

Singing from the same sheet – Social networks for fusion communication

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Introduction

Fusion is the nuclear process that powers and drives the production of energy in stars. Opposite to fission, in fusion lighter nuclei are combined to heavier ones, processes by which considerable amounts of energy are produced. 'Considerable' translates into a compelling comparison: half a gram of fusion fuel contains the same equivalent of energy than 11,000 tons of coal.

Driven by the attractive aim to harvest sheer abundant, CO₂-free fusion energy by the middle of this century, twenty-nine signatories, representing 27 European countries, signed the agreement to the EUROfusion consortium, the European Consortium for the Development of Fusion Energy. In addition about 100 Third Parties contribute to the research activities through the consortium members. EUROfusion funds fusion research activities under EURATOM Horizon 2020.

The FuseCOM communication network

Since the early days of fusion research in the 1970s European labs collaborated on the research level. It is as late as 2001 when the first communication group was created forming the predecessor of what is known today as FuseCOM, the communicators' network on fusion research. The network is facilitated by the Head of the EUROfusion Communications office.

The research towards the realisation of fusion energy is funded by the EUROfusion consortium which leads naturally to overlapping communication topics. Coherent messages on these topics and across countries are the foundations to engage in a credible way with the identified audiences which might vary from lab to lab and country to country.

As probably in other research fields as well, in fusion research communication is regarded as an option (when all other areas are covered sufficiently), rather than an obligation towards society or as an instrument to secure funding through reliable, frequent information and engagement with target groups.

Working together but being spread across Europe bears particular challenges for the involved personnel. Besides regular video conferences and newsletters a blog eases exchange of information to and from EUROfusion as well as on a horizontal level across Research Units.

Though resources are scarce – as the findings of this paper lay out – network members use the communication channels to keep each other informed and discuss communication matters.

All communication efforts are published each summer in an internal activity report which provided the database for some conclusions of the research described in this paper.

Social Economic Studies (SES) under EUROfusion are divided into two parts both equally relevant to communicators: firstly, the economic aspect, namely the competitiveness of fusion energy in the future market and secondly, societal aspects concerning acceptance of fusion energy. Since 2014 the social scientists have cooperated with the EUROfusion Communications Office and the FuseCOM network in the way described later.

Readers should feel encouraged to contact the authors as two reasons motivated this paper: first, sharing the experience and findings to the benefit of networks in other scientific fields and second, getting through this paper in touch with other science communicators who believe that European science communication in general is still stuck in the 20th century and that this needs to change.

The SES Social Studies and the research to enhance the EUROfusion communication strategy

Social Economic Studies have had a well-established tradition in the field of fusion research long before EUROfusion was launched in 2014. Since 1995 the European fusion community engaged on research (formerly known as EFDA, currently EUROfusion) has a working group carrying out research on the social aspects of fusion, namely public opinion, lay understandings or dialogues with stakeholders.

In 2015 the development of an evidence-based approach to enhance the communication strategy around fusion was identified as a relevant opportunity for the SES social research team. This is the final objective entitled 'Research to enhance the communication strategy of fusion research'.

Thus, the aim is to feed forward and back on the main tools developed by the fusion community (COMs group and FuseCOM network) to communicate with the general public. SES can then assist in mapping relevant stakeholders and 'publics', providing evidence to support the design of information materials, tailoring the suitability of communication strategies to different audiences and evaluating the efficiency of materials and strategies.

The final aims of our collaborative work are:

- To improve the main communication tools with the general public (evidence-based and user-based design).
- to provide support for the scientific assessment of the communication tools

According to the work plan, the 2015 research activity focused on the transmitters of the EUROfusion communication tools and strategies, i.e., the COMs group and the FuseCOM network.

Methodological approach

In order to understanding and eliciting the goals, challenges, and opportunities of the main fusion communicators, a mixed-method approach combining qualitative (interviews and hybrid focus groups) and quantitative (content analysis) techniques was implemented as follows.

→ Semi-structured interviews with EUROfusion COMs staff

As a first approach to the Communication Group in EUROfusion, a semi-structured interview with its head was conducted via Skype in April 2015. This interview collected information on the functioning of the COMs Group, its interaction with the FuseCOM network, the communication strategy of EUROfusion and the planned activities for the short and medium term.

→ Quantitative analysis of FuseCOM Annual Activity Reports

The annual activity reports of the FuseCOM network provide valuable information regarding each network member, namely the profile of the communications officer and the activities performed in the previous year. The last four annual activity reports (2011/12, 2012/13, 2013/14 and 2014/15) were collected and examined, by building a database and performing statistical analysis through the software SPSS Statistical Package for the Social Sciences.

→ Group Dynamic at the FuseCOM network Annual Meeting

SES social researchers attended the FuseCOM network annual meeting in Tampere, Finland, in July 2015. The SES group took the opportunity to get to know and interact with the members of the network, to observe their discussions and to engage with them in a group dynamic. This one and a half hour exercise comprised several activities:

- Personal Meaning Map – using the prompt “Communicating fusion”, network members were asked to write whatever came to their minds on this issue just at the beginning of the session; at the end of the session they were asked to add, remove or change (in a different colour pen) their work.
- Semi-SWOT – after a short presentation with a quantitative analysis of the 2013-14 Activity Report of the FuseCOM network, members were asked to fill in an individual table with the main strengths and weaknesses of their work; afterwards they were divided in 4 groups of 4 people and asked to fill in a similar table based on group consensus; finally each group was asked to present their results, which were then collectively debated (this debate was recorded on tape for a ulterior analysis).
- Resource allocation Exercise – each member was given a list of communication activities (based on the Activity Report) and a limited sum of resources (€1M), divided in fixed amounts (€400k, €300k, €200k and €100k), and was asked to select activities to be funded.

The purpose of this exercise was to better understand the conceptions and attitudes of fusion communicators, as well as the constraints and opportunities they face in their daily activities. It also may provide relevant information on the activities that can benefit from a social research approach.



Fig. 1: Group dynamic at the FuseCOM annual meeting

Key findings: Characteristics, practices and resources of the network

The analysis of the annual activity reports allows us to build a broad picture of the FuseCOM network. The most salient data is perhaps the internal diversity of the network. The Research Units have quite different approaches to communication. Some clearly dedicate more manpower resources, in terms of having at least one dedicated employee, whereas other units add communication to the chores of some researchers or administrative personnel. Some see communication as a full time job, whereas others award as little as 1 to 5 hours per week to communication activities. Some lay the responsibility of communication on a single individual, whereas others have communication teams, with different tasks allocated (media, internet, internal communication). This diversity in terms of communication officer's profiles has an impact over the number and kind of communication activities performed in each research unit. More resources correspond of course to more activities and more diversification. It must be thus quite challenging to design a communication approach common to such a heterogeneous community.

In terms of communication activities, the less intensive ones such as issuing press releases or receiving VIP visits are more common than more demanding ones such as holding open days or evenings (Figure 2). With regards to education activities, lectures to students and the public, less interactive and less resource intensive, are performed by more network members than organizing courses for teachers or holding exhibitions (Figure 3); students and school groups are the main target groups of these activities.

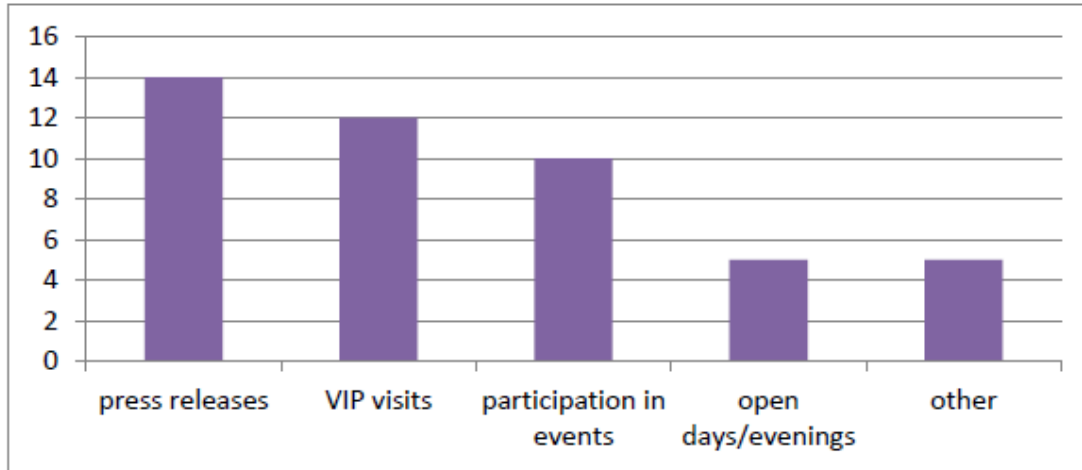


Fig. 2: Types of communication activities (2014-2015)

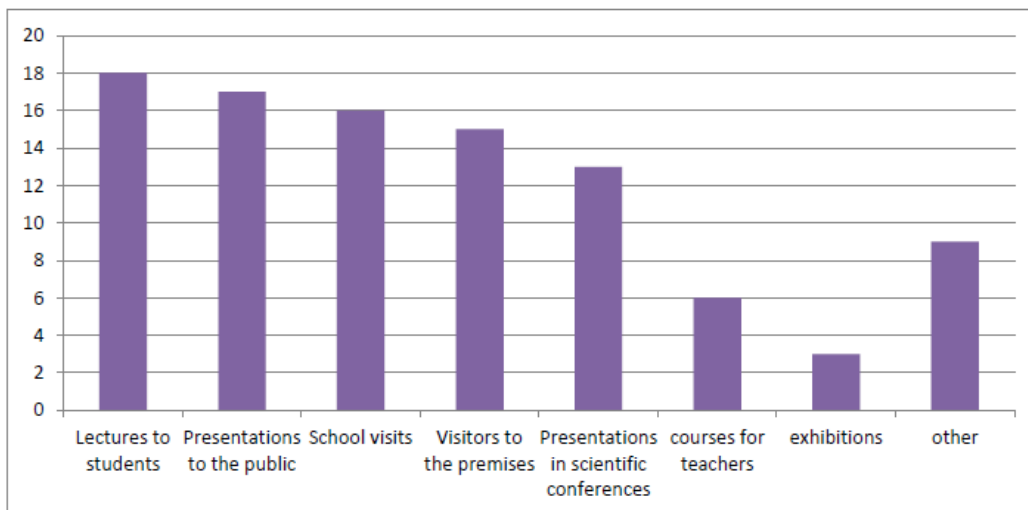


Fig. 3: Types of education activities (2014-2015)

However, the Resource Allocation Exercise (RAE) has shown that there is a significant gap between what communicators do (Activity Reports) and what they would like to do. RAE is a technique drawn from problem structuring methods (PSM) to explore allocation and/or priority options (Rosenhead and Mingers, 2001; Horlick-Jones & Rosenhead, 2002; Mingers & Rosenhead, 2004; Prades et al, 2008). Participants were invited to role-play the process of establishing priorities and investment for fusion communication options.

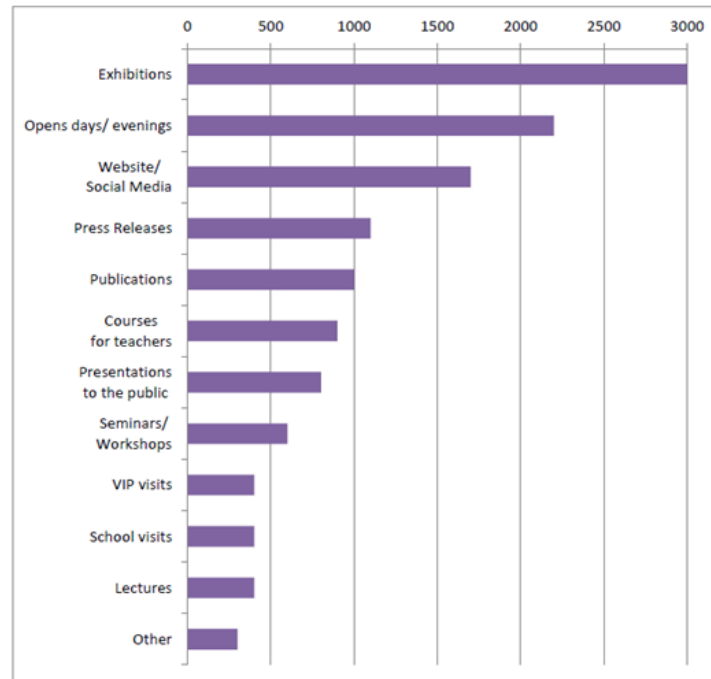


Fig.4: RAE (Resource Allocation Exercise): Preferences of FuseCOM members

As Figure 4 illustrates, the more interactive and the more resource intensive options are clearly preferred: exhibitions, open days. The comparison between the activity reports and the responses to the resource allocation exercise shows that the priorities of communication officers do not quite match what they most commonly do (press releases, VIP visits, and lectures).

The semi-SWOT analysis shows that the issue of resources is also key in terms of the weaknesses of the communicators' activities. SWOT analysis is a quite common method to evaluate a project, organisation or business venture, by listing the strengths, weaknesses, opportunities and threats it has (Hill and Westbrook 1997). It is frequently used in management but has spread to other fields, such as education (Balamuralikrishna and Dugger 1995) or energy (Terrados et al. 2007). In this case, we proposed participants in the FuseCOM meeting to perform a limited version of a SWOT analysis, focused only on strengths and weaknesses, regarding their work as fusion communicators.

As to the main strengths identified, participants mentioned mainly the importance of a solid networking; personal skills, experience and knowledge (in general or applied to communication tasks); and collaborative related issues (the support of the research unit and colleagues) and of the FuseCOM network.

The identification of weaknesses paints a quite different picture. The intrinsic characteristic of fusion, in particular the extended timeframe, is also seen as a problem. Personal characteristics are deemed less relevant than institutional hurdles. Even though some participants still mentioned areas in which lack of knowledge or skills hinders their work (communication officers with a research background miss on communication expertise, professional communicators feel the absence of research training), it is far more frequent attribute problems to the research unit: insufficient time or resources, unwillingness of colleagues to collaborate. The national context is identified as the source of some limitations, such as being the only fusion group in the country.

Strengths	Weaknesses
<p>NETWORKING</p> <ul style="list-style-type: none"> - Common strategy (EUROfusion); Fusion communication group (FuseCOM); Importance of a solid networking; Ideas <p>PERSONAL SKILLS</p> <ul style="list-style-type: none"> - Ability and background in communication; Ability to exam a complex fact simply; Sharing technical and personal experience in a vulgarized way; - Organizational skills + precision <p>CHARACTERISTICS OF FUSION</p> <ul style="list-style-type: none"> - The social relevance of fusion <p>COLLABORATION</p> <ul style="list-style-type: none"> - Ability to delegate an answer to a question we can't reply to; support from the management 	<p>CHARACTERISTICS OF FUSION</p> <ul style="list-style-type: none"> - Complex, far away, not appealing - Problems to positively sell our results <p>RESOURCES</p> <ul style="list-style-type: none"> - Budget - financial support, human resources, time <p>PERSONAL SKILLS</p> <ul style="list-style-type: none"> - Lack of communication skills, knowledge in Physics, prioritizing the information flow <p>COLLABORATION</p> <ul style="list-style-type: none"> - Difficulty in encouraging scientist to communicate their results, lack of collaboration

Tab.1: Semi-SWOT analysis results

Finally, based on the activity reports but also on the other data gathering techniques, there is little evidence that communication officers perform any sort of evaluation of the effectiveness of their activities, even in more prolific Research Units. This evaluation might be valuable to assess the impact of communication on the different types of public and to fine-tune the activities, allowing for a better allocation of resources.

Key findings: Representations and attitudes towards fusion communication in the network

The SWOT analysis highlighted already that the characteristic of fusion energy can be seen by communication officers as both a hindrance (complex, distant in time) and a help (social relevance) for communication. This finding resonates with the results of the Personal Meaning Maps (PMM). PMMs is a technique developed by Falk and Dierking (2000) that measures the degree of change prompted by a learning experience. It has been mostly used for assessing the impact on visitors of museums and exhibitions (in particular scientific ones) (see, for instance, Bowker and Jasper 2007) but can be used for other types of experiences.

The PMM exercise provided a clearer picture of how the communicators envision fusion communication. It shows the diversity of opinions, associated with the diversity of profiles of communicators, but also some common trends. It highlights some of the characteristics of fusion that pose challenges (the double nature as energy source and as research endeavour, the long term realisation of fusion energy) but also the ones that prove appealing (fusion as harnessing the energy of the Sun). It also draws out some of the concerns with the communication process, which are still very much focused on format rather than content and on education/information rather than engagement. Notably, communicators with a background in research focused their attention more on fusion than on communication aspects; the intrinsic characteristics of fusion tend to be seen as a source of fascination that makes communication easier ('the Sun on Earth'). Communicators with a background in communication perceived the characteristics of fusion as a hindrance - it is a complex subject, not appealing to the public, difficult to 'sell' because of the time scale and the costs. Few communication officers mentioned the practical applications of fusion, something that is far more to be likely to be appealing for the public.

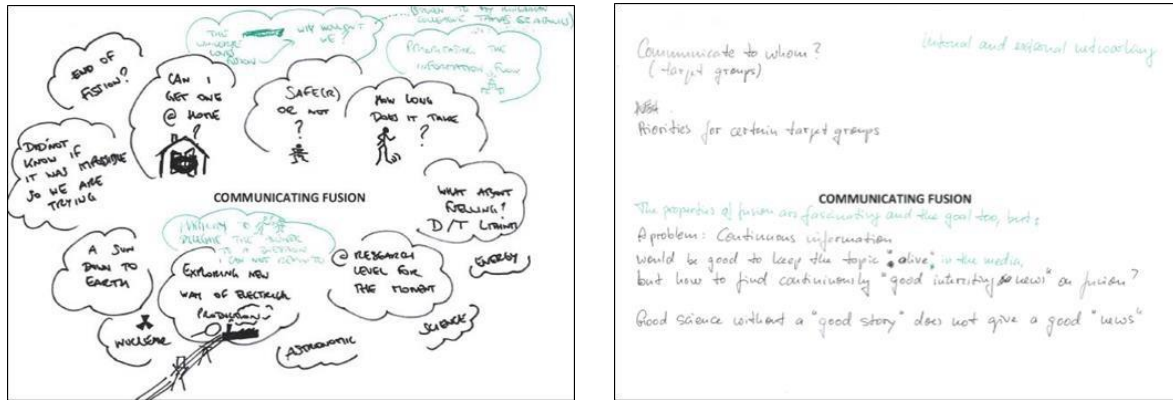


Fig. 5: Personal Meaning Maps

Conclusion

Singing from the same sheet is essential for the fusion community's profile and to engage in a trustworthy dialogue with their audiences. Identifying common goals, highlighting mutual benefits and triggering a constant communicational exchange remains the heart of the network. However, the FuseCOM network is extremely heterogeneous, comprising a majority of researchers and engineers, rather than officers with a background in science communication. Also, the fluctuation of members in the network is high, which poses challenges to cohesion and group work. Furthermore, FuseCOM members' engagement is affected and limited by their background, available resources, institutional support, and national context. Despite that, the idea that working within a network is seen as advantageous by the vast majority of members.

Regarding the attitudes of communication officers towards science communication, the outdated view of providing one-way information still dominates over promoting dialogue between scientists and citizens. The EUROfusion Coms group continues to support the laboratories helping them to embed their communications activities into a strategy which includes engagement with those they want to reach.

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