

European Spallation Source – a new lease of life?

After recent setbacks, the European Spallation Source (ESS) might have obtained a new lease of life. The ESS nuclear facility - a plus 1500 M€ project - is expected to be the biggest neutron-scattering research centre in the world. Ostensibly, Hungarian and Swiss site candidates are about to be announced besides the five that already are or have been in the race and a Swedish initiative could renew interest for the project on the European level. However, the flaws that have scared off potential donors in the past are still present and could derail the project once again.

In Mid-July 2004 the Swedish Government asked Allan Larsson, former minister of finance and director general at the EU-Commission, to review the possibility of hosting the ESS facility in Sweden. At the same time the government declared its intentions “to continue an ambitious research policy and to seize opportunities for collaborations regarding large research projects in Europe, such as ESS”¹.

With a one-year mandate the former minister is to clarify the interest from the scientific community and industry, analyse the long term effects on economic growth, investigate the interest of possible regional, Nordic and European contributors and clarify the position of the EU-Commission and the interest of other countries to participate in the project. The results are to be presented July 1, 2005 and the Swedish government will then decide whether Sweden will submit a formal bid.

The rocky past of ESS

All this is good news to the people formerly organized in the ESS Council, the originator of the project, which dissolved itself and disbanded its central project team in September 2003, the ambition of seeing ESS realized within a reasonable timeframe seemingly crushed.

The giant project that has been under development since 1991 at the expense of at least 500 man-years first ran into trouble in July 2002 when a subgroup of the steering committee „Large research facilities for basic research“ of the German Science Council (GSC) as part of a comparative study of nine large-scale research facilities concluded in its assessment of the project that even though it acknowledged the technical feasibility of ESS, “the scientific case (had) to be advanced intensively and should be better intertwined with the rapid development of other characterisation tools, such as synchrotron radiation, microscopy, spectroscopy (in particular Nuclear Magnetic Resonance (NMR)) and computer simulation”².

Although the sub-panel emphasized the European character of the ESS and regarded the intention to include a large number of scientific institutions from various European nations as exemplary, it also stressed that these advantages could only have the desired effect if the ESS had a clear project structure involving transparent decision-making in the project planning and the implementation phase and if the role distribution of the partners together with their scientific and technological contributions were clear-cut.

To make things even worse for the ESS Council, the GSC mocked its ambition of building the largest neutron source in the world – planned to be almost thirty times as big than any currently in existence - stating in its concluding appraisal of the ESS, that “in the case of a new investment on

¹ Utbildningsdepartementet, Pressmeddelande 8 juli 2004, *Uppdrag till Allan Larsson att undersöka möjligheten att placera European Spallation Source i Sverige*, <http://www.regeringen.se/sb/d/4164/a/27275/m/wai:jsessionid=aR4nIFbLDexg>

² The German Science Council, *European Spallation Source (ESS)*, Drs. 3753/02, Berlin, 12 July, 2002, p. 40, http://neutron.neutron-eu.net/FILES/Assessment_WR.pdf

this financial scale, the priority must be to open up new research areas for neutron scattering rather than to develop neutron sources solely on the basis of foreseeable technological limitations of the neutron sources currently operated in Germany and elsewhere in Europe (so-called “neutron gap”)³.

Finally, three categories were established in GSC’s appraisal of the nine research facilities in question based on their strengths and weaknesses in the context of further national and international scientific development of the research fields they belonged to and an assessment of their interaction with other disciplines: *The first category* included facilities which, when implemented, would provide a research infrastructure of a new quality, which would contribute decisively to the development of the research field concerned and which would promise new scientific knowledge, therefore meriting unconditional support⁴. *The second category* included facilities which, when implemented, would also give rise to research infrastructure of a new quality, which would contribute decisively to the development of the research field concerned and which promise new scientific knowledge, although meriting only conditional support⁵. However, for the large-scale facilities in *the third category* - to which ESS ostensibly belonged - continued work on their scientific programmes and the technical design reports should lead to more extensive insights and to a new project proposal. As regards these facilities, the Science Council would consider it necessary to carry out a new assessment⁶.

Hence, the German Science Council gave ESS a low funding priority. Although the ESS Council lobbied hard to get a re-evaluation without changing the scientific programmes or the technical designs for the ESS, it never emerged, and as a consequence the German government withdrew its support for the two German site candidates, Forschungszentrum Jülich in Nordrhein-Westphalia and Halle-Leipzig backed up by the Federal States of Saxony and Saxony-Anhalt, in February 2003.

To add insult to injury, the British government decided to upgrade an already existing neutron-scattering facility - the ISIS neutron source at the Rutherford Appleton Laboratory near Oxford - where more than £100 million was to be spent over the next five years to build a second neutron target. It also increased its commitment to the Institut Laue-Langevin’s (ILL) neutron facility in Grenoble, France, at least temporarily leaving the two English ESS site candidates out in the cold⁷. With respect to ESS, the government decided to postpone the final decision until after an analysis of the need for neutron scattering facilities in England, which is to be completed at the middle of 2005.

The ESS transmutation connection

With its two German and two English competitors effectively out of the race, the Swedish-Danish-Norwegian consortium ESS Scandinavia was expected to launch a successful campaign to get the project to Sweden, but so far it has met with very little progress.

³ The German Science Council, *Statement on nine large-scale facilities for basic scientific research and on the development of investment planning for large-scale facilities*, Berlin, 12 July 2002, p. 54, <http://www.wissenschaftsrat.de/texte/5385-02.pdf>

⁴ According to the GSC, the large-scale research facilities belonging to this category were the High Field Laboratory Dresden (HLD) and the High Altitude and Long Range Research Aircraft (HALO), *ibid.* p. 77.

⁵ This group included the TeV-Energy Superconducting Linear Accelerator (TESLA), the TESLA X-ray Free Electron Laser (TESLA XFEL) and the International Accelerator Facility for Beams of Ions and Antiprotons, *ibid.* p. 77.

⁶ Apart from ESS, the large-scale research facilities belonging to this category were the Soft X-ray Free Electron Laser (Soft X-ray-FEL), the European Spallation Source (ESS), the High Magnetic Field Facility for Neutron Scattering Research and the European Drilling Research Icebreaker (Aurora Borealis), *ibid.* p. 77.

⁷ *Nature* 422, 17 April 2003.

The local resistance against the mammoth facility – the biggest research project ever in Scandinavian history – started in the beginning of 2002, when the municipality of Lund in the Oeresund region began to apply for the ESS. The dissatisfaction was caused by the one-sidedness of the marketing of the project and by the way, the decision was bulldozed through the municipality council. Local citizens and environmental groups pointed out that the size of the research centre in itself was a problem – the accelerator was almost a kilometre long and at least two and a half square kilometres of some of the best arable land in the country would have to be expropriated for the benefit of the centre. Furthermore, the research facility that was in reality a nuclear facility was located too close to Lund considering that it would contain large quantities of radioactive material and explosive and toxic substances. This concern was amplified by the fact that this was not a run-of-the-mill industrial facility based on tested out technology and that safety parameters were not transparent. Almost immediately, local sceptics started to organize themselves and lobby for a local referendum on the ESS.

Another obstacle emerged in November 2002 when four environmental groups in Denmark and Sweden – Barsebaecksoffensiv (BBOFF), the Danish Ecological Council, Folkkampanjen mot Kärnkraft-Kärnvapen and the Swedish Green Party – organized an international symposium in Copenhagen to raise concerns about the safety and environmental implications of the project⁸.

The conference focused on a wide range of issues, but the most controversial aspect was whether the ESS facility could be used for experiments into the transmutation of nuclear waste. Transmutation that in some circles is considered to be the hope for the future of a nuclear industry currently in decline is the idea of converting long-lived radioactive waste either into non-radioactive isotopes, or if this is not possible, into radioactive isotopes with shorter half-lives. This, however, will only work if the waste is first reprocessed to remove plutonium and uranium. Reprocessing, as at Sellafield in the UK and La Hague in France, leads to radioactive discharges considerably greater than those of nuclear power plants, and production of plutonium, which can be used in nuclear weapons. After removal of plutonium and uranium, the remaining waste will undergo “partitioning” – which is more complex and potentially even more polluting than reprocessing – to separate the long-lived radioactive isotopes from the short-lived and stable isotopes.

The application of transmutation is only meaningful in countries that rely heavily on nuclear power. Hence, the main concern of the organizers was that if ESS was built in Scandinavia, the Oeresund region might end up being “the nuclear waste transmutation capital of the world”, thus making it increasingly difficult to phase out nuclear power in Sweden.

Things heated up a couple of days before the conference when WISE-Paris published a memorandum commissioned by the organizers of the symposium - *The European Spallation Source Project and Nuclear Waste Transmutation*⁹ – which established the existence of a double strategy in the ESS project management process concerning this subject. The WISE-Paris memorandum concluded that “the present preliminary analysis of the history and purpose of the ESS Project shows that nuclear waste transmutation experimentation has clearly been a strategic and logical orientation of the project throughout its development. The recent redefinition of the project in 2001 no longer mentions transmutation. However, the future adaptation of the redefined project in order to carry out transmutation experiments is both: feasible without major technical challenge and

⁸ See *WISE/NIRS Nuclear Monitor* 578.5470, “Scientists boycott seminar over transmutation claims”, <http://www.antenna.nl/wise/578/5470.html>

⁹ Vincent Legrand, Xavier Coeytaux, Mycle Schneider, Yacine B. Faïd, *The European Spallation Source Project and Nuclear Waste Transmutation*, WISE-Paris, Paris, 26 November 2002, <http://www.folkkampanjen.se/doc1/wise021127essmemo.pdf>

economically achievable (...) The reasons presently preventing the ESS Council from maintaining the transmutation option are not technical, but rather seem to be political and financial in nature". Protesting the memorandum, the representatives of ESS Scandinavia and the ESS Council pulled out the day before they were supposed to give presentations at the symposium and sent out a press release, emphasizing that "ESS (would) not be used for any activities linked to transmutation, partitioning or reprocessing of spent nuclear fuel or any transmutation related experiments"¹⁰. This was the first time that the leading persons of the ESS had ever publicly rejected the transmutation option.

The organizers' findings

Although the organizers of the symposium welcomed the statement of the ESS representatives on transmutation, they also took note of the fact that it was not contested that the strategic core of transmutation technology, i.e. the advanced accelerator and adapted spallation target, were present in the latest design of ESS and that this design would allow future developments to reintegrate transmutation. They also noted that 7 of the 26 neutron scattering facilities around the world had designs comparable with the ESS and most of them had been equipped with sub-critical reactors allowing transmutation studies. Moreover, a major spallation project currently under construction in Japan specifically included waste transmutation research and applications in the main proclaimed purpose of the facility.

The information provided from the symposium and the WISE-Paris memorandum also raised a number of other fundamental questions, including the viability of the project as a whole. Mainly, it sets forth the question, what would be the result of a comprehensive social, environmental and economical analysis of yet another accelerator based system in Europe, considering:

- *Risk assessments of all parts of the outlined ESS facility and elaboration of worst-case scenarios.* The spallation target stations consist of 30 t. mercury, a poisonous liquid metal, which would become radioactive during use and have to be stored in a nuclear waste repository for 3000 years after the decommissioning of the research centre. If the cooling fails in the target stations, there could be an explosion, which could spread mercury not only over the city of Lund, but the whole region;
- *Impact assessments of worst case scenarios on a local and regional scale;*
- *The projected investment cost of some 1500 M€ and the projected annual expenditure of over 140 M€.* What other budget lines are influenced by this huge investment in spallation-related science and could the money be used better in order to pursue EU's sustainability strategy?
- *The significant electricity needs.* Could ESS in Lund provide a further excuse to delay the closure of the nearby 600 MW Barsebaeck-2 reactor, situated in the middle of the most densely populated part of Scandinavia and only 20 km from the centre of Copenhagen?
- *The significant underlying driving force motivated by competition with the US and Japan beyond identifiable scientific rationale;*
- *Contribution to sustainable development;*

Consequently, the organizers proposed that a thorough independent investigation on the impact of the ESS project should be made **before** any decision on the viability of the project was taken. Considering that the funding of the ESS could derive from The European Union and to some degree

¹⁰ ESS Scandinavia press release, 28 November 2002, http://www.ess-scandinavia.org/ess-more/Pressrelease_eng021128.htm

from the hosting country, the investigation should be a joint enterprise between the EU and the applicant countries. The investigation should comprise an independent in-depth assessment of the justification, long-term orientation, environmental and social benefit and effects of the project. The project's local and regional safety implications should be analyzed as well as the project's role in the EU policy for sustainable development, especially as regards the enormous energy consumption of the research facility. And in order to guarantee the neutrality of the investigation one or more independent research agencies should participate in the enterprise¹¹.

Lukewarm Scandinavian support for ESS in Lund

The location of ESS in Lund have always had the wholehearted support of powerful Scandinavian industrial organizations – e.g. the Confederation of Swedish Enterprise and the Confederation of Danish Industries¹² – but leading politicians in Sweden and Denmark have so far embraced the project with some apprehension.

In January 2003 representatives of ESS Scandinavia were almost successful in persuading the Danish delegation in the Nordic Council into promoting a resolution conceived by the consortium itself. The resolution recommended the ESS-project to the Scandinavian governments and the Nordic Council of Ministers. However, before the council meeting Danish and Swedish green NGOs contacted the Danish delegation and all the council members, informing them of the findings of the November 2002 symposium and recommending an independent analysis of the ESS project¹³. The delegation abstained from promoting the resolution and the Danish delegation leader, the former Social Democratic minister for taxation, Ole Stavad, stated in the media that further inquiries into the project would be necessary.

Sensing that the main obstacle to Danish political support of ESS in Lund was the project's potential negative impact on a swift decommissioning of Barsebaeck 2, ESS-Scandinavia commissioned a report from the Swedish energy consultant agency *ÅF Energi & Miljö AB* – an agency that the Swedish government had cooperated with in the past in order to establish whether the conditions for closing the Barsebaeck NPP has been met. The report which was published in March 2003 concluded that the facility would not have an impact on the Swedish government's decision on whether or when to decommission Barsebaeck 2, because its effects on the region's effect balance would only be marginal¹⁴.

ESS Scandinavia was now expected to lobby for another resolution in the Nordic Council, but before that could happen, BBOFF and Folkkampanjen published a memorandum, pinpointing a series of inaccuracies in the report and documenting serious inconsistencies in ESS-Scandinavia's marketing of the project¹⁵. On one hand the consortium played down the facility's own significant electricity consumption - estimated to be 120-150 MW, corresponding with the electricity consumption of a Danish city of between 89.000 and 111.000 inhabitants - and on the other hand it played up the project's economic development potential, claiming that up to 80% of the funding for

¹¹ The Danish Ecological Council, Press release, 5 December 2002, "The organizers' conclusions and recommendations", <http://www.folkkampanjen.se/doc1/ess20021205statement.pdf>

¹² E.g. see http://www.ess-scandinavia.org/new/source/Nyheter/LetterDK_SE.pdf

¹³ Pressemeldelse fra Barsebäcksoffensiv i anledning af Nordisk Råds møde 3.- 4. februar i Stockholm, http://www.noah.dk/energi/presse_nordisk1.html

¹⁴ Karin Byman, David Ringmar och Maria Stenkvist, – *Elförsörjning till European Spallation Source – en forskningsanläggning i Sydsverige*, ÅF Energi & Miljö AB, Stockholm 2003-03-03, http://www.ess-scandinavia.org/new/source/Nyheter/AF_ESS_030303.pdf

¹⁵ *Barsebäcksoffensiv og Folkkampanjen mot Kärnkraft-Kärnvapen om Barsebäck 2/ESS-rapporten fra ÅF Energi & Miljö AB 2003-04*, <http://www.folkkampanjen.se/dok1/ess200304.pdf>

the project would be reinvested in the regional economy, which would inevitably lead to an additional increase in the electricity consumption¹⁶.

No luck with the Danish government

In May 2003 Lund municipality put pressure on ESS Scandinavia and the Swedish government by signalling that it would abandon ESS due to lack of resources, if the government did not involve itself in promoting the project¹⁷. However, it took almost six months for the Swedish government to send a formal request to the Danish government, asking it for its view on ESS in Lund and by any standard the contact was half-hearted. This fact is striking, considering that Mats Johnsson, State Secretary in the Swedish Ministry of Education, publicly stated that “the future of the ESS research centre is in the hands of the Danish government” and that Denmark’s answer would determine the future of the project, because ESS could only be built in Lund if Denmark and Sweden cooperated. He also insisted that if the governments of Denmark and Sweden backed up the project, Norway and Finland should also be asked if they would participate in the financing of the project¹⁸.

However, the letter concerning ESS from the Swedish Minister of Education, Thomas Östros, to the liberal/right wing Danish Minister of Science, Technology and Research, Helge Sander, received a chilly answer. In his short reply Helge Sander noted that it was his understanding that the Swedish government was investigating the financial possibilities of locating ESS in Lund (which it was probably not doing at this point in time) and that he therefore would await the result of these analyses¹⁹.

In an answer to a question posed to him in the Danish parliament shortly after, the Danish minister was more outspoken²⁰: After mentioning the English plans for a neutron-scattering research facility he went on to say that he found it “natural and gratifying that the English government (had) taken this initiative (considering that) about 2000 of a total of 5000 European neutron scattering researchers are situated in England”. In contrast to this, “the number of Danish researchers who at this point in time would benefit in their work from access to high quality neutron scattering is relatively small. A conservative estimate is that they are in the order of 20 Danish researchers”.

This first, formal contact between the Swedish and Danish government could only be seen as a devastating blow to the ambitions of the lobbyists in ESS Scandinavia and especially to the Danish part of the consortium, considering that scientists at the Risoe National Laboratory in Denmark were among the originators of the project on the European level and that the Laboratory had always been an ESS Council and ESS Scandinavia powerhouse.

A classic regional development project

With no hopes of bringing the Danish government on board and deprived of the synergism of a broad inter-Scandinavian initiative, ESS Scandinavia now had to rely on its safest card in its quest for official support: To downplay the scientific aspects of the project and “sell” it purely as a classic regional development project financed mostly by money from abroad. And furthermore: If the Danish government could no longer be scared off by the project’s enormous electricity

¹⁶ E.g. see *Dagens Industri* 20 February 2003 and *Sverige i Dag*, 28 February 2003.

¹⁷ *Sydsvenskan*, 21 May 2003, “ESS-anläggningen får deadline”, <http://w1.sydsvenskan.se/Article.jsp?article=10044870>

¹⁸ *Sydsvenskan*, 22 September 2003, “ESS-anläggningen i danska händer”, <http://w1.sydsvenskan.se/Article.jsp?article=10059503>

¹⁹ Undated letter from October 2003 from the Danish Minister of Science, Technology and Research, Helge Sander, to the Swedish Minister of Education, Thomas Östros.

²⁰ http://www.ft.dk/Samling/20031/udvbilag/UVT/Almdel_bilag26.htm

consumption, because it had already turned its back on ESS, why not turn the electricity consumption into an asset?

In January 2004 ÅF-Energi & Miljö AB issued another report commissioned by ESS Scandinavia – this time estimating the future costs for electric energy for the ESS facility and the income for the Swedish electricity market and revenue from taxes to the Swedish government²¹. In a scenario with the facility's power demand set to be 120 MW, the report estimated the total costs for the electricity supply to be 49-59 M€year in 2010 and 55-81 M€year in 2020. The revenue to the government from energy tax was estimated to be 25-32 M€year in 2010 and 31-46 M€year in 2020. Finally, the income to electricity suppliers from ESS in Lund was estimated to be approx. 22 M€year in 2010 and 23-30 M€year in 2020. In this respect, the income of the electricity suppliers was almost as relevant to the Swedish state as the electricity tax revenue, considering that the largest electricity supplier in the country, Vattenfall AB, that produces 50% of Sweden's electricity, is owned exclusively by the Swedish state.

At the same time two recommendations were introduced in the Committee for Trade and Industry in the Swedish parliament, both calling on the Swedish government to promote ESS in Lund. However, the response that was published in March 2004 must have been a disappointment to the lobbyists because of its striking environmentalist stance: Although the Committee recognized that the planned ESS facility could be an important part of the European technical R&D infrastructure in various strategically important fields and attractive for Sweden to host, it still stressed the necessity of an independent, comprehensive overall evaluation of the project along the lines set by the critical ESS symposium in Copenhagen in November 2002.

In such an evaluation “the useful effects of the facility (had) to be weighted against the value of preserving the natural and cultural environment in Lund's surroundings. Furthermore, the various risk factors (had) to be taken into consideration, e.g. the handling of environmentally hazardous waste, plus that the effect balance in Southern Sweden (should) not be affected negatively”. According to the Committee, even if the result of such an analysis added up to an positive outlook on ESS, the Swedish parliament should be obliged to weigh the research facility against other R&D initiatives.

Taking all the above-mentioned into consideration, the Committee for Trade and Industry decided to reject the two recommendations²².

A flawed decision-making process

Notwithstanding its own potential regional environmental and socio-economic impact and its own potential consequences for European science policies, the ESS project raises several principal questions regarding the assessment of large-scale research facilities now and in the future. In order to understand and evaluate the decision-making mechanisms that have characterized ESS, it would be wise to implement the approach of the GSC in the European context²³: Following the GSC perspective, if one wants to improve coordination of and to review suitable initiatives according to

²¹ ÅF-Energi & Miljö AB, Rapport nr SR-ESS 040107, *Ekonomisk analys gällande elförsörjningen av European Spallation Source byggd i Lund, Öresundsregionen*, Stockholm, 2004-01-07, <http://www.ess-scandinavia.org/new/source/Nyheter/SR%20ESS%20040107.pdf>

²² Näringsutskottet 2003/04:NU10, Utskottets överväganden, Neutronforskningsanläggningen ESS, p. 78-79, <http://www.ess-scandinavia.org/new/source/Nyheter/Senaste%20ESS.pdf>

²³ Cf. *Statement on nine large-scale facilities for basic scientific research and on the development of investment planning for large-scale facilities*, p. 73-75. The report firmly establishes that decisions on procurement above a cost limit of 50-100 M€ which will be used by several institutions and are important for large sections of the European scientific community must be based on funding recommendations made from a suitably broad perspective.

uniform scientific and research policy criteria, it is self-evident that such projects should be examined on the basis of an increasingly networked higher education and science system, i.e. from a cross-institutional perspective, and that decisions on large investments which involve a considerable proportion of government funding or funding from the EU, that are binding in the long term, should become more transparent. To solve this problem, a continuous, established procedure would be required, which uses the available options for making assessments.

Hence, it is important not only to examine the procurement of specific facilities, but also to discuss the importance of and the prospects for the research areas concerned. Expert assessments should be conducted in a structured framework that offers as much scope for comparison as possible, permitting an “external viewpoint” in the sense of judging and comparing performance from an international point of view that also includes – it one also adds the environmental stance as mentioned above - an independent assessment of the justification, long-term orientation, environmental and social benefit and effects of the project and the project’s role in the EU policy for sustainable development.

For this reason alone, institutions or research organizations should not be able to opt for the procurement of large-scale facilities of supra-regional importance on the basis of internal decision-making processes.

If these considerations are to be taken seriously, the inevitable conclusion is, however, that the decision-making process with respect to ESS is flawed in a multiple sense: The mechanism of the project originators first “selling” the project to educational institutions and industrial associations and then together with them marketing it to the political decision-makers – who in turn ask the originators or the interested parties what they think, when in need of an independent expert opinion – has been predominant throughout the history of the project on the regional, national and European level.

The so far most striking example of the predominance of “internal decision-making” is probably the role that The European Strategy Forum on Research Infrastructures (ESFRI) has played in determining the need for ESS in Europe²⁴. In order to assess this need, ESFRI commissioned a report - *Medium to long-term future scenarios for neutron-based science in Europe*²⁵ - from the ESFRI Working Group on Neutron Facilities²⁶. The report is a comparative study of different medium to long-term future scenarios for the development of facilities for neutron-based science in Europe. It concludes that “a neutron landscape with ESS fully implemented as the new world leading facility, supplemented by a baseline including fully developed ILL and ISIS and a selected network of regional and national sources (...) would provide world-leading capability in all areas of neutron science and could serve a growing community of researchers”.

*However, this recommendation was made by 10 persons, of whom at least 7 had strong ties with the ESS project at the time*²⁷.

²⁴ That the originators of ESS more or less consider ESFRI a vehicle for promotion that has to “make clear to Europe the importance of ESS” can be seen from an article in *EU-Wochenspiegel Nr. 37/02 25.10.2002*, p. 8.

²⁵ *Medium to long-term future scenarios for neutron-based science in Europe*, Working Group on Neutron Facilities, European Strategy Forum on Research Infrastructures, January 2003, http://neutron.neutron-eu.net/FILES/esfri_report.pdf

²⁶ ESFRI was established on research commissioner Busquin’s initiative. It comprises, in general, high-level civil servants from each of the member states of the EU, for consultations on new investments in large facilities, or in jargon, research infrastructures. The Working Group on Neutron Facilities was established by the European Strategy Forum on Research Infrastructures (ESFRI) at its meeting on July 3, 2002.

²⁷ The seven people in the ESFRI Working Group on Neutron Facilities with close ties to ESS were F. Barocchi, Chairman of ENSA (“European Neutron Scattering Association”), University of Florence (**ESS Council Member at the time**), Italy, J.K. Kjems, Director of Risoe National Laboratory (**former Chairman of the ESS Council**), the Risoe

One has to conclude with respect to the above-mentioned that if the political decision-makers did not have a sound base for decision-making before, they certainly do not have it now: Vital potential problems inherent in the design of the ESS and their possible negative effects must be illuminated and faced before binding decisions on the funding aspects of the project are made. Hence, the newly appointed Swedish arbitrator is on a mission impossible, when he tours Europe to clarify whether the support for ESS is there. As matters are now, regional, national and European decision-makers have no way of knowing what they are saying yes or no to. As already mentioned, it is vital that a comprehensive, independent analysis on the content and the impact of the ESS project must be made **before** any political decision on the viability of the project is taken.

Niels Henrik Hooge, NOAH - Friends of the Earth Denmark, 2004-9-22.

For more information on the ESS project, see:

Folkkampanjen mot Kärnkraft-Kärnvapen - <http://www.folkkampanjen.se/essinfo.html>

European Neutron Portal - http://neutron.neutron-eu.net/n_ess

ESS-Scandinavia - <http://www.ess-scandinavia.org/new/source/index.asp>

National Laboratory was **ESS Partner at the time** and is **presently member of ESS Scandinavia**), Denmark, F. Mezei, Hahn-Meitner-Institut Berlin (**ESS Task Leader (instrumentation) at the time**, the Institute was **ESS Partner at the time**), Germany, A. Taylor, ISIS Facility, CCLRC Rutherford Appleton Laboratory (the Laboratory is **ESS site candidate** for the Oxfordshire region), UK, P. Tindemans (**Chairman of the ESS Council at the time**), G.E. Törnquist, University of Lund (the University is **presently member of ESS Scandinavia**), Sweden and C. Vettier, ILL (**member of ESS Scientific Advisory Committee at the time**), France.