

Fusion Energy Momentum Highlighted at Ministerial Meeting Hosted by IAEA and Italy

Government ministers and senior officials from dozens of countries convened at the Italian Ministry of Foreign Affairs and International Cooperation in Rome for the inaugural ministerial meeting of the World Fusion Energy Group (WFEG) today, underscoring the growing interest and progress in developing fusion technology to provide a clean, safe and limitless source of energy.

International Atomic Energy Agency (IAEA) Director General Rafael Mariano Grossi and – on behalf of the Italian President of the Council of Ministers Giorgia Meloni – Undersecretary of State to the Presidency of the Council of Minister Alfredo Mantovano delivered the opening speeches together with the Italian Deputy Prime Minister and Minister of Foreign Affairs Antonio Tajani and the Italian Minister of Environment and Energy Gilberto Pichetto Fratin.

During the WFEG ministerial discussions, co-organized by the IAEA and Italy, participants widely agreed that cross-border collaboration is essential to accelerate the transition from fusion research to commercialization. Speakers highlighted the need to work together to establish international supply chains and develop the required specialised workforce.

The meeting – the first of its kind – showed how recent developments and technical breakthroughs in the fusion sector have generated new momentum, making the deployment of fusion plants in the near future increasingly plausible.

In a further sign of increased interest, the IAEA launched two fusion publications – the World Fusion Outlook 2024 and Fusion Key Elements – on the occasion of today's meeting.

“The fusion sector is experiencing an unprecedented transformation, driven by scientific breakthroughs, combined with a surge in private sector investment,” said IAEA Director General Rafael Mariano Grossi, who presented the two publications at the WFEG.

“The IAEA has intensified its involvement, resulting in the World Fusion Outlook and Fusion Key Elements, as well as the expansion of our activities devoted to advancing fusion engineering, ensuring safety, addressing environmental concerns, developing regulatory frameworks, and examining the socio-economic dimensions related to fusion energy,” Director General Grossi said.

“It is no coincidence that the World Fusion Energy Group is gathering for the first time in Italy. We are here thanks to our tradition, our prestige in the field of scientific research and the key contribution that Italy has made to global technological

progress,” Undersecretary Mantovano declared. “We are endowed with top level technological expertise. Our university system trains a significant number of internationally renowned nuclear engineers and physicists, and our centres of excellence stand out with large research and development projects.”

Discussions at the WFEG meeting were focused on three main topics: the status of fusion energy; global collaboration and public-private partnerships; and sustaining resources and exploring alternative business opportunities.

“The strong attendance at today’s meeting clearly demonstrates the growing optimism about the immense potential of fusion energy as a long-term clean energy solution,” Director General Grossi said. “Until recently, fusion energy had been a distant dream, but now with burgeoning private sector involvement and major technical breakthroughs, it seems fusion's realization is now within reach.”

“The atom can be a safe, effective and clean source for the future. It is a concrete prospect, in which we can and must believe. Today we want to start an ambitious path of sharing and discussion that will concern not only the current situation of fusion energy, but also the path to follow in order to reach this momentous goal,”

Undersecretary Mantovano stated. “The Group encourages each of us to look beyond our own borders and to lay the foundations of a new energy and environmental diplomacy that multiplies the opportunities for cooperation between the North and the South of the world.”

World Fusion Outlook 2024

In its second edition, the World Fusion Outlook 2024 provides an overview of the current state and direction of the fusion field. It highlights emerging plant concepts, projected development timelines, policy frameworks and trends in both public and private investment. It also covers research output metrics and offers regional and sectoral outlooks.

At least 20 fusion energy plant concepts are at various stages of development in ten countries with the target completion dates ranging between the late-2020s and mid-2050s. The concepts featured in this year’s outlook are being developed by governments, private companies and public-private joint ventures.

Fusion Key Elements

Fusion Key Elements highlights the importance of sharing a common vision and understanding of the path leading to commercialization of fusion energy among all stakeholders involved. It is structured around six key elements, each addressing facets of the fusion energy paradigm. These include:

1. Research, development and demonstration priorities and metrics, and commercialization milestones
2. Resources, workforce and knowledge management for industrialization
3. Safety, security and non-proliferation
4. Global collaboration
5. Roles of stakeholders
6. Public engagement, outreach and communication

Together, these six elements form the foundation of a unified strategy to navigate challenges and seize the opportunities inherent in fusion energy development. Experts from around the world, including members of the International Fusion Research Council (IFRC) contributed to the publication.

“The IAEA remains steadfast in its support of fusion energy development, championing initiatives that bring us closer to realizing the dream of limitless, clean energy,” Director General Grossi said. “Together, let us embrace the promise of fusion energy, forging a path towards a brighter, more sustainable future for all.”