FUSION FOR ENERGY

Global Investment in the Private Fusion Sector

Report from the F4E Fusion Observatory

Second edition

Foreword

Fusion- an energy for the future

Fusion is the process that powers the Sun and other stars.
Reproducing it on Earth can provide safe, clean, and virtually limitless energy.
The fuels required are widely available, with very small quantities capable to release plenty of energy. Fusion produces no greenhouse gases or long-lived radioactive waste, and it is inherently safe. As a steady power supply, fusion can complement renewables and strengthen Europe's long-term energy security and autonomy.

Fusion for Energy

Fusion for Energy (F4E) is the European Union's organisation for the development of fusion energy. It is mainly responsible for Europe's contribution to ITER - the largest international fusion experiment, amounting to nearly half of the project. In parallel, F4E is involved in major fusion projects such as JT-60SA, IFMIF-EVEDA and IFMIF-DONES. The knowledge and expertise acquired will feed into the construction of future fusion power plants.

Europe's investment in fusion generates business opportunities. F4E works with an impressive supply chain connecting large companies, SMEs and laboratories to manufacture complex components, deliver advanced technologies and provide infrastructure. The skills, technology transfers, and business opportunities are paving the way for a European fusion industry that is competitive and resilient.

F4E Fusion Observatory

The F4E Fusion Observatory provides objective analysis and intelligence on global and European fusion policies, R&D, technologies, investments and industrial activity for the benefit of European policy makers, the scientific community and other interested parties.

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Executive Summary

The pursuit of fusion energy has entered a new and decisive phase, transitioning from a primarily public research endeavour to a dynamic arena for private investment. This updated release of the F4E Fusion Observatory's first report is published in response to the **unprecedented acceleration of investments in fusion companies since June 2025**, which are consolidating fusion as a fast-growing emerging market. This second edition provides an updated, comprehensive analysis of this emerging sector, characterised by rapid but highly concentrated growth and offering a perspective on the EU's position.

In just three months, global private fusion funding has surged from €9.9B to €13B, driven by several landmark developments that are reshaping the competitive balance. The United States saw the largest funding increase since 2021 with Commonwealth Fusion Systems'(CFS) €797M Series B2 in September, followed by ENI's announcement of a $1B+ power purchase agreement for CFS's planned 400 MW ARC reactor—its second major offtake deal in three months after Google's 200 MW PPA in June. At the same time, Europe recorded its strongest-ever semester for private fusion investment, led by Proxima Fusion's €130M Series A and subsequent €15M extension, which have positioned it as one of the continent's best-funded fusion startups.

Meanwhile, China signalled a decisive push to increase state-controlled coordination of R&D and industrial deployment with the creation of China Fusion Energy Co. (CFEC), a new state-owned enterprise capitalised at €1.9B, reflecting a top-down strategy where public sources account for over 70% of national fusion funding. Yet this state-led model is now being complemented by a new wave of private activity, exemplified by NovaFusionX (Shanghai), which was founded in April 2025 and has raised €60 million in the largest angel round ever for a private fusion firm in China.

Beyond these landmark developments, the Observatory's updated dataset captures a wider wave of activity since June 2025 that reflects the increasing interest of capital markets in fusion technologies and projects. Multiple new funding rounds have been recorded across regions and several new or newly identified fusion companies (from 68 to 77) have also entered the map, reflecting both new market entrants and firms that had previously remained under the radar. These developments confirm the accelerating pace of private capital mobilisation and the growing role of national industrial strategies in shaping the fusion market, which the F4E Fusion Observatory will continue to monitor.

With due regard to the data and methodological constraints described in the annex, the **following findings are presented for policy considerations**:

1. A Rapidly Growing but Concentrated Market. Our analysis using the methodology described in Annex 1, shows that global fusion private investment has reached a total of **€13B**, representing a 30% increase since June 2025 a more than eight-fold rise since 2020. However, this growth is highly concentrated, with the US and China accounting for over 85% of all funding. This creates a competitive landscape defined by a few heavily capitalised national ecosystems.

2. The Dominance of US and Chinese Models. The US leads the private race with 42 out of 77 private fusion companies and 53% of global funding. China is a strong second, securing 34% of funding with a highly concentrated model of only 8 companies. These two dominant models appear to be setting the global pace. In only three months since the first 2025 release of this report, the global share of Chinese investment in fusion has increased by almost 9%, while the US share has declined by 7%, reinforcing the trend towards

the consolidation of a bipolar competitive landscape, with a potential catch-up of Chinese investments led by state-controlled initiatives.

3. The EU's Scaling Challenge.
The EU's private ecosystem, with 8 companies and 81 investors, has raised a significant €712M (~5% of global funding). However, a critical scaling challenge emerges from the data: the average EU investment round is around three times smaller than in the US and 30 times smaller than China. This gap in access to large-scale private capital may be a potential bottleneck for the EU advancing towards capital-intensive demonstration phases.

4. A Divergent Technology Strategy.
The global private market currently favours magnetic confinement fusion (78% of funding). The EU private sector instead allocates 54% funding to inertial confinement and only 46% to magnetic confinement. This shows an important difference in the EU ecosystem and may be a result of the availability of stable public funding for magnetic confinement fusion in the EU (a subject for future analysis).

5. A Negative Cross-Border Investment Balance.
The EU's negative cross-border investment balance of €79M (€157M with the US), while demonstrating the global reach of its investors, indicates that EU capital is also contributing to the growth of a fusion ecosystems outside the EU. This probably reflects the attractiveness of the more mature US venture market but could also be an indication of a lack of investable fusion projects within the EU. Again, this may be due to the availability of stable public funding sources for magnetic fusion initiatives within the EU (to be further explored).

6. The Central Strategic Duality: Industrial Strength and Private Sector Scale.
An important conclusion is that the EU's position is one of strategic duality. In contrast to the US where privately funded fusion initiatives are dominant, the **€6.8B public investment in the EU ITER supply chain through F4E** has created a foundational asset of unparalleled value, a world-class industrial base. However, aside from spinoff applications outside fusion, the long-term sustainability of these supply chains depends on the development of a future market for fusion technologies and commercial fusion plants, and this may be, and this may be one of the main challenges facing the EU in the coming years.

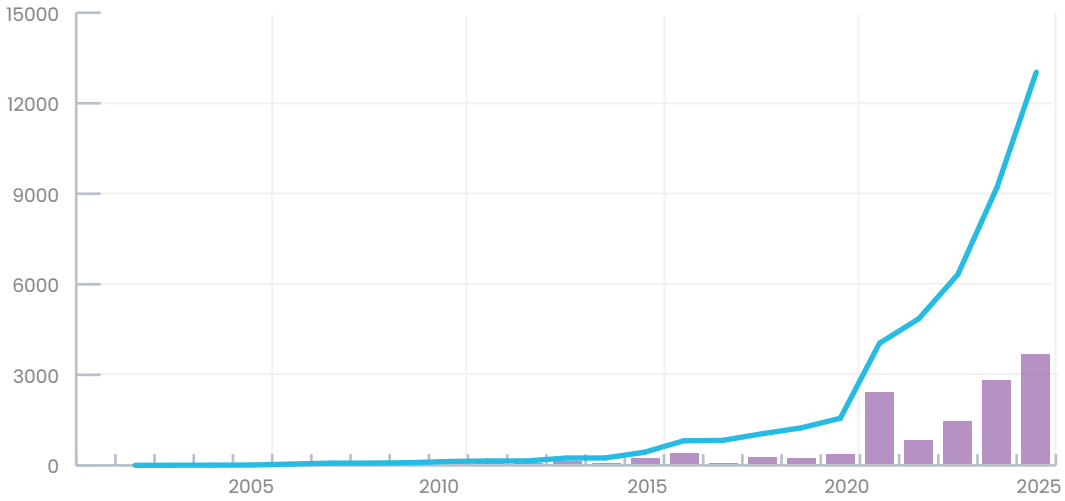
Note that this analysis does not consider public sector funding to national public fusion initiatives that remains an important component of the overall fusion landscape (this will be the subject of ongoing analysis and future reports). This may help to explain some of the trends seen in this report including the allocation of investment to different fusion concepts and technologies where, for example, EU private sector investment is focussed on inertial confinement and magnetic confinement in other regions.

Fusion energy is shifting from a public research endeavour to a dynamic arena for private investment.

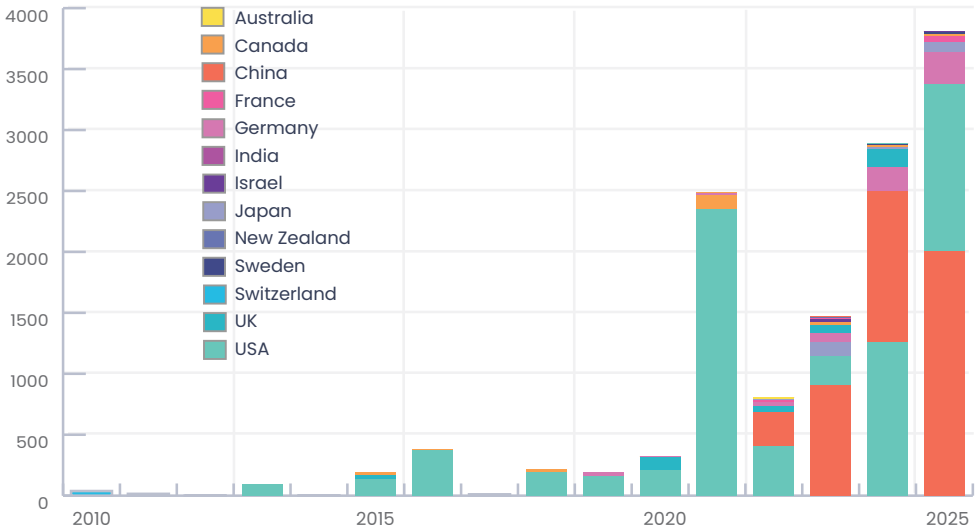
02
Global Investment Overview

Global Trends and Growth

The overall evolution of cumulative investment in private sector fusion companies shows an inflection point **from just over €1.5B in 2020 to an estimated €13B today**. This funding is a mix of sources: private capital accounts for the majority at over €8.9B while public funds, totalling around €4.1B, are increasingly flowing into private ventures through grants and institutional support. A further €84M comes from hybrid forms like Public-Private Partnerships and state-backed investments.



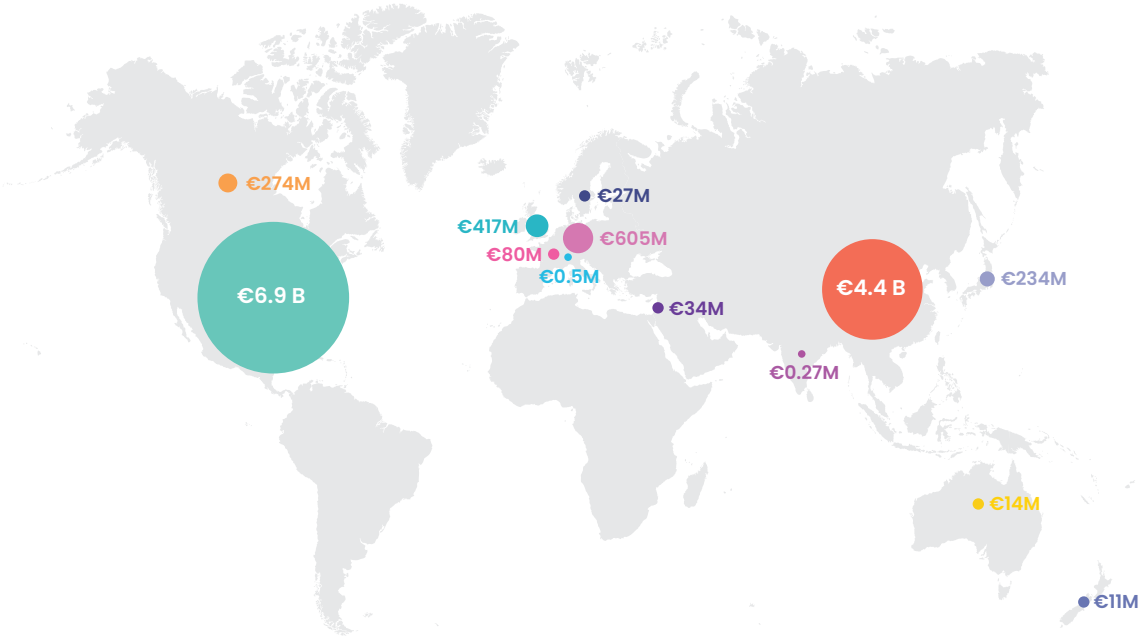
Progressive growth of global investments in fusion companies from 2000 to present (Amount in Millions of EUR)



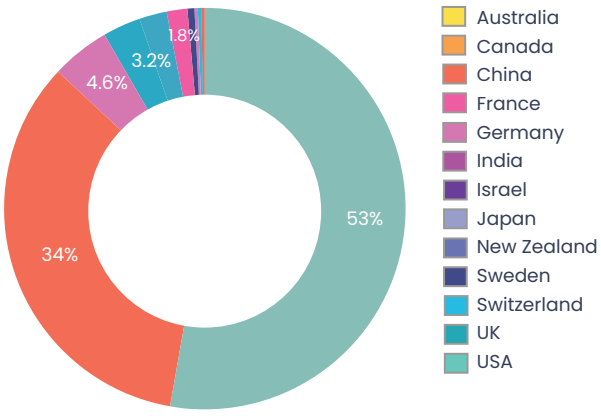
Annual investments in fusion companies by country (Amount in Millions of EUR)

Regional distribution

A global map of the **€13B** in total funding reveals a landscape dominated by two primary hubs: **North America (€7.2B) and East Asia (€4.7B)**. A more detailed breakdown by country sharpens this picture. **The United States leads** with **€6.9B (53%)**, while **China** follows with **€4.4B (34%).** Together, these two nations account for 86% of all private fusion funding, creating a bipolar structure at the top of the market.



Geographical global investment overview by country (Amount in Millions of EUR)

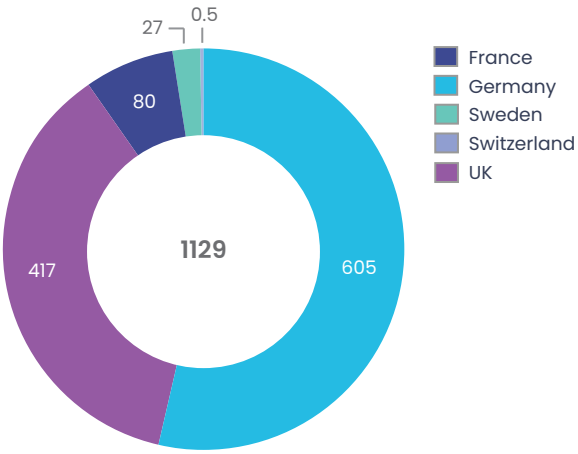


Breakdown of global investments by country of fusion company

The US and China together account for 86% of all private fusion investment worldwide.

Europe´s position

Within Europe, investments are concentrated mainly in the **United Kingdom (€417M)** and a few **EU member states (€712M).** Germany is the clear leader in the EU, with its companies raising €605M, corresponding to 85% of the total of investments in the EU, indicating that the EU's private ecosystem is not only smaller but also highly concentrated.



Investments by country in Europe (Amount in Millions of EUR)

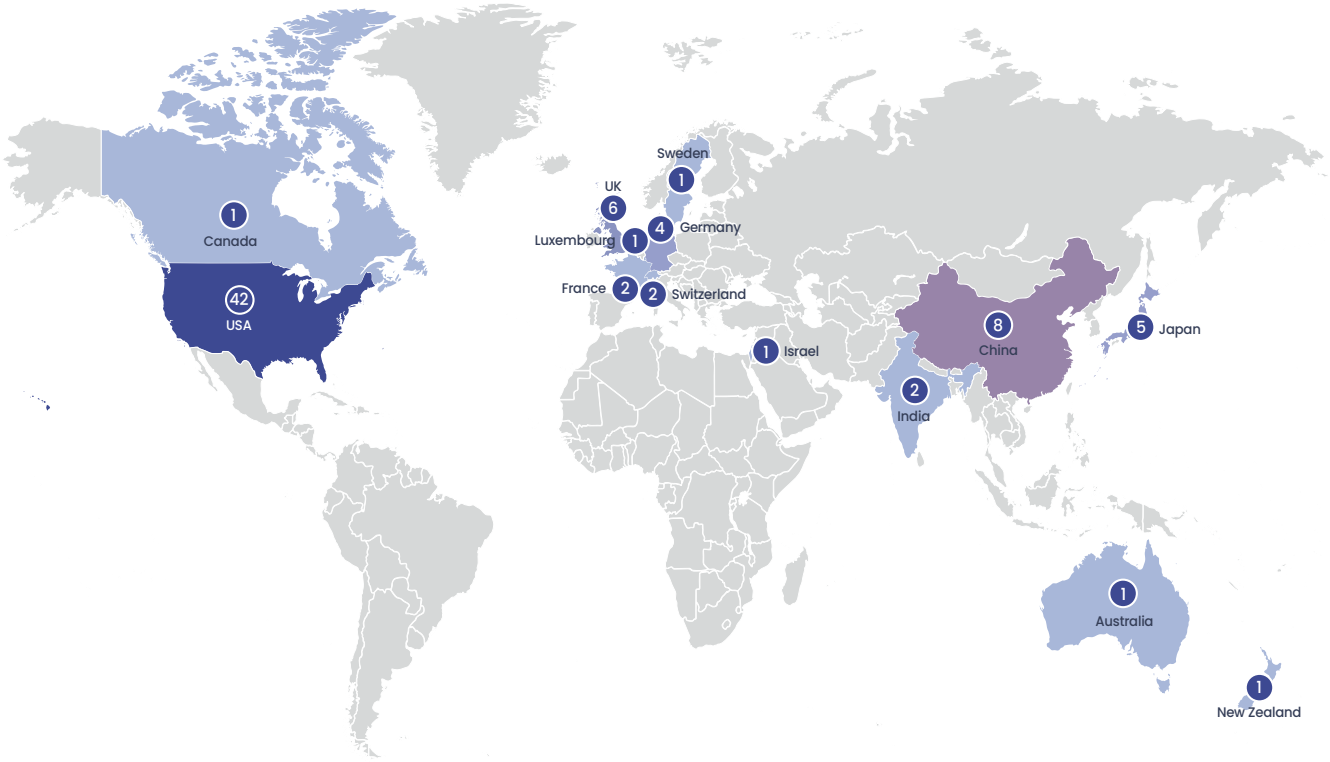
Europe's investment overview (Amount in Millions of EUR)

The EU accounts for 5% of global funding, with Germany representing 85% of all EU private investment.

Fusion Companies Worldwide

This financial landscape is reflected in company demographics. The **US hosts 42 of the 77 companies tracked**, indicating a mature ecosystem with a high degree of "critical mass". The **EU is home to 8 companies.**

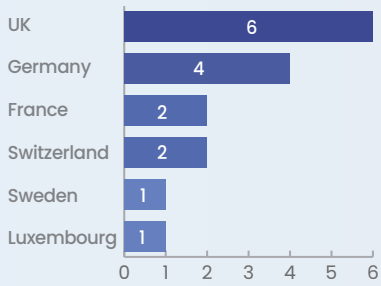
This concentration of capital has produced some "unicorns" like **Commonwealth Fusion Systems (USA, €2.6B), China Fusion Energy (China, €1.9B), NEO Fusion (China, €1.9B) and TAE Technologies (USA, €1.3B)**. Remarkably, these four companies **alone account for more than half of all global private investment**. These **"fusion unicorns"** are not only technology leaders but are also tightly embedded in national innovation and energy strategies, having also received significant government support. Their scale gives them a decisive role in shaping the direction, pace, and geography of global fusion development.



Number and location of fusion companies worldwide

The US hosts 42 of 77 private fusion firms; the EU, only 8.

Focus on Europe



Number and location of fusion companies in Europe

Focus on the United States

The United States hosts the world's most mature and capital-intensive private fusion ecosystem, driven by venture investment and accelerated development cycles. The flagship of this model is **Commonwealth Fusion Systems (CFS)**, a spin-out from the **MIT Plasma Science and Fusion Center** founded in 2018. Widely regarded as the best-financed private fusion venture globally, CFS has become the **symbol of the US venture-led approach**, attracting a uniquely broad investor base ranging from major technology companies to institutional funds.

CFS is currently constructing **SPARC**, a compact high-field **tokamak** using **REBCO high-temperature superconducting magnets**, which aims to achieve **net energy gain (Q>1) by 2026**. SPARC will serve as the pathfinder for **ARC**, CFS's planned first-of-a-kind commercial fusion power plant, expected to deliver ~400 MWe and enter service in the early 2030s.

Top-Funded Fusion Companies in the US

- Commonwealth Fusion Systems
- tae
- HELION
- SHINE
- PACIFIC FUSION
- ZAP ENERGY

The US fusion ecosystem, led by CFS, reflects a mature, venture-driven model focused on rapid commercialisation, with SPARC paving the way for the world's first private fusion power plant in the early 2030s.

Focus on China

China has rapidly emerged as the **second-largest global hub for private fusion funding**, building on decades of state-led R&D and a growing industrial base. In recent years, the country has shifted from purely experimental research towards **preparing for industrial-scale deployment,** embedding fusion as the third stage of its national nuclear development roadmap.

At the center of this shift is **China Fusion Energy Co.**, Ltd. (CFEC), officially launched in July 2025, after an initial announcement in 2023. With ¥15 billion in registered capital (≈€1.9B), CFEC is a state-owned enterprise under the **China National Nuclear Corporation (CNNC)**, established to consolidate activities previously dispersed across research institutes and industrial groups and to act as the national industrial backbone for fusion commercialisation. CFEC is expected to lead large-scale engineering programs, supply chain development, and capital mobilisation for major national projects, notably the China Fusion Engineering Test Reactor (CFETR).

Alongside this state-driven approach, **NEO Fusion** – founded in 2023 in Anhui Province with ¥14.5 billion (≈ €1.9B) in registered capital – has emerged as a flagship of China's hybrid public–private model. Combining **provincial state backing** with private investors such as NIO and NIO Capital, NEO Fusion symbolises the emergence of a more entrepreneurial and market-oriented strand within China's fusion ecosystem. NEO Fusion's stated ambition is to commercialise fusion energy within two decades by leveraging state-backed capital, industrial park infrastructure, and private technology investment.

While CFEC reflects a top-down national strategy, NEO Fusion embodies a more decentralised and entrepreneurial approach, highlighting the growing diversity of China's fusion innovation ecosystem.

Top-Funded Fusion Companies in China

China Fusion Energy (CEFEC)

NEO Fusion

ENN 新奥

China is rapidly positioning itself as a global fusion leader through a dual strategy: a powerful state-led industrial backbone (CFEC) and a growing, market-oriented private ecosystem (NEO Fusion).

Europe's Private Fusion Landscape

In the European context, the leading companies operate at a different financial scale. The **UK's Tokamak Energy (€307.7M)** is the most well-funded, followed by **Marvel Fusion (€256M) and Proxima Fusion (€206.5M)** – both based in Germany. The list continues with Focused Energy (€115M), based in Germany but with strong operational ties to the US, First Light Fusion (€103.7M) in the UK and emerging ventures like Renaissance Fusion (€61M) in France. While these firms are advancing rapidly with innovative technologies, their capital levels are still **between 10 and 20 times** lower than their American or Chinese counterparts.

The rise of fusion unicorns

Commonwealth Fusion Systems: €2603M, China Fusion Energy Co.: €1939M, NEO Fusion: €1875M, TAE Technologies: €1276M emerge as the sector's fusion 'unicorns,' each surpassing €1 billion in funding and together accounting for nearly half of global private investment.

Top funded Fusion companies in Europe

France

GenF
Fusion Generated Energy

RENAISSANCE FUSION

Germany

FOCUSED

GAUSS FUSION

MarvelFusion

Proxima Fusion

Sweden

NOVATRON

UK

ASTRAL SYSTEMS

first light

Tokamak Energy

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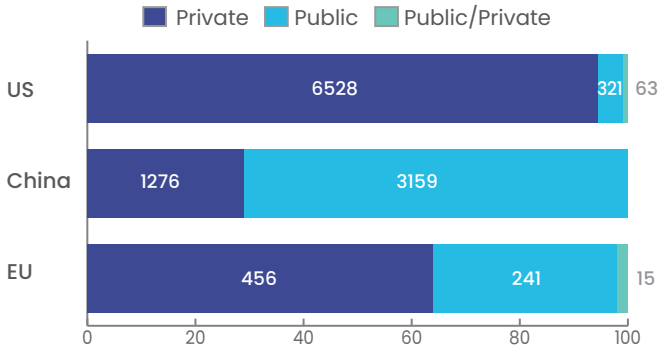
03
Investors Landscape

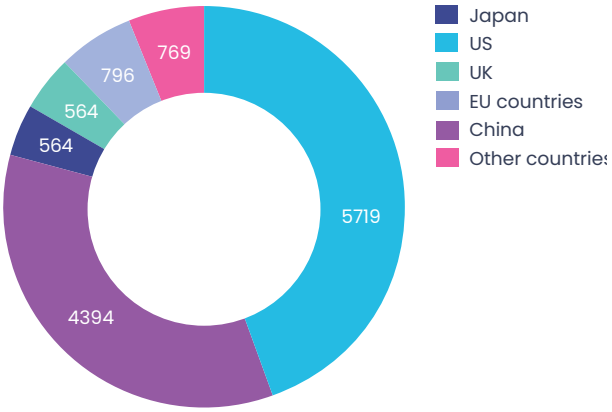
Three Distinct Funding Models

The sources of capital reveal distinct regional investment philosophies. As illustrated in the comparative charts, three models emerge[3]:

- **A venture-led model** in the United States, where private capital (94.5%) is the primary engine of growth.
- **A state-guided model** in China, where public funding (71.2%) reflects a top-down industrial strategy.
- A **hybrid model** in the European Union, with a mix of public (33.9%), private (64%), and public-private (2.1%) funding.



Investors type in the US, China and the EU (Amount in Millions of EUR)



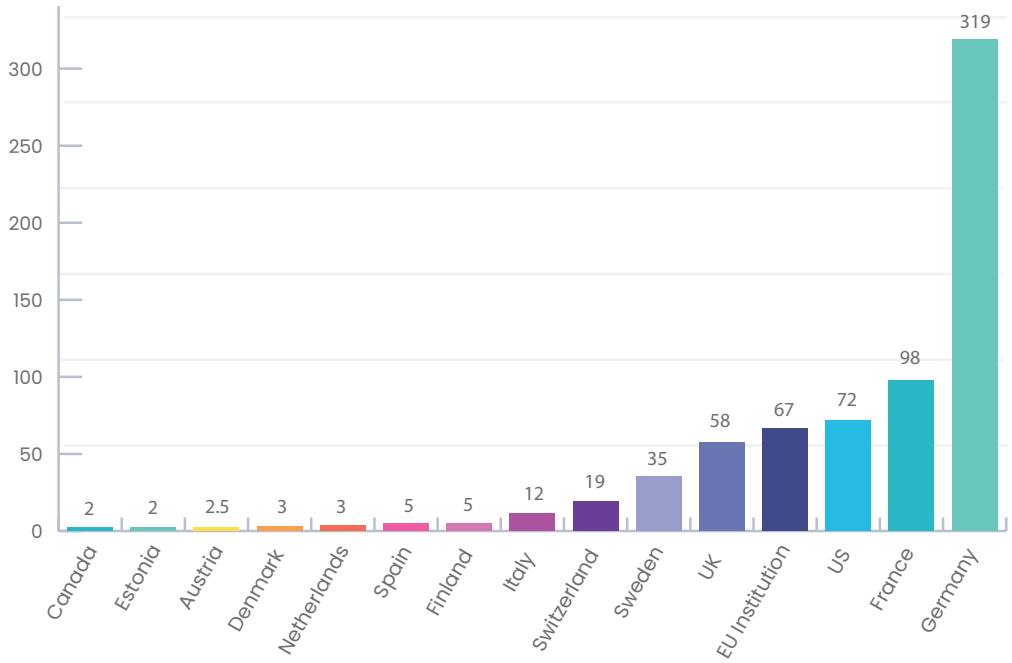
Geographical origin of investors – Global level (Amount in Millions of EUR)

Global Investor Distribution

Globally, **US-based investors** are the primary source of capital, deploying **€5.7B (46%)**. Within the EU, the investor base is more localised, led by **German (45.8%)** and **French (14%)** investors. The key investor groups in each region are highlighted in the figure on the next page. This global flow of capital, results in a negative investment balance for the EU.

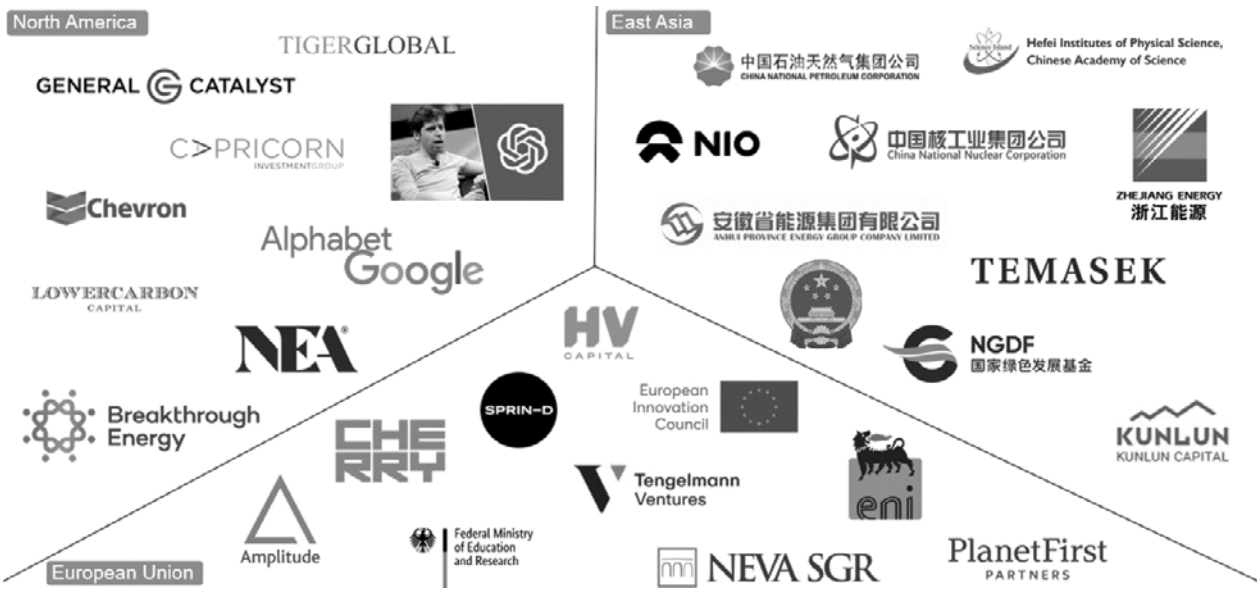
[3] Since the first edition issued in June 2025, the F4E Fusion Observatory methodology has evolved to capture better the different types of funding (private, public and hybrid). See methodological annex.

EU Investor Distribution



Geographical origin of investors investing in EU based fusion companies (Amount in Millions of EUR)

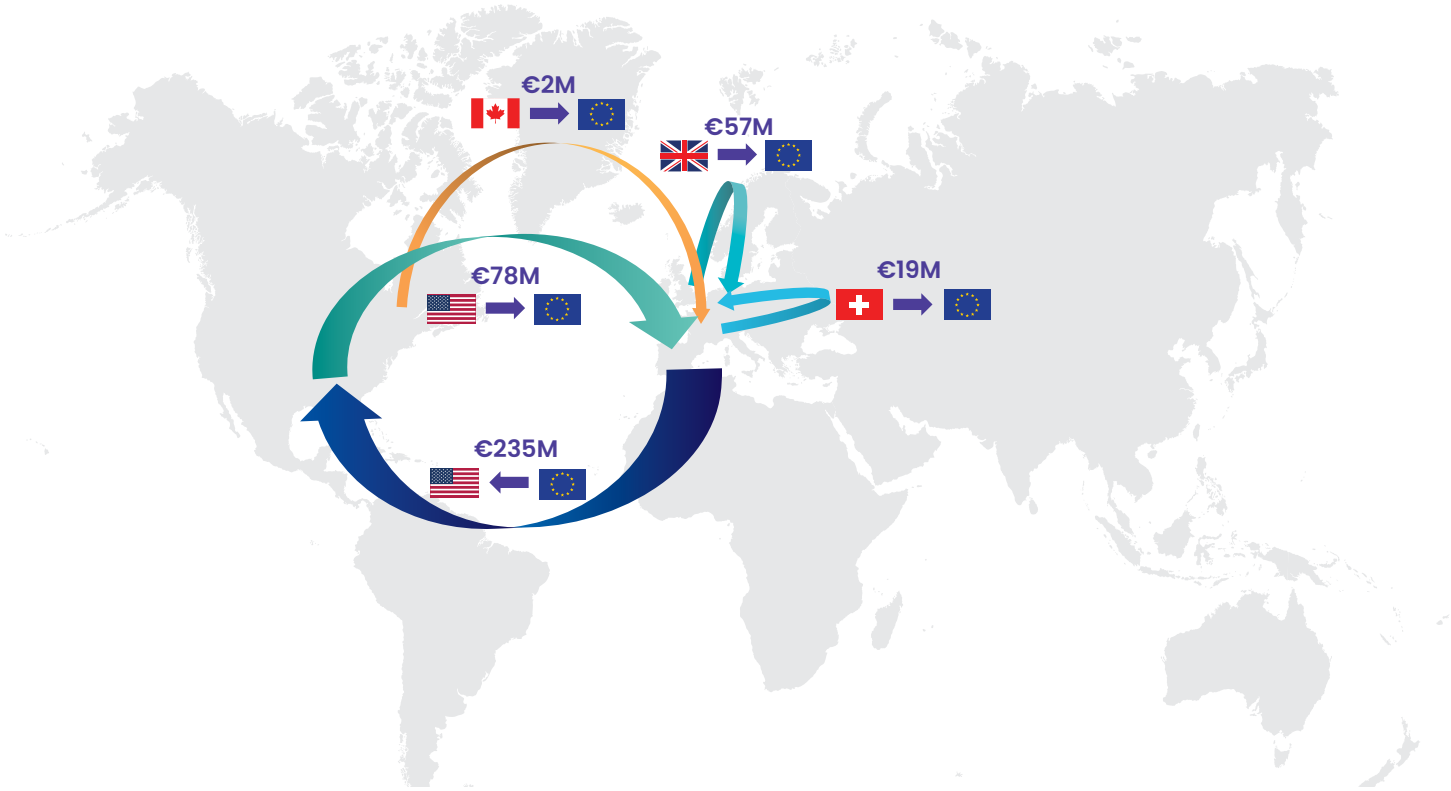
Top 10 investors by region[4]



[4]Company logos shown for information purposes only. All trademarks are property of their respective owners.

European Capital Outflows to Non-EU Fusion Ecosystems

As concluded in the findings of this report, the **EU has an overall negative cross-border investment balance of €79M with €157M with the US alone**, indicating that European capital is actively supporting the growth of a fusion ecosystems outside the EU.



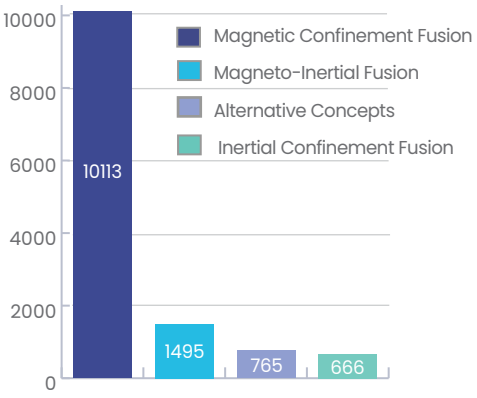
Cross-border investments with the EU (Amount in Millions of EUR)

04
Technology Focus

Private Investment Favors MCF

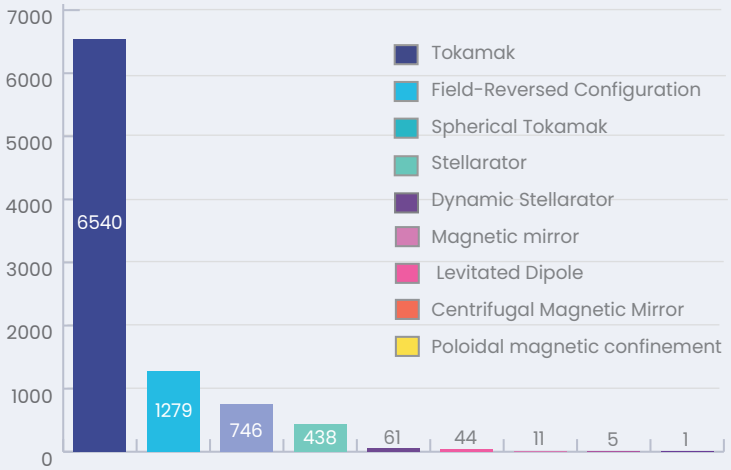
At a global level, private investment favours **Magnetic Confinement Fusion (MCF)**, attracting €10.1B. Within this category, the Tokamak concept leads with €6.5B, underscoring the profound influence of large public projects like ITER on private sector confidence.

Magnetic Confinement dominates worldwide, while Europe invests in Inertial Fusion.



Funding by technology - Global level (Amount in Millions of EUR)

Focus on Magnetic Confinement Fusion

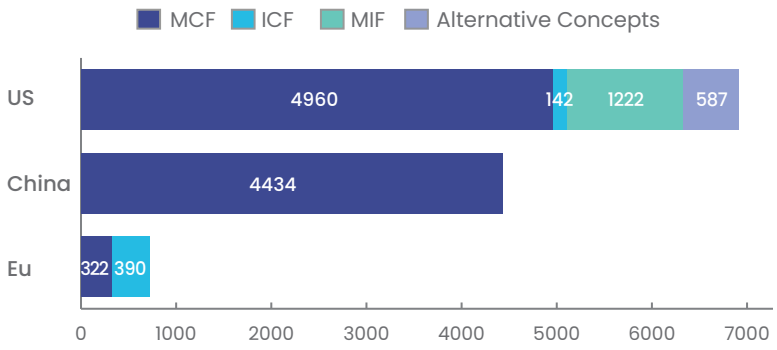


Global level (Amount in Millions of EUR)

Regional Technology Divergence

A striking strategic divergence emerges at the regional level. Both the United States and China have mirrored the global trend, directing most (if not all, in the case of China) of their investment toward MCF.

The **EU stands in stark contrast**. Here, the private investment landscape is inverted, with **Inertial Confinement Fusion (ICF) attracting €390M**, more than the amount invested in MCF companies. This shows the EU private sector charting a different course, exploring alternative pathways.



Funding by technology in the US, China and the EU (Amount in Millions of EUR)

Focus on the three main Fusion technologies

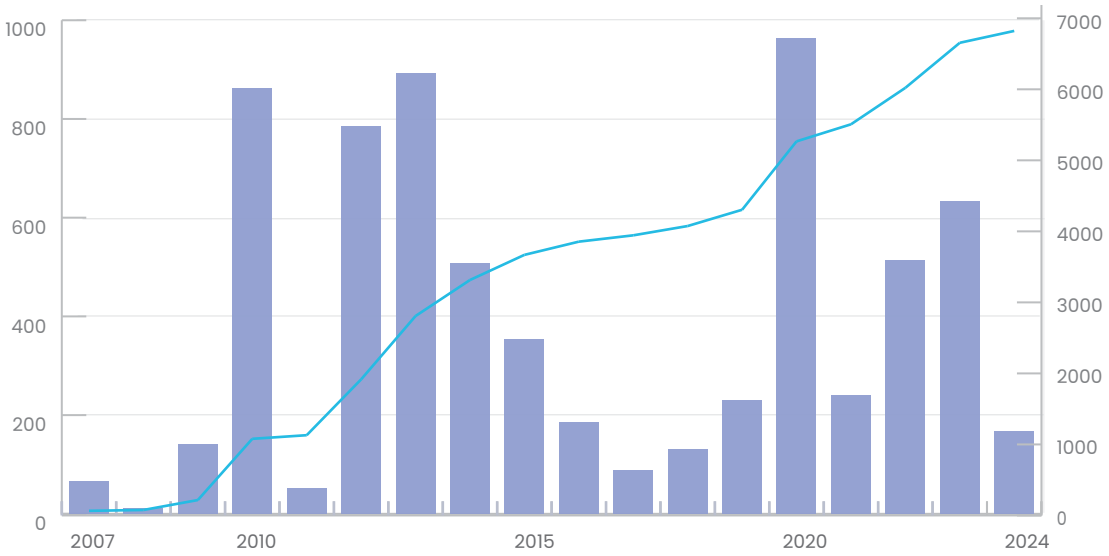
Magnetic confinement fusion (MCF): Uses strong magnetic fields to confine and control hot plasma long enough for fusion to occur.

Inertial confinement fusion (ICF): Uses powerful lasers or particle beams to rapidly compress and heat a tiny fuel pellet so quickly that it fuses before it can expand.

Magneto-inertial fusion (MIF): A hybrid approach that pre-magnetises the plasma and then compresses it inertially, reducing heat losses and requiring less extreme compression than pure ICF.

05

ITER Supply Chain



Annual (bars) and cumulative (blue line) investment in EU supply chain by F4E

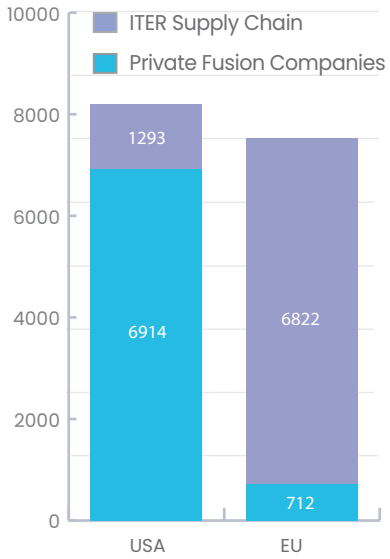
A Comprehensive View of European Fusion Investment

An analysis focused solely on the investment in private sector fusion companies provides an incomplete perspective on Europe's real position. Apart from the (mostly) publicly funded public sector, fusion activities, it is important to consider the investments being made in industrial supply chains to fabricate components for the ITER international fusion project.

Since the start of ITER procurement in 2007, **F4E has awarded around 1300 contracts to EU industry**, with total funding **amounting to approximately €6.8B**. The scope of these contracts is broad and includes superconducting magnets, vacuum vessel, civil engineering, cryogenics, diagnostics, robotics, etc.

Considering the broader picture of both the investment in private sector fusion companies in sections 2 and 3 of this report and the ITER supply chain investments from this section, it is possible to perform a comparative analysis of the EU and the US. According to the US ITER Update (February 2025), more than $1.4B (€1,3B) is invested in the US fusion supply chain. While the total level of funding is broadly comparable to that of the EU, it highlights the striking differences between the two ecosystems. Note that the value of the ITER supply chain in both the EU and US is underestimated since this does not includes contracts awarded directly by the ITER International Organisation.

The EU has invested €6.8 billion in its ITER supply chain since 2007, representing more than 1300 contracts across Europe.



Comparison of Investment in Private Fusion Companies and the ITER Supply Chain in the US and the EU (Amount in Millions of EUR)[5]

Different Investment Models, Different Impacts

Clearly this shows the respective strengths of each region: **the US is building momentum in private fusion innovation whereas the EU has built a industrial supply chain** through public procurement and coordination. That said, one must be careful with this comparison - **investment in the supply chain, while substantial, has a different kind of impact than equity in a fast-scaling fusion company**. For instance, it does not necessarily translate into the same level of innovation, IP ownership, or investor confidence. One must also recognise that supply chains established for the delivery of a component or service under contractual terms, may not be sustained after the contract ends. The level of US investment in the supply chain may also be underestimated, as many of the private fusion companies are, or will be, diverting a significant amount of their capital into the supply chain.

The US is building momentum in private fusion innovation whereas the EU has built an ITER supply chain.

[5] https://usiter.ornl.gov/iter-project/

Annex

Description of the Methodology Used

The F4E Fusion Observatory uses a multi-step, rigorous process to collect, validate, and analyse all funding data for private fusion companies. By integrating diverse data sources, applying consistent currency conversions, and categorising each investment both by technology and by financing, the Observatory ensures that its findings are reliable, transparent, and readily comparable across companies, regions, and time. The figures and charts rely on data that was harvested until 10 September 2025.

Data Sourcing

Our core dataset is compiled from publicly available releases, dedicated fusion-industry databases (notably FusionXInvest and Fusion Energy Base), reputable press articles, and official company announcements. To guarantee data fidelity, each funding figure is cross-checked across at least two independent sources. Whenever conflicting figures arise (e.g., differing round sizes or divergent dates), we undertake targeted follow-up investigations, scrutinising additional press coverage, consulting official regulatory filings, or reaching out directly to company representatives, to arrive at the most accurate estimate.

- **INFUSE Grant Estimates:** Certain public grants (such as those awarded by Fusion Energy Sciences via the U.S. Department of Energy's INFUSE program) are not broken down by individual beneficiary. In these cases, FusionXInvest-derived allocations are used as proxies, since DOE reports only the aggregate sum.

- **Company Location Tagging:** For organisations operating in multiple jurisdictions, we assign "primary location" based on the company's main economic activity (i.e., where most R&D or manufacturing occurs). This ensures that regional analyses reflect each company's genuine operational footprint.

Investment Values & Currency Conversion

All investment amounts are standardised in euros (EUR) to facilitate apples-to-apples comparisons. When a European company discloses an amount already denominated in EUR, we accept that figure as is, no further conversion is applied. For non-European companies, each foreign-currency investment (typically reported in USD, GBP, CNY, or JPY) is converted to EUR using the European Central Bank's reference exchange rate for the year in which the funding was announced. If the announcement date is unavailable, the company's founding year serves as a proxy to select an appropriate annual rate. This approach preserves historical context – accounting, for example, for periods of currency volatility – so that year-over-year trends remain meaningful.

To increase the accuracy of capital flow attribution, the Observatory has introduced a standardised methodology for allocating investment amounts among multiple investors participating in the same funding round and designed to approximate investment figures in cases individual investor contributions are not disclosed:

- When a single investor participates, the investor is attributed 100% of the amount.
- When there are two investors and one designated lead, the allocation is 60% to the lead investor and 40% to the other investor.
- When there are two investors and no designated lead, the allocation is divided equally (50% each).
- When there are more than two investors and at least one designated lead, the lead investor is allocated 50%, while the remaining 50% is divided equally among the other investors.

- When there are more than two investors and no designated lead, the amount is divided equally among all investors (1/N each).
- When there are two lead investors, each lead receives 25%, and the remaining 50% is divided equally among the non-lead investors.

Technological Approach & Classification

Each entity is classified according to its primary "technology family" using a taxonomy derived from authoritative sources (IAEA World Fusion Outlook 2024, IAEA Fusion Key Elements, peer-reviewed literature) and validated via F4E's internal expert review. This hierarchical structure allows us to group companies and investments into well-defined categories:

- **Magnetic Confinement Fusion (MCF)** – Sub-technologies: Tokamak, Spherical Tokamak, Stellarator (and variants such as Quasi-isodynamic and Dynamic Stellarator), Field-Reversed Configuration (FRC), Magnetic Mirror (and subtypes like Centrifugal Magnetic Mirror), Closed Orbit, Levitated Dipole, Electro-centripetal confinement, Plasma Fusion Propulsion.
- **Inertial Confinement Fusion (ICF)** – Sub-technologies: Laser-driven ICF (short-pulse or shock-driven), Shock-driven inertial confinement.
- **Magneto-Inertial Fusion (MIF)** – Sub-technologies: Z-pinch, Dense Plasma Focus, Plasma Jet–Driven MIF (PJMIF), Magnetized Target Fusion, Pulsed Magneto-Plasma Pressurized Confinement, Magnetized Liner Inertial Fusion (MagLIF), Pulsed Magnetic Fusion.
- **Alternative Concepts – Sub-technologies:** Muon-catalyzed fusion, Lattice Confinement Fusion (LCF), Magnetic-electrostatic confinement, Electrostatic Confinement, Beam-target Fusion (beam-solid, beam-gas, beam-plasma), Proprietary confinement designs, Aneutronic Fusion, Plectoneme, Spindle Cusp, Superconducting Shielded-grid Inertial Electrostatic Confinement, Direct laser–driven pB11, Miniaturized reactor concepts.

This classification ensures that we can accurately quantify how much funding each fusion approach has attracted – both globally and within Europe – as well as track shifts in technological preference over time. The allocation of funding has been further refined in the latest report to provide a more accurate representation.

Funding Categorisation (Equity, Grant, Convertible, etc.)

To analyse the financing mix, we assign each funding event to one of five "Investment Type" buckets based on keywords in source disclosures and investor identities:

- **Equity**: Deals labelled "equity" or where terms such as "Series A/B/C," "VC," "Seed," "Pre-Seed," or "Crowdfunding" appear.
- **Grant/Subsidy:** Transactions explicitly described as "grant," "subsidy," or "funded by government."
- **Convertible:** Rounds designated as "SAFE" (Simple Agreement for Future Equity) or "convertible note."
- **Prize/Award:** Non-dilutive awards labelled "prize" or "award."
- **Corporate Strategic:** Investments made by known strategic corporations (e.g., Eni, Chevron, Google) that are clearly tied to a corporate innovation or R&D mandate.

- **Unknown:** Any rounding that cannot be conclusively assigned to one of the above categories.

This classification facilitates comparative analysis of how much funding originates from venture capital versus direct government grants or strategic corporate investors.

Public vs. Private vs. Public-Private Partnerships

Each organisation is tagged as "private" only if it is majority-owned by non-governmental entities and not listed on any public exchange. If a company receives funding directly from government agencies (grants, awards) or operates under a mixed public-private structure (e.g., a consortium partially owned by a national laboratory), it is classified accordingly:

- **Private:** Majority-privately owned fusion enterprises.
- **Public:** Entities primarily funded or operated by government bodies (e.g., national labs, university spinouts still majority-government-controlled).
- **Public-Private Partnerships:** Joint ventures or collaborative R&D projects where public funding is explicitly tied to private-sector commercialization goals.

This triage allows the Observatory to isolate pure private-sector momentum from state-led initiatives and joint government-industry collaborations.

The Observatory uses a three-tier classification to categorise the nature of each investment: **Public, Private,** and **Public-Private.** It is important to clarify that the label **"Public-Private"** in our graphs **does not necessarily imply the existence of a formal Public-Private Partnership (PPP)** or joint venture. Instead, it indicates cases where **both public and private entities participated in the same funding round,** regardless of whether a formal collaboration structure was in place. This distinction helps capture the growing role of public support for private ventures without overstating the institutional relationships behind them.

Data Management & Validation Tools

All raw transactions and metadata are first compiled in a master Excel workbook, which is tightly integrated with Microsoft Copilot to automate routine tasks, such as flagging missing data, suggesting potential outliers, and cross-referencing investor names across multiple rounds. Once cleaned and harmonised, the dataset is imported into Power BI, enabling dynamic dashboards that reveal funding trends by year, by region, by technology family, and by investor type. An in-house AI tagging engine assists with technology classification (e.g., parsing press releases to confirm that a company's "primary approach" is indeed "magnetic confinement fusion"). This combination of human oversight and AI-guided tooling ensures that our methodology remains both thorough and repeatable.

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

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