

FIA Comments to the Public Consultation on Euratom

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About the Fusion Industry Association

The Fusion Industry Association (FIA) is a global non-profit organisation and the voice of the private fusion industry. FIA members are working to accelerate and deploy commercial fusion energy in a decade. Its 37 members and over 80 affiliate members are the companies and research institutions involved with building fusion machines today that will show that commercial fusion will be deployed in a timeframe relevant for tackling the climate crisis.

The world needs more affordable, baseload, clean, safe and secure energy and we believe fusion power to be the optimal solution. Moreover, fusion energy will become a key pillar to secure Europe's energy security and strategic autonomy in the future. The FIA is committed to collaboration across public and private sectors to accelerate the development of fusion power and deploy it widely on the grid. With the right combination of investments, policy incentives, regulatory certainty and by empowering fusion companies, suppliers and research institutions, fusion energy is what Europe needs to accelerate and facilitate its green transition.

Aligning public research to the needs and timelines of the private industry

The FIA welcomes the opportunity to provide comments to the Euratom Research and Training Programme 2021-2025 and its extension for 2026-2027. The current programme aims to foster the development of fusion energy and contributes to the implementation of the European Research Roadmap to the Realisation of Fusion Energy. While, the FIA supports the overarching objective of the roadmap which is to align the priorities in fusion research and development towards the ultimate goal of achieving electricity from fusion energy, the Commission should take into account ongoing activities by private fusion companies and re-align timelines to match commercialisation needs going forward.

It is critical that public fusion research be aligned to the needs of commercialisation. The clear R&D “gaps” in fusion science and technology are well-understood by both the public and private fusion sectors. To enable commercialisation in the near term, public research must prioritise closing those scientific gaps that would accelerate commercialisation such as advancing materials science for the first wall and divertors, tritium breeding, remote maintenance systems, and development of next-generation (HTS) magnets, among other things.

We appreciate the Commission's suggestion to strengthen the focus on the involvement of the private sector as part of the extended Euratom Research and Training and look forward to working together to design new public private partnerships (PPPs) programs that would leverage the strengths of both the public and private sector.

Improving the transfer of knowledge from research labs to industry

A strong scientific knowledge base is one of Europe's key assets and has allowed the EU to become world-class in several research fields including fusion energy. To continue to build on this success, the EU should aim to improve knowledge transfer between public research institutions and industry. Private industry should be involved in setting direction for the applied aspects of research and manufacturing related to fusion.

For this reason, the European Commission should take initiatives aiming at fostering a closer collaboration between research institutions, fusion start-ups, and large companies. Knowledge transfer is critical to ensure industry can benefit from publicly funded research and further advance the development of fusion.

EU budget for fusion should be increased significantly

With the emergence of private fusion start-ups, Europe can unleash new dynamics in fusion technology development. Access to funding - both public and private investment - is crucial to deploy commercial fusion. The total budget for the Euratom Research and Training Programme for the period 2021-2025 was €1.38 billion, among which €583 million were dedicated to indirect actions in fusion research and development.

As fusion is a capital-intensive endeavour and securing funding is vital for fusion startups, the FIA believes the Euratom budget needs to be increased significantly and used to fund public research endeavours as well as public-private partnership programmes. Indeed, the EU should have a specific focus on fostering the highly innovative private fusion landscape via direct support and public-private partnerships. The Euratom budget should also be made available to varying technological approaches to fusion beyond ITER and for both public and private initiatives.

Learning from other existing forms of public-private partnerships

The EU's approach to PPPs is currently mostly focus on the cooperation with ITER. The report conducted by Trinomics highlights fairly well that the EU needs to adapt to new forms of PPPs, moving beyond ITER. The EU should learn from other existing forms of PPPs that have proven to be successful.

Germany's programme Fusion 2040 is a good example of PPP. Germany announced it will provide more than €1 billion for fusion research by 2028. As part of the new programmatic spending, up to €100 million per year will be made available to fusion companies. This funding programme is open to the multiple technology approaches to fusion and provides grants of €5-10 million.

The United States has already authorised \$415 million for their fusion milestones-based programme. Moreover, under the US Inflation Reduction Act (Sec. 13702. Clean Electricity Investment Tax Credit), a 50% tax credit is granted for the construction of net-energy fusion power plant prototypes.

Other countries are also exploring milestone-based PPPs that provide support to companies for achieving important milestones on the way to a commercial power plant. This approach protects taxpayers and incentivises innovation.

Making better use of public funding by leveraging industry expertise

Currently, the EU fusion research programme is mainly focused around the completion of ITER, IFMIF-DONES, and DEMO. As the world's largest fusion experiment and a great example of international cooperation in research led by Europe, ITER has been instrumental in advancing fusion science and fusion engineering. However, despite great efforts, the ITER project has faced significant technical challenges and substantial delays.

The FIA recently conducted a survey which highlights that 88% of fusion companies believe that the first fusion power plant will deliver electricity to the grid in the 2030s or before. By focusing only on ITER and on the construction of DEMO, the EU is prioritising one possible pathway for fusion commercialisation and not creating an innovation environment that allows for optionality and for multiple shots on goal.

FIA members are pursuing commercialisation along technically diverse pathways, including variations in fuel type and device type. For the fusion industry, that diversity increases the chances of success for commercialisation of fusion energy by engaging in multiple pursuits simultaneously.

The EU's approach to fusion should follow the principle of technology neutrality. Indeed, the EU should remain neutral in the competition between alternative fusion technologies, and should not "pick winners". Instead, it should focus its research and development funding on supporting commercially-relevant science and technology that is applicable across multiple technologies.

Direct financial support for the construction of small-scale net-energy prototypes by private companies should also be envisioned, as successful completion of these can massively propel the fusion industry forward, attracting further private capital to tackle the remaining challenges towards commercialisation

The FIA stands ready to support the EU as it transitions its fusion programme from a purely scientific endeavour to a commercially-relevant programme.

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