



The Thermonuclear Fusion Lesson

The paper analyses some of the aspects developing during the period 1997-2008 in which the Author has been involved in SERF Programme (Socio Economic Impact of Fusion) as Italian responsible of Public acceptance and communication process of ITER at moment in construction in Cadarache France. In particular Public acceptance of technology and communication process shall be take into account

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Public acceptance and communication for large technological plants is not always fully recognized. Nevertheless, fusion energy and its social environment is a very interesting example. The management, or rather governance, of large technical systems has attracted great attention in recent years, as well as the relationship between experts, politicians and the public.

Public acceptance and communication process

The main activity in the field of fusion public acceptance has been realised inside SERF programme the so-called Porto Torres project, which had two main objectives:

- to focus the participation processes more specifically on the topic of fusion, in order to get specific answers to its social, cultural, economic and environmental acceptability;
- to identify better strategies of local development compatible with the installation of a large fusion demonstration facility.

The first phase of SERF studies had demonstrated that such an installation is more acceptable if composite (instead of mono-cultural) development perspectives are proposed to the local population: fusion has better chances to be accepted if it is proposed within *et-et* instead of *aut-aut* solutions (Borrelli et al. 2000, Lackner et al. 2001).

Having shown the readiness of the local community to develop their town with the help of high tech, it had to be determined under which conditions this development could go along with the installation of a

large experimental facility. The Porto Torres project developed through three steps:

- a comparison of the socio-economic situation of Porto Torres with Culham (UK), where the JET laboratory is operational since 1983 (“indirect approach”);
- a visit of a delegation of citizens of Porto Torres to the JET laboratory and their meeting with representatives of the local community in Culham (UK) (“direct experiences”);
- the participation of representatives of the local communities of Porto Torres in a Strategic Scenario Workshop: in this adaptation of the European Awareness Scenario Workshop (EASW) to the new local conditions, citizens discussed possible local future development scenarios with or without the construction of a large fusion demonstration facility and became aware of the consequences of either choice (Borrelli et al. 2000, Lackner et al. 2001)

The presence and participation in this phase was higher both at the public hearings and at the final awareness workshops. This increase of public participation is linked to a deeper awareness in the whole local community. As to the final identification of the acceptance factors for ITER in Porto Torres the environmental compatibility seemed to be the most important element to accept the project.

The second important aspect was information and communication, which must be large, complete and continuous. Economic factors were ranked third; they indicate that the implementation of the project must improve the local economic devel-

opment (Borrelli et al. 2000, Lackner et al. 2001).

As consequence of Porto Torres Project, a study was carried out which focused on public participation, namely on the format of citizen panels and consensus conferences to relevant technological issues and also looked at trust and confidence from the public in socio-technological systems, regarding the often rather cautious or often even hostile reaction of the public towards political decisions about new technologies or site procedures of plants which are regarded as unduly risky. The problem of communicating technical and environmental risks and building up a proper atmosphere of social trust in the responsible decision-makers and decision processes, public authorities and regulating bodies has gained great scientific interest during the last decades (Gazsó et al. 2004).

In 2003 a study on the awareness of fusion in schools across Europe was conducted by ENEA, investigating the effectiveness of informative processes and of the communication connected with the awareness of fusion technology. Questions like “How much is the communication on nuclear fusion in general, and on ITER in particular, comprehensible?” or “Does the communication support learning about the subject or does it cause alienation?” were to be addressed in this study. After providing information and communication to the students, they were asked to fill in a questionnaire, investigating the communicative, cognitive and emotional dimension of the issue at stake. It was realised that the role of teachers is very important to understand the communication on energy and fusion. They are important in this kind of activities to reach and to

involve more potentially interested students. Teachers proposed some useful suggestions, e.g. that information material should be accompanied with lessons of experts. The activity clearly showed that energy is not only a technical problem, but it is also a social problem. When students can say their opinion, such an activity can reduce the gap between the scientific world and every-day life and stimulate critical thought towards the energy topic. The lesson learnt from the whole experience carried out was that when a new technological innovation is communicated in a participative way giving clear information, its acceptability increases (Bonfà et al. 2003).

Lesson by fusion

On the basis of the above-mentioned experiences, we can affirm that activity on fusion has been useful for participatory and communication studies too. The same difficulties encountered in thermonuclear fusion studies have also been found in other studies related to the social acceptance of technologies, i.e. power plants' waste management.

- It is very difficult to implement a participation process about those technologies: for what concerns fusion, its image is strictly perceived in association with the theme of nuclear fission. We must spend a lot of time to arrive to a separation between fusion technology and fission technology.
- For what concerns participation processes we must take into account that a process of mistrust toward scientific experts and scientific institutions is in act.
- Nevertheless, it is our opinion that a development project needs

public participation because of the high social costs derived by public opposition.

- Moreover, we can affirm that the political situation inside industrialised critical areas, Porto Torres is one of more significant case in Italy, requests a process of involvement of citizens and local administrators. Without the implementation of this process it is not possible to promote any technological enterprise.

Faced with these issues we feel we can affirm that the methodologies we put in place in SERF Project has proved to be very effective in general. In fact, we can say we have brought our research tasks to an end and that four issues emerge strongly:

- The strong need for participation in decision processes expressed by local populations;
- The fundamental role played by local actors in stimulating and managing such participation processes (i.e. the University as the first intermediary with the local territory and the local administration - in the person of the Mayor, in particular - as the first interlocutor with whom it is possible to develop strategies for adequate action) and thus by the network that can be developed starting from those primary actors;
- The role played by participants in the workshop: they were chosen according to their role in the local community and now they are important allies for our work: they are the strategic knots of a network that extends itself to the whole of the community. If they perceived the importance they have they are more than willing to collaborate;

- The need for strategies of development that are not monocultural, but that can be configured according to composite development visions.

Conclusion

Besides fusion experience we think that a new stage of the project needs to be put in action with three main objectives:

- To continue the participation process that has been started, by adopting the same methods that have been adopted up to now and that have proved successful: that would be a further test for such tools and can lead to possible amelioration and would enable us to keep the network we have built up to now.
- To focus such participation processes and the methods involved on the topic of fusion and high technology more specifically than it has been focused up to now, to get specific answers about the social, cultural, economic and environmental acceptability of issues related to those issues.
- To identify strategies of development compatible with large-scale technological facilities. Our evidence shows that the acceptability of a project is higher if composite development perspectives are proposed to local population instead of monocultural development.

In conclusion in relation to Fish-off's stages to risk communication, we notice that one of the first steps is information, while the last one states: "All we have to do is make them partners". Our experience shows that we must turn this vision upside-down. We have started

from the last step and now we think we have reached a good level of trust and mutual respect with local populations as well as a sufficient level of information, what we need to do now is to keep and eventually reinforce trust and mutual respect and now to reinforce information more specifically about high technologies, numbers and all the rest they need to participate in a really democratic process. In order to attain such trust what we did was to call local population to discuss as experts themselves, because they really are the first experts of the territory in which they live. We cannot keep thinking that we are the side of society that owns the knowledge: starting from this point of view has proved unsuccessful in previous experiences. Besides, if you want

to have partners some kind of parity has to be established and that starts from our recognition of our limits and from the recognition of the knowledge possessed by local populations about their own reality. If we do this, we are already on the right track. Evidence confirmed our hypothesis that this can happen if local socio-cultural specificity is adequately considered and that this gives the possibility to elaborate forms of composite development with reference to social, economic cultural and environmental factors within an approach that must be verified every time (i. e. an adaptable approach developed out of rigid models). The general indication for such a flexible approach regards the role of local actors that must be seen as such and not only

as mediators. More in particular, local administrators are to be the first interlocutors with whom it is possible to develop a common method because they are the first interpreters of the reality they live in. In accordance with them it is possible to develop instruments to enable citizens to take decision on their own, and, most of all, to understand what kind of guarantees do citizens want about the arena in which discussion takes place and about the actors involved.

Discussion on fusion, like discussion on other new technology issue, cannot avoid social conflict. Our experience shows that, instead of avoiding it or to directing it, it is possible to manage social conflict to make it productive in terms of social composite development.

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