



The Global Fusion Industry

Canadian Workshop on Fusion Energy Science and
Technology (CWFEST) 2025

Andrew Holland

Chief Executive Officer

Fusion Industry Association

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What is the FIA?



Our Mission Statement

The Fusion Industry Association is the leading voice of the fusion industry. It is a membership organization dedicated to accelerating and deploying commercial fusion energy through advocacy and transparent public communication

Overview

- **53** verified private fusion companies of diverse technologies
- Ove **\$10.5 billion** in investment
 - **\$3.4 billion** raised in the last year
- **84%** increase in government funding to private companies
- **4,000 new jobs** in or supported by the fusion industry
- Many billions more is needed

The global race to fusion has begun

The global fusion industry in 2025

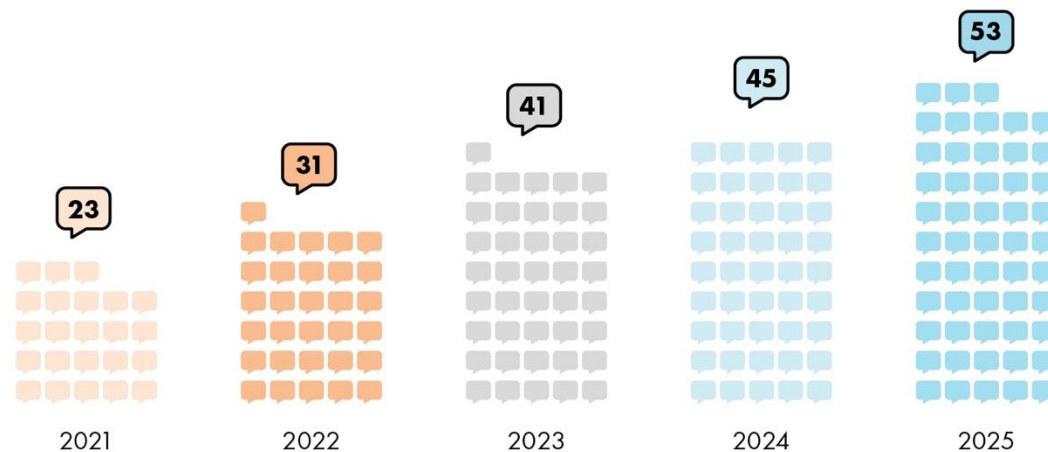
Fusion Companies Survey by
the Fusion Industry Association

Five Year Trends



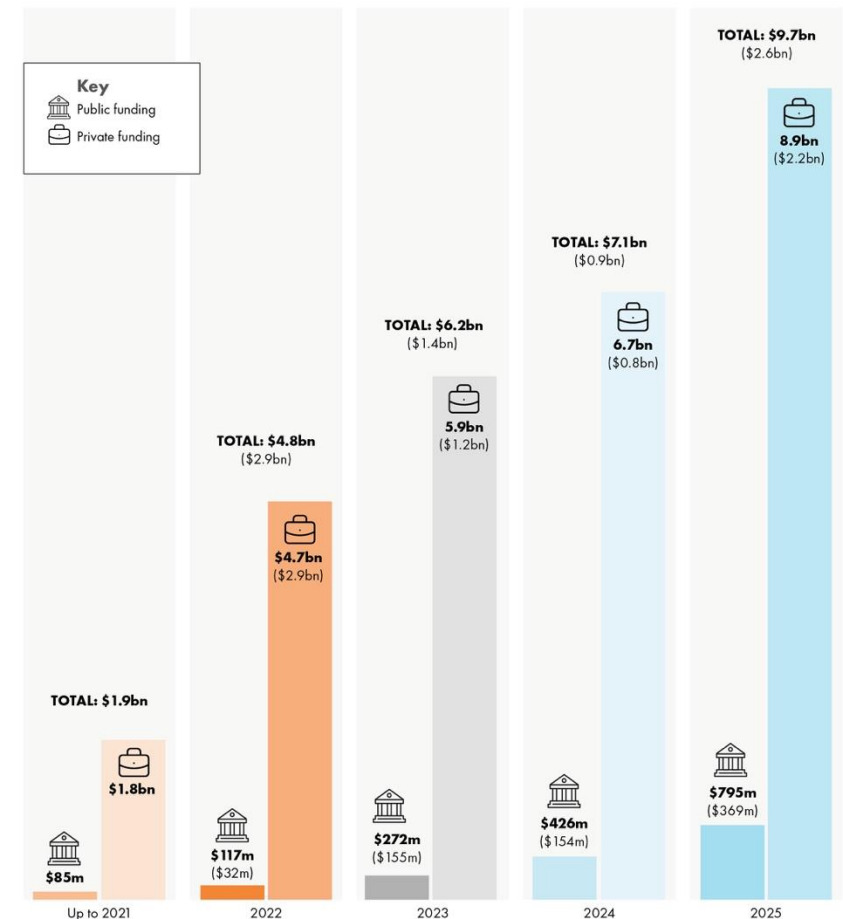
- 5x increase in funding
- 30 more companies

Number of respondents



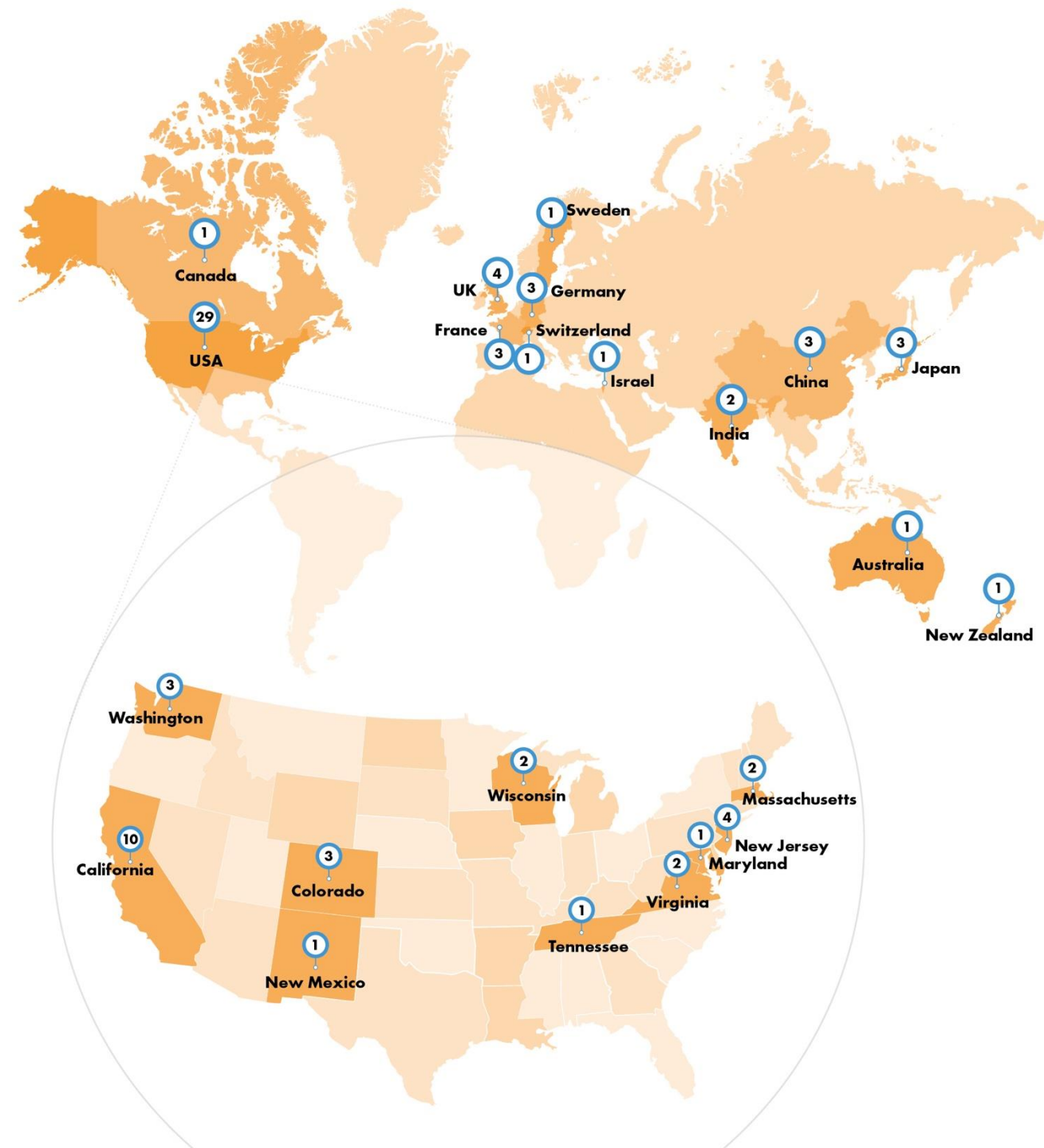
Total funding

(annual increase in brackets)



Geographic Distribution

- 29 American Fusion Companies
 - With > 80% of the investment
- Emerging “Hubs” of Ambition
- Global supply chain, workforce, and scientific collaboration



Canada



generalfusion®



- Longtime home of one leading fusion company, with another accelerating partnerships
- Home to 3 FIA Affiliate Members
- New “Centre for Fusion Energy”



ONTARIOPOWER
GENERATION



Canada G7 Collaboration

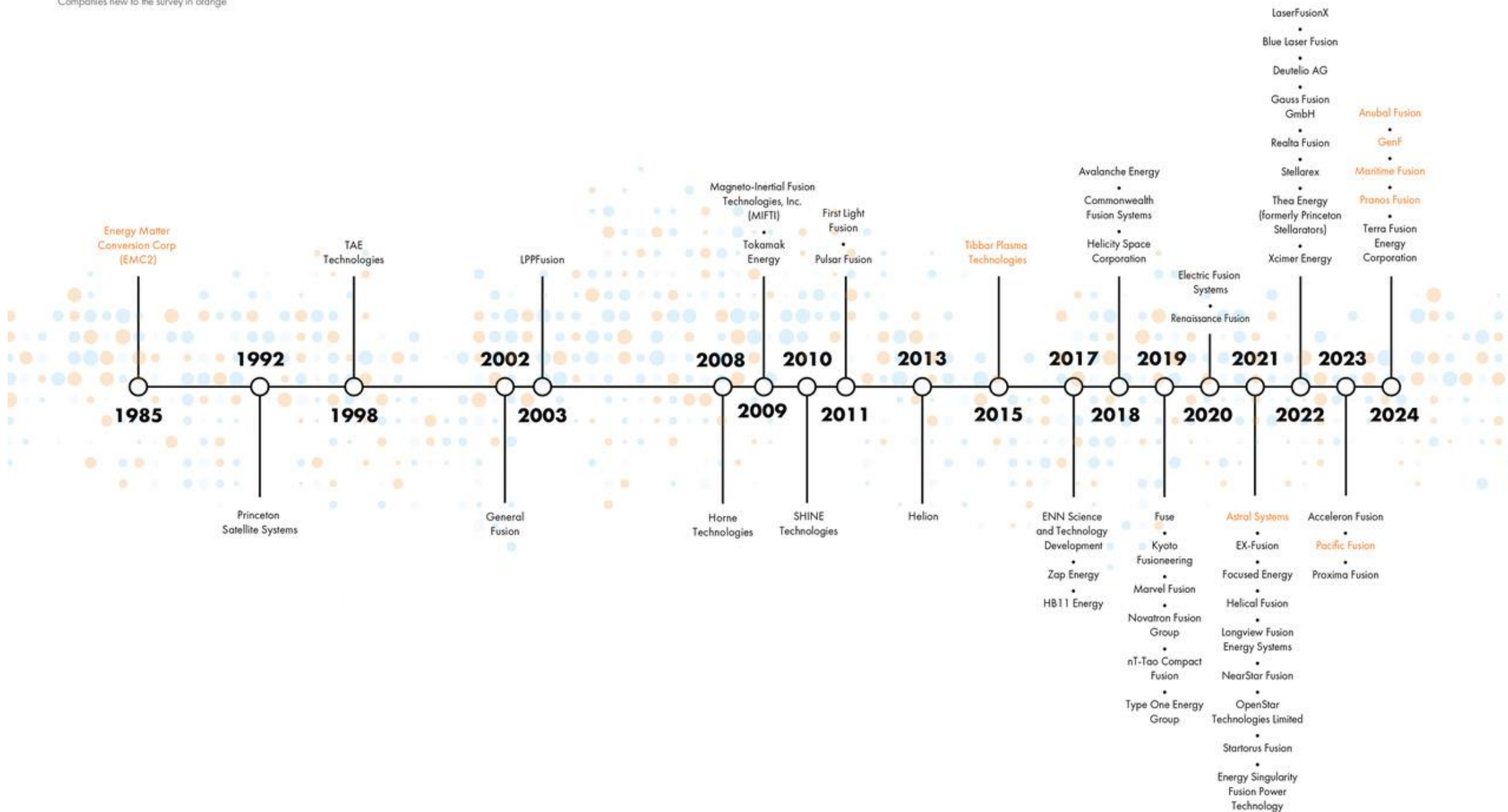


- As host, **Canada drove a joint G7 push** for deeper international fusion cooperation.
- Led calls for **aligned, risk-appropriate fusion regulation** across G7 partners.
- Continued the **G7 Fusion Working Group** to coordinate global policy and research.



12. Timeline of companies founded

Companies new to the survey in orange



Technological Diversity



General approach

- **25** Magnetic confinement (inc. Tokamak, Stellarator)
- **11** Inertial confinement
- **6** Magneto-inertial
- **4** Hybrid electrostatic confinement
- **1** Muon-catalyzed fusion
- **4** Non-traditional concepts/Not stated



Specific approach

- **7** Stellarator
- **7** Laser-driven inertial confinement
- **4** Spherical tokamak
- **3** Tokamak
- **3** Magnetized target fusion
- **3** Magnetic-electrostatic confinement
- **3** Field Reversed Configuration
- **2** Laser-driven inertial confinement, with pB11 fuel
- **2** Z-pinch
- **1** Active-target muon production and high density fusion cell
- **1** Inertial-electrostatic lattice confinement
- **1** Poloidal magnetic confinement
- **1** Pulsed magneto-plasma pressurized confinement
- **1** Shock-driven inertial confinement
- **1** Plectoneme
- **1** Supporting Multiple Approaches
- **1** Dense Plasma Focus
- **1** Magnetic Mirror
- **1** Dynamic Stellarator
- **1** Levitated Dipole
- **1** Pulsar-driven inertial confinement
- **1** Quasi-isodynamic stellarator
- **1** Spindle cusp, superconducting shielded-grid Inertial Electrostatic Confinement
- **1** Magnetic Mirror
- **1** Electrostatic confinement
- **1** Centrifugal Magnetic Mirror

7. Fuel Source

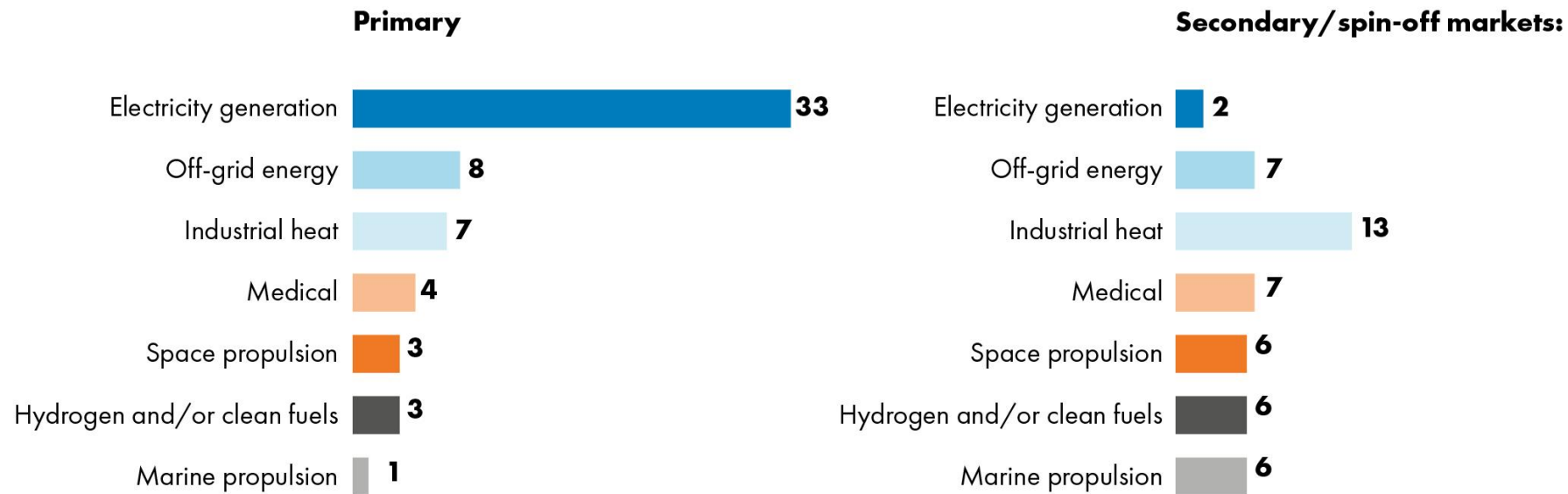


Target Markets



2. Target markets

Primary and secondary markets (respondents could select multiple)



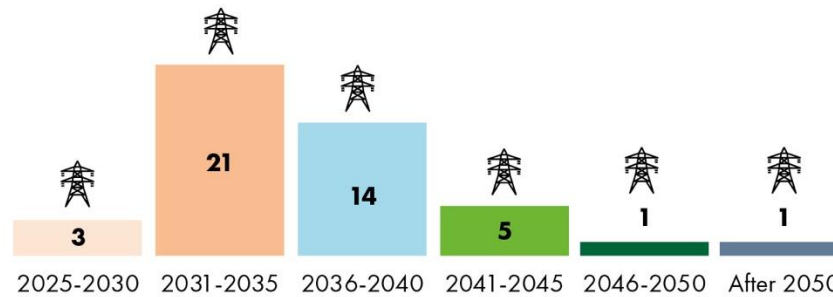
Other named markets included: materials research, lithium breeding, nuclear waste transmutation, laser driven imaging, neutron source, Radiation-as-a-Service (RaaS), hard rock tunneling and mining, diagnostic development, neutron imaging and radiation effects testing for advanced industrial inspection, tritium and radioisotope production.

Timelines



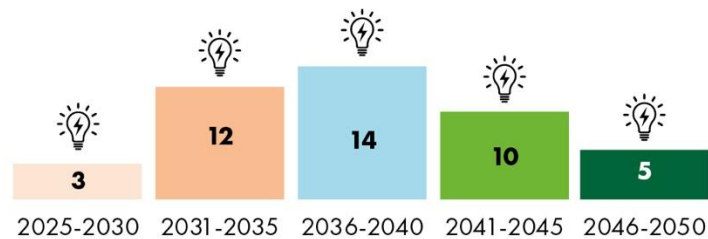
When will the first fusion plant deliver electricity to the grid?

(45 responses)



When will the first fusion plant demonstrate a low enough cost/high enough efficiency (Q) to be considered commercially viable?

(44 responses)



Industry's Timeline



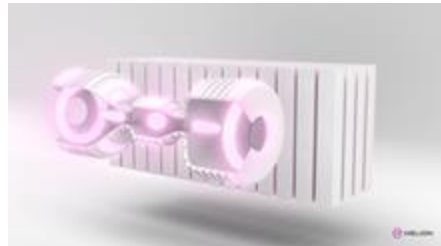
60 years
of
research

- Scientific basis for fusion energy



Mid 2020s

- Scientific Proof of Concept



Late
2020s

- Design and build Pilot Plants



Early
2030s

- Operate Pilot Plants, first sales



Mid 2030s

- Commercial Fusion, rapid scale-up to global deployment

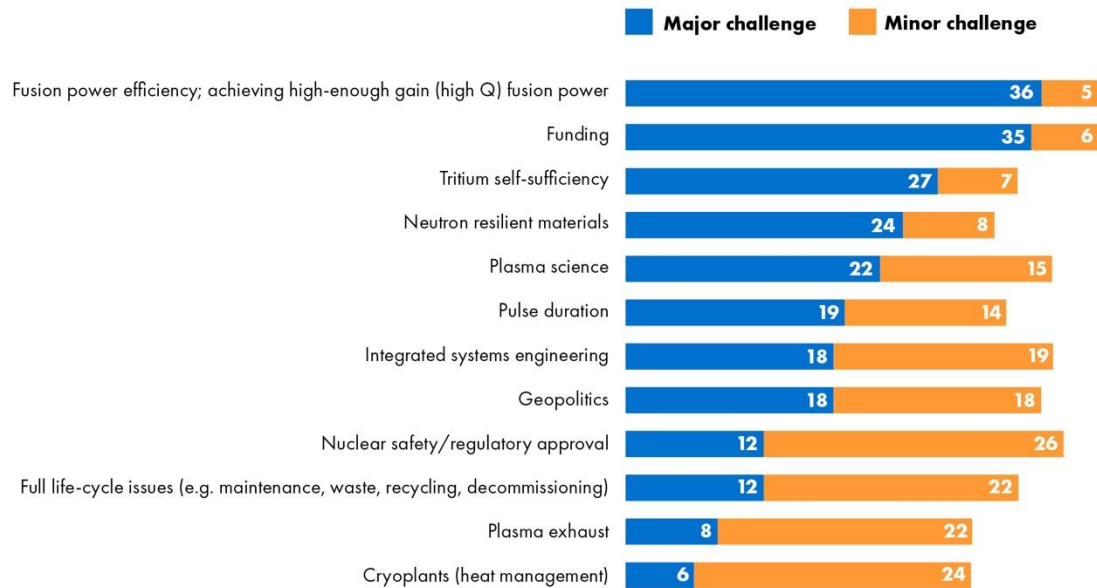


Fusion is Hard



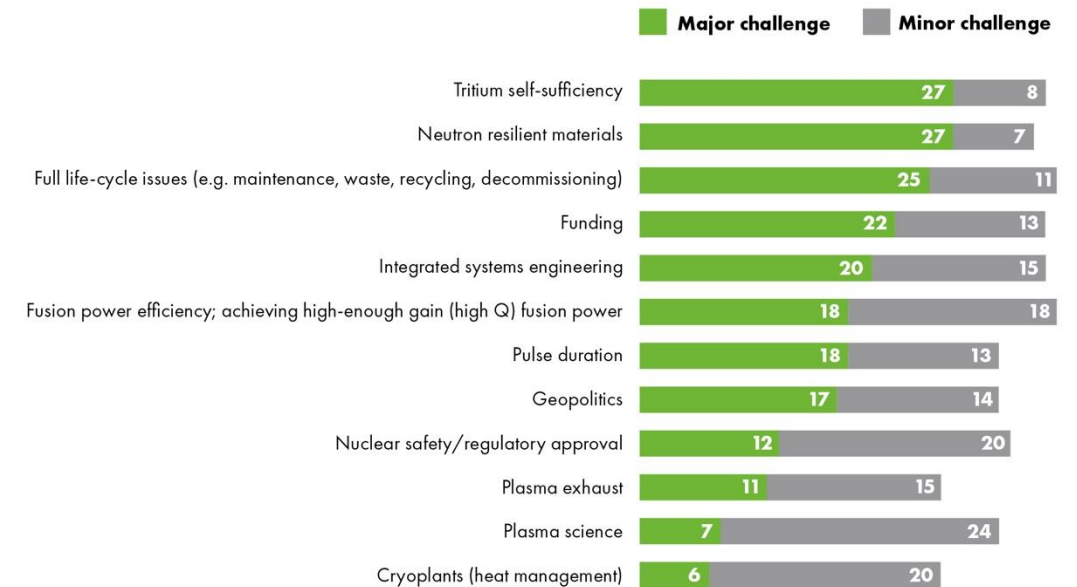
What do you see as the main challenges for fusion energy up to 2030?

(42 responses, non-reported answers indicate not seen as a problem/don't know)



What do you see as the main challenges for fusion energy after 2030?

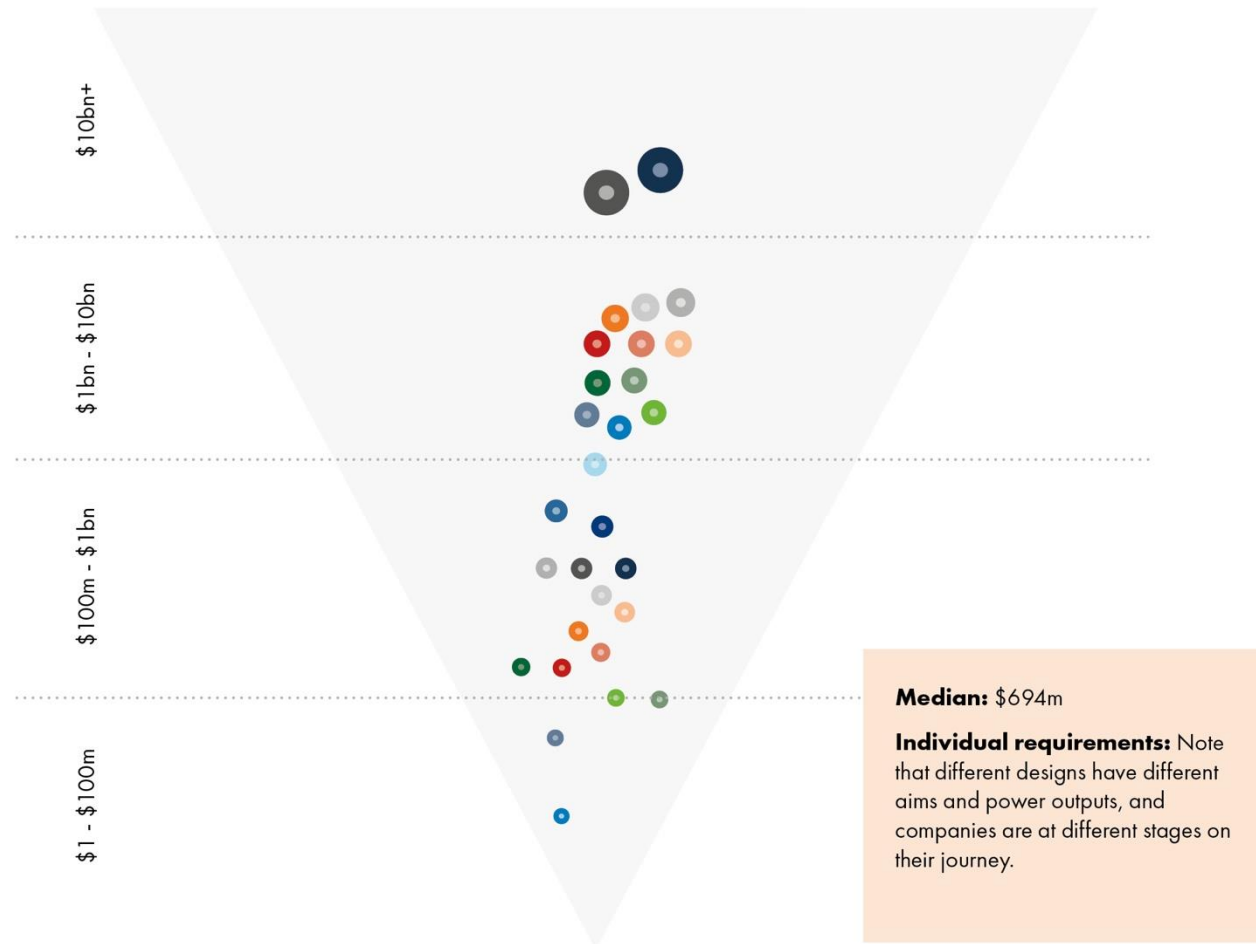
(38 responses, non-reported answers indicate not seen as a problem/don't know)



Billions More are Needed



29 responses



- Median Response: \$694 million
- Range: \$10m to \$12 billion
- Total: \$77 billion for all 35 respondents

FIA's Principles for Accelerating Fusion



Public-Private Partnerships

The private sector should have access to the scientific research that governments have pursued for decades. While government programs transition from pure science to supporting commercialization, Public-Private Partnerships that include government support to private fusion companies can rapidly accelerate fusion development by driving new private investment

Ensuring Regulatory Certainty

The regulatory regime for fusion should be predictable, proportional to the risk, and supportive of innovation, while also giving confidence about ensuring public safety and security. Fusion energy regulation must be permanently separated from fission regulation and should not require lengthy permitting process for every facility.

Communicating Fusion's Benefits

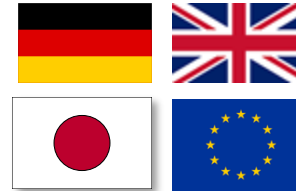
Stakeholders should understand the promise of fusion energy, that it is coming on an accelerated timeline, and actively support its deployment. A knowledgeable public should support fusion deployment at scale.

Growth in public-private partnerships



United States

- **Milestone-Based Fusion Development Program:** \$70m over 8 companies – poised to grow rapidly
- **INFUSE:** \$6m/yr to partner with National Labs
- **FIRE Collaboratives:** >\$100m/yr to address commercially-relevant science
- **Private Fusion Research Program:** \$25m to support public research on private devices
- **Fusion BRIDGE:** to support commercial-relevant test-stands at “hubs” around the country, supported with private, state, and philanthropic



U.S. Allies

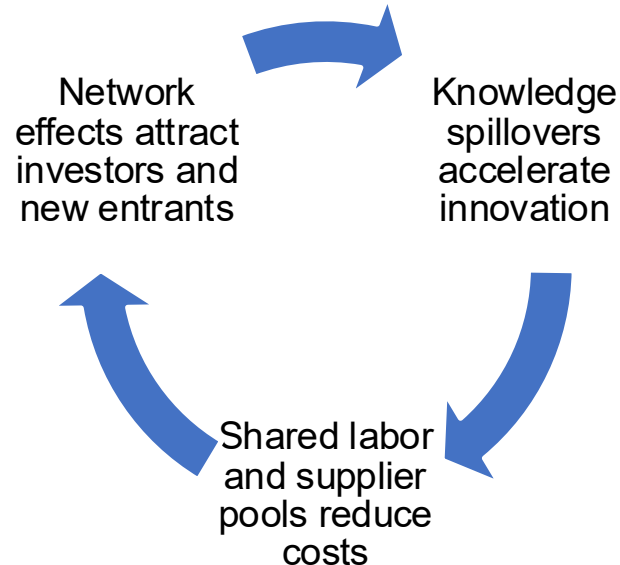
- Germany's new government has announced a plan for the first fusion power plants, and to invest into private companies
- Japan's new fusion strategy has accelerated their timeline to 2035 and will invest in private industry through a new “Moonshot” program
- The UK's ambitious new “Fusion Futures” program invests 2.5 billion GBP over 5 years in the key technology providers
- The European Union is creating a consortium that will invest in private fusion efforts by 2026

Why Should Canada Care?

The logic of clusters

Economic Agglomeration Effects

- Co-location of firms, talent, and capital → **increasing returns to scale**



How Clusters Form & the Role of Policy



Seeds of a Cluster

- Anchor institutions (universities, labs)
- Leading firms and spin-outs
- Mission-driven public R&D
- Concentrated talent and quality of life
- Organic growth of suppliers

What government can (and can't) do:

-  *Catalyze* via R&D funding, infrastructure, procurement, and convening
-  *Force* a cluster—must build a regional comparative advantage
- Best outcomes come from **organic growth + strategic support**

Scale and Strategic Implications



How Big Can a Cluster Be?

- Knowledge spillovers strongest within **30–50 miles**
- Tech ecosystems emerge as **networks of regional hubs**

Suggestions

- Anchor R&D institution should encourage private co-location
- Ensure policy certainty and demonstration markets
- Invest in skills, infrastructure, and connectivity

Bottom Line:

Governments don't build clusters. Create ***the conditions*** for entrepreneurs, scientists, and investors to do so.



What can Canada do?

Regulation

Siting – Permitting & Investment

Workforce

Support Supply Chain Development

Perspectives for Canada's Regulatory Approach



- **FIA supports a unified regulatory framework** for all fusion machines
 - Preferably under **Class II**—aligned with actual hazard potential.
- **FIA opposes the CNSC's proposed “Two Categories” approach,**
 - Creates risks of regulatory uncertainty, arbitrary thresholds, and reduced investor confidence.
- **FIA looks forward to further stakeholder engagement** (workshops, public meetings, iterative comment periods) before any final rulemaking.
 - January 22, 2026 workshop
- **Benefits of a consolidated approach:**
 - clarity for developers,
 - scalable oversight from prototype to deployment
 - improved competitiveness for Canada as a fusion destination.

Siting First Plants



The New York Times

Fusion Start-Up Plans to Build Its First Power Plant in Virginia

Commonwealth Fusion Systems, an M.I.T. spinoff, aims to generate carbon-free electricity in an industrial park near Richmond in the early 2030s.

Google strikes deal to buy fusion power from MIT spinoff Commonwealth

Focused Energy and RWE to explore 1GW fusion pilot plant in Germany

The energy pilot plant will be constructed at the Biblis nuclear site.

Microsoft signs power purchase deal with nuclear fusion company Helion

By Timothy Gardner

May 10, 2023 3:41 PM EDT · Updated 2 years ago



Helion Energy starts construction on nuclear fusion plant to power Microsoft data centers

By Stephen Nellis

July 30, 2025 12:20 PM EDT · Updated July 30, 2025



Fusion Energy Project Sited at Former TVA Coal-Fired Power Plant

Fluor to design laser fusion power plant

Monday, 11 March 2024

California-based Longview Fusion Energy Systems has contracted US engineering and construction firm Fluor Corporation to design the world's first commercial laser fusion power plant.



NUCOR AND HELION TO DEVELOP HISTORIC 500 MW FUSION POWER PLANT

Build a skilled workforce



- Expand and modernize fusion-focused education
- Leverage national laboratories as training hubs
- Create centers of excellence for key skills
- Promote cross-sector talent migration

The skills needed by the fusion industry and its supply chain

- Skills to develop specialized components such as for heat management, plasma-facing first wall, and vacuum pumps
- Precision engineering skills at the cutting edge
- Skills for large scale production of power electronics
- Scientists, including plasma physicists
- Nuclear and plant process engineers
- Engineers to design and assemble fusion machines and power plants
- Machine learning and digital engineering
- Those experienced in navigating new regulatory frameworks

De-risk Supply Chain Capacity Building



- Structured Public-Private Partnerships
- Fund demonstration hardware, pilot plants, and research collaborations
- Targeted incentives and financial tools
- Reduce trade and export barriers
- Support diversification of fuel supply chains

30%
of suppliers:

We have clear direction from the fusion industry about its long-term component needs

"The products required are highly specialized, costly to produce and volume demanded currently is extremely low."

Anonymous fusion supplier

FIA Membership



FIA Affiliate Members: Fusion Suppliers, Fusion Customers & Nonprofits





Thank You

*For more information, contact [Andrew Holland](mailto:aholland@FusionIndustryAssociation.org), FIA CEO:
aholland@FusionIndustryAssociation.org
www.FusionIndustryAssociation.org*