



Contribution ID: 925

Type: **Keynote**

Fusion for Sustainable World Development

Monday, 17 October 2016 09:00 (30 minutes)

It has been more than half a century since fusion energy research was disclosed at the 2nd Atoms for Peace conference, held in September, 1958 in Geneva. During the course of this period, DT-burning experiments were actually conducted in TFTR and in JET, both intended for energy breakeven: $Q=1$. This is a tremendous achievement of mankind, wishing to create a self-burning star on the Earth.

The IAEA fusion energy conference was once held in Kyoto in 1986, so that this is the second time hosted in Kyoto. In the meantime, another IAEA-FEC was held in October, 1998 in Yokohama, which happened to be right after the DT-burning experiments, mentioned above. Interestingly, it was around that time the ITER-EDA came to a critical phase.

As opposed to the rest of the world, from the beginning the Japanese fusion research community chose to explore multiple possibilities, including magnetic confinement by tokamak, helical and mirror configurations, and also laser-driven inertial confinement, each having made remarkable progress. In addition to achieving burning plasmas in tokamaks, LHD built at NIFS has been a unique effort in helical plasma studies, until recently W7-X in Germany has been put in operation.

It is remarkable to find that these confinement facilities are making progress in their respective missions towards, the integration of which will hopefully lead to the realization of fusion energy. On its way, however, an experimental reactor, ITER being constructed in France, must be successful in sustaining the energy break even condition with $Q>10$, which will no doubt affect the design of the first DEMO reactor.

For the rest of the process before fusion energy can be realized, all the governments in the fusion research community will hopefully provide continuous support for these confinement experiments, but basic research conducted in laboratory-scale facilities as well, which could end up with unexpected "spin-off" products, valuable for other communities. For example, the technology developed for superconducting magnets can be used for the long-distance DC-power transmission of solar energy.

As such, one must remember that although the public acceptance of it may vary due to the socio-technical situation, fusion energy research and development can always contribute in many ways to the sustainable global development.

Paper Number

O/1-4

Country or International Organization

Japan

Primary author: Mr IIYOSHI, Atsuo (Chubu University, 1200 Matsumoto, Kasugai, Aichi, 487-8501 Japan)

Presenter: Mr IIYOSHI, Atsuo (Chubu University, 1200 Matsumoto, Kasugai, Aichi, 487-8501 Japan)

Session Classification: Opening: O/1

Track Classification: Keynote