



Global Investment in the Private Fusion Sector

Report from the F4E Fusion Observatory
2nd Edition (Cutoff:10 September 2025)



Fusion for Energy

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Note that the views expressed in this report are those of the authors and do not necessarily reflect the official position of Fusion for Energy or the European Union.

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

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1. 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 release provides an updated, comprehensive analysis of this emerging sector, revealing a sector characterized by rapid but highly concentrated growth and offering a perspective on the EU's position within it.

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 round since 2021 with **Commonwealth Fusion Systems' (CFS) €797M Series B2** in September, just 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.

At the same time, China signaled 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 capitalized 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 mobilization 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** (cutoff 10 September 2025), 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 capitalized national ecosystems.

2. The Dominance of US and Chinese Models. The US leads the private race with 42 of 77 private fusion companies and 53% of global funding. China is a strong second, securing 34% of funding with a highly efficient model of only 8 companies. These two dominant models appear to be setting the global pace. In only three months since the June 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 bi-polar 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 EU advancing towards capital-intensive demonstration phases.

4. A Divergent Technology Strategy. The global private market currently favours magnetic confinement fusion (70% of funding). The EU private sector instead allocates most funding (69%) to inertial 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 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 though 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 a future fusion technologies market and commercial fusion plants, 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.

2. Global Investment Overview

The overall evolution of cumulative investment in private sector fusion companies (Figures 1 and 2) shows an inflection point from **just over €1.5B in 2020 to an estimated €13B today** (cutoff 10 September 2025). This funding is a mix of sources: private capital accounts for the majority at over €8.9B but 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.

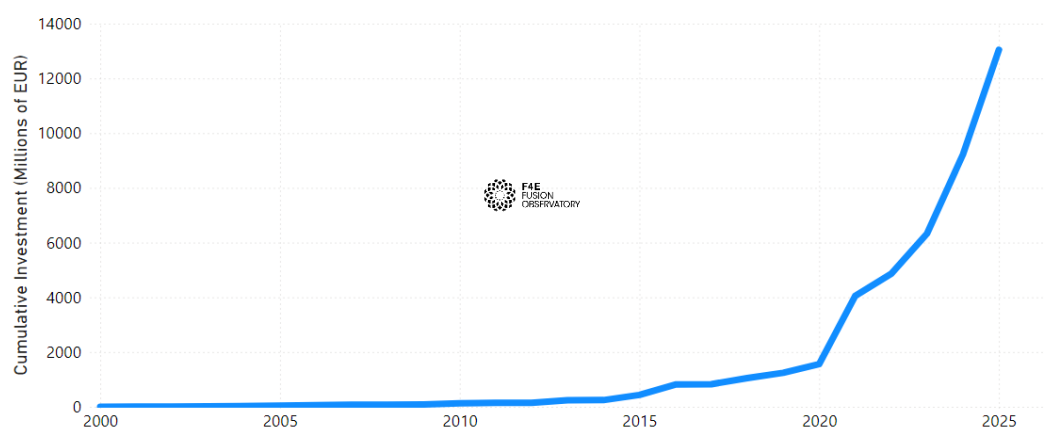


Figure 1 - Progressive growth of Global Investments in Fusion Companies from 2000 to Present (Amount in Millions of EUR)

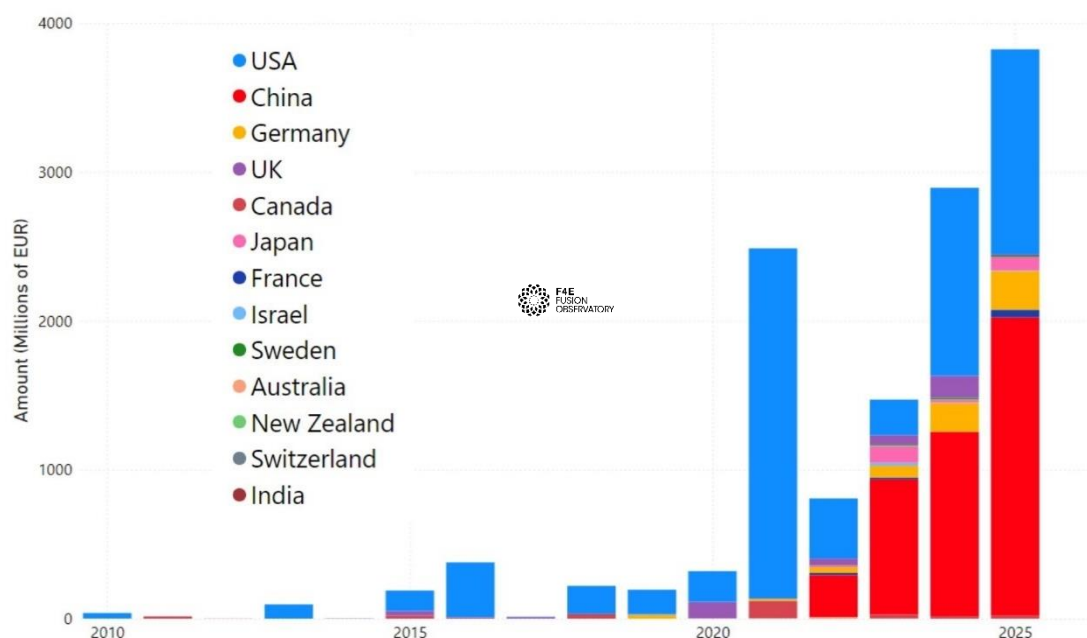


Figure 2 – Stacked chart showing annual investments in fusion companies by country (Amount in Millions of EUR)

A global map of the **€13B** in total funding (Figure 3) reveals a landscape dominated by two primary hubs: **North America (€7.2B)** and **East Asia (€4.7B)**. A more detailed breakdown by country (Figure 4) 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 duopolistic structure at the top of the market.



Figure 3 – Geographical Global Investment Overview by Country (Amount in Millions of EUR)

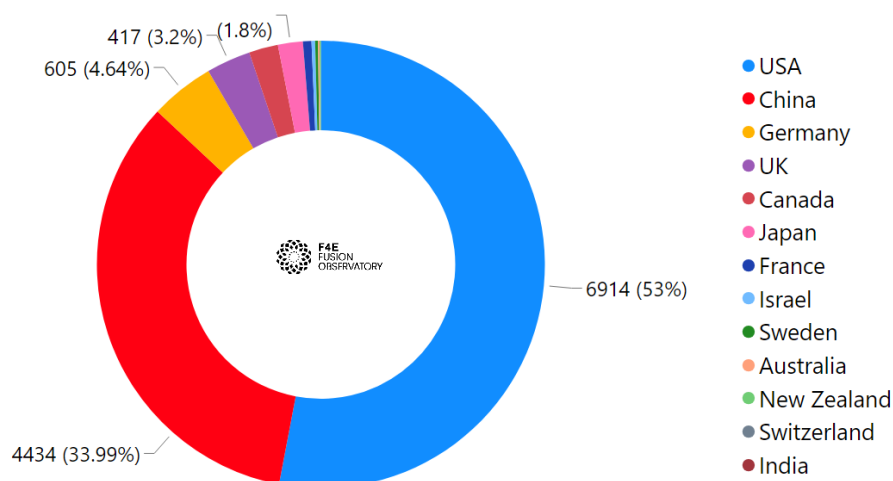


Figure 4 – Breakdown of global Investments by Country of Fusion Company (Amount in Millions of EUR)

Within Europe (Figures 5 and 6), investments are concentrated mainly in the **United Kingdom (€417M)** and a few **EU member states (€712M)**. Germany is the clear leader within the EU, with its companies raising €605M, corresponding to 85% of total of investments in the EU, indicating that the EU's private ecosystem is not only smaller but also highly concentrated.

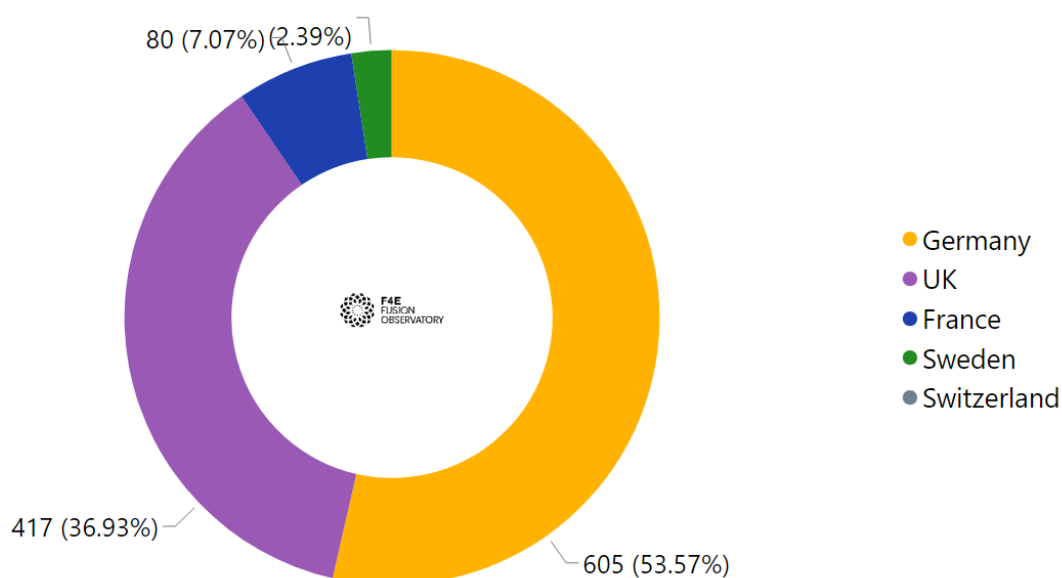


Figure 5 - Investments by Country in Europe (Amount in Millions of EUR)

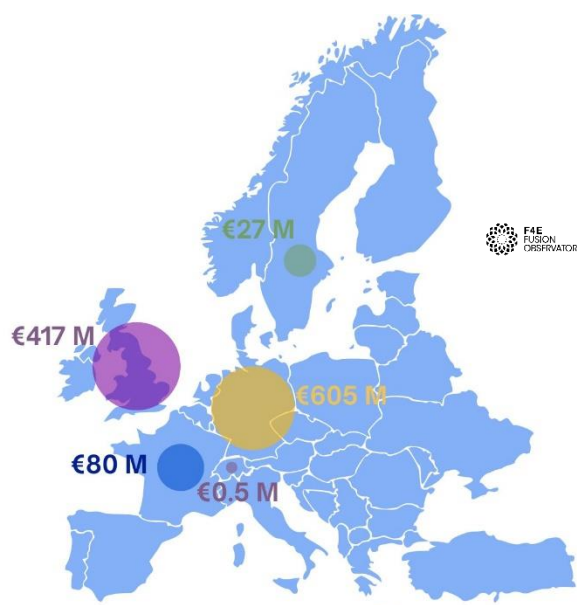


Figure 6 – Geographic Investment Overview in Europe (Amount in Millions of EUR)

This financial landscape is reflected in company demographics (Figures 7 and 8). 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**.



Figure 7 - Number and Location of Companies Globally



Figure 8 - Number and Location of Companies in Europe

This concentration of capital has produced some “unicorns” (Figure 9) 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 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.

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 registered capital of approximately ¥15 billion (≈€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 commercialization. CFEC is expected to lead large-scale engineering programs, supply chain development, and capital mobilization 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 ¥5 billion 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 symbolizes the emergence of a more entrepreneurial and market-oriented strand within China’s fusion ecosystem. NEO Fusion’s stated ambition is to commercialize 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 decentralized and entrepreneurial approach, highlighting the growing diversity of China’s fusion innovation ecosystem.

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.

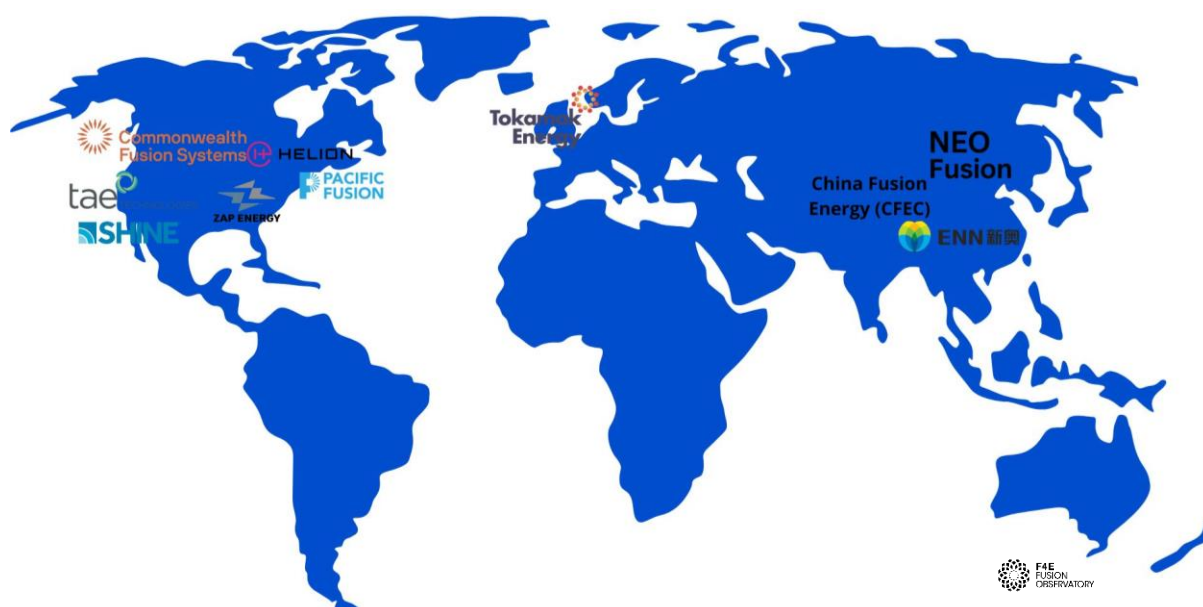


Figure 9 - Top-Funded Fusion Companies Worldwide¹

In the European context (Figure 10), 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)**. 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.

¹ Company logos shown for informational purposes only. All trademarks are property of their respective owners



Figure 10 - Top-Funded Fusion Companies in Europe²

² Company logos shown for informational purposes only. All trademarks are property of their respective owners

2. Investors Landscape

The sources of capital reveal distinct regional investment philosophies. As illustrated in the comparative charts of Figure 11, three models emerge³:

- 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.

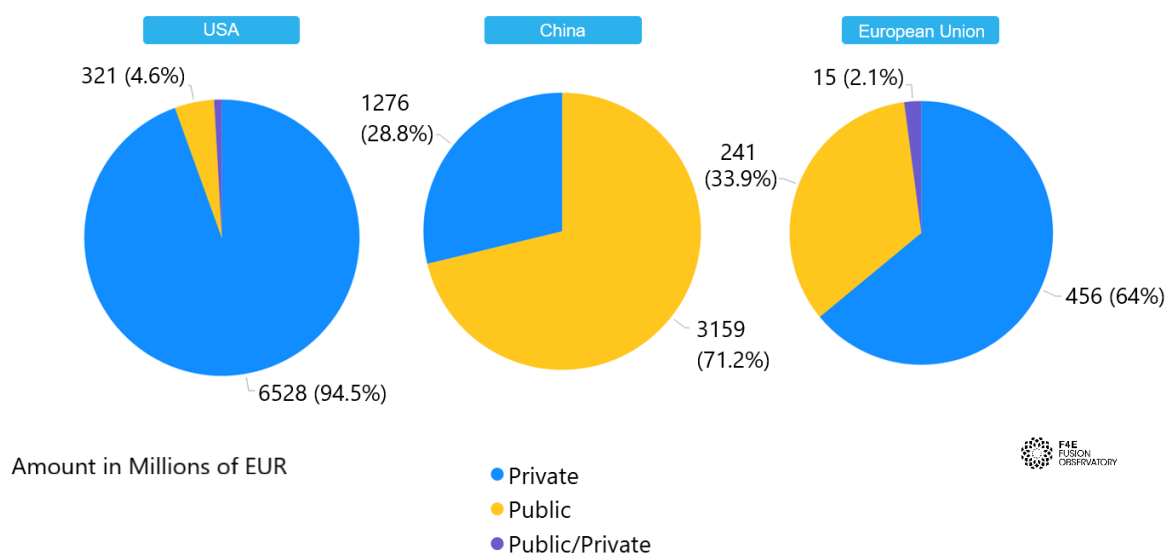


Figure 11 – Investors Type in the United States of America, China and the European Union (Amount in Millions of EUR)

Globally (Figure 12), **US-based investors** are the primary source of capital, deploying **€5.7B (46%)**. Within the EU (Figure 13), 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 Figure 14. This global flow of capital, detailed in Figure 15, results in a negative investment balance for the EU. As concluded in this report's findings, the **EU has an overall negative cross-border investment**

³ Since the first report issued in June 2025, the F4E Fusion Observatory methodology has evolved to be able to capture a better approximation of the articulation between types of funding (private, public and hybrid) - see methodological annex.

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.

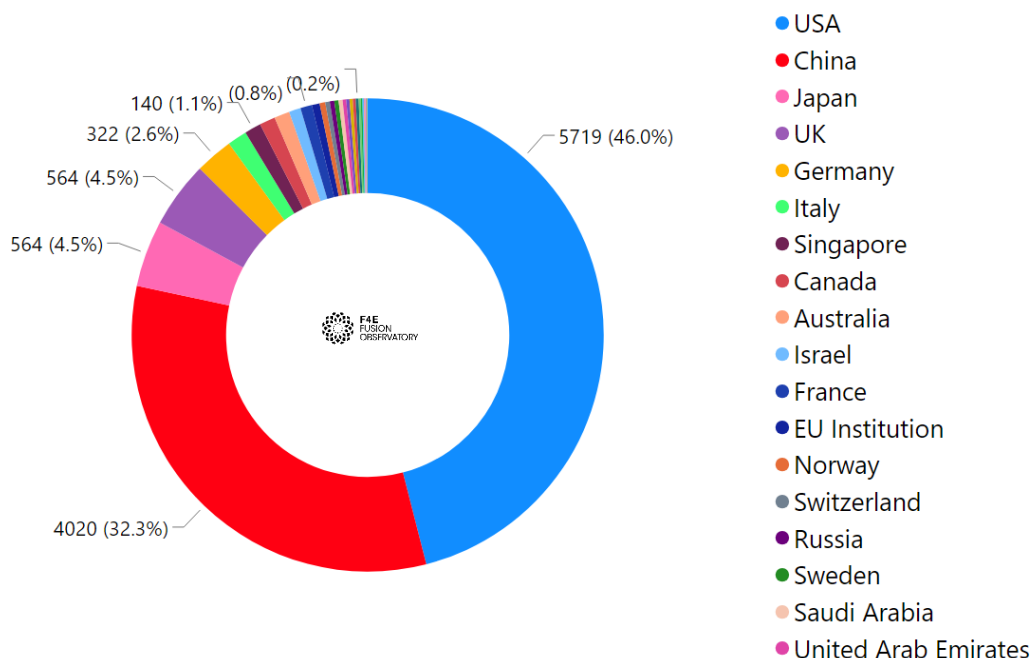


Figure 12 – Geographical origin of investors – Global level (Amount in Millions of EUR)

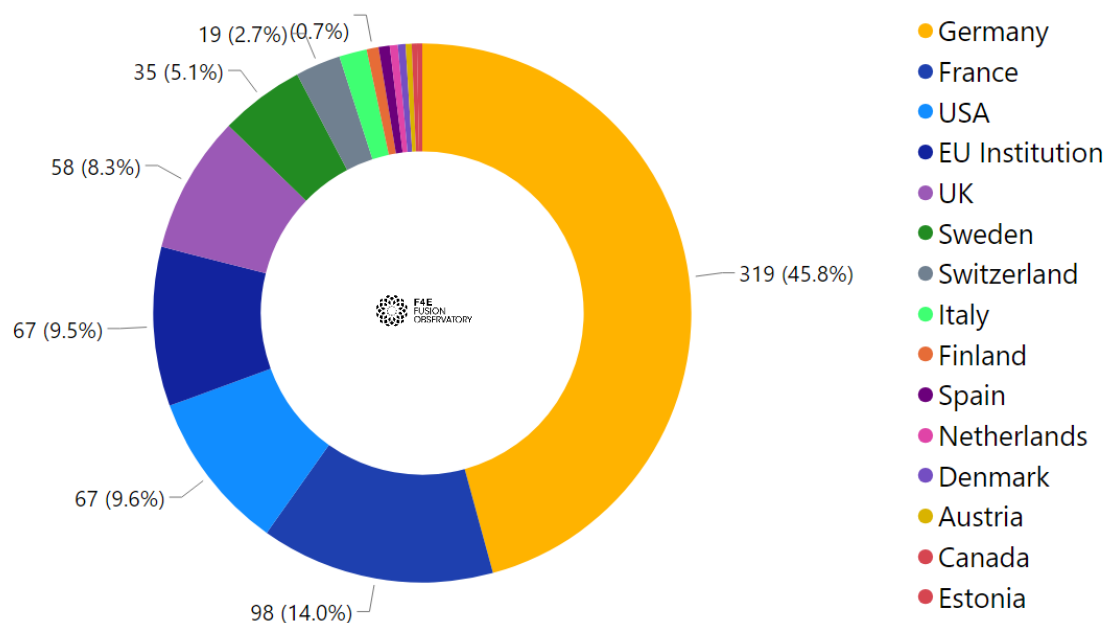


Figure 13 – Geographical origin of investors investing in EU based fusion companies (Amount in Millions of EUR)



Figure 14 – Top 10 Investors by Region⁴

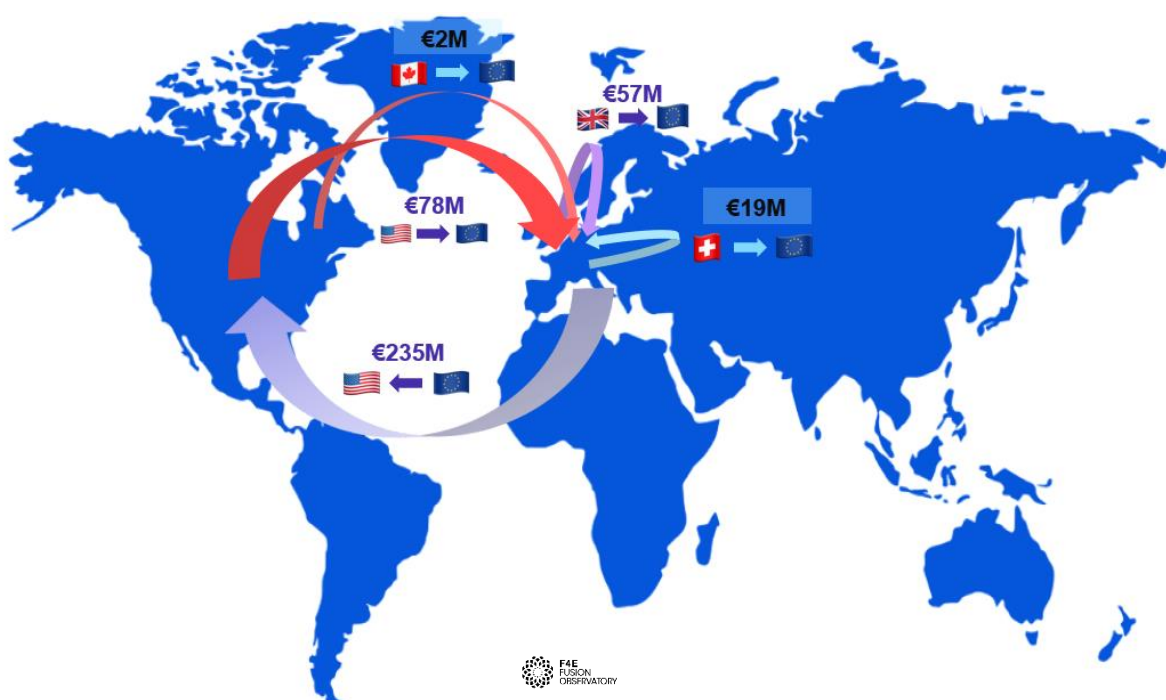


Figure 15 – Cross-border investments with the European Union

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3. Technology Focus

At a global level (Figure 16), private investment has shown a clear preference for **Magnetic Confinement Fusion (MCF)**, attracting **€7.2B**. Within this category (Figure 17), the **Tokamak** concept leads with **€4.6B**, underscoring the profound influence of large public projects like ITER on private sector confidence.

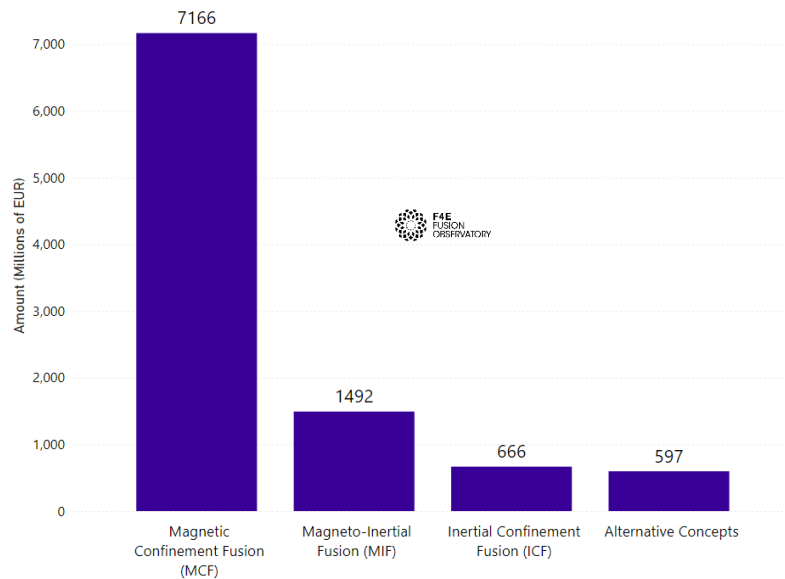


Figure 16 – Funding by Technology Family – Global level (Amount in Millions of EUR)

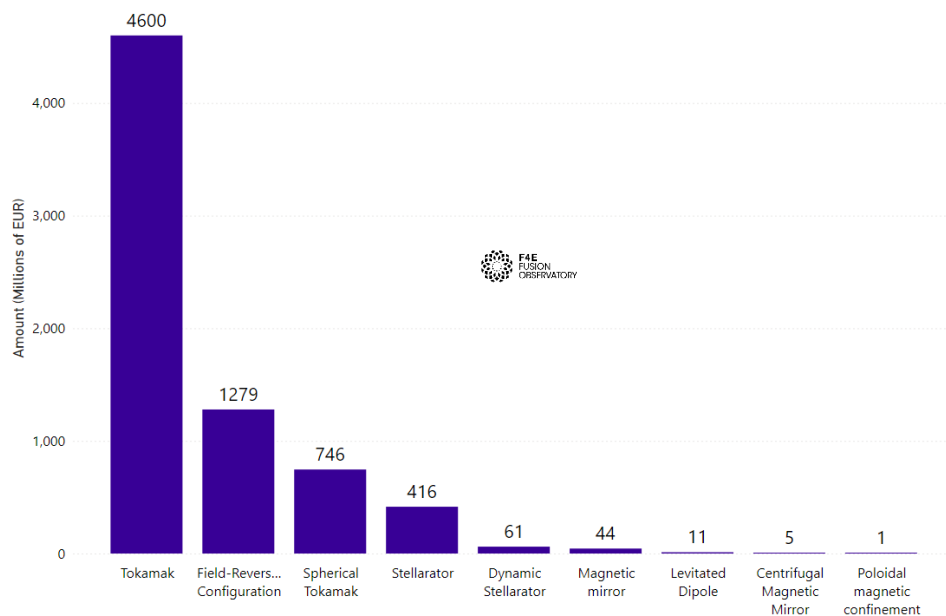


Figure 17 – Focus on Magnetic Confinement Fusion – Global level (Amount in Millions of EUR)

A striking strategic divergence emerges at the regional level (Figures 18, 19, 20). Both North America and East Asia have mirrored the global trend, directing most 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.

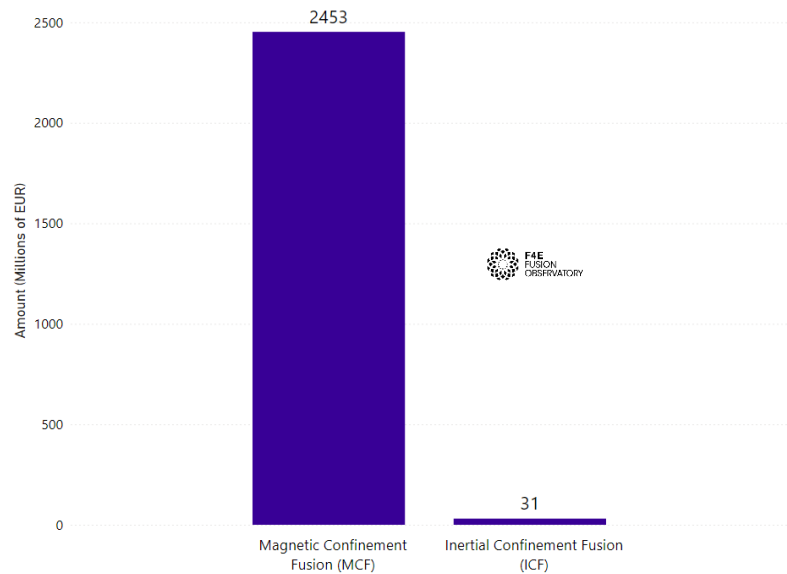


Figure 18 – Funding by Technology Family – East Asia (Amount in Millions of EUR)

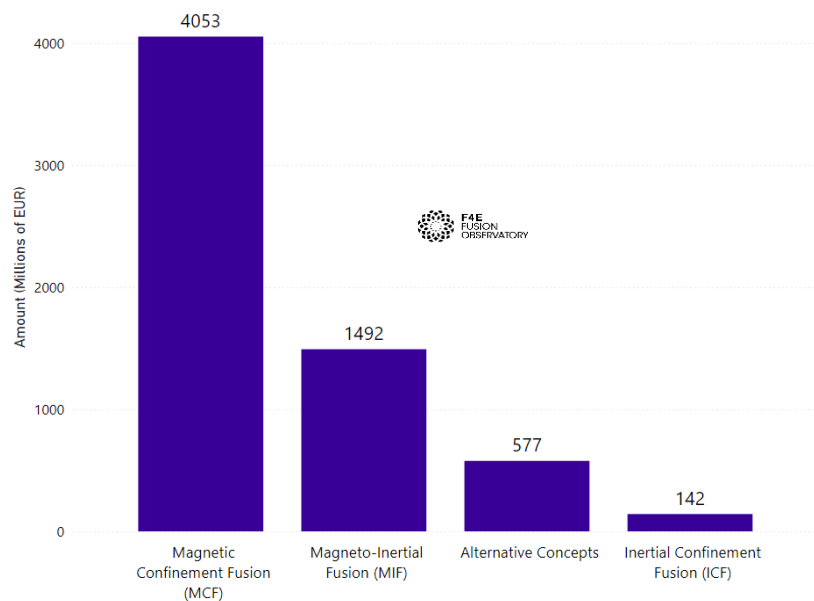


Figure 19 – Funding by Technology Family – North America (Amount in Millions of EUR)

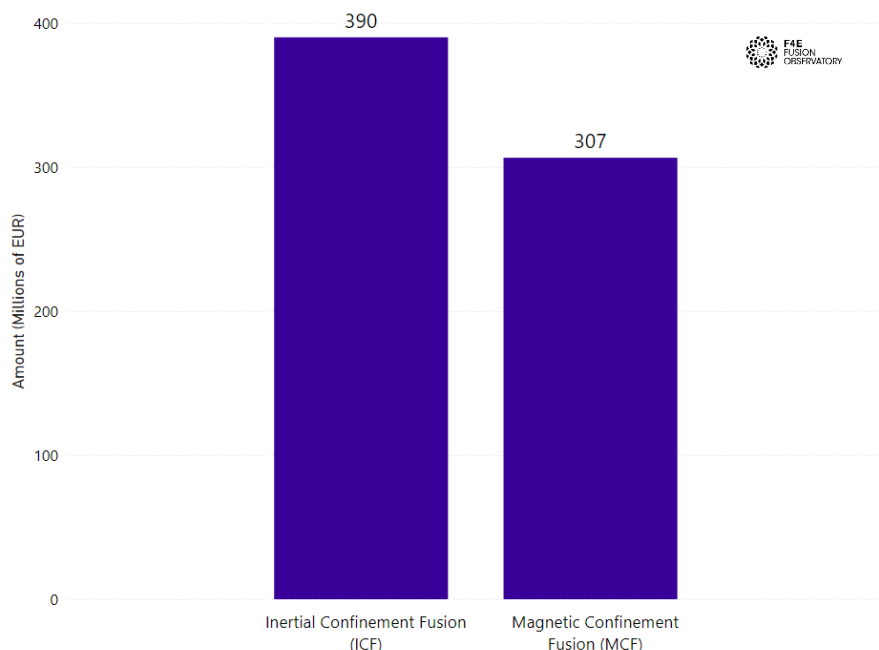


Figure 20 – Funding by Technology Family – European Union (Amount in Millions of EUR)

4. ITER Supply Chain

An analysis focused solely on the investment in private sector fusion companies provides an incomplete perspective on Europe's true position. Apart from the (mostly) publicly funded public sector fusion activities (laboratories and research organisations) that will be subject to future analysis by the F4E Observatory, it is important to consider the investments being made in industrial supply chains to fabricate components for the ITER international fusion project.

With the EU responsible for 45% of the total in-kind contributions to the ITER project, the investment in the supply chain has been substantial. Figure 21 shows the annual amounts awarded by F4E mostly through **~1300 contracts to EU industry, amounting to a total of €6.8B** for the period since 2007 when ITER procurement started. The scope of these contracts is broad and includes superconducting magnets, vacuum vessels, 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 is invested in the US fusion supply chain. One can therefore compare the overall funding in figure 22. The totals are coincidentally similar but show the striking difference 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 include contracts awarded directly by the ITER International Organisation.

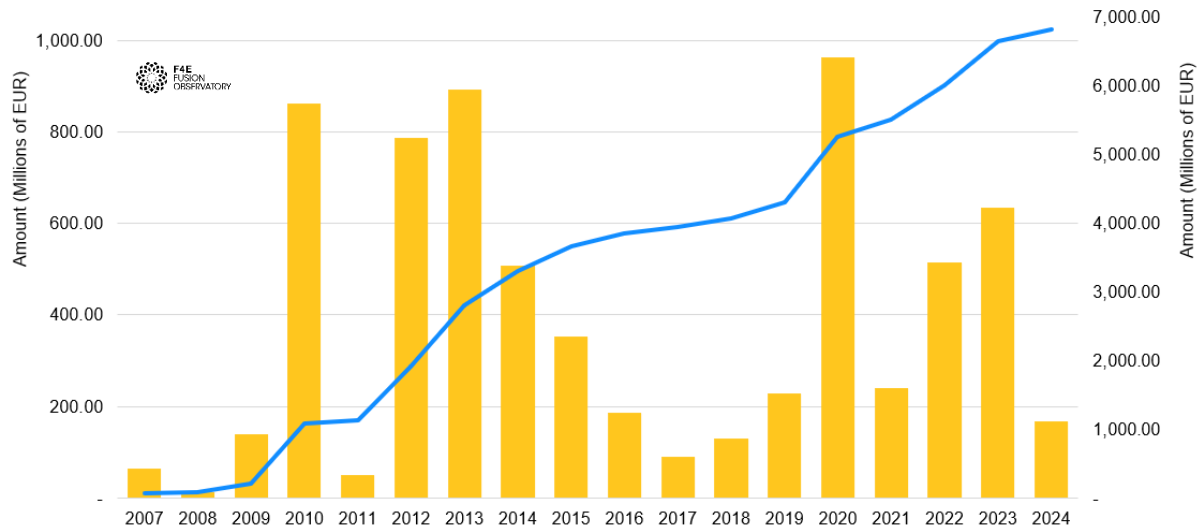


Figure 21 – Annual (yellow bars) and cumulative (blue line) investment in EU supply chain by F4E

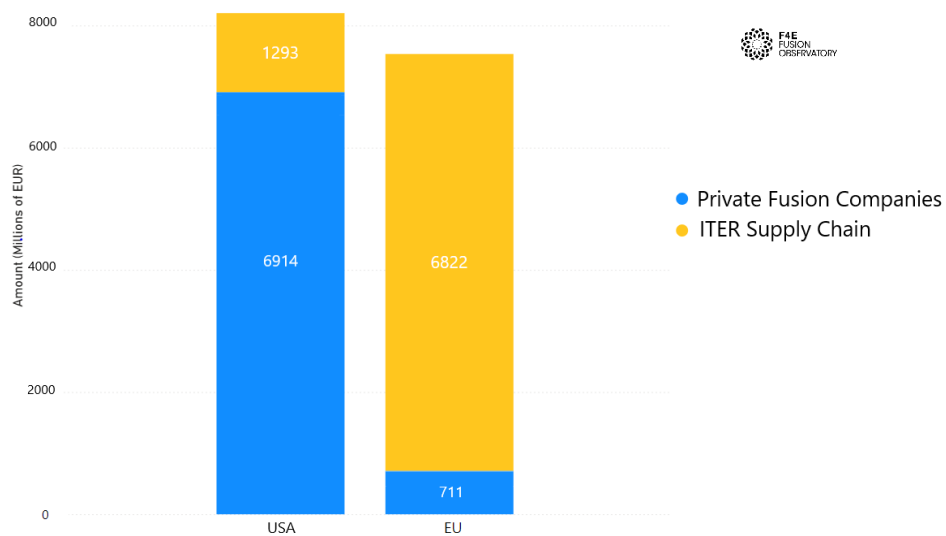


Figure 22 – Comparison of Investment in Private Fusion Companies and the ITER Supply Chain in the US and the EU (Amount in Millions of EUR)⁵

Clearly this shows the respective strengths of each region: **the US is building momentum in private fusion innovation whereas the EU has built an 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 supply 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.

⁵ <https://usiter.ornl.gov/iter-project/>

Annex

Description of the Methodology Used

The F4E Fusion Observatory utilizes 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 categorizing each investment both by technology and by financing type, the Observatory ensures that its findings are reliable, transparent, and readily comparable across companies, regions, and time periods.

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 event 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, scrutinizing 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 organizations 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 standardized 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 standardized 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.

Funding Categorization (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 organization 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 categorize 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 normalized, 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 agent 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.