enhance support during tender preparation phase
- Facilitate the use of matchmaking tool to improve effective collaboration between SMEs and larger industrial partners

Strengthening SME collaboration requires reducing barriers to entry and fostering a more accessible and supportive ecosystem within the F4E procurement framework.

KEY LESSONS FROM WORKING WITH F4E

- Importance of aligning with nuclear-quality standards from day one
- Strong project planning is essential due to strict milestones
- Continuous technical dialogue improves delivery and quality
- Collaboration improves our positioning in strategic international markets

Working with F4E is demanding but highly rewarding: it pushes SMEs to scale up in quality, discipline, and international competitiveness.

This contract demonstrates Marotta's capability in high-precision manufacturing for the nuclear fusion sector, contributing directly to one of the world's most advanced scientific infrastructures – ITER.

SCAN ME

Thank you for your attention.

SUCESS STORIES & LESSONS LEARNED

Barcelona, Oct. 02/2025

ROLF KIND GMBH – COMPANY PROFILE

Rolf Kind GmbH – Thinking Steel

- Specialized in **open-die forgings** up to 50 tons
- Founded in 1969 – **56 years of experience**
- 100% family-owned SME
- ~100 employees | ~€35 million annual turnover
- Based in Lindlar (Germany), near Cologne
- Export share: up to **80%**

Materials:

High-alloy stainless steels, corrosion-resistant materials, nickel-based alloys, titanium

Markets served:

- Chemical, Petrochemical, Oil & Gas
- Machinery and plant construction
- Nuclear Applications
- **Research & large-scale science projects**

FORGING FOR FUSION –A SUCESS STORY

Kind & Fusion – A success story

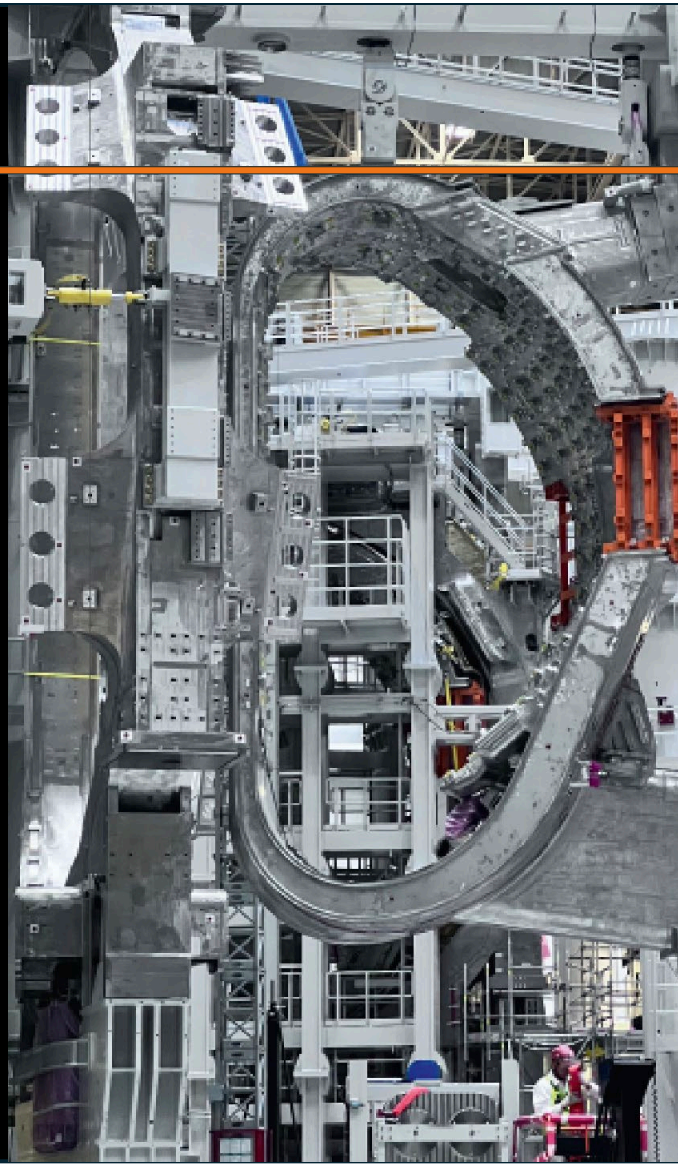
- Forgings for all major fusion programs:
  ITER, **JT-60SA**, **K-Star**, **SPARC**, others
- Over **7,000 tons** of forgings delivered for **ITER** in the last 15 years
- Key components:
  - **TF & CS Coil Systems**
  - **Vacuum Vessel**
  - **Blanket & First Wall**
  - **Divertor Structures**
  - **Diagnostic Heating systems**

Working with 6 Domestic Agencies:

F4E, USDA, RFDA, JADA, ITER-India, KODA

Materials delivered:

F316 LN, F316 LNH, F316 LNM / LNL, F316 L(N) IG (also ESR), XM 19/Nitronic 50, SS Grade 660, Inconel 718, CuCroZr



CHALLENGES AND OPPORTUNITIES

Experiences with Fusion Projects: Insights of a German SME

- Growth of the market drastically increased
- Entry requires approval & qualification – a time-intensive, quality-focused process
- Fusion = research-driven timelines. Flexible, focus on long-term results
- Quality over speed: each component must meet strict safety & material standards

Lesson learned:

- Fusion is not “just another market“
- It requires **passion, patience and precision**
- But it **rewards** reliability and deep technical know-how

FUSION AND THE ROLE OF SMES

Opportunities in Fusion Projects – Shaping the Future

Global competition is rising

- Former European high-tech products now produced elsewhere, often cheaper

Innovation as key differentiator

- Europe must lead through quality, technology & reliability

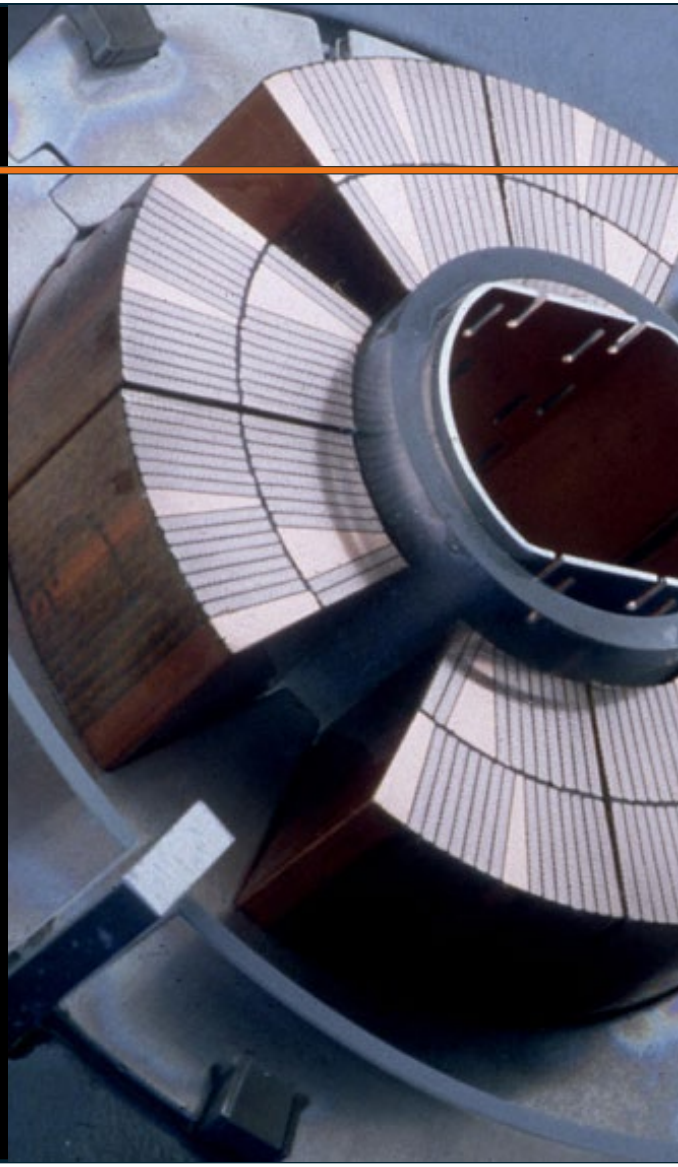
Fusion as strategic opportunity

- Demands excellence – rewards long-term commitment

SMEs as drivers of progress

- Innovative, specialized, globally competitive

Fusion empowers hidden champions – and secures Europe's industrial future.



WORKING WITH F4E – ADVANTAGES

Benefits for Industry Partners

High visibility & large contract volumes

- Access to a multi-billion-euro research project

Technology & know-how development

- Advancement in critical areas (e.g., superconductors, vacuum systems)

European support mechanisms

- Funding, training, technical advice & risk mitigation

Long-term collaboration

- Repeat contracts and reliable project timelines

Networking & partnerships

- Strong connections across Europe's research and industrial landscape

WORKING WITH F4E – CHALLENGES

Our experience as an SME

Complex bureaucracy

- Tendering and reporting are time-consuming
  - Fusion for Energy's legal procurement rules are based on the EU public procurement framework, particularly Regulation (EU) 2018/1046 (Financial Regulation or GFR) and relevant EU Directives

High entry barriers

- Certifications and documentation often difficult to obtain

Extended project cycles & payment terms

- Requires upfront investment and financial endurance

Strict formal requirements

- Occasionally applied rigidly, even when technically unnecessary

The entry is demanding – but achievable with persistence and quality.

IMPROVEMENTS IN RECENT YEARS

Encouraging changes from F4E:

More market surveys

- Early engagement via technical notes
- Better preparation and transparency before tenders

Faster approvals

- Improved turnaround for procedures and manufacturing reports
- Clearer communication with industry partners.

- BUT: It is still not on the level of industry but it looks that F4E is on the right way.

F4E is evolving – towards more effciency and practical collaboration

FUSION FOR ENERGY

A LONG WAY TO GO – AND A ROLE TO PLAY

Why the journey is worth is:

Fusion is a global mission

- Collaboration to create **clean, safe, and sustainable energy** for future generations

Projects are progressing

- From research to realization – with strong industry involvement

SMEs play a key role

- Agility, deep expertise, and personal commitment

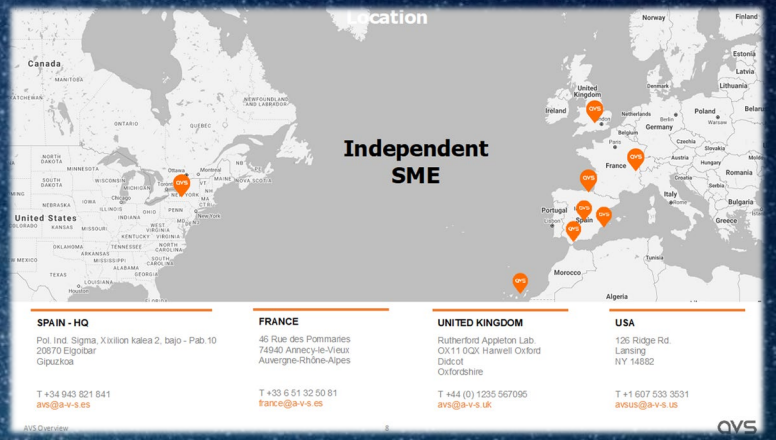
The vision becomes reality

- Entry may be tough, but perseverance opens global opportunities

Our contribution: reliability, technological depth, and long-term commitment.

THANK YOU.

BOOSTING SCIENTIFIC KNOWLEDGE



About us

GLOBAL SME
SET-UP IN 2006

+200 PEOPLE
HIGHLY QUALIFIED PERSONNEL
(80% MSc, MEngs and PhDs)

ISO 9001 & EN 9100

+10.000 m^2 FACILITIES

MODELLING DETAILED-DESIGN ANALYSIS PROCUREMENT MANUFACTURING ASSEMBLY INTEGRATION TEST

From concept to commissioning

"OUR SUCCESS OUR PEOPLE"

F4E contracts

F4E-OMF-0795-01 FWC MITICA Beamline Components

F4E-OMF-0795-01-01 MITICA Beamline Components stage1

F4E-OMF-0795-01-01 MITICA Beamline Components stage2

F4E-OFC-0905-01 FWC Diagnostics Eng. support

F4E-OFC-0905-01-01 F4E-OFC-0905-01-04

F4E-OFC-0905-01-02 F4E-OFC-0905-01-05

F4E-OFC-0905-01-03 F4E-OFC-0905-01-06

F4E-OMF-0847-02 FWC Design activities in Diagnostics (CPTS, CXRS, E

F4E-OMF-0847-02-01 Design CXRS core

F4E-OMF-1126-03 FWC Manuf. FDT, CTS, WAVS

F4E-OMF-1126-03-01 WAVS inV

F4E-OMF-1244-03 FWC Manuf. RNC, CPTS, CXRS

Signature process FWC

What aspects of working with F4E went well for your company

- Professionality* of the Neutral Beam team (Heating and current drive) from different aspects:
  - Follow-up of manufacturing activities, milestones, payment
  - PM and schedule tracking/progress activities
  - Excellent technical complementarity
  - Excellent team spirit / problem solving focussed team spirit (instead of contractual spirit)

- Understanding the challenges that the Diagnostics' group are facing (PDR-FDR phases)

*inc. sound previous experience in manufacturing contracts)

Areas that could be improved to enhance the collaboration between F4E and SMEs

- Better understanding between both organizations
  - Not only at project level
  - But at strategic level

- Outside F4E – SME collaboration (general improvement): to reduce review process/ time to approve docs
- Constrains of the ‘Design team’ & ‘F4E team’ approach impacting the project

Key lessons your company has learned from your experience with F4E

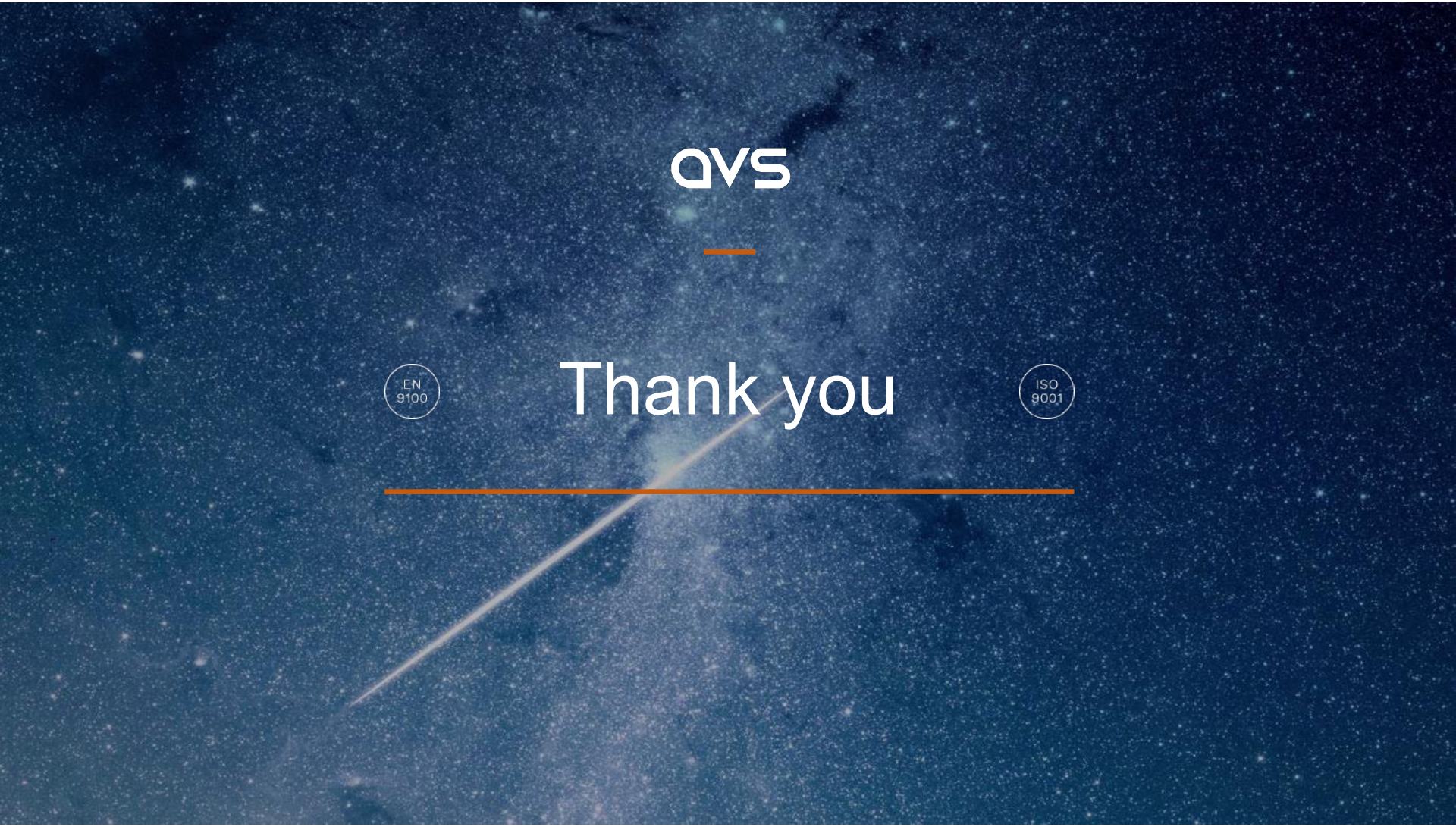
- Working for state-of-the-art developments brings benefits by definition; development of technical solutions, fruitful technical and management discussions with F4E team, consolidation of AVS (medium enterprise) as large system integrator, recognition of F4E of AVS as key reliable supplier...
- Working as a team with F4E is key (mutual recognition, trust, reliability)
- Keeping your strategic supply chain alive is an exercise of responsibility
- During MITICA contract implementation, additional large contracts from Accelerators, Space, Synchrotron areas. Managing challenges, expectations and unexpected issues whilst delivering with top quality

  Medium enterprises (lead) and small enterprises is key receipt to upcoming fusion

  → Technical capabilities, flexibility, speed, agile

  → Equivalent 'real' capacity of large enterprises

  → Improved management of small enterprises as subcontractors vs LEs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Thank you
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FUSION FOR ENERGY

SUPPLY CHAIN DAYS

30 Sept – 2 Oct 2025

12:45 – 14:10

Group Photo & Lunch / Informal Networking

FUSION FOR ENERGY

SUPPLY CHAIN DAYS

30 Sept – 2 Oct 2025

14:10 – 14:15

Stop & Breath Exercise


Stop & Breathe
make time for yourself

FUSION FOR ENERGY

SUPPLY CHAIN DAYS

30 Sept – 2 Oct 2025

14:15 – 15:15

Presentations: F4E Innovation Procurement

Javier Serrano, F4E and Rodia Tsitsikli, F4E

FUSION FOR ENERGY

SUPPLY CHAIN DAYS

30 Sept – 2 Oct 2025

A Technology Development Programme to support EU Innovation and Industry

1. The New Paradigm: Collaboration & Competition

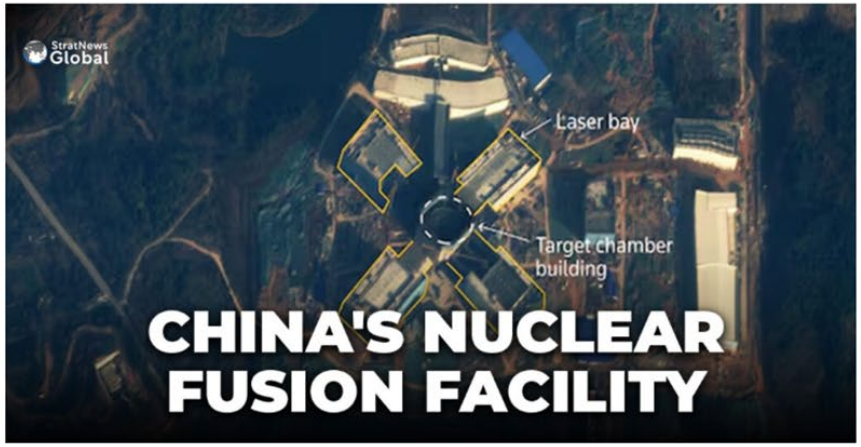
StratNews Global | World News | Neighbours | Videos | Documentaries

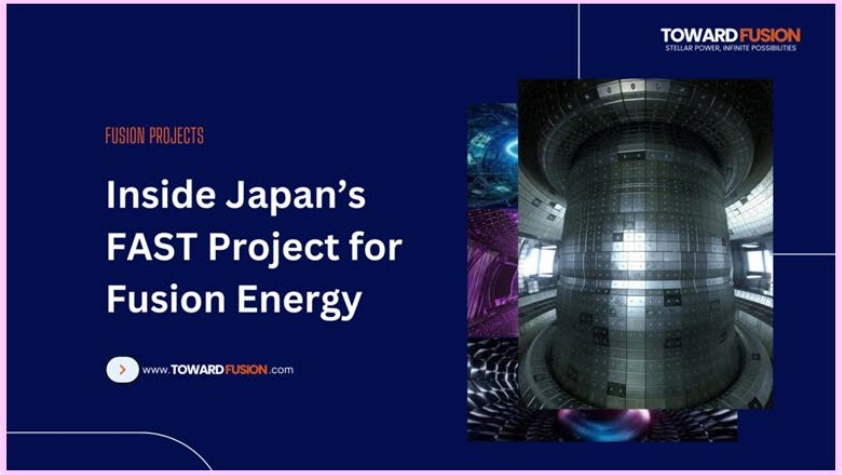
Home › Asia › Satellite Images Reveal China's Massive Fusion Research Facility

Satellite Images Reveal China's Massive Fusion Research Facility

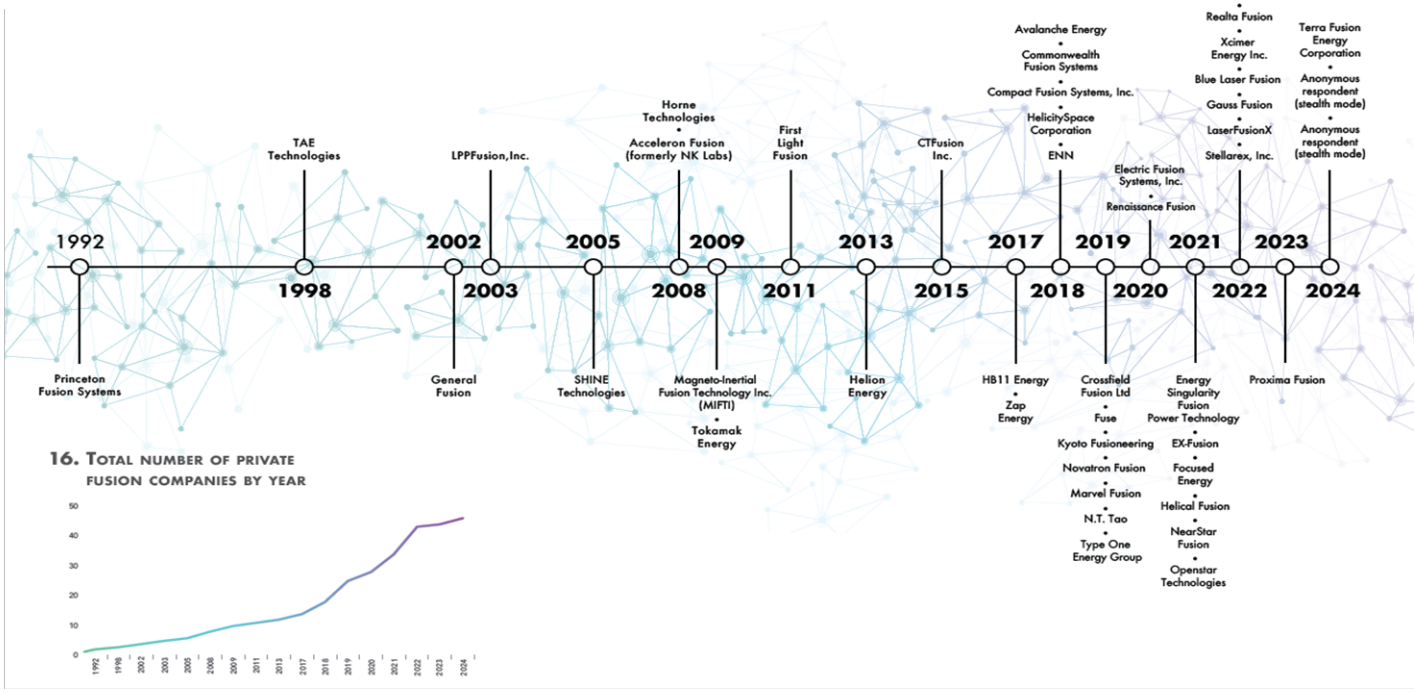
China's fusion research facility is a similar layout to the $3.5 billion U.S. National Ignition Facility (NIF) in Northern California but it is about 50% bigger than the NIF, currently the world's largest.

By **Team StratNews**; - Jan 29 2025, 13:42



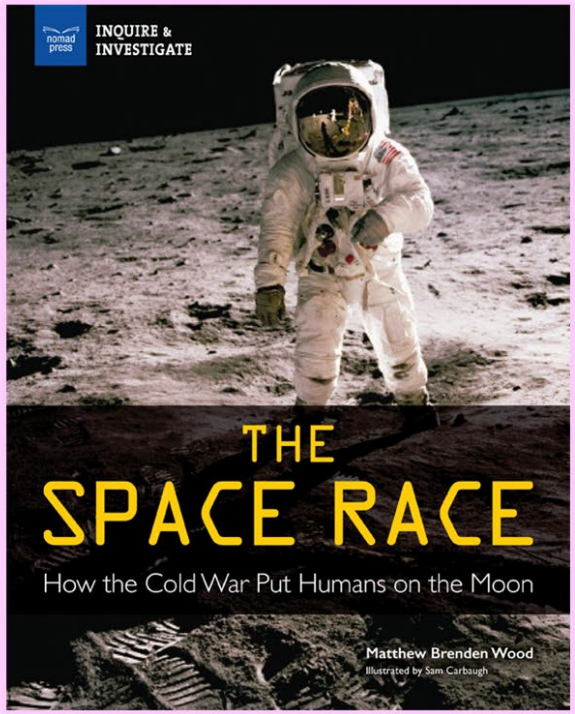


1. The New Paradigm: Collaboration & Competition



Fusion Industry Association FIA – The Global Fusion Industry in 2024

1. The New Paradigm: Collaboration & Competition



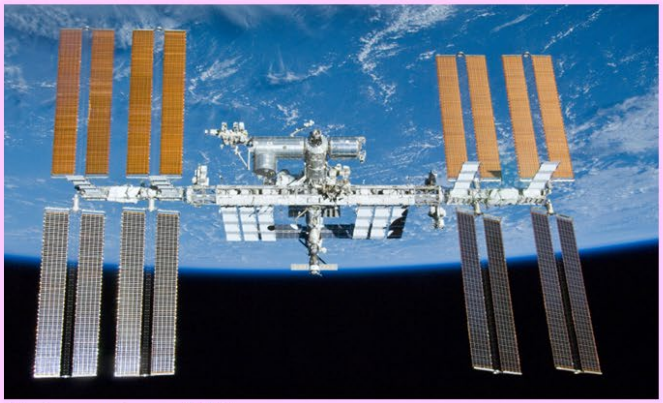
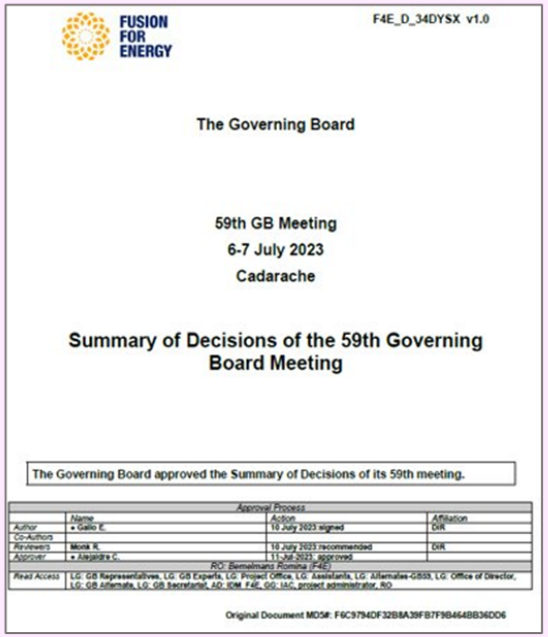


Photo courtesy of ESA

Photo courtesy of ESA

1. The New Paradigm: Collaboration & Competition

2. The F4E Industrial Policy and the TDP



FUSION FOR ENERGY

F4E_D_34DYSX v1.0

The Governing Board

59th GB Meeting
6-7 July 2023
Cadarache

Summary of Decisions of the 59th Governing Board Meeting

The Governing Board approved the Summary of Decisions of its 59th meeting.

Approval Process			
	Name	Action	Affiliation
Author	• Gallo E.	10 July 2023 signed	DIR
Co-Authors			
Reviewers	Monk R.	10 July 2023 recommended	DIR
Approver	• Alejaldre C.	11 Jul 2023 approved	
	RO: Bemelmans Romina (F4E)		
Read Access	LG: GB Representatives, LG: GB Experts, LG: Project Office, LG: Assistants, LG: Alternates-GBSS, LG: Office of Director, LG: GB Alternate, LG: GB Secretariat, AD: IDM F4E, GO: IAC, project administrator, RO		

Original Document MOS#: F6C9794DF32B8A39FB7F9B464BB36DD6

- Procurement Process
  - 1) Strategic procurement
  - 2) SME-targeted recommendations
- Early involvement of EU Industry
  - 3) Implementation of a Technology Development Program (TDP)
  - 4) Better articulation of F4E-EUROfusion collaboration & enhanced involvement of European Fusion Labs (EFLs) expertise

What is the need for a F4E Technology Development Program?

Formal answer i: Governing Board Mandate

Formal answer ii: F4E DIR Vision

"We pave the way for a transition from the research to the industrial sector, and the creation of a competitive European industrial fusion sector"

Other directions: European Union Focus on Innovation

"EU benchmarking shows that Europe is exploiting only half of the potential power of innovation procurement, in particular in R&D procurement". [1]

"Public buyers, acting as lead customer, will need to boost innovation procurement and help businesses to develop innovative solutions in key industrial ecosystems". [1]

" This lack of dynamism does not reflect lack ideas or lack of ambition. It is because innovation often lacks synergies, and because we are failing to translate ideas into commercial success". [2]

European Autonomy

Technological Sovereignty and non-dependence

8. ENERGY TECHNOLOGIES	• Nuclear fusion technologies, reactors and power generation, radiological conversion/enrichment/recycling technologies • Hydrogen and new fuels • Net-zero technologies, including photovoltaics • Smart grids and energy storage, batteries

Resilience

Inherent fragility around high-tech, first-of-a-kind projects

Key strategic priorities for F4E should include:

- **Building Foundations:** F4E should lead or support the establishment of foundational elements, including the supply chain and key technologies, in collaboration with the industry. These foundations are essential for designing and constructing a future pilot fusion power plant.
- **Enhancing Coordination:** As the entity responsible for Europe's contribution to ITER construction and exploitation, and other fusion-related projects, it is recommended that F4E, EUROfusion and the future fusion public private partnership (PPP) be closely aligned to minimise redundancy, enhance collaboration, and maximise synergies across programmes.

F4E TECHNOLOGY DEVELOPMENT PROGRAMME (TDP)

📌 Identify critical areas for R&D activities on advanced technological capabilities to prioritize investment and maximize impact.

📌 Explore the feasibility and suitability of cutting-edge technologies.

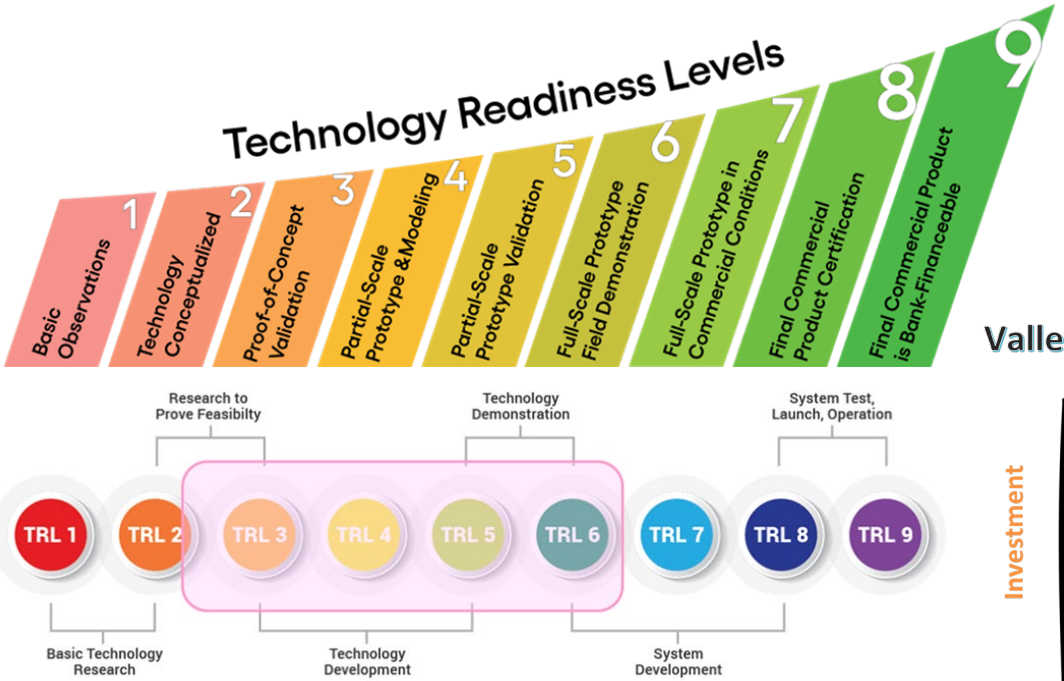
📌 Ease availability of fusion key enabling technologies (right technologies at the right time!) for commercial fusion.

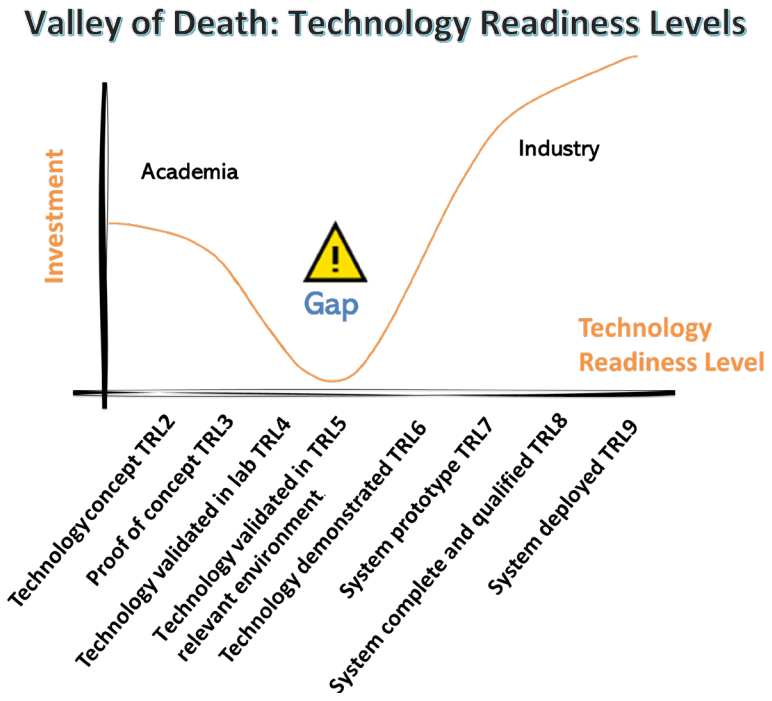
📌 Promote strategical technology actions for future-proofing the competitiveness of European Fusion Supply Chain.

📌 Address critical technologies gaps for European fusion technology non-dependence.

ESA
Technology Development
ROI

3. The F4E TDP Concept

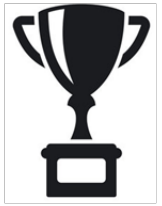




3. The F4E TDP Concept

ADVANTAGES

- R&D activities fully financed by F4E **100%**
- In support of a competitive European Fusion Supply Chain



- Ownership by the company of IP rights generated

- Work based on Best Effort approach

- Simplified Technical Specifications (functional requirements)
- Ad hoc simplified Specific Contract terms
- Ad hoc simplified Tender Provisions

Simplify

- Quick Procurement Lead Times

4. The F4E TDP Activities

TDP2024

R&D Pilots 2024

R&D CONTRACTING

Gradient joints on Tungsten/CuCrZr

Real-time personal monitor for Tritiated Water vapor in air

TDP2025

FIRST YEAR FORWARD

CALL FOR IDEAS

160

52

NEXT STEP FUSION

KYOTO FUSIONEERING

ENEA

EUROfusion

KIT

ASG SUPERCONDUCTORS

GAUSS FUSION

IBERIA

eni

Ciemat

4. The F4E TDP Activities

TDP2025

FIRST YEAR FORWARD

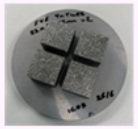
R&D Actions 2025

R&D CONTRACTING

European Pyrobreaker - Development of a Fast DC Circuit Breaker

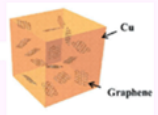
Fire detection based on optical fiber to operate in a harsh radiation environment

R&D CONTRACTING

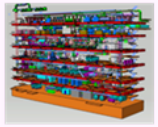


Additive Manufacturing of Tungsten Using Low-Cost Powder

Develop Fusion Relevant FM-LiDAR technology within Europe



Graphene-reinforced copper-alloys for improved properties



Multifunctional facility for testing packing and processes for water detritiation purpose

4. The F4E TDP Activities

TDP2025

TECHNOLOGY ROADMAPPING

FIRST YEAR FORWARD

COLLABORATIVE

Technology Development Programme
—
Fuel Cycle Technology Mapping Workshop
March 2025
FUSION FOR ENERGY EUROfusion

Technology Development Programme
—
Artificial Intelligence Mapping Workshop
8 April, 26-27 May
FUSION FOR ENERGY

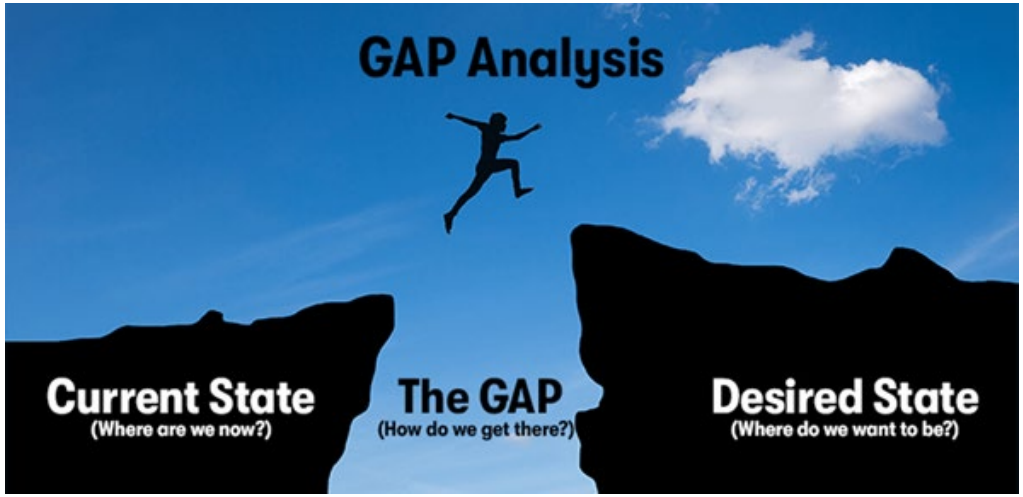
Technology Development Programme
—
Magnets Technology Mapping Workshop
2025
FUSION FOR ENERGY EUROfusion CERN

Technology Development Programme
—
Advanced Manufacturing Mapping Workshop
September 2025
FUSION FOR ENERGY

Critical Technologies Mapping

MORE TO COME

4. The F4E TDP Activities



FUSION
F4E HUB

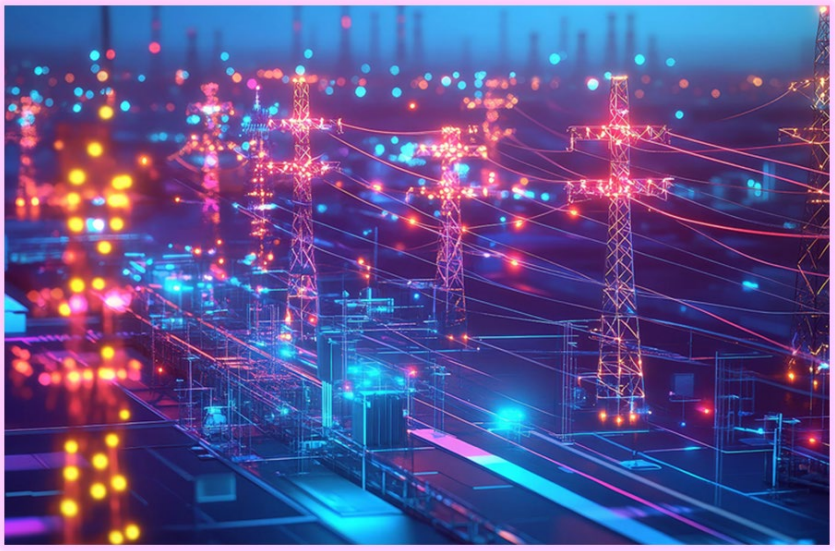


Photo courtesy of Electrical Review

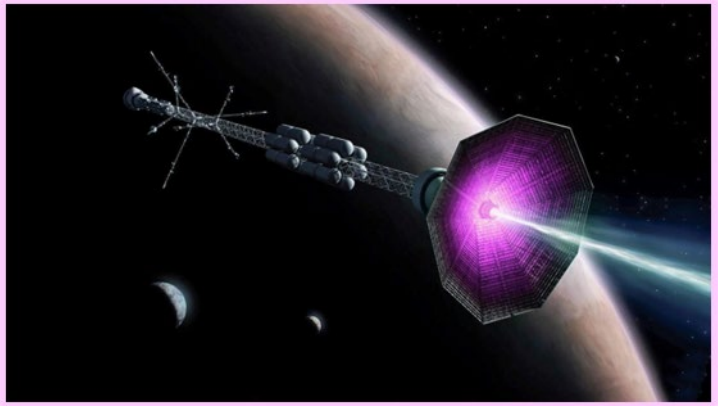


Photo courtesy of ESA

FUSION FOR ENERGY

SUPPLY CHAIN DAYS

30 Sept – 2 Oct 2025

Exploring innovative collaboration with our supply chain for fusion technology development

1. Driving Innovation: How the TDP Supports F4E's Vision and Industry Goals

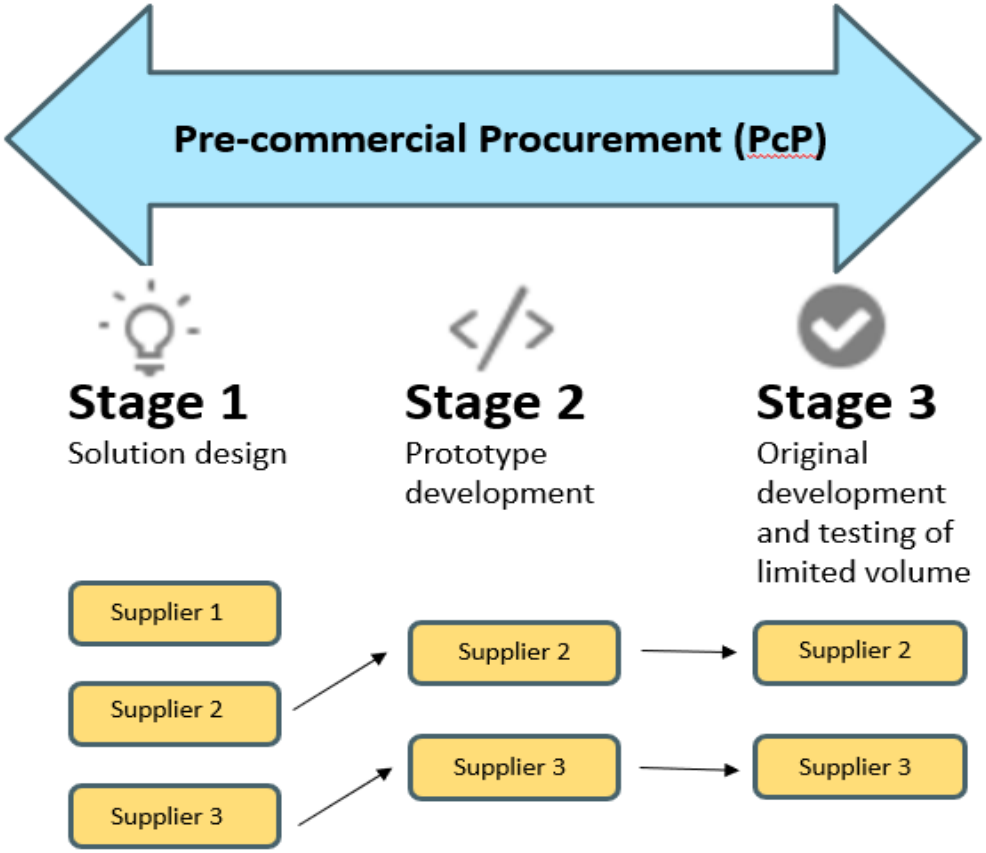
The TDP directly implements Action 3 of F4E's Industrial Policy, advancing the shift from research to industrial deployment and supporting a competitive European fusion sector

KEY FEATURES of the TDP and how they align with F4E's vision

Pre-commercial procurement	F4E funds R&D for technologies not yet available on the market, bridging the gap between early-stage research and commercial readiness.
Flexible procedure	Negotiated procedure
Industry-research collaboration	Encourages partnerships between industry and public fusion research labs to foster knowledge exchange and skill development.
Favourable IP terms	Contractors retain intellectual property rights if they commit to exploiting the results, incentivising participation and investment.
Market foresight	Designed to avoid monopolies and promote a diverse, competitive supplier base for fusion technologies in Europe.

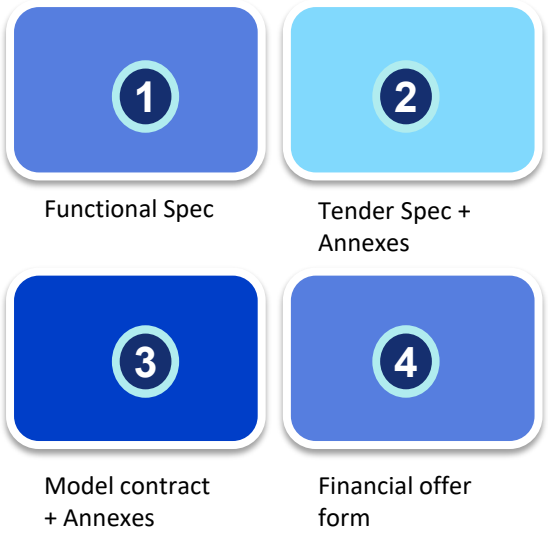
2. PCP Overview

PCP targets innovative solutions for long-term public challenges through staged, competitive R&D services to ensure best value for money.



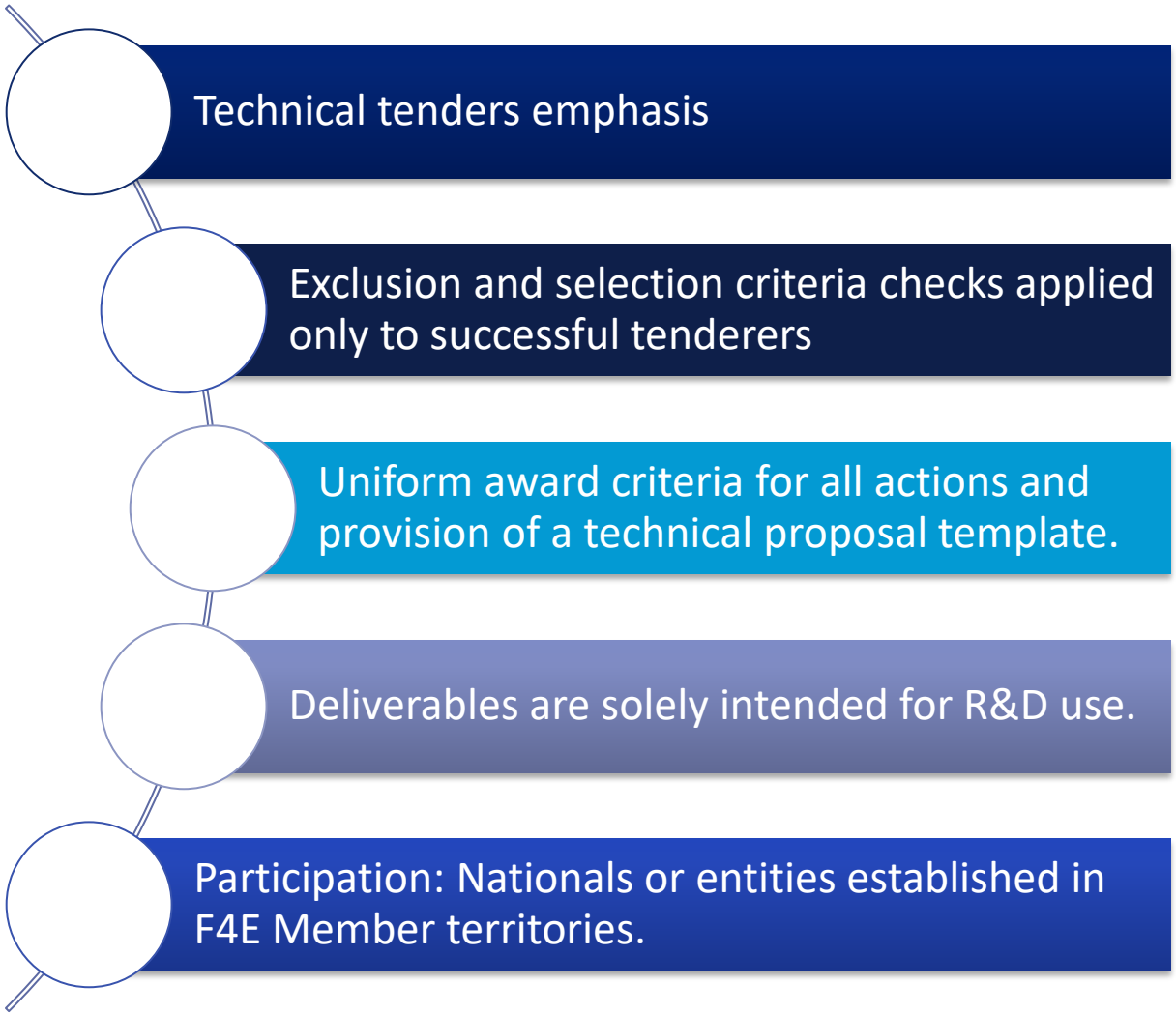
3. Simplifications

TDP Tender Modalities Simplifications and Tender Package



- Quick lead times – 4 months from launch to first contract signature
- Reduced administrative documents
- Exempted from safety and quality requirements associated with the ITER project

4 Specificities

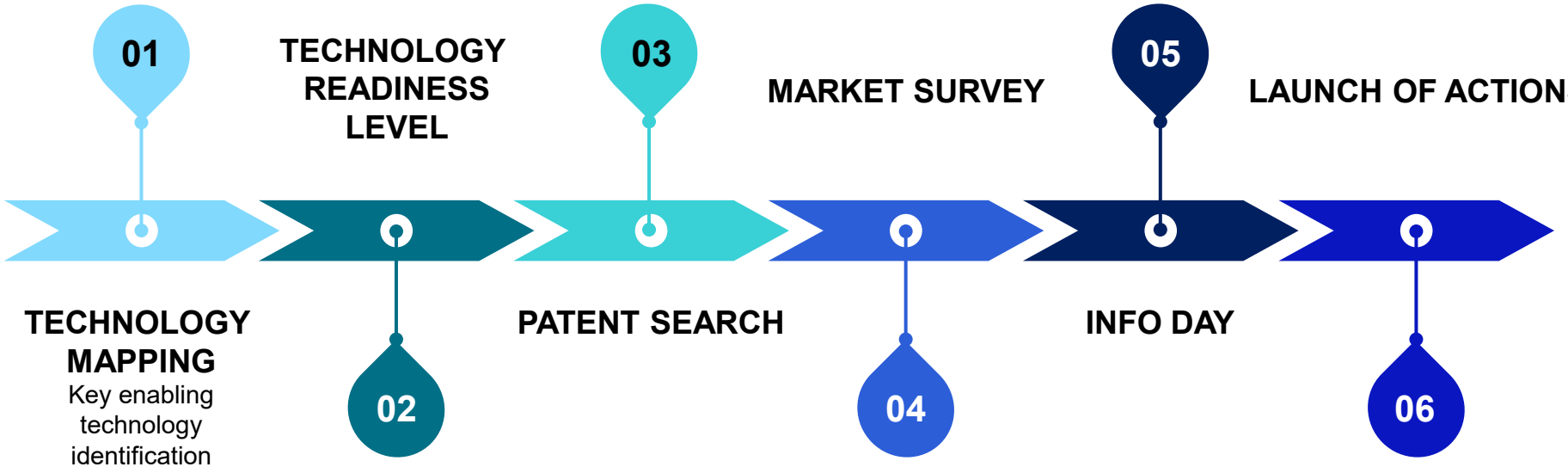


5. Contractual simplifications

TDP Model Contract	Standard lump sum service contract
Best Efforts required	Certain **results** required
No warranty	**Warranty**
Possibility of **no delay damages or liability for defects** or **not satisfactory results – if Best Efforts made**	**Delay damages and liability** for defects or not satisfactory results
Pre-financing up to **70%**	**Pre-financing** up to **30%**
Liability capped at **30%** of the Contract Price	**Liability** capped at **100%** of the Contract Price
No Management Specifications, applicable documents	**Management Specifications**, applicable documents
Supplier owns **Foreground**	**F4E** owns **Foreground**

6. From Concept to Action

FUSION FOR ENERGY SUPPLY CHAIN DAYS



7. Pilot phase

Overview of pilot projects and early implementation

1

Pilot 1. R&D for a Personal monitor for Tritiated Vapor in Air

Development of a prototype of a wearable real-time tritium concentration in air monitor discriminating tritiated water vapor from tritiated hydrogen gas.

2

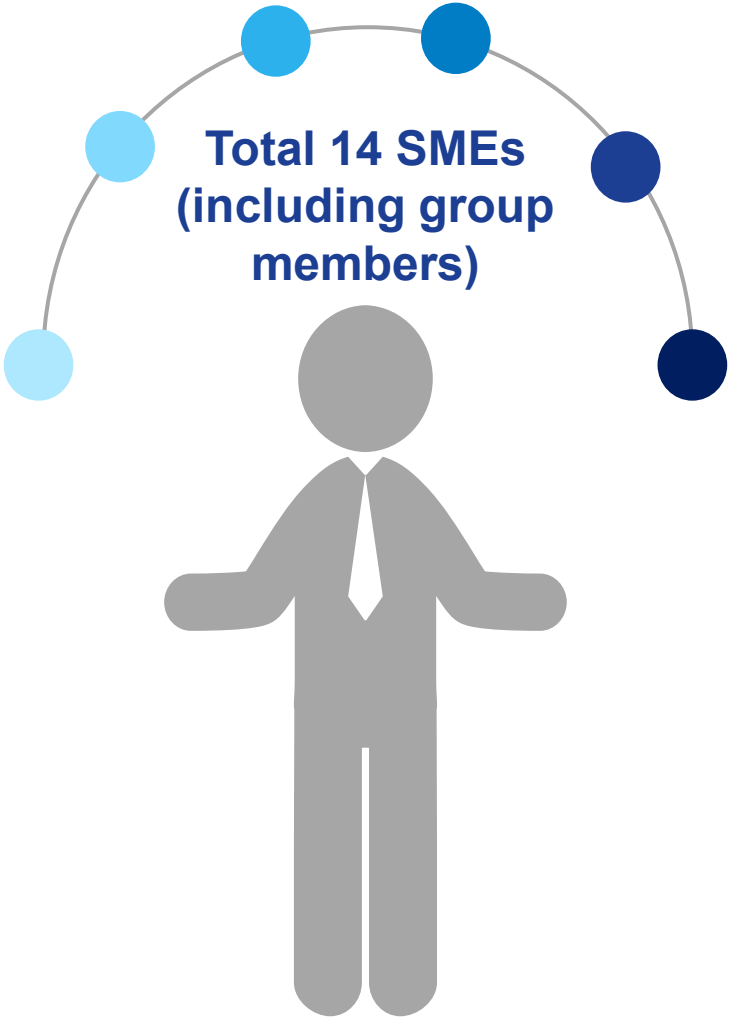
Pilot 2. Feasibility study to manufacture Tungsten to CuCrZr gradient joints

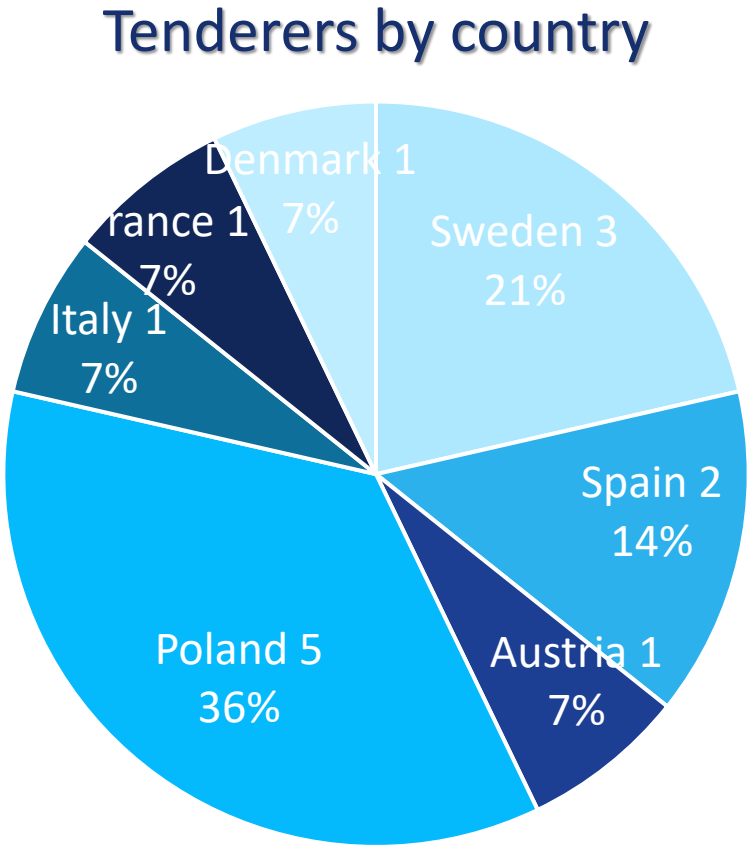
Feasibility study to demonstrate an unscalable industrial manufacturing route of plasma facing material consisting of Tungsten (W) as top armour joined to CuCrZr as heat sink.

- 5 contracts signed following launch of two pilot projects.
- **Objective**: Develop and test innovative technologies to pave the way for commercialization.

8. First pilot - outcomes

FUSION FOR ENERGY SUPPLY CHAIN DAYS





FUSION FOR ENERGY

SUPPLY CHAIN DAYS

30 Sept – 2 Oct 2025

15:15 – 15:45

Coffee Break & Networking

FUSION FOR ENERGY

SUPPLY CHAIN DAYS

30 Sept – 2 Oct 2025

15:45 – 16:30

Presentation: Assisting SMEs in Engaging with F4E Supply Chain

Benjamin Perier, F4E

SMEs with F4E Supply Chain

Facts & figures

Tools for Business

QA & documentation

Some facts & Figures

FUSION FOR ENERGY SUPPLY CHAIN DAYS

SMEs in the EU ecosystem (estimations)

- >99% of EU companies are SMEs… mostly in services or retail
- Industry-related SMEs are 20–25% of all SMEs (~38% in manufacturing)

What about SMEs in Fusion?

- Large companies in capital investment and infrastructure.
- SMEs active in component manufacturing, project management and supply chain logistic
- **>50% of F4E Supply Chain companies are SMEs**.

SMEs and certifications

- ISO 9001 adoption among SMEs is slightly lower than in large companies.
- Perceived barriers: cost, admin burden, lack of perceived benefit.

F4E has launched initiatives to:

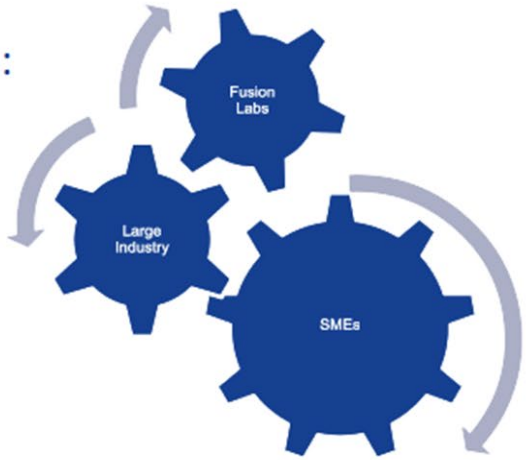
- Facilitate partnerships with larger firms + “premium support” still active / ILOs
- Provide guidance on quality and nuclear safety standards

SME-friendly Procurement Practices
Promote Partnerships

FUSION FOR ENERGY
SUPPLY CHAIN DAYS

Promote Partnerships through:

- Industry Portal
- ILOs
- Information Days
- Market Surveys



Tools to assist SMEs...

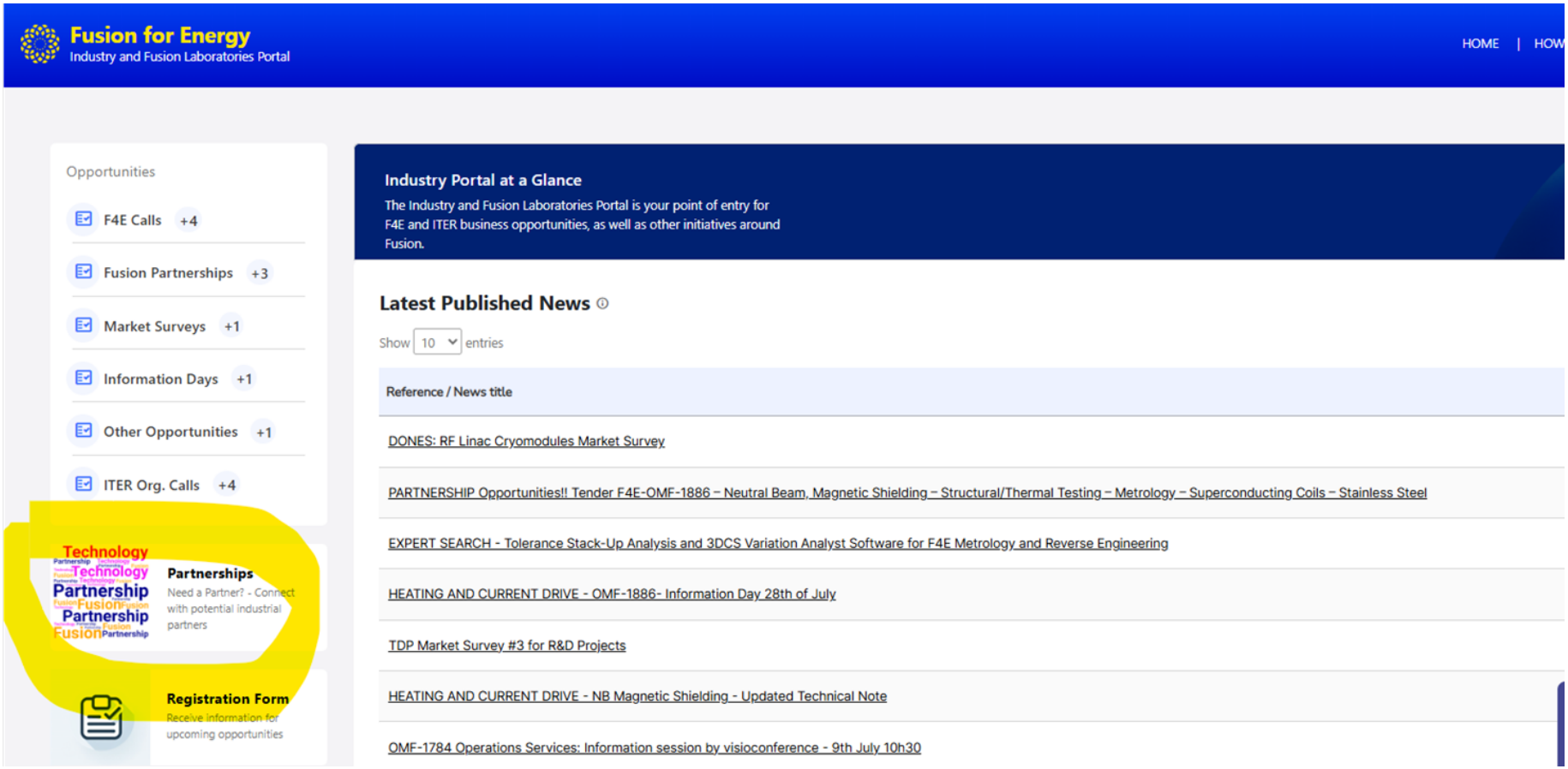
FUSION FOR ENERGY
SUPPLY CHAIN DAYS

mehdi.daval@f4e.europa.eu

benjamin.perier@f4e.europa.eu

Partnership - Access

FUSION FOR ENERGY SUPPLY CHAIN DAYS



Partnership – Make your point

FUSION FOR ENERGY

Partnership

Are you looking for partner to fulfill the requirements of current or forthcoming F4E business opportunity?
Do you have relevant expertise, technologies, or interesting raw materials to offer?
Or do you simply want to introduce your company and engage in the EU Fusion Industry Supply Chain?

Whether you are a large corporation, an SME, an established fusion player or a newcomer to the field, this is your starting point.

In just a few minutes, you can submit an offer or request below. Our Market Analysis team will review your submission and feature it in the Fusion Partnerships section of the F4E Industry Portal.

Thank you for joining us and contributing to the future of fusion!

F4E Market Analysis and Techno Transfer Group

* **Description (Please describe what you are offering / looking for. If related to a specific Call for Tender or Business Opportunity with F4E or ITER IO please indicate the name and reference)**

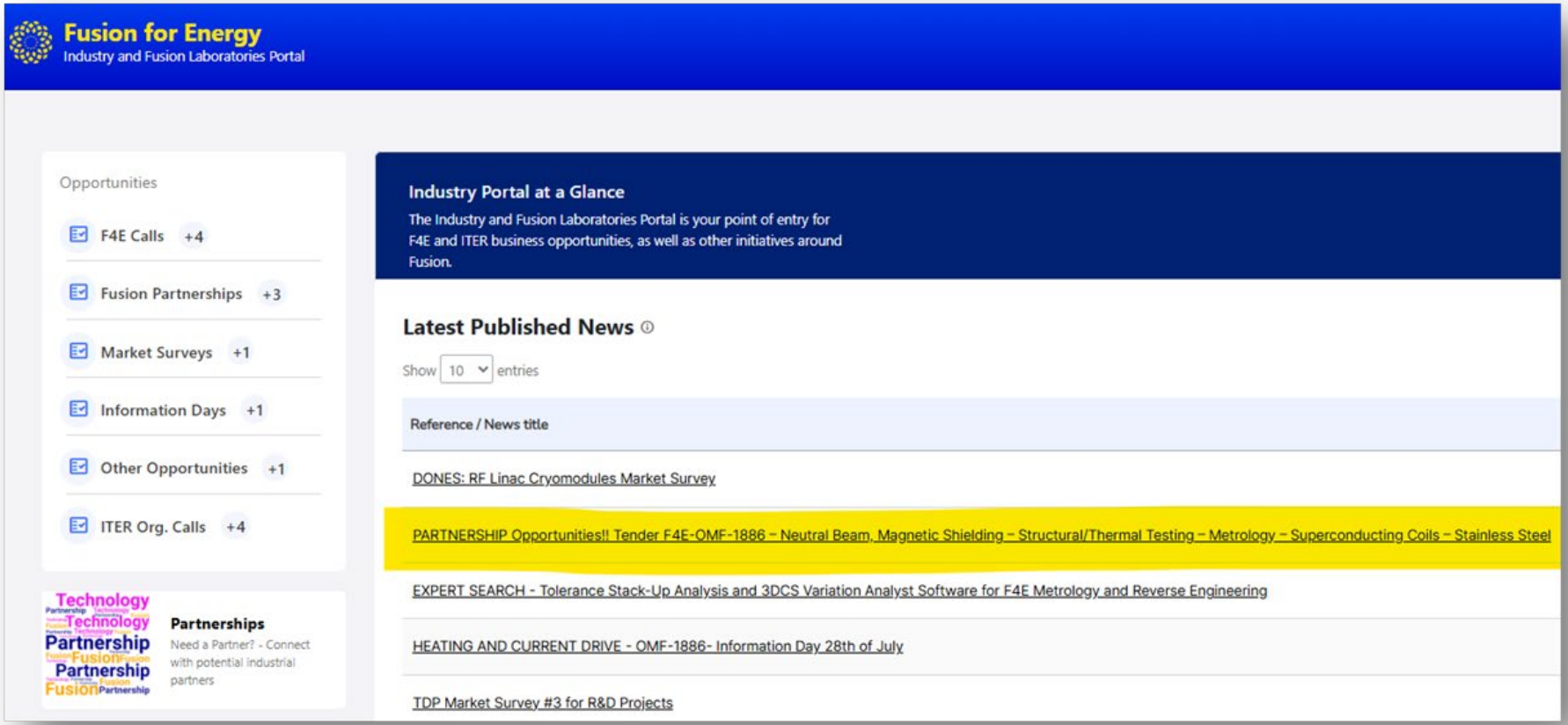
* **What form of collaboration would you like to promote?**

- ○ Offer - my organisation has relevant expertise, technologies, or raw materials to offer
- ○ Request - we are looking for specific expertise, technologies, or raw materials
- ○ Both of the above

* **Please indicate below the collaboration preferences you wish to highlight (you can select more than one)**

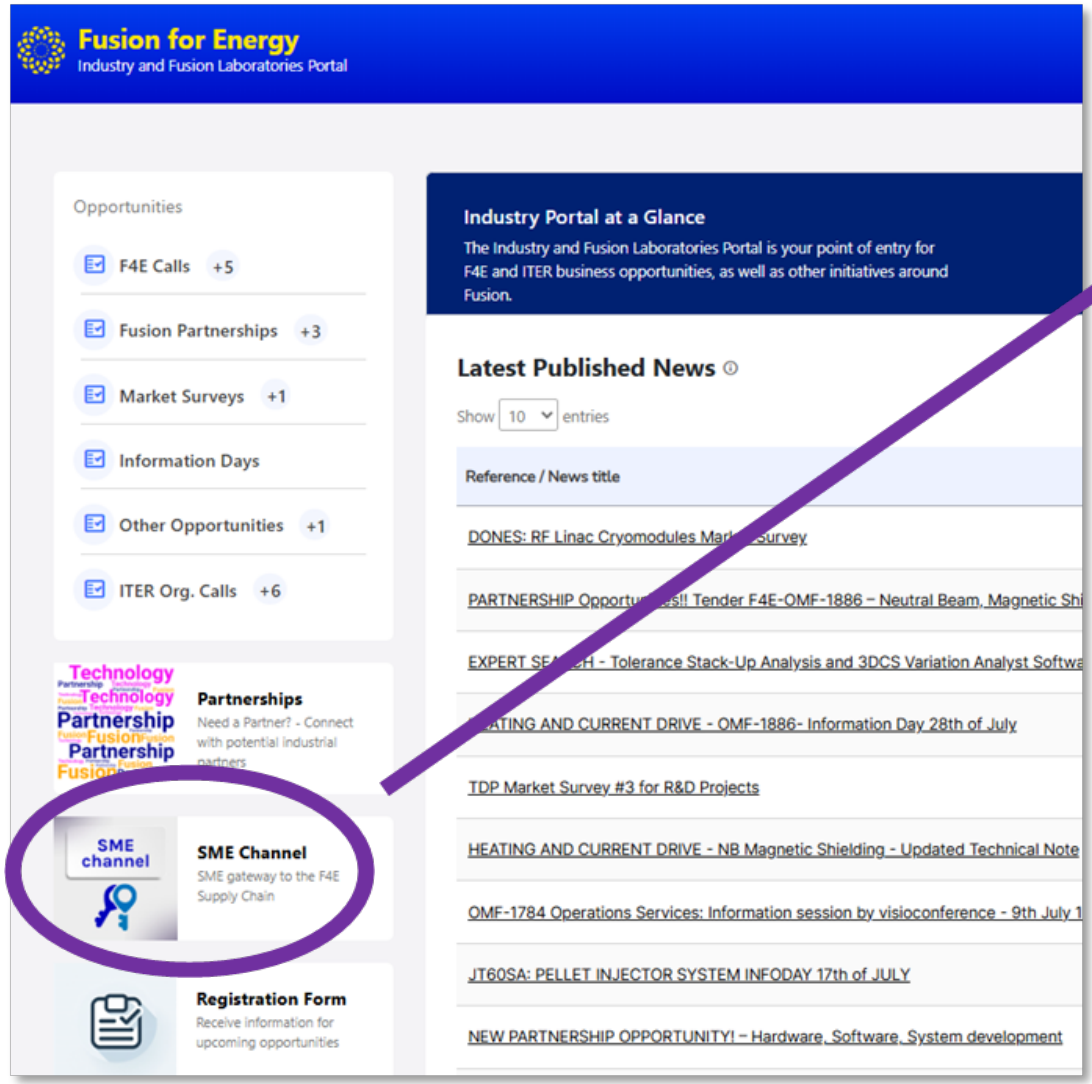
- ☐ Specific expertise and technologies
- ☐ Specific materials
- ☐ To sub-contract to partners
- ☐ To co-contract with partners
- ☐ Sharing general technologies and business presentations
- ☐ Other

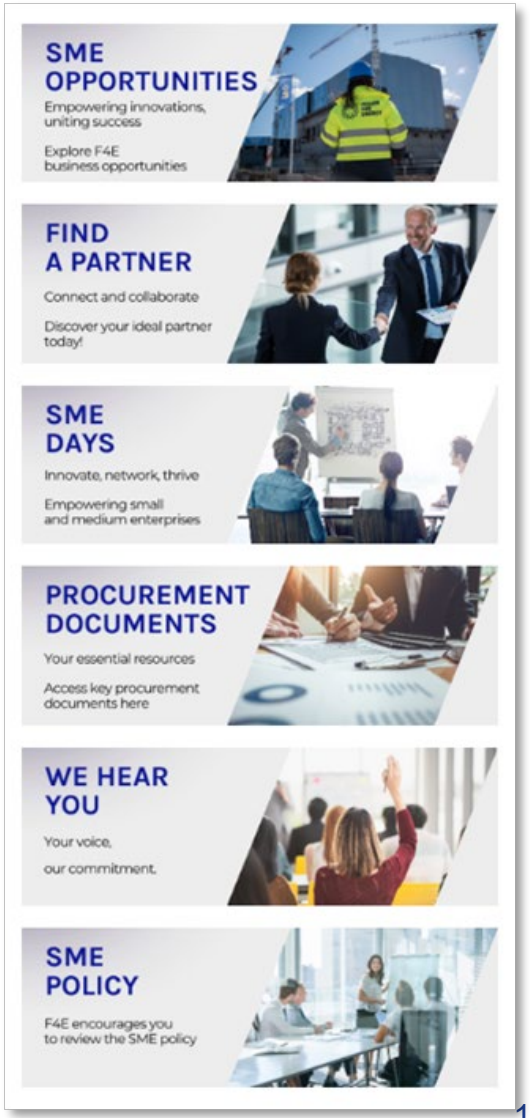
Partnership – We advertise



SME Channel

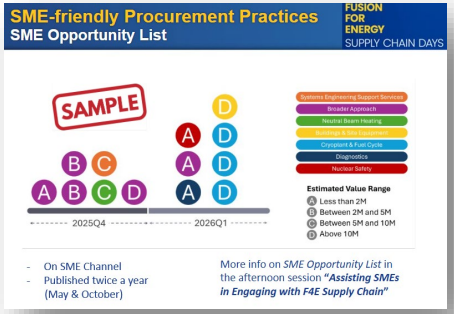
FUSION FOR ENERGY SUPPLY CHAIN DAYS





SME Channel – Upcoming calls

FUSION FOR ENERGY SUPPLY CHAIN DAYS



A < 2M
B Between 2 and 5M
C Between 5 and 10M
D > 10M

DRAFT

PROGRAM	Title	Value Range	Estimated Launch Date
BROADER APPROACH	Supply of Gamma ray detector for JT-60SA	A	2025-Q4
BROADER APPROACH	Computarised maintenance management system	A	2026-Q1
BROADER APPROACH	Supply of a Doppler Reflectometry for JT-60SA	A	2026-Q2
BROADER APPROACH	Supply of stray radiation detectors for JT-60SA	A	2026-Q2
DIAGNOSTICS	Procurement and Delivery of Support for Manufacturing & Assembly for CTS	A	2026-Q1
NUCLEAR SAFETY	Nuclear Safety Culture assessment	A	2026-Q1
TBM, IFERC & DEMO	EUROFER 97 Procurement	A	2026-Q2
TBM, IFERC & DEMO	Procurement of Stainless Steel for TBM Sets	A	2026-Q2
BROADER APPROACH	Prototypes of a Low-Beta Half-Wave Resonator and RF-Power Coupler for SRF	B	2025-Q4
BROADER APPROACH	Procurement of Lithium raw material	B	2025-Q4
FUTED	Collective 2026 R&D Selected Action	C	2025-Q4
NEUTRAL BEAM HEATING	Procurement of Steel for NBI 1&2	C	2025-Q4
SYSTEMS INTEGRATION	Systems Engineering Support Services	C	2025-Q4
BROADER APPROACH	RF Power system (DONES	D	2025-Q4
BUILDINGS & SITE EQUIPMENT	Design & Construction of Buildings 42, 43, 57, 58, 59 & 60	D	2026-Q1
CRYOPLANT & FUEL CYCLE	Manufacture for Heating And Diagnostic Neutral Beam Cryopumps	D	2026-Q1
CRYOPLANT & FUEL CYCLE	REMS Qualifications and Procurement main monitors - directly manufacturers	D	2026-Q1
CRYOPLANT & FUEL CYCLE	Final design, manufacturing and delivery of Helium Refrigerator System	D	2026-Q1
CRYOPLANT & FUEL CYCLE	Design to Delivery for Water RAP- purification unit and skids	D	2026-Q2
DIAGNOSTICS PROGRAMME	PORT Structures Manufacture, Diagnostic Integration, Assembly & Test	D	2026-Q2
BROADER APPROACH	LIPAc maintenance and obsolesence management - AF16	Unknown	2025-Q4
ELECTRICAL ENGINEERING - I&C	Provision of Safety I&C engineering services	Unknown	2025-Q4
ELECTRICAL ENGINEERING - I&C	Provision of I&C Cubicle and Hardware assembly services	Unknown	2026-Q1
FUTED	Mechanical analyses of ITER components	Unknown	2025-Q4
FUTED	Plasma Engineering Studies Part II	Unknown	2026-Q1
FUTED	Engineering Support services in the area of Thermo Hydraulics and Fluid Dynamics	Unknown	2026-Q2
FUTED	PPM Support	Unknown	2026-Q1
TBM, IFERC & DEMO	WCLL Water Cooling Systems (WCS) & Coolant Purification System (CPS) FD & Proc	Unknown	2025-Q4
TBM, IFERC & DEMO	PbLi loop Final Design & Procurement	Unknown	2025-Q4
TBM, IFERC & DEMO	NAS Final Design & Procurement	Unknown	2025-Q4
TBM, IFERC & DEMO	Ancillary Equipment Unit & Pipe Forest (AEU & PF) Final Design & Procurement	Unknown	2025-Q4
TBM, IFERC & DEMO	WCLL & HCCP TES & TAS Final Design & Procurement	Unknown	2025-Q4
TBM, IFERC & DEMO	Final Design of WCLL and HCCP TBM Set	Unknown	2026-Q1
TBM, IFERC & DEMO	ANB conformity	Unknown	2026-Q2

Technology Transfer - Principle

Matching between Technology Offers & Market Needs

Facilitators of business opportunities

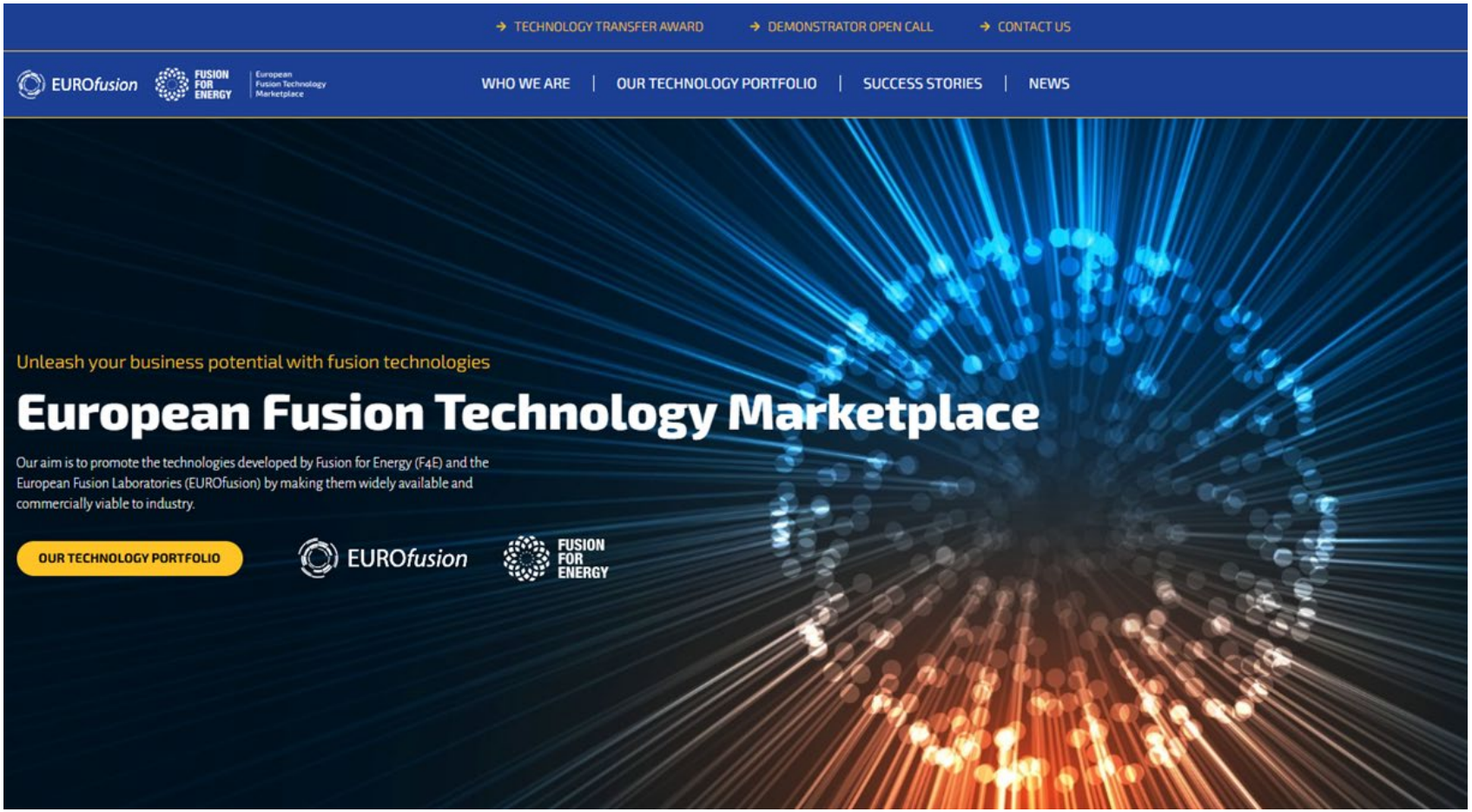
Developers of F4E technologies looking for new markets

EUROfusion | FUSION FOR ENERGY | European Fusion Technology Marketplace

Connecting companies and ecosystems, cross-fertilization

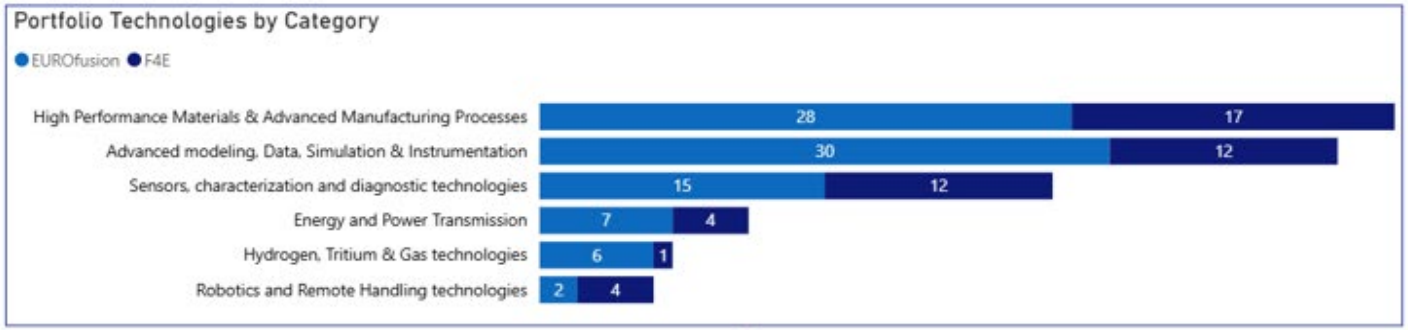
Industry looking for innovation (new technologies, new products)

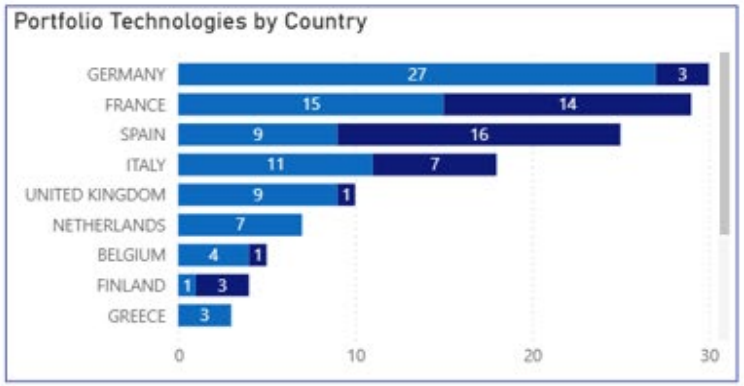
Technology Transfer - Showroom

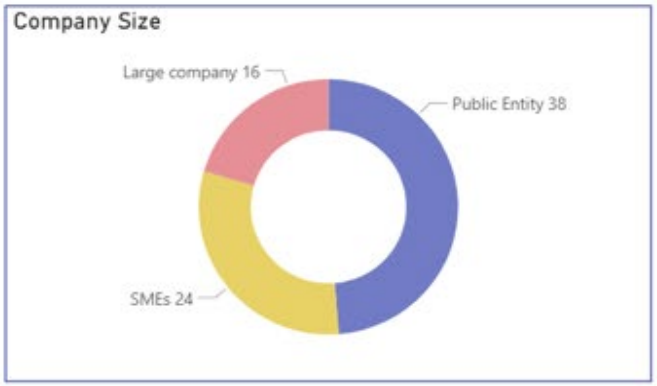


Technology Transfer - Status

Technologies in Portfolio	Companies	Countries
131	78	14







Technology Transfer - Examples

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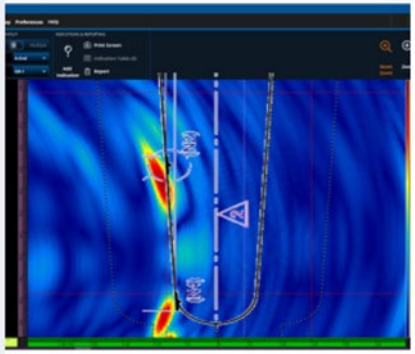
SIL 3 Signal Conditioner for Hydrogen Sensors

Hydrogen, Tritium & Gas technologies

READ MORE



Novel phased-array ultrasonic techniques for the nondestructive testing (NDT) of nuclear fusion materials

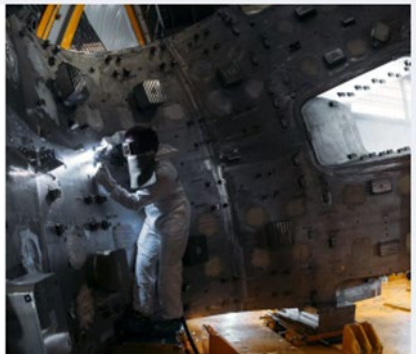
Advanced modeling, Data, Simulation & Instrumentation

READ MORE

New Artificial Intelligence models for an efficient processing of phased-array ultrasonic testing data

Advanced modeling, Data, Simulation & Instrumentation

READ MORE



Success Stories

Revolutionising Cancer Research with Fusion Imaging Technology

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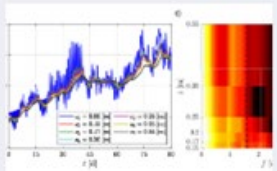

Tracking Heat Transport from Fusion to Groundwater Research

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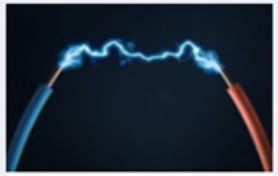

Advancing Electrical Safety with Fusion-Inspired Arc Modelling

READ MORE

Innovative Tungsten Alloys Extend the Life of Corona Discharge Electrodes

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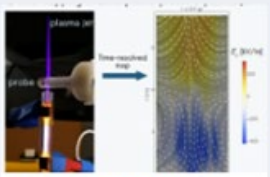

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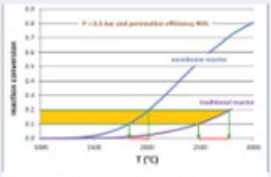

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Most required Standards & Requiremen

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🔧 Technical and Quality Standards

- ISO 9001 – Quality Management Systems - Baseline requirement to ensure consistent quality in manufacturing and services.
- ISO 14001 – Environmental Management Systems construction or manufacturing to ensure environmental compliance.
- ISO 45001 – Occupational Health and Safety: Especially relevant for companies working on-site or in hazardous environments.
- EN/IEC Standards – for electrical, mechanical, and instrumentation components. These include EN 10204 for material certification, IEC 61508 for functional safety, IEC 60709 for nuclear installations.

🧪 Nuclear and Fusion-Specific Requirements

- RCC-MRx – French code for design and construction of nuclear components.
- ASME Boiler, Pressure Vessel and piping Code (BPVC)
- PED (Pressure Equipment Directive) – Required for components under pressure within the EU.
- EN ISO 9606 – for welding personnel.
- EN ISO 9712 – for non-destructive testing personnel.

What is needed and when

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✅ **Almost always**:

- ISO 9001 – Quality Management System (mandatory for most suppliers).
- EN ISO 9712 / EN ISO 9606 – For NDT and welding personnel when there is a related activity in the contract.
- PED compliance – For pressure equipment.
- Traceability – Required across all contracts.

🔍 **Variable Requirements:** standards and certifications depending on:

- Type of contract: e.g., mechanical components vs. software development.
- Risk level: higher-risk components (e.g., vacuum vessel parts) require stricter nuclear-grade standards like RCC-MRx or ASME BPVC.
- Location of work: on-site work at ITER or remote manufacturing may trigger different safety and environmental standards.
- Technology domain: diagnostics, cryogenics, magnets, etc., each have their own technical norms, e.g. contact for remote handling systems might require robotics safety standards (ISO 10218), contract for cryogenic systems might require EN 13458 and ISO 21013.

ISO 9001 - the F4E offer

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What is meant by "European equivalent" to ISO 9001?

Any QMS or certification :

- aligned with ISO 9001 principles and recognized within EU.
- having documented and auditable quality practices.

ex. UNE-EN ISO 9001 (Spanish version of ISO 9001) or Sector-specific standards like EN9100 (aerospace), ISO/TS 16949 (automotive).

Internal QMS audited by 3rd parties even if not formally certified.

- F4E accepts these equivalents if they meet the contract's QA requirements (Annex A of each tender).

How SMEs can qualify [without ISO 9001]?

- Demonstrate that there is a robust management system in place (providing Quality manual, internal procedures).
- Submit a Project & Quality Management Plan (PQMP) tailored to the contract and detailing the methodology to comply withy Quality requirement (staff qualifications, traceability, control plans...)

EU Supporting tool

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💼 **Your Europe – Business**

- What it offers: Funding opportunities. Training and partnerships. Guidance on certification and compliance. Tools for public procurement eligibility and DD.
- Use case: SMEs find tailored support for certification-related needs (QMS).

🧠 **Enterprise Europe Network (EEN)**

- What it offers: Access to Digital Innovation Hubs for technical support. Sustainability. Advisors to guide SMEs on standards. Crash courses in AI, cybersecurity, compliance.
- Use case: SMEs can build capacity for certification through training/expert support.

🧪 **ACCOMPLISH Project**

- What it offers: AI-based tools for automated certification and compliance. A Compliance Digital Passport for traceability.
- Use case: SMEs can streamline certification processes, reduce consultancy costs.

📏 **Standardization (CEN-CENELEC Helpdesk)**

- What it offers: Free advice and mentoring on standards. Monthly newsletters and expert contacts. Access to European and international standardization bodies.
- Use case: SMEs can get direct support to implement standards like ISO 9001.

💶 **Standards and Awards for SMEs Grant Scheme**

- What it offers: Up to €20,000 in funding for certification advisory services. Covers ISO 9001/14001, and other management system standards. Available until Dec. 2026.
- Use case: SMEs can apply for financial support to cover certification costs.

EU Supporting tool (continued)

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Horizon Europe

- Funding for research/innovation projects (support for QA/certification).
- For SMEs involved in high-tech sectors like fusion, materials science, and engineering.
- How it helps: Certification costs can be included in project budgets, especially when linked to market readiness or technology validation.

Single Market Program (SMP)

- Managed by: European Innovation Council and SMEs Executive Agency (EISMEA).
- Focus: Improving SME access to finance, markets, and standards.
- Support: Includes funding for training, certification, and participation in standardization processes.

Strategic Technologies for Europe Platform (STEP)

- Launched in 2024 to support critical technologies including fusion.
- Offers: Financial support (EUR 10–30 million) to SMEs and startups for scaling up, which may include certification and QA investments.

European Social Fund Plus (ESF+)

- Purpose: Helps SMEs improve competitiveness through training and capacity building.
- Certification relevance: Can fund training programs for ISO standards and QA systems.

https://single-market-economy.ec.europa.eu/smes_en?prefLang=es

Thank you for your attention

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SUPPLY CHAIN DAYS

30 Sept – 2 Oct 2025

16:30 – 17:15

One-on-One Consultation: Meeting F4E Procurement Officers & Contract Managers

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SUPPLY CHAIN DAYS

30 Sept – 2 Oct 2025

17:15 – 17:30

Closing Remarks for the Day

Julie Abou Yehia, F4E

Wrap up of 2nd SME day

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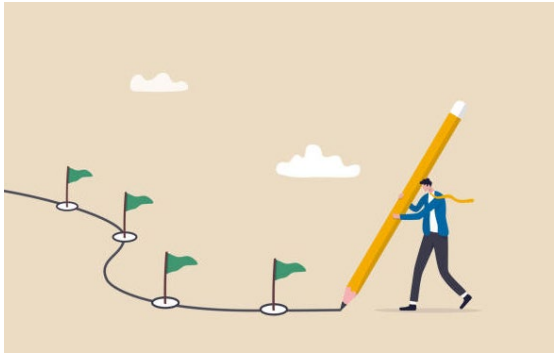
SUPPLY CHAIN DAYS



A day to present our continuous work to enhance collaboration with SMES

A day to connect together industry, ILOs, F4E…

A day to keep on shaping our collaboration in the future

Together we are building the future of Fusion

Your feedback matters

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FUSION FOR ENERGY

SUPPLY CHAIN DAYS

30 Sept – 2 Oct 2025

17:30 – 17:35

Closing Remarks for the Event

Marc Lachaise, F4E

FUSION FOR ENERGY

SUPPLY CHAIN DAYS

30 Sept – 2 Oct 2025

Thank you!