The adapting European fusion energy research programme

Rudolf Strohmeier

European Commission RTD, Directorate J Energy (Euratom), B-1049 Bruxelles, Belgium

The ITER project is now firmly established with many of the important initial contracts placed with industry. The European fusion programme must now adapt with ITER at centre stage in Europe. The first step in this adaptation has been an extensive review of facilities. This review concluded that during the period of ITER construction the key strategic R&D emphasis should be on supporting ITER construction and the preparation for its operation, as well as preparing the DEMO design, and simultaneously carrying out long lead DEMO R&D. In the ten year period after the ITER construction the programme focus must shift towards preparing for DEMO construction. These ITER and DEMO priorities must be complemented by pursuing innovation, and maintaining and renewing the staffing basis of the Programme.

For the strategic R&D in support of ITER the key European facilities JET and ASDEX UG have been identified as the most relevant and their research programmes are being adapted with ECRH being considered, in a possible international partnership, for the JET facilities and ASDEX UG preparing for plasma stabilisation and tungsten wall experiments. The JT-60SA will also become available during the ITER construction period with European researchers having a significant share in its exploitation. The third large facility in Europe, W7-X, will also start operation in 2014 to demonstrate the potential of the Stellarator as a fusion steady state reactor concept. This programme of research must be accomplished under severe budget constraints imposed from the rising cost of ITER and the current world economic crisis but every effort is being made to provide ITER with all the information that it requires to ensure its success.

In parallel to ITER, Europe will keep the DEMO activities alive and will use this, building on the industrial interest in ITER, to integrate industry more strongly in the programme. ITER construction and DEMO R&D can provide real added value to industry. Through a Fusion Industry Innovation Forum, industry will be able to exploit fusion research to increase competitiveness and maximise the returns to EU society as well as contribute to the next steps in fusion technology development. In addition they will be able to develop important fusion technology skills and competences.

On the international stage, Euratom has already seven bi-lateral Cooperation Agreements on fusion research in force, in chronologically order with Switzerland, Japan, U.S. Department of Energy, Russian Federation, Ukraine, Kazakhstan and Rep. of Korea. Two further Cooperation Agreements were signed with India and Brazil and another is being negotiated with China thereby covering all ITER Members. Through these bi-lateral agreements European Researchers will have access to some of the best facilities in the world as well as the possibility to share Europe's ideas and research programme. One further very important international agreement is the Broader Approach with Japan. Here the engineering design of the International fusion materials irradiation facility (IFMIF) is advancing as well as the supply by France of the High Performance Computer to the *International Fusion Energy Research Centre* in Rokkasho, Japan.