

Press release of the Bridge Forum Dialogue a.s.b.l.

**“The ITER project, a decisive step toward the availability of
fusion energy during this century”**

The Bridge Forum Dialogue organized yesterday a videoconference under the title: ‘The ITER Project: A Decisive Step toward the Availability of Fusion Energy during this Century’. ITER (“The Way” in Latin) is one of the most ambitious energy projects in the world today. The event was held under the chairmanship of Mr Massimo Garribba, Deputy Director-General responsible for EURATOM coordination, Directorate-General for Energy, European Commission. The speaker was Dr Bernard Bigot, Director-General of the ITER Organization.

A significant and distinguished audience attended the event, including representatives from the European institutions and bodies, industry, academia, governmental authorities, and financing institutions.

Massimo Garribba introduced the speaker and the subject matter of the conference.

Dr Bernard Bigot has been the Director-General of the ITER Organization since 5 March 2015. However, he has been closely associated with the ITER project ever since 2003 when France offered to host the project.

Dr Bernard Bigot started by highlighting **the need of carbon-free energy** on a massive scale given the significant role electricity plays in social and economic development, the current efforts to decarbonise energy production, and the projected increase in global energy consumption, i.e. around 60% growth by 2030. Therefore, the development of **sustainable clean energy sources** is of paramount importance and fusion power represents a promising solution in this sense, according to the speaker.

Dr Bernard Bigot illustrated the advantages of hydrogen fusion. According to him, fusion energy is a **predictable baseload power** source that can **complement renewable energy** sources in a safe and environmentally responsible way. He underlined that fusion energy production would **not emit any greenhouse gases** and would have no long-lasting high activity radioactive waste. The speaker indicated that **fusion fuel**, which is made of two isotopes of hydrogen: deuterium and tritium, is **virtually unlimited** for hundreds of millions of years and evenly distributed across the globe.

The speaker summarized the main features of the **ITER experimental device - the tokamak**, and some of the technical requirements to achieve a fusion reaction. Fusion reactions take place inside plasma, which is technically challenging to produce and control as it requires sustainable high-temperatures, strong magnetic fields to shape and confine it, and a tokamak of considerable size to produce a plasma that outputs more thermal energy than is put into it. The ITER project constitutes a significant scaling-up in size of a tokamak to create and shape a fully controlled sustained plasma by means of magnetic confinement fusion, proving that **fusion engineering can be done at full-scale**.

The ITER project is an international collaborative research project to build and operate an experimental fusion device in the South of France. ITER aims to demonstrate the scientific and technological **feasibility of fusion power for peaceful purposes**, necessary for the future commercial production of fusion-based electricity.

The speaker explained that ITER is 'a multinational scientific collaboration without equivalent in history', between seven global partners - China, the European Union (EU), India, Japan, Korea, Russia, and the United States. Dr Bernard Bigot added that the ITER Agreement, signed in 2006, established **the ITER Organization** to implement the project and manage the project integration. As signatories to the ITER Agreement, the seven members provide cash and in-kind contributions in the form of completed components, systems or buildings to the ITER Project. The **EU, as the host Member**, is responsible for 45% of ITER's construction and manufacturing costs. Each of the members has in place a Domestic Agency to manage their industry suppliers. Dr Bernard Bigot mentioned in this context the benefits to the global supply chain since the ITER project is creating a worldwide network of companies with experience in meeting the demanding requirements of fusion engineering.

Dr Bernard Bigot emphasized that, despite the Covid-19 crisis, the project has made steady progress, and is **nearing 75% completion of 'total construction through First Plasma'**. The complex logistics designed to deliver massive, high-precision components from three continents has proven reliable, even during the pandemic. He indicated that ITER is envisaged to achieve first plasma by the end of 2025.

Dr Bernard Bigot concluded by stressing that ITER is a First-of-a-Kind project, both as a scientific experiment and as a global collaboration, with still many challenges ahead. It will be followed by a DEMO (a DEMOnstration fusion reactor), which is a pilot fusion power plant to draw on lessons learnt through ITER in order to make the final step towards a functional commercial plant. He noted that the **first fusion power plant(s) might be connected to the grid in Europe by 2060**.

Mr Massimo Garribba complemented that the EU is fully **committed to the success of the project**, highlighting the continued technical, political and financial support. The EU committed **EUR 5.61 billion to the ITER project** under the current EU's multiannual financial framework 2021-2027.

The presentation was followed by a stimulating questions and answers session. The audience was highly interested in the **ITER design and construction**, including about possible impact of **natural hazards** as earthquakes. Participants enquired about the **potential risks** for ITER finalisation, be it political, geopolitical, technical, or financial. As of the last, several questions were raised about the **total costs of the ITER project** and **the possibility to accelerate its completion** given the pressing need of clean energy sources. Certain participants questioned whether the investment in ITER might not deprive **more immediate energy projects** of financial support, and about the advantages of project as compared to other promising **nuclear advanced technologies**, such as Small Modular Reactors. The **prospects for the commercial deployment of fusion reactors for power generation**, including grid connection and electricity costs, attracted numerous enquiries.

Dr Bernard Bigot estimated that the costs of fusion-based power would be **competitive with other energy sources**, with **no changes to existing networks** being required to deliver it. As regards the ITER project, he underlined that ITER is facing a **technological challenge** given the **high precision** for assembling large components, namely the vacuum vessels and coils. In terms of budget, Dr Bernard Bigot explained that the total ITER cost is difficult to estimate since it is dependant on the budget of the ITER members. Their **continued support is essential**, not only from the financial perspective, but also from the industrial and intellectual point of view. He indicated a rough total of EUR 22 billion for the full construction until 2035. He recalled that ITER is a **First-of-a-Kind project**, thus requiring time to manufacture all components and a **high level of attention** to take the best of the **learning curve**. 'It will be such a large breakthrough, that it is worth to be patient', he said.

The video of the conference is available on the website of the Bridge Forum Dialogue: www.forum-dialogue.lu and on the player page:

<https://streaming.bce.lu/bridge-forum-dialogue/iter-project/19/#/event>



Photo from left to right:

Dr Bernard Bigot, Director-General of the ITER Organization

Mr Massimo Garribba, Deputy Director-General responsible for EURATOM coordination, Directorate-General for Energy, European Commission