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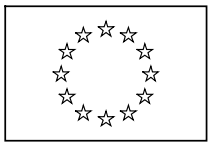

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COMMUNICATION FROM THE COMMISSION TO THE COUNCIL

State of progress of the negotiations concerning the ITER international nuclear fusion energy research project

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Preamble

This communication summarises the state of the negotiations conducted by the Commission on behalf of the European Union concerning the ITER nuclear fusion energy research project.

These negotiations reached a significant point in February 2003 with the accession of the People's Republic of China and the United States of America. In detailing the state of negotiations, this communication presents among other things the fundamental questions of choice of site and cost sharing between the parties. A modified reference for EU financial participation is proposed.

Whereas, in order to help provide the means for sustainable growth, it is in the interest of the EU to consolidate the position of excellence that it has acquired in fusion research, the Commission underlines,

the importance of siting ITER in Europe;

the importance, in consequence, of the Union taking actions to maximise its chances to achieve this.

Finally, the Commission hereby announces to the Council its intention to present by the end of 2003 proposals for decisions concerning the international and European organisations which would be responsible for ITER implementation and EU participation in the project respectively.

1. INTRODUCTION SUMMARY ON FUSION ENERGY AND ITER

There are three energy sources which, as an alternative to fossil fuels, contribute to or are capable of contributing to society's energy supplies without significant greenhouse gas emissions: renewable energy sources, nuclear fission energy and nuclear fusion energy.

Fusion, which is the source of the energy radiated by the sun and other stars, is by far the most widespread in the universe but the least developed on earth of these three non fossil energy sources. However, because of its potential in terms of environmental benefits, safety of operation and availability of fuel, fusion energy is the subject of research in most industrialised and the major developing countries.

Nuclear fusion is an important area of Community energy research and was in some ways a precursor of the European Research Area. The integration of all European fusion activities, which has been a feature of Community programmes for 30 years, has contributed a great deal to the international position of excellence that European research has acquired in this area.

An key element of this excellence has been the success of the JET (Joint European Torus) project, constructed and used for some twenty years at Community level. Although JET

remains a powerful research tool, it has achieved all the objectives for which it was designed. Taking research beyond JET requires an even more powerful experimental facility, ITER, the size of which will approach that planned for a future industrial reactor.

With the aim of sharing skills and reducing each party's financial input, the European Union, with which Canada was associated, Japan, the Russian Federation and the USA carried out detailed studies on ITER during the 1990s under an international agreement. The USA cut back its fusion research after 1996 and ceased its ITER collaboration in 1998. The other partners re-scaled the project between 1998 and 2001 in order to reduce its cost and take advantage of the scientific and technical advances achieved in the interim.

The objectives of ITER are both scientific and technological. It will have to demonstrate the scientific and technical feasibility of fusion energy for peaceful purposes. To do this, ITER will have to create, study and control a particular state of matter, plasma, which will produce a fusion power of some 500 million watts during extended duration and then continuous discharges. For the first time in the world, this power will greatly exceed, by a factor of ten, the power applied to the plasma. ITER will also have to test components and technologies which are vital to a future industrial reactor and demonstrate their integration in one unit.

The timetable for and costs of ITER implementation were set out in detail in Commission staff working paper SEC(2002)276 of 7 March 2002:

– ITER implementation will include a construction phase lasting about ten years, an operation phase lasting about 20 years and a decommissioning phase,

– the total cost of the construction phase is estimated at €4 570 million, at 2000 values. The total cost of the project, covering the three phases mentioned above and including funds for decommissioning, is estimated at €10 300 million.

2. CURRENT NEGOTIATIONS (SEE ALSO ANNEX)

International negotiations on ITER between the EU, represented by the European Commission, Canada, Japan and Russia began in 2001. The directives adopted by the Council of the European Union on 6 November 2000 limited the scope of these negotiations to the development of a legal framework for possible implementation of the ITER project.

The directives were amended by Council Decision of 27 May 2002, which allows the Commission to transmit to the other parties offers of potential candidate sites proposed by Member States and to negotiate financing and cost sharing arrangements in conjunction with site offers.

The negotiations have made satisfactory progress. The annex to the communication details the course of the negotiations and the results obtained so far. Agreement has been reached on the legal status of the entitywhich would be responsible for ITER implementation. However, fundamental points have still to be discussed, such as choice of site, sharing between the parties of the costs of and responsibilities for supplying components for the project and their management. This contribution "in kind" will form the main part of the overall contribution of each party during the construction phase.

The eighth negotiation meeting (N8) which was held on 18 and 19 February in St Petersburg saw the return of the USA, announced on 30 January 2003 by President Bush, and the arrival of China at the negotiating table. The American Delegation highlighted the extremely detailed

analysis that the United States had carried out before deciding to rejoin ITER. The Chinese Delegation gave the reasons for China joining the project: as the largest developing country, China has a great need of alternative energy sources to fossil fuels. It considers that ITER could lead to a new form of energy contributing in the long term to peaceful and sustainable development.

It is anticipated that the bases and principles established in the course of previous negotiations will not be called into question by the American and Chinese new arrivals, that the level of participation of each will be limited but significant and that they will not propose new sites for ITER.

The international organisation envisaged for ITER

The negotiators soon reached a consensus that an organisation under international law should be the legal instrument used for ITER implementation. This Organisation would have a duration of thirty-five years with the possibility of an extension of a maximum of ten years. It would have legal existence and would be granted privileges and immunities by the parties and the host country which are similar to those normally granted to international organisations. The ITER agreement will also cover the decommissioning of the machine and the termination of the Organisation.

The activities of the Organisation will be supervised by a Council in which each of the parties will be represented. Except for a limited number of areas where unanimity will be required, decisions will be taken by consensus. In the absence of a consensus, they will be taken by a vote in which the weighting of each of the parties will depend on its contribution to the project. A Director-General and a project team will be responsible for the proper day-to-day running of the Organisation.

Given the scale and complexity of the project, it has also been accepted that each party should have only one clearly identified interface with the Organisation, managing its contribution both in cash and in kind.

The specific requirements of the host country concerning legal and administrative authorisations, in particular the health and safety of staff and the public, will be specified in the agreement itself and in a "host" agreement which will have to be concluded between the Organisation and the host country.

Current discussions concern the resources of the Organisation and its management, in particular the principles to be followed concerning staff, financial regulations and the technical supervision of contributions "in kind" and interfaces between the Organisation and the parties.

Structure envisaged for the management of the European contribution

Taking advantage of the experience gained from the integration of fusion activities in Europe, in particular with JET, a debate has been initiated in the programme committee, the CCE-FU, between the "Associations", i.e. all the European laboratories working on fusion research, and the Commission regarding the structure to be set up to manage the European contribution to ITER and to serve as an interface with the international organisation responsible for the project. A joint undertaking structure has been adopted, the members of which would be Euratom and the usual partners in the Community fusion programme.

The tasks of this undertaking would be, as a contract agent, to collect, manage and supply to the international organisation contributions in cash and in kind from the members of the joint undertaking. The setting up of the undertaking should be prepared at the same time as that of the international organisation so that the EU is ready to manage its contribution to ITER as soon as the decision to implement the project is taken.

It has also been agreed to propose, as a second stage, a reorganisation of all European R&D activities on fusion, including participation in ITER and the accompanying physics and technology programme which is necessary to take full advantage of international collaboration.

3. THE QUESTION OF THE SITE

At international level

At the present time, four sites have been proposed, one by Canada, one by Japan and two in Europe, Cadarache in France and Vandellos in Spain. The technical studies for these various sites have now been completed and the evaluation report was approved by the negotiating parties in February 2003[1]. Despite objective differences concerning the local geography and the infrastructure to be installed, none of the four sites has an overwhelming technical advantage over the others, and the report confirms that each of them could meet the essential technical criteria to host ITER. The choice of the site will therefore be a political decision, which should rest on a set of technical and economic considerations (notably the construction and operation cost estimates). The Commission envisages consulting on these questions with high level scientists who are involved by their functions in the political decision making process. A consensus will probably only be reached on the basis of an agreement at a high political level which will cover the choice of the site and the arrangements for sharing costs and responsibilities among the international parties.

At European level

The negotiating directives adopted by the Council in May 2002 have allowed the Commission to transmit to ITER partners the technical dossiers presented by the Member States. These twin European candidatures, and the resulting fair competition, have so far served the interests of the Community well by demonstrating the lively interest of the Member States and the quality of their proposals. In order to strengthen still further the Community's position, it is appropriate now to converge towards the identification of the EU site candidate through a consensual and well regulated process. This is again a political question which should aim at maximising the benefits that the Community will draw from ITER construction, including adding the most value to the research effort that the Community is developing in the nuclear field. Recognising the political sensitivity of the subject , the Commission urges France and Spain to pursue actively and constructively their bilateral discussions.

To facilitate these contacts and a convergence of the points of view, the Commission intends to set in place a process that will contribute to identifying the elements of a consensus taking into account elements other than the purely technical aspects. This process will pursued in dialogue and in close co-operation with the authorities of the countries concerned. To this end, the Commission envisages establishing objective criteria amongst which will figure

[1] The evaluation report which includes the Findings Reports specific to the four proposed sites as well as the final report that summarises them is available at Internet site www.iter.org.

questions of "site preparation" and the scientific, technical and social environment, in particular the political, financial and administrative guarantees that the site and its surroundings can be prepared within the deadlines laid down and that the regulatory authorities will be in a position to issue the necessary permits in good time. These criteria will be established in concert with the French and Spanish authorities between now and the end of May 2003. The process that will follow will call on the expertise needed to maximise the chances of ITER finally being realised in Europe, and should allow the Council to reach a consensus in September 2003.

Meanwhile, it is essential that our international partners should be convinced that the European Union supports the ITER project and is committed to its implementation in Europe.

4. ITER COST SHARING

Reference used by the European negotiators

The European negotiators have used the scenarios for the sharing of ITER costs among the various parties which were set out in the staff working paper [SEC(2002)276 of 7.3.2002] which the Council, in the negotiating directives adopted in May 2002, took as a reference for discussions on funding. This reference may be summarised as follows:

The cost of ITER construction, estimated at €4 570 million at 2000 values, is divided into two main areas, the "Non-Common Area" covering activities borne exclusively by the host party, such as buildings and work connected with the site proper, and the "Common Area" shared between all parties and covering components, particularly high-technology ones, the supply of which could be shared.

In the abovementioned working paper, the non-common area is assumed to represent 20% of construction costs, to be borne by Europe alone if ITER is constructed there. In this case the non-common area would be financed in equal proportions by Euratom and the host Member State.

The common area, which therefore represents 80% of construction costs, was expected to be financed independently of the site chosen at a rate of 14% by Russia and 33% by each of the two other partners, Japan and the EU. Within the EU, the expected breakdown was 90% for Euratom and 10% for all the other parties associated with the European fusion programme.

To sum up, European participation in construction (Euratom + associates) was expected to amount to 53% if ITER is constructed in Europe and 33% if it is sited in Japan. The scenario of a Canadian site is highly specific, since the Canadian offer was limited to an advance of funds for the non-common area repayable by the other parties during the operation phase.

Development of the positions of the EU's partners since May 2002

During the negotiations held since May 2002, the various parties have revealed what their respective attitudes might be to ITER cost-sharing.

Canada has stated that its offer was being reassessed to make it more attractive to the other parties. A financial participation would now be considered even if ITER is outside Canada.

The Japanese position has also changed. Although its proposal to determine the contribution of a party in direct proportion to the amount of its GDP has been sidelined, it is very unlikely that Japan will agree to contribute to the common area at the same level as the EU, particularly if ITER is sited in Europe.

During the discussions it has also become apparent that the Russian contribution would be lower than the 14% expected in the working paper of March 2002.

As stated above, it is anticipated that the level of participation of each of the new partners, China and the USA, will be minority but significant and that neither will propose a site for ITER. Finally other international partners could declare their readiness to collaborate in the project, but in the absence of figures this possibility cannot be considered below.

New reference case possible in 2003

The working hypothesis to establish a new reference is that three partners (China, Russia and USA) will together account for more than 30% and two partners, Japan and EU, will make a larger individual contribution and present a site candidate. Pending a revised offer from Canada, the scenario "ITER in Canada" has not been considered as a reference situation. The Canadian delegation evaluates the non-common area at 18% of total construction cost whereas the Japanese delegation puts it at 25%. The original European estimate, of a median value of 20%, is maintained below.

In these circumstances, the shares would be as follows:

Non-Common Area	20%
Common Area	80%
China + Russia + USA	more than 30%
EU + Japan	less than 50%

Maintaining EU - Japan parity in the common area would mean a share for each party of less than 25% (instead of 33% in the March 2002 working paper). The Japanese request to tie rigidly the amount of such participation to the GDP of the partner would mean an EU contribution to the common area of up to 33%.

With the aim of illustrating what ITER construction in Europe would cost the Community and comparing this with the current fusion budget, a new reference case for the negotiating position in the case of ITER construction in Europe, whether at Cadarache or Vandellos, could therefore be defined in the following way. Assuming around 20% for the non-common area and 25% for the EU share of the common area, the participation would amount to 45%, or around €205 million per annum on average over ten years. As a consequence, and if the cost sharing arrangements between Euratom and the European associates remain the same as those presented in working paper SEC(2002)276, the contribution from the Community budget to ITER construction costs would be around €150 million per annum on average (at year 2000 values), or €600 million over four years. This figure should be compared with the €750 million that the 6th framework programme sets aside for all fusion research, including up to €200 million for ITER implementation.

On the basis of the assumption that the EU contribution to the common area is the same whether or not ITER is sited in Europe, the 2002 working paper concludes that the total cost of the project for Euratom (construction + operation) would be more or less identical whether

ITER is constructed in Europe or Japan. This is due to the contribution from the host Member State which continues during the operation phase. Making the same assumptions, this conclusion would remain valid.

5. COLLABORATION ON ITER AS PART OF A FAST TRACK APPROACH

A study carried out in 2001 at the request of the Council Presidency to examine the feasibility of a fast track towards fusion energy concluded that the design of ITER is sufficiently flexible for it to be used to carry out, in anticipation of the following stage, more detailed studies on aspects related to energy production. These studies would have to be accompanied by a speeding-up of research into the materials needed for future reactors.

Taking such a "fast track" approach would naturally require additional funds for the research programmes that will follow FP6 even if savings could be achieved through wider international cooperation on materials research, particularly the joint creation of a neutron source which is optimised for such use. The IFMIF (International Fusion Materials Irradiation Facility) project, the study of which is currently the subject of cooperation similar to that for ITER, would meet these requirements.

Coordinated planning of the two main international fusion projects, ITER and IFMIF, could be considered with our partners. The detailed studies for IFMIF could be launched at the same time as ITER construction begins, and the construction of IFMIF could begin around 2009-2010. The decision to construct IFMIF and the choice of its location will certainly be linked to the prior decisions on ITER. Thus it is very probable that IFMIF will be implemented outside Europe if ITER is constructed in Europe. In that case, a very provisional estimate of the Community financial contribution would be around €15 to 20 million per year over ten years.

6. STAGES OF THE DECISION-MAKING PROCESS

The decision-making process must obviously take account of the constraints to which all parties to the project are subject. Emphasising that the detailed studies on ITER were completed successfully, the decision on the specific programme of research and training (2002-2006) states that the construction of ITER could actually begin in 2005-2006. In the light of this planning schedule and the constraints of the political timetable of our international partners, the negotiating parties set the end of 2003 as the target for establishing and transmitting to their respective political authorities a draft agreement on ITER implementation, including the site and the financial contributions of the parties involved.

The countdown for the Community decision-making process from the end of May should therefore be as follows:

– End 2003, submission of a proposal for a Council Decision on the agreement of the construction, operation and decommissioning of ITER. At the same time the Commission submits to the Council a proposal for a Decision concerning the establishment of the joint undertaking responsible for the European contribution to ITER.

– The convergence process described at point 3 should be concluded during the course of summer 2003, such that the Council could achieve a consensus on this subject in September 2003.

– At the end of May 2003, the Commission notifies the additional objective criteria guaranteeing that the sites proposed actually conform to the requirements laid down.

7. CONCLUSION

The outcome of fusion research, the use of a "sustainable" energy source, concerns the whole of humanity. The best illustration of this is given by the statements of those countries which declare their interests in participating in ITER. However, Europe has a special interest in carrying out this project since, thanks notably to the integration of all its research activities under a Euratom programme, the European Union is a world leader in this field.

The scale of the cooperation which is being established for ITER implementation makes it one of the largest international projects in existence. If ITER is constructed in Europe, the EU will be able to consolidate its position of excellence and take full advantage of the investments made, whether in terms of transfer of know-how to European industry or the participation of associate laboratories in the construction and operation of the project.

For this reason, given the importance of what is at stake and the progress of negotiations, the Commission is bringing the Council's attention to the fact that it is important for the European Union that the ITER project should be constructed in Europe and that the European site which will compete with candidate sites presented by our international partners should be identified as soon as possible.

The Commission will of course keep the Council and the European Parliament informed of developments in the negotiations on the ITER project. The Commission hereby notifies them of its intention to submit by the end of 2003 two proposals for decisions, one concerning the international agreement on ITER implementation and the other the structure of the joint undertaking which will be responsible for the European contribution to this project.

ANNEX

Background

1. At the end of the ITER Engineering Design Activities (EDA) in July 2001, and following extensive domestic scientific, technological and economical assessments by each of the Parties[2], the ITER Council concluded[3] that the objectives of the ITER EDA Agreement have been fully met and consequently recommended to the Parties *" to take the necessary steps to realise a Joint Implementation of ITER as the next step in the development of fusion as a source of energy for peaceful purposes*".

2. In light of this successful completion of the EDA and following the submission by the government of Canada of an offer to host ITER at Clarington near Toronto, inter-governmental negotiations on the possible Joint Implementation of ITER started in November 2001 among four Participants - Canada, Euratom, Japan and the Russian Federation. Seven such meetings took place in the period to end 2002, including two held in the European Union - at Cadarache, France in June 2002 and in Barcelona in December 2002. At the Eighth Negotiators Meeting on 18-19 February 2003 in St Petersburg (RF), China and the USA acceded to the Negotiations.

3. The European Commission participated in the Negotiations under the Directives of a Council Decision of 16th November 2000. This mandate was at first limited to the development of a legal frame for possible joint implementation of ITER, if and when so decided, and was without prejudice to questions of siting and of cost sharing.

4. By a Decision of 27th May 2002, arising from a joint proposal of Commissioners BUSQUIN and LOYOLA DE PALACIO, the Council amended its Directives[4], in particular to authorise the Commission *"to transmit to the Parties offers of potential candidates for European Sites proposed by Member States and to negotiate with the Parties financing and cost-sharing arrangements in conjunction with site offers."* Accordingly, in June 2002 the Commission transmitted to the other Participants proposed European site candidatures at Cadarache, France and Vandellos, Spain. (At the same time Japan also tabled an official site candidature at Rokkasho-mura, Aomori Prefecture.)

5. The amended mandate also provided for the Parties to establish appropriate transitional arrangements to ensure a smooth transition towards the Joint Implementation of ITER.

6. Council Decision of 3 June 2002 concerning the 6th framework programme (Euratom) stressed that the progress made on the research and the result obtained, in particular with the European JET tokamak, now makes it possible to consider moving on to the Next Step which would produce a machine capable of generating fusion reactions in conditions comparable to that of an energy producing reactor. The completion of the preparatory work on the detailed design of the Next Step in the context of the ITER international co-operation project makes it possible to take a decision about the launching of this project and the construction of the machine.

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2 EU Domestic Assessment of the ITER-FEAT Final Design Report, May 2001
3 Final Report of the ITER EDA, ITER EDA Documentation Series No. 21, IAEA, VIENNA, 2001
4 SEC (2002) 205 Final

Status of ITER Design and Cost Estimates

Status of the Design

7. With the completion of the EDA, a complete, detailed and mature design for ITER was put at the disposal of the Parties, with a supporting body of validating analysis and R&D and other technical information, which meets the detailed technical objectives and cost objectives set for it, including those relating to safety and environmental considerations. Since then, further collaborative scientific and technical work on ITER was undertaken within the frame of so-called "Co-ordinated Technical Activities" (CTA) in support of the Negotiations. This work was based on the design established in the EDA phase and was aimed at maintaining the integrity of the design and at enabling a smooth start of ITER construction if and when so decided. The CTA phase expired at the end of 2002 and was superseded by the ITER Transitional Arrangements (ITA) under which the activities ensuring the design integrity and preparation for the possible implementation have continued. Both the CTA and ITA have been established under IAEA auspices through exchanges of letters between the participants in the negotiations and the IAEA Director-General.

8. Since the completion of the ITER-EDA, the European fusion activities have been further focussed on ITER through the scientific and technological programmes undertaken within the framework of the European Fusion Development Agreement (EFDA) and through the Euratom Contracts of Association. The European staff complement within the ITER International Team has been broadly maintained.

Cost Estimates

9. Information on the estimated costs of ITER was presented to the Council in March 11, 2003 2002 in the Commission Staff Working Paper, "The Cost to Europe of ITER Joint Implementation According to Various Hosting Scenarios"[5] The Working Paper summarised cost estimates for the various phases of ITER Implementation based on the figures reported in the "Summary of the ITER Final Design Report", and indicated the costs that Europe might bear on the basis of first approximate assumptions on the possible cost sharing schemes that might be negotiated, and how those costs might be distributed within Europe.

10. At the end of the EDA the negotiating Parties had each undertaken detailed evaluation and confirmed their acceptance of the overall Cost Estimates for ITER presented by the Project as forming a complete and sound basis. As there has been no material change to the design since the end of the EDA the current participants in Negotiations have undertaken no further overall review of the costing. Nevertheless, in the context of its discussions of a US strategy for a burning plasma, the US DoE established a special Committee which visited the ITER Joint Work Site in Garching on November 21-25, 2002 to undertake an assessment of the ITER cost estimates. The Committee's findings were uniformly positive, concluding for instance that *"..the ITER Team has prepared a complete cost estimate that is based on sound management and engineering principles...*" and "*The credibility of such a value estimate is supported by the design and R&D results that are unusually mature for a science project facing the decision to fund construction."*

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[5] SEC (2002) 276

11. The possible cost sharing schemes are now starting to figure explicitly in the course of the Negotiations. The other participants are aware of the working assumptions used in the Commission Staff Working Paper, which provided the initial basis of the European position in the discussions.

Accession of third parties to the ITER Negotiations

12. A major development in the ITER Negotiations has been the accessions of China and the United States at the N8 Meeting in February 2003.

13. The Council Directives to the Commission directs the Commission to negotiate with "*ITER EDA Parties and other qualified countries".* Thus the mandate provided for the EU to accept participation in Negotiations of the USA, as one of the signatories to the ITER EDA Agreement, once it had declared its wish to do so.

14. With respect to third countries such as China the negotiators reached consensus in November 2002 on the factors that could qualify a third country. In particular, a third country requesting access to the Negotiations would be expected to declare that it intends to make a substantial contribution to the Project and that it would share the common understanding and results achieved in the negotiations up to the date of its accession. There should also be a verification of the technical capabilities of the third party, and assurances of adherence to peaceful uses and non-proliferation principles and respect for the intellectual property rights that the existing ITER Parties have established through their co-operation to date. Accession to the Negotiations by a third country would require unanimous agreement among the current Participants.

15. On 30th January 2003, President Bush and Energy Secretary, Spencer Abraham, announced that the United States would join the international negotiations on ITER. The US was accordingly invited to and participated in the N8 meeting 18th-19th February 2003 in St Petersburg.

16. The accession by China followed a formal request to join the Negotiations from the Chinese Ministry of Science and Technology, dated 10th January 10, 2003, which incorporated the statements of intent and other required undertakings. After an inter-service consultation, and given the positive report of a mission to evaluate China's technical capabilities, the EU delegation supported the request for access to the negotiations under the conditions expressed in the request. Subsequently, agreement was reached with all other Participants to accept China's accession to the Negotiations, starting at the N8 Meeting.

17. The Republic of Korea also expressed its interest in joining the negotiations and informal interactions are expected to explore the legal and technical aspects of a possible formal request.

18. None of the three above countries has given any suggestion of interest in proposing to host ITER.

19. Following the accession of the additional participants to the Negotiations a reconsideration of the steps made to date among the current participants on the allocation of responsibilities for procurement is necessary.

Cost Sharing among the International Partners

Procurement Allocations

20. At informal technical level the Participants have started to discuss the so-called "procurement allocation" i.e. the proposed allocation among the Parties of obligations to contribute in kind the various component elements of ITER. Discussions have focussed on large and technically demanding procurements that need to be started most early in the construction phase, without prejudice to the overall scheme of cost sharing. The process can be completed only in the context of a consensus on the site and associated overall cost sharing.

Summary of Cost Sharing assumptions presented in Doc. SEC (2002) 276

21. The international cost sharing aspects of the Commission Staff Working Paper were based on a number of key assumptions made in the light of circumstances as they stood at that time. They were based on the principle of equality stated in the ITER EDA Agreement, but modified in recognition that the Russian Federation could not be expected to contribute the same level of resources as EU and Japan. These assumptions have to be revisited in the light of the evolution of the Negotiations.

22. At the beginning of the Negotiations, the number of partners in the joint implementation of ITER was presumed to be limited to three (or four if ITER would be hosted in Canada). As to cost-sharing, the hypothesis was made that the Host Party would contribute to the capital cost - the so-called "non-common area" of those parts of ITER construction such as the buildings that are inherently best suited or can only be provided from a local source. Whilst its value falls in a bracket centred around 20% of the estimated total capital cost of ITER, it is recognised that the precise figure will be a matter for negotiation. The basis for sharing the costs of the remaining so-called "common area" - approximately 80% of the total - remained to be resolved. The Russian Federation was assumed to contribute the equivalent of about 14% of the total cost while Europe and Japan would contribute equally to the remaining 66%.

23. According to this preliminary simplified breakdown of cost sharing of the capital cost for construction, Europe would have contributed 33% in the common area wherever ITER would be hosted. The European share as a whole for ITER construction in Europe (for the Community share see Para. 32) would have been 53%. This share would have been 33% if ITER was constructed outside Europe.

24. The option of siting in Canada represented a special case in which the Host Party proposed the non-common area to be financed largely through private sector loans in anticipation of a flow of revenues during ITER operations, guaranteed by the non-Host Parties.

Evolution on cost sharing assumptions during Negotiations

25. In discussing the allocation of responsibilities among the Parties for procuring the elements of ITER construction, it has now become apparent that the value of the contributions that the Russian Federation envisages to provide would be closer to 10% than the previously assumed 14%.

26. Japan, in presenting its site offer in June 2002, proposed a new cost sharing criterion, based on a link between the relative contributions to the common area from EU and Japan and their relative GDP's; on this basis the EU would contribute twice the Japanese contribution.

27. At the December 2002 Negotiations meeting in Barcelona, the EU announced that it could not accept any link between cost sharing and GDP's of the Parties and recommended to consider a pragmatic approach, without rigid pre-conditions that may block a solution. Japan reacted that "*some basis for discussion is needed since it is not feasible for each Party to contribute equally. Consideration including reflection of economic scale on cost sharing and requiring a certain level of contribution by all Parties could realise each Party's contribution in a way which is as balanced as possible"*.

Canada

28. The Canadian Government position is at this moment under review. The Canadian Delegation announced at the December 2002 Negotiation Meeting that it had advised its government that *"the Canadian offer to host had diminished chance of success given current developments in the Negotiations unless the Government of Canada agreed to participate financially in the project. The Government of Canada is now reviewing its offer in concert with the Government of Ontario and with Iter Canada and its member organizations. The Canadian Negotiators anticipate a revised offer by the end of March 2003"*. It is expected that Canada's hosting offer may become more comparable to those from Europe and Japan as concerns the non-Common area and that it might revise its former position that it would not participate in ITER implementation outside of Canada.

New participants in Negotiations

29. As noted above, the current Negotiating Participants have made clear that any country newly acceding to the Negotiations would be expected to provide a substantial contribution to the project at least comparable to what is envisaged by current participants in the Negotiations. The formal request from the Chinese government included such a statement of intent.

30. For the US, the National Research Council's "Burning Plasma Assessment Committee" of the US National Academies recommended in December 2002 that:

"The United States should negotiate a level of involvement consistent with the size of the U.S. contribution to the program, which at a minimum should guarantee access to all data from ITER, the right to propose and carry out experiments, and an appropriate role in producing the high-technology components of the facility."

At the N8 meeting the US delegation noted that "the US wishes to make a significant contribution that is comparable to other non-host parties."

31. Thus the accession of new participants to the Negotiations intending to make substantial contributions (and of a possible revised Canadian position) suggests that feasible cost sharing schemes could result from the Negotiations, notwithstanding the reduction in the expected Russian contribution and the Japanese unwillingness to match the European input.

Cost sharing within the European Union

32. With respect to the cost sharing within Europe, the assumptions made in the Commission Services Working Paper were that the costs of the non-common area of construction would be shared equally between the Community Budget and the Host Member State and the costs of the Common area would be borne 90% by the Community Budget, the remaining 10% to be shared by the Associates. The possible cost sharing of the European contribution to total costs during operations phase would be borne 75% by the Community Budget if ITER is hosted in Europe and 95% if it is hosted outside Europe.

Joint Assessment of Specific Sites

33. The four candidate sites have been assessed within the framework of the Negotiations. A technical assessment process called the Joint Assessment of Specific Sites (JASS) was undertaken in the period September to December 2002 by an Ad-Hoc group composed of experts from the four Participants in the Negotiations at that time. It was developed on the basis of detailed input documents based in turn on in-depth studies performed by the proponents. The report on the JASS was approved at the N8 by the four Participants that commissioned and undertook the assessment, with the main conclusion that:

" ...despite the differences between the candidate Sites, the JASS ascertained that all four Sites are sound and fully capable to respond to all ITER Site Requirements and Design Assumptions, as approved by the ITER Council in its January 2000 meeting.

As a result of the assessment process, the JASS Ad-Hoc group has concluded that ITER may be successfully implemented at any of the candidate Sites. Some differences amongst Sites do however exist. The assessment of some issues led to the identification of appropriate mitigation measures to be put in place by the respective Hosts."

Exploration of a Fast Track

34. On the initiative of the Belgian Presidency, Experts examined in November 2001 the possibility of a fast track towards fusion energy production. Following this approach, the next two generations envisaged today beyond ITER could be combined into a single step that should be designed as a credible prototype for a power-producing fusion reactor. The Meeting of Experts concluded that ITER is the essential step towards energy production on a fast track and that construction should start as soon as reasonably achievable. In addition, there would need to be an appropriate high energy, high intensity neutron source such as the International Fusion Materials Irradiation Facility (IFMIF) to test and verify material performance in fusion reactor conditions. It also stressed that the two major international ventures on fusion energy

development, i.e. ITER and IFMIF should proceed in a co-ordinated way, with the realisation of ITER starting in parallel with the detailed engineering design of IFMIF.

35. This work has had an influence on the international partners. In the US, the Fusion Energy Sciences Advisory Committee submitted a preliminary report to the USDOE on the prospect and practicability of electricity into the US grid from fusion in 35 years. A more detailed plan, including cost estimates is due for March 2003. Japan has established a committee under the Atomic Energy Commission, to discuss future Japanese R&D plan, including the acceleration of the realisation of fusion energy within about 30 years. The Russian Federation also declared support for a fast track approach.

36. Technical work is continuing in the framework of the IEA and the definition of an appropriate international framework to conduct the Engineering Validation and Engineering Design Phase of IFMIF is in progress.