The Greens | European Free Alliance
in the European Parliament

Fusion blows the budget

An Up-dated note on International Thermonuclear Experimental Reactor (ITER)[1]

3 May 2011

"All the reasons for a reversal are there: The estimated construction costs have tripled before the main construction has even started and nuclear fusion will not contribute to the EU's energy supply for decades - if ever. Several studies have come to the conclusion that renewables will be able to cover the EU's energy supply by 2050. Since fusion will not be commercially available before that, it has become irrelevant for Europe's energy future."

Rebecca Harms, 7 December 2010

The proposed €5.311 billion budget for research into nuclear energy to 2013 is a huge increased compared to €1.35 billion for the previous programme. Fusion/ITER will receive the majority of this budget[2]. This is 4.5 times the amount the EU allocates to R&D for renewables and energy efficiency during the same period.

The European Parliament and the Council have to stop paying for ITER, which otherwise will result in cuts in the EU research and agriculture budgets. Two billions Euros are needed to start the construction of this experimental reactor in Cadarache (France) in the next two years. Should Europe support the start of the major construction activities in 2012, it will begin a process that will be difficult to stop. Public money will be asked -not only for the whole construction phase, i.e. at least until 2020, but also for the operation and the decommissioning of ITER.

At the end of the day, ITER will not deliver a single kilowatt hour on the electricity grid.

This project is too risky to be allowed to operate and it must be stopped now.

[1] This note is an up-date of the Greens/Efa short backgrounder on ITER dated May 2010 and the article "Fusion blows the mind, but it also blows the energy budget", by Rebecca Harms, co-president of the Greens-EFA group in the European Parliament, and published by Research Europe , 6th August 2009

[2] If adopted by the EU Institutions, €4.2 billion out of €5.3 billion (79%) might go to fusion R&D Euratom during the period of 2007-2013.

Background

On 20 April 2011, the Commission adopted two important documents on ITER:

1. the draft EU budget for 2012[3] and
2. a proposal to modify the current Financial perspectives in order to allow increased financing of ITER.[4]

Earlier, on 7 March 2011, the Commission launched its proposal for a Council's Decision concerning the research activities in nuclear energy - the Euratom's Framework Programme - for the years 2012-2013.[5]

In its proposals, the Commission is suggesting to boost the construction of the **ITER** nuclear experimental reactor in Cadarache (South of France) to spend **more than € 2 billion EU public money during the next two years, i.e. 2012-2013.**

This is an increase of € 1.3 billion compared to the existing 2007-2013 multi-annual financial framework (MFF).

Figure 1: Proposed Euratom Framework Programme 2012-2013

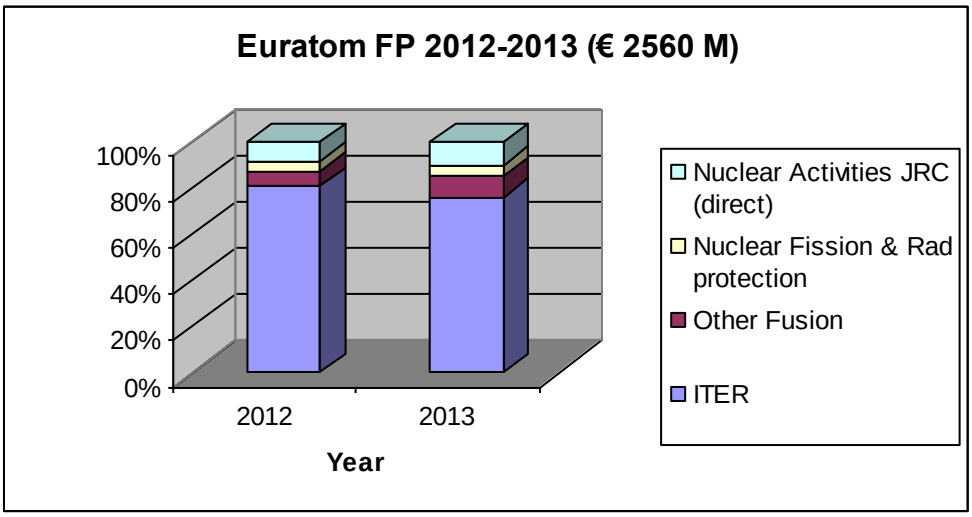

Figure 1 shows that, if adopted, ITER alone will get 78% (€2012 million) of the overall Euratom research budget for the coming two years, i.e. 2012 and 2013. Including other fusion projects (€197 million), this percentage increases to 86%.

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[3] EC 2011: Preparation of the and budget 2012, 20 April 2011, SEC(2011) 498 http://ec.europa.eu/budget/figures/2012/2012_en.cfm

[4] EC, 2011: "Decision of the European parliament and of the council amending the Interinstitutional Agreement of 17 May 2006 on budgetary discipline and sound financial management as regards the multiannual financial framework, to address additional financing needs of the ITER project", 20 April 2011, COM(2011)226.

[5] EC 2011: Proposal for a Council Decision concerning the Framework Programme of the European Atomic Energy Community for nuclear research and training activities (2012-2013), 07 March 2011, COM(2011)72 final - 2011/0046 (NLE)

How ITER is supposed to be financed in 2012-2013?

The Commission has proposed to allocate to ITER nearly € 1107 million in 2012 and € 905 million in 2013[6].

This is supposed to be financed by

a) cuts of the FP 7 EC Programme of **€ 460 million for the years 2012-2013** (€100 million in 2012 and €360 million in 2013) and

b) cuts of the 2011 MFF ceilings of Heading 2 (Preservation and management of natural resources, including CAP) by 650 million and of Heading 5 (Administration) by 190 million.

As stated by the Commission[7]:

> The proposals for the Euratom Framework Programme 2012-2013 provides a general framework for research activities in the nuclear field and an appropriate budget. However, the draft appropriations initially foreseen for the nuclear research in the Multiannual Financial Framework for 2007-2013 (Mff) are insufficient due to the substantial cost increase of the ITER project. The Commission proposes that the legislative process concerning proposals for Euratom FP for 2012-13 will be carried out in parallel to the on-going discussion on the budget for ITER as well as the new 2012 budgetary procedure. Agreement on additional funding through redeployment between Headings and within the Heading (in accordance with the table that follows) will allow for swift adoption of the Euratom research programme in 2011.

	Transfer between Headings € Million	Redeployment within heading 1A € Million	Total
2012	650	100	750
2013	190	360	550
Total	840	460	1300

[6] The anticipated ITER expenditure from the existing 2007-2013 multi-annual financial framework was roughly €700 million for 2012-2013 in current value. Therefore EURATOM is facing an estimated financial gap of about €1.3 billion (in current value) for the years 2012-2013. This means additional funds up to 750 million € in 2012 and 550 million € in 2013).

[7] EC 2011: Proposal for a Council Decision concerning the Framework Programme of the European Atomic Energy Community for nuclear research and training activities (2012-2013), 07 March 2011, COM(2011)72 final - 2011/0046 (NLE)

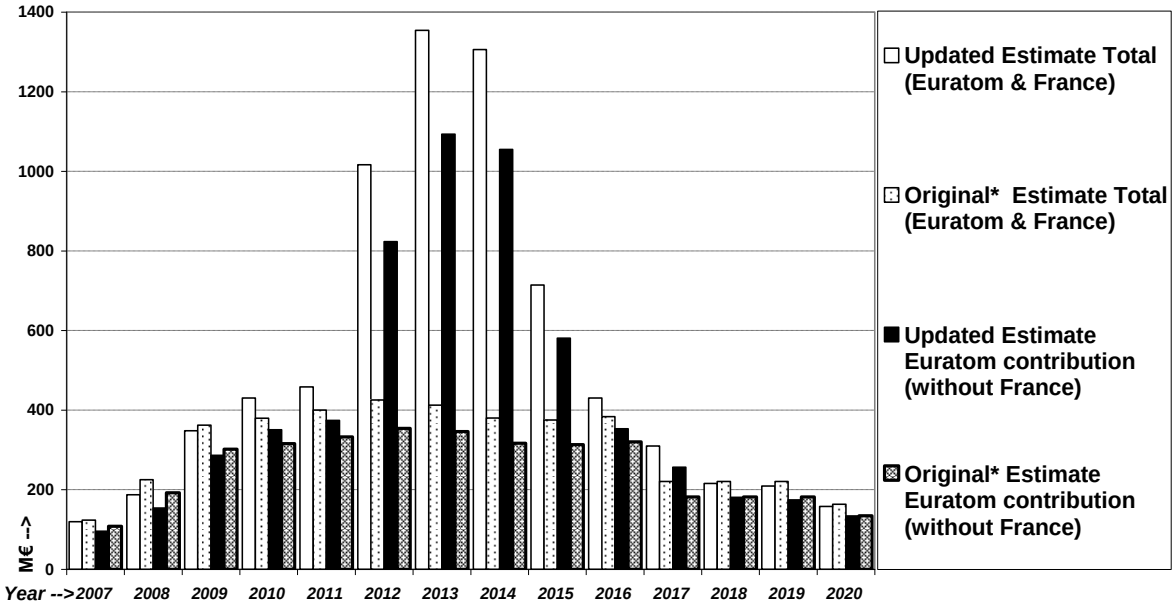
Will these 2 billions Euros be enough to build ITER?

The 2001 cost estimates for the total ITER construction was € 5.9 billion (€ 5.896 billion in 2008 value). The construction time was reported to be around 10 years. However, by early 2010, the cost estimate has nearly tripled and is about € 16 billion (2008 value). Of the seven partners the EU (plus Switzerland) has the largest financial share, providing 45% of the total construction budget. On 12 July 2010, the Council agreed on a **6.6 billion € (in 2008 value) limit of the European contribution to the construction phase of ITER until 2020**.

Lock-in effect

Should Europe support the start of the major construction activities in 2012, this will start a process that will be extremely difficult, if not impossible, to stop. As shown by the Commission, in this case, the resources needed for the construction will peak during the years 2012 to 2015 at about €4 billion, which basically means EUR 1 billion per year (see figure 2).

Figure 2: EU Budget Schedule for the ITER



*The original estimate in this graph includes the Euratom contribution to ITER construction based on 2001 assessment and the resources projected for the running cost of F4E and other activities as included in the 2007 Council decision establishing F4E

Source: EC 2010[8]

In 2008, even before the new constructions costs were estimated, an independent analysis of EU research funding into fusion undertaken for the European Parliament concluded that "organisational and management arrangements appear insufficient to tackle the extreme riskiness of the project". Furthermore, the assessment found

[8] EC 2010: Commission Staff Working Document "Status of the ITER project" - Accompanying Document to the Communication of the Commission to the European Parliament and the Council on "ITER status and possible way forward", May 2010, SEC(2010)571

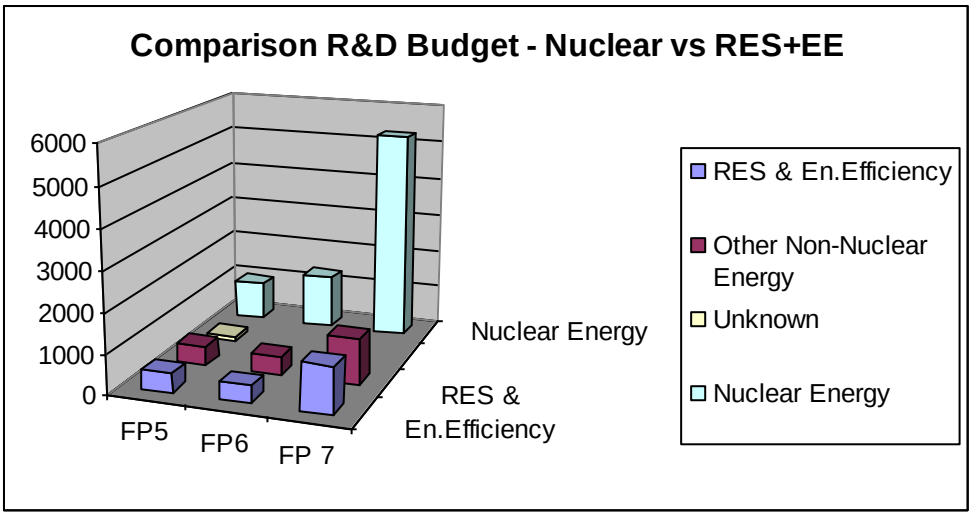
that the "excessive focus on ITER" might "jeopardise the attainment of important EU goals" such as the development of a sustainable energy mix[9].

These budgets do not include possible additional costs following the Fukushima catastrophe (like those related to stress tests or higher accident prevention standards), financing for the operation and decommissioning of the facilities. At the time of the agreement of financing the project the annual costs of operating ITER were estimated to be, on average, on the order of $188 M (54% of the 1998 ITER design operating costs). This was to be shared among the participating Parties, and totalling $3760 M over 20 years. These estimated costs include personnel costs (~32%), energy and tritium fuel costs (~20%), and capital improvements, spare parts and materials, and waste management operations (48%).
However, given the rise in construction costs, it is expected that these estimates are likely to rise.

How has the budget evolved compared to renewables and energy efficiency?

Figure 3 highlights the nuclear budget and how it compares to the rest of the EU's energy research and development. As can be seen the current research programme proposals, **the EU nuclear research budget during the period 2007-2013 is roughly 4.5 times that allocated to renewables and energy efficiency under FP7** during the same period[10].

Figure 3: EU Framework Programme Non-Nuclear Energy and Nuclear Budgets (million €)



[9] European Parliament 2008, Evaluation Of EU Funding Of Research In The Fields Of Nuclear Fusion And Aeronautics/Aerospace, European Parliament, Policy Department of Budgetary Affairs, July 2008. http://www.pedz.uni-mannheim.de/daten/edz-ma/ep/08/EST22651.pdf

[10] Should the Euratom FP 2012-2013 being adopted as suggested by the Commission on 21 April 2011, EU money allocated to nuclear research will amount to €5311 million, which is about 2.4 times the amount earmarked for non-nuclear energy (€2350 million) under FP7 or, taking as assumption that renewables and energy efficiency will get half of this budget, 4.5 times the amount for this type of research and development.

ITER - Financial white elephant

After decades of negotiations the *ITER* Agreement was signed in November 2006 by Ministers from the seven Members (China, EU, India, Japan, Russia, South Korea and United States), which approved the project's location in Cadarache, France. The choice of the Cadarache site for the ITER is contentious, as in 2003 a commercial plutonium fuel-fabrication plant on the site was shut down because of its vulnerability to earthquakes. Protection against seismic risk further complicates the ITER design and increases costs.

The 2001 cost estimates for the total ITER construction was € 5.9 billion (€ 5.896 billion in 2008 value). The construction time was reported to be around 10 years. However, by early 2010, this has nearly tripled and is estimated to reach about € 16 billion (2008 value).

Of the seven partners the EU (plus Switzerland) has the largest financial share, providing 45% of the total construction budget, out of which France has committed to pay 20%. Therefore, in May 2010[11]:

- The original EURATOM contribution was expected to be €2.7 billion (€2.680 billion in 2008 value).
- This contribution was updated according to the revised schedule (2007-2020) and presented to the ITER Governing Board in March 2010, and had reached €7.253 million (in 2008 value).

However, on 12 July 2010, the Council set out a number of guidelines on cost containment and management and agreed on a 6.6 billion € (in 2008 value) limit of the European contribution to the construction phase of ITER until 2020. This included EUR 1.4 billion additionnal during period of 2012-2013.

At the extraordinary ITER Council meeting of 28 July 2010 the Baseline was adopted. Euratom's support was given *ad referendum*.The European Parliament and the Council are still to approve the Commission's proposed amendments.

The Council reached an agreement in November 2010 on the use of existing margins of the 2010 budget and redeployment within the MFF and 7th EU Research Framework Programme to cover the additional ITER needs at the level of EUR 1.3 billion, i.e. 100 Million € short of the needs of 1.4 Billion € acknowledged by the Council conclusions of 12 July 2010. According to the Commission, *"[t]he reduction of 100 Million € for the period 2012-2013 does not contradict, nor cancel, the Council's commitment to an overall the Council's commitment to an overall European contribution to the ITER construction costs at the level of 6.6 Billion €."*[12]

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[11] European Commission 2010: Communication From The Commission To The European Parliament And The Council ITER status and possible way forward, SEC(2010) 4th May 2010, COM(2010) 226 final

[12] EC 2011: Proposal for a Council Decision concerning the Framework Programme of the European Atomic Energy Community for nuclear research and training activities (2012-2013), 07 March 2011, COM(2011)72 final - 2011/0046 (NLE)

In the framework of the conciliation procedure for the 2011 budget and the linked discussion on the MFF flexibility, the budgetary authority did not conclude an agreement on additional European funding for ITER. Therefore, a decision on that matter, based on the Commission's proposal[13] will have to be taken in 2011.

In these circumstances, the Commission proposed parallel legislative processes:

- On 7 March 2011, the Commission launched its proposal for a Council's Decision concerning the research activities in nuclear energy - the Euratom's Framework Programme - for the years 2012-2013[14], on which the EP is only consulted.
- On 20 April 2011, the Commission adopted two important documents on ITER a) the draft EU budget for 2012[15] and b) a proposal to modify the current financial perspectives in order to allow increased financing of ITER.[16]

Clearly, there is little change in the Commission policy regarding nuclear as one can read from one support document on the proposed 2012 budget[17], which was published after the Fukushima catastrophe: '*In a context of increasing interest and development of nuclear energy in a vast majority of the Member States, the objective of the European Commission is to carry out independent inspections while strengthening the EU legal framework to ensure the highest levels of safety and security, which are absolute priorities for the European Union.*' There is no increase of the nuclear safety budget but ITER might get 2 billion Euros in the next two years if we do not stop this project. It seems that the Commission has never heard about Fukushima.

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[13] Proposal for a decision of the European Parliament and of the Council amending the Interinstitutional Agreement of 17 May 2006 on budgetary discipline and sound financial management as regards the multiannual financial framework, to address additional financing needs of the ITER project, COM(2010) 403

[14] EC 2011: Proposal for a Council Decision concerning the Framework Programme of the European Atomic Energy Community for nuclear research and training activities (2012-2013), 07 March 2011, COM(2011)72 final - 2011/0046 (NLE)

[15] EC 2011: Preparation of the and budget 2012, 20 April 2011, SEC(2011) 498 http://ec.europa.eu/budget/figures/2012/2012_en.cfm

[16] EC, 2011: "Decision of the European parliament and of the council amending the Interinstitutional Agreement of 17 May 2006 on budgetary discipline and sound financial management as regards the multiannual financial framework, to address additional financing needs of the ITER project", 20 April 2011, COM(2011)226.

[17] EC 21 April 2011, Supdoc 29 - 32 - ENER