

IUPAP Standing Committee on Fusion (*Clean, Safe, Sustainable Energy Through Fusion*)

Mandate: Promoting international cooperation in research and development in the field of nuclear fusion by establishing a unified, inclusive, and transparent global framework that bridges borders, disciplines, and geopolitical divides.

Our planet faces an existential climate crisis, driven largely by global warming resulting from the rapid rise in greenhouse gas emissions caused by the burning of fossil fuels for energy generation. Renewable energy sources, like solar and wind, while free from such emissions, suffer from the problem of intermittency. On the other hand energy from nuclear fission faces opposition due to radioactive waste generated. In this scenario, nuclear fusion offers a vision of clean, sustainable energy free from greenhouse gas emissions and long-term radioactive waste. As living standards in the Global South rise, higher demand for energy would further exacerbating climate change. At present, most nations from the Global South are virtually disengaged from the discussions or in the development of fusion energy. The IUPAP, with its credibility, its large footprint across the Global South, and strong track record of facing global challenges is well equipped to handle this issue. The creation of a new Standing Committee on Fusion could provide an international and neutral platform for all stakeholders to come together and have free exchange of ideas and information.

Nuclear Fusion* is a rapidly evolving field, bringing physics and technology together to realize future fusion power plants. The latter is being pushed forward and taken up by newly created private-public partnerships and by the private sector, like start-ups, companies etc. Generally fusion research is very well connected internationally, as exemplified in the international fusion project ITER, with China, the European Union, India, Japan, Korea, Russia and the United States as its members.

On the other hand, many countries around the world are either peripherally or even not at all involved in fusion research, especially from the Global South. This is precisely where a newly created Standing Committee on Fusion could serve as a platform that provides a neutral forum for discussions with a vision to disseminate information on fusion related activities, enable training in plasma physics and related areas through suitable courses/relevant documents, and provide opportunities for training talent from the Global South with an aim to get their respective physical societies involved, possibly even reach out and raise awareness among their respective governments.

*The term “fusion” here includes the two main approaches, namely, “*magnetic fusion*” and “*laser fusion*”, both of which are intended to be the initial focus of this Standing Committee and could be further expanded in the future.