

Inaugural Ministerial Meeting of the IAEA - World Fusion Energy Group (WFEG)

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Statement by India

**Delivered by Dr. Ajit Kumar Mohanty,
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(Her Excellency Giorgia Meloni, President of the Council of Ministers of the Italian Republic), Mr. Rafael Grossi, Director General of the International Atomic Energy Agency (IAEA), distinguished delegates, ladies and gentlemen,

Namaste and good morning. It is an honor for me to represent India at this august forum. On behalf of Government of India, I warmly greet the distinguished delegates gathered here today.

Excellencies:

1. Stakeholders in fusion energy, both public and private sectors have assembled here to discuss a path for early transition of fusion from laboratory

to commercial exploitation in energy production. The time could not be more opportune. The adverse impact of dependence on fossil fuels on climate have never been so prominent. At the same time, a developing global economy requires to address pressing needs for energy security. We need predictable, sustainable and affordable energy. India's net-zero emission by 2070 is planned around a credible energy-mix including high stress on renewables and a strong contribution from nuclear energy which includes fission based reactors as immediate solution and fusion in future.

Excellencies,

2. As India sets its path to establish itself as a developed nation (*Viksit Bharat*), Government of India has announced policy directives like (a) setting up of Bharat Small Reactor, (b) research and development of Bharat Small Modular Reactor and (c) newer technologies for nuclear energy in order to fulfil the base load demand of the grid.

Excellencies,

3. While nuclear energy based on fission will see an upward surge for immediate deployment, fusion energy is expected to play a significant role in future. The essential breakthroughs in controlling fusion reactions to enable its commercial utilization still appear to be a few decades away. The world is eagerly expecting the ITER to initiate operations with 'burning plasma' and generate much-needed knowledge for furthering D-T fusion.

Excellencies,

4. As a responsible member of the ITER collaboration, we have completed most of the in-kind contributions required for start of operation of the machine. These include (a) the 30 m tall and 30m diameter Cryostat, (b) Cryogenic distribution systems, (c) the Cooling Water System capable of exchanging approx. 1 GW of heat for the entire high-power pulse duration, (d) the In-Wall Shield Blocks that are inserted inside the double walled vacuum vessel to work as neutron shields. All of these components, being First Of-A-Kind, involve several challenges and have been fabricated by Indian industries including a large number of

small industries (SMEs) with active support from the scientists and engineers of Institute for Plasma Research (IPR) at Gandhinagar, Gujarat, India.

Excellencies:

5. While we wait till the opportune moment for ITER to prove the feasibility of producing energy from fusion, it is prudent for us to maintain the public trust on this complex science. Innovations and alternate pathways, including active efforts from private initiatives are very relevant in this regard.

Excellencies:

6. Institute for Plasma Research (IPR) and Department of Atomic Energy have spearheaded plasma science as well as fusion R&D in India for more than three decades. India's fusion program started with commissioning of ADITYA, ADITYA-U followed by SST-1 tokamak. India has achieved many technological milestones like cryogenically-cooled large superconducting electromagnets and operating them successfully in steady state, developing cryopumps, high heat flux test facilities and novel electromagnetic pellet injectors, R&D

into high power neutral beam sources with long pulse operation, etc.

7. We, in India, are actively looking for feasibility of early usage of fusion, for example fusion-fission hybrid modes for electricity generation or radioactive nuclear waste incineration. This concept is called a fusion driven sub-critical reactor or fusion-fission hybrid reactor. This would be an intermediate step while we wait for encouraging results from D-T experiments in ITER. India remains committed to expand peaceful applications of Fusion energy technology, both in power and non-power sector. We believe, harnessing fusion reaction is not negotiable for a sustainable civilization for millennia and sustained research is essential. We look forward for this IAEA WFEF forum to pro-actively explore options and collaborations among all stakeholders for early deployment of fusion.

Excellencies,

We thank the city of Rome, the people and the Government of Italy and the Agency for hosting the 1st Ministerial Meeting of the IAEA -WORLD FUSION ENERGY GROUP.

I thank you all for your kind attention.

Thank you and Jai hind