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Engaging the public in nanotechnology? Three visions of public engagement.

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1. Introduction

"Public engagement", "involvement" and "dialogue" have become important themes in nanotechnology policy discourses. While several social scientists from science and technology studies (STS) advocate "upstream public engagement" (Wilson and Willis, 2004; Wynne, 2001, 2003a), this notion has been introduced in official discourse, especially in the United Kingdom (Royal Society, 2004), and also at the European level. In a 2004 document, the European Union calls for "dialogue" with the public (European Union, 2004), while the "Science and Society" part of the 6th European research and development framework program funds projects to explore the ways to "involve citizens in dialogue and participation"[1]. In France, official political statements about public participation in nanotechnology remain rare. However Prime Minister de Villepin asked in May 2005 for a "national public debate"[2], and numerous public debates were held in the following years about the societal implications of nanotechnology.

In the following, I will use the notion of "public engagement" in a broader sense, as long as it implies two-way exchanges between the public and those who have knowledge of or power over the particular issues at stake. Whenever actors characterize a particular mechanism as public "participation", "involvement", "dialogue" or

1 Science and Society program, Directorate-General for Research, http://ec.europa.eu/research/science-society/science-governance/science-governance_en.html

2 Speech of the Prime Minister given for the General Estates of Firms and Sustainable Development, May 31, 2005.

"engagement", I will consider it as object of study. Brian Wynne (2003) makes clear that public engagement is not value-neutral. By focusing on risks, it often constructs a particular "public" afraid of technological developments and unable to make good decisions without scientific inputs. Therefore the notion of the "public" itself should not be considered un-problematic, but rather a part of what is defined through the design, use and critique of participatory mechanisms.

The notion of public engagement can be granted different meanings. A reason for that is that different motivations can underlie a decision or a statement in favour of public engagement. Fiorino (1990) proposes three motivations for public participation in science and technology: participation is good in itself (normative reason), it is more efficient as it has a legitimizing effect (instrumental reason), and it produces better end-products (substantive reason). These three motivations can be present simultaneously about the same mechanism, which may lead to certain confusion about what public engagement means for the actors that sponsor or advocate them. Indeed, in the case of nanotechnology, the official uptake of the notion of "public engagement in nanotechnology" does not go without "confusion and ambiguity" as MacNaghten et al. state (2005). One of the misunderstandings that these authors point to relates to projected "impacts" of nanotechnology: although it is not the purpose of upstream public engagement to predict them, the references to this notion are numerous in official documents.

These accounts make clear that the notion of "public engagement in nanotechnology' can be understood differently among various actors. My aim is here to go one step further in the analysis of public engagement by studying more extensively different visions of public engagement in nanotechnology articulated not only by officials and social scientists, but also by activists. I am interested in this paper in the different ways

through which officials, scientists, activists and social scientists give meaning to public engagement through the design, the use and the critique of particular mechanisms.

This paper is based on an empirical study, and will consider the city of Grenoble as example. Grenoble is a city in the French Alps where nanotechnology research projects are led, and have been facing opposition from activist groups. Focusing on the design, use and critique of the public engagement mechanisms that have been attempted in Grenoble, I will show how various groups of actors articulate different visions of public engagement, which can even be in some cases a rejection of it. Indeed, the extension of the analysis to anti-nanotechnology activism will lead to analyze an extreme vision of public engagement that defines it as mere alienation.

The analysis of public engagement will be led at two levels. First, the framing of the issues at stake will be studied. “Nanotechnology” does not represent the same notion for all the actors involve, and this contributes to create differences in the understanding of public engagement. The second level of analysis will be the definition of the role of the citizen in Grenoble. Sponsoring, organizing, criticizing and participating in a particular public engagement mechanism are ways to articulate visions of how the citizen should engage in science policy. Through these two levels of analysis, I will thus demonstrate that the different meanings granted to public engagement are strongly connected to competing definitions of nanotechnology on the one hand, and of citizenship on the other. Therefore each vision of public engagement is related to a particular model of understanding of what nanotechnology issues are and how the citizen should engage in the governance of science and technology.

The notion of “framing” nanotechnology and citizenship should be explained. In this paper, I will explore the strategies in discourses and practices through which nanotechnology and citizenship are assigned specific meaning. Communication scholars

have been stressing the need to study the framing of nanotechnology for science communication matters (Scheufele, 2006; Nisbet and Mooney, 2007)[3]. Their position implies that nanotechnology is a reality that can be effectively communicated if "framed" in ways appropriate to specific publics. On the contrary, I claim that nanotechnology and citizenship are categories that are constructed through discourses and practices that engage human and material actors, thus becoming part of public discourse (Hajer, 1995; Fischer, 2000). This study can be seen in the same line as previous STS works that focused on biotechnology (Gottweis, 1998; Jasanoff, 2005). These remarks apply to what I called "visions" of public engagement. The term "vision" is not to be understood as if public engagement existed in a neutral, objective fashion that would be distorted by those who try to implement or critique it. Rather, a *vision* of public engagement is for me a construction of a specific public engagement.

In the following, I will first describe the situation in Grenoble, and introduce the public engagement mechanisms that were attempted. Then I will present three competing visions of public engagement. Articulated by scientists and officials, activists, and social scientists, these three ways of understanding public engagement define differently its role in science and technology governance– one of them even rejects it. They are related to particular models for the definition of nanotechnology issues and the engagement of the citizen in science policy. I will conclude with some implications for the role of social science (and especially science and technology studies) in public engagement in nanotechnology.

[3] Scheufele (1999) provides an overview of the literature on the topic, which focuses on "frames" as cause or consequence of individual or group action in a linear fashion. I prefer focusing on "framing" to stress the dynamic process (in a coproductionist way)

2. Nanotechnology in Grenoble: research projects, activism and a need for dialogue

a. Nanotechnology projects in Grenoble and social opposition

Nanotechnology projects in Grenoble have roots in scientific activities in the *Commissariat à l'Energie Atomique* (CEA), and more precisely in a CEA laboratory called LETI, specialized in solid-state physics and electromagnetics (Jacq, 1996; Pestre, 1991). CEA started to develop research activities in biotechnology and nano-electronics in the late 90s. In the same time, contacts between CEA-LETI, engineering schools and local administrations started to establish a joint research center. CEA and *La Metro*, the Grenoble metropolitan area council, signed the agreement launching the *Minatec* project in January 2002. The objectives of *Minatec* were "to become Europe's top centre for innovation and expertise in micro and nanotechnology"[4] by bringing together research activities in nano-electronics and nano-biotechnology (especially biochips development). Parallel to that, the Joseph-Fourier University, the largest higher education institution in Grenoble, started the *Biopolis* project in 2001 to host newly created companies from universities and research institutions. This incubator received also funding from *La Metro* and opened in fall 2002. The *Nanobio* project was also launched in 2001 by CEA and the Joseph-Fourier University, with the financial support from local authorities. *Nanobio*, which is part of the European Network *Nano2Life*, brings together engineers, physicists and biologists and has a broad portfolio of activities, from bio-imaging and bio-detection to surface chemistry.

Technological projects in Grenoble faced opposition from a group of activists since

[4] *Lettre Minatec no.1*, Jan.2001 (my translation)

2001. A poster against *Biopolis* was found in Grenoble in October 2001; it was soon followed by numerous texts and leaflets that attacked *Biopolis*, *Nanobio* and the *Minatec* projects. The opposition has been led by a group called *Pièces et main d'oeuvre* (PMO). Originally composed of no more than a few activists, PMO has no centralized structure. Activists from other groups can join temporarily or be loosely affiliated. PMO members tend to be highly educated and some of them have scientific or engineering background[5].

Other groups in Grenoble, mostly with leftist and anti-globalization agenda, intervene in anti-nanotechnology contestation. When doing so, they often refer to PMO, which can be regarded as the most influential group in anti-nanotechnology critique in Grenoble. The structure of activists' activities in Grenoble relies strongly on the Internet. For instance, the Grenoble branch of *Indymedia*[6] is a privileged locus for the gathering and circulation of information about the opposition against scientific research.

Two streams of criticism are present in PMO's texts[7]. They are closely associated in the activists' argumentation, yet I separate them for analytical clarity. First, PMO denounces a particular model of economic development, seen as typical of Grenoble, in which science, industry and local administrations have close links and decisions are made without consulting the population. Characteristic of this model is for PMO activists the case of the major of Grenoble, who holds a PhD in nuclear physics and used to work as research engineer for CEA. The second stream of criticisms

[5] PMO is reluctant to give information about the identity of its members. These general remarks come from interviews with PMO members (January 15 and January 17, 2007), as well as a radio broadcasting ("Nanotechnologies: refus de modernité ou d'inhumanité", France Inter, June 2, 2006).

[6] Indymedia Grenoble is part of a global network (Independent Media Center, Indymedia) created after the demonstrations in Seattle in 1999 and devoted to independent information on an anti-globalization agenda (Morris, 2004).

[7] Most of PMO's texts are published on the Internet (www.piecesetmaindoeuvre.com/). Others circulate among members (some of them were provided to this paper's author by the activists).

concentrates on nanotechnology itself. Nanotechnology is seen as a way to ensure control on the human being through RFID techniques and its alliance with biotechnology, as well as a source of technologies for military application. Indeed, contracts between CEA and the *Direction Générale de l'Armement* (DGA, General Direction for Armaments) ensure an "active cooperation"[8] between the two in the nanochip domain. Nanochips, military applications, manufacturing at the atomic scale are invoked as example of the control of nature and human beings that would be the purpose of nanotechnology research. Linking ironically nanotechnology to biotechnology in the same objectives of control of the human being, the opponents coined the term *nécrotechnologies* to describe the lethal consequences of converging technologies. *Nécrotechnologies* is a synonym for *program of control*, another expression they use extensively. The labelling of nanotechnology as program of control allows PMO to bring together the two themes of its criticisms: the expression refers to the control that technocracy and economic interests exercise over society, and to the control over nature and human beings that underlies nanotechnology research.

b. Engaging public dialogue?

The construction work of the buildings that would host *Minatec* began in 2002. Contestation kept growing, still focusing on the two main issues of contestation of a model of development and rejection of nanotechnology. In 2003, in the same time that scientists and industrialists were invited to discuss about future partnerships in the so-called "*Minatec* meetings", PMO organized movie projections and discussions about

8 *Lettre Minatec no.5*, July 2003.

nanotechnology in Grenoble and called them "*Minatoc meetings*"[9]. Activists organized various kinds of demonstrations on the *Minatec* construction site. For instance, a few of them occupied a crane for a day in December 2004; pictures were seen in the local newspaper and mentioned in national periodicals.

A need for "public dialogue" began to be formulated in local administration's discourse and it manifested itself clearly at the *Forum Science et Démocratie* (Science and Democracy Forum), described by a member of the municipal majority as "the first participatory mechanism in science in Grenoble"[10]. Organized by *La Metro* and held in June 2005, the *Forum* was a two-day event, open to the public, during which scientists, social scientists, local administrators and representatives of environmental associations discussed themes like "science and ethics" or "the response to social demand", and answered questions from the public. The president of *La Metro*, said in the local newspaper that the *Forum* was an "open and participatory event" and an opportunity to have a "contradictory debate". He concluded by saying: "and then everybody makes up his mind", which the activists interpreted as an acknowledgement that there would be no link to political decision-making[11].

Indeed, the *Forum* raised very general points and led to no concrete decision by *La Metro*. Some among those who criticized the *Forum* were acknowledged by the organizers and had the possibility to write a few lines at the end of the report of the event. These critics were political opponents from ecologist and far-left parties who blamed *La Metro* for having waited too long before organizing a public event like the *Forum*. PMO members were not invited to participate along other associations and remained unacknowledged opponents although they strongly criticized the *Forum* of

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9 In French, "toc" is slang for "junk".

10 Interview with a Grenoble city councillor, in charge of new technologies, January 18, 2007.

11 PMO, "Migaud recrute un mercernaire", published online in May 2005, www.piecesetmaindoeuvre.com/spip.php?page=resume&id_article=39

being a "parody of democracy"[12].

The *Forum* concluded by saying that the "general public"[13] should be involved in technology policy, but did not consider how. The meanings granted to the "engagement of the public" differed greatly according to the speakers, ranging from conveying information to active participation in the decision-making process about the nature of research projects. Following the *Forum, La Metro* ordered a report to a group of Science and Technology Studies (STS) scholars led by Pierre-Benoit Joly. They were asked to do a comparative review of public participatory mechanisms in technology and make recommendations. The report (Joly, 2005) was released in September 2005 and recommended to organize a citizen conference to decide about the future of nanotechnology projects in Grenoble. Within the context of the decisions already made, it identified the possibility of public intervention, in terms of research orientation and funding, which could have been led, for example, in the case of the second phase of the *Nanobio* project.

The *Forum* and the commission of the Joly report can be interpreted as signs of the growing role of public engagement in official nanotechnology discourses in the Grenoble area. They were followed by another attempt sponsored by the European Union as part of the *Nanodialogue* project. The Grenoble part of this project was coordinated by the *Centre de Communication Scientifique, Technique et Industrielle* (CCSTI), a science communication agency funded by the Grenoble municipality. The CCSTI organized a "citizen dialogue" in the Grenoble area in March 2006 to "identify social concerns" and "bring them up to the European Commission"[14]. As the *Forum*, the "citizen dialogue" formulated a demand for information but did not consider the

12 Ibid.

13 Concluding intervention of the president of *La Metro*, June 17, 2005.

14 This expression is used by CCSTI in *Nanodialogue* press release (www.ccsti-grenoble.org/download/CP_nanodialogue.pdf). This idea of two-way dialogue is part and parcel of the statement of the overall *Nanodialogue* project (http://www.nanodialogue.org/)

possibility of a deeper public implication. It received little media coverage and attention from officials, although some of them mention it as a "step in the good direction"[15].

The move of local administrations to the acknowledgment of the need to answer social concerns did not satisfy the activists. PMO criticized the *Forum*, the Joly report and *Nanodialogue*, claiming that the purpose was the "social acceptability" of nanotechnology[16]. They blamed the "appearance of democracy"[17]: they did not see how *La Metro* or CEA would change anything in the *Minatec* project since the major decisions were already made. The Joly report was described as an attempt to sell nanotechnology through particular social science disciplines. In December 2005, six months before the opening of *Minatec*, the *Opposition Grenobloise aux Nécrotechnologies* (Grenoble Opposition to *Nécrotechnology*) was constituted to fight against "servile sciences for totalitarian industries"[18]. This initially small group managed to organize counter-events (such as movie projections and discussions in cafes in the Grenoble area) and finally a 1000 people demonstration on June 2, 2006, the day of *Minatec* opening.

To the credit of the activists' arguments, *La Metro* has not followed the recommendations of the Joly report, has not organized a citizen conference so far, and this has not been mentioned as a future project. However it ordered and sponsored *Nanoviv*, a series of public debates organized in Grenoble by *Vivagora*, which is an association led by a small group of former scientific journalists. *Vivagora* is devoted to the organization of public debates, and is strongly influenced by STS academic works.

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15 Interview with a Grenoble metropolitan area councillor, January 17, 2007

16 PMO, "La part du feu", published online in November 2005, www.piecesetmaindoeuvre.com/IMG/pdf/La_part_du_feu.pdf

17 Ibid.

18 Statement of the *Opposition Grenobloise aux Nécrotechnologies*, published on OGN website. This website does not exist anymore as the group was intended to be temporary. As PMO members stated in interviews, this choice was made because activists "do not seek recognition" and want to stay anonymous. As such, the fact that OGN was a temporary group is part of the activists search for interest-free positions. This latter argument will be developed in part 2.

The objectives of *Nanoviv* were the "identification of the actors and stakes", and the "formulation of recommendations for policy-makers"[19]. The method employed sought to reach a consensus at the end of each debate on needed regulations. Each of the debates focused on a particular theme (e.g., "nanomaterials and toxicology" or "nanoscience and application to medicine"), and scientists, social scientists, politicians and administrators were invited. PMO was invited by the organizers as well, but refused to join, arguing that *Nanoviv* was a mere communication device, unable to question major decisions[20]. The invitation was interpreted as an attempt made by officials to "recruit" the activists, just as they had "recruited" social scientists such as Pierre-Benoît Joly[21].

Nanoviv started in summer 2006 and ended in December 2006, after six public debates. Activists have been continuously blaming these events for trying to regulate "impacts" without contesting nanotechnology projects themselves[22]. For them, these debates "do not even consider the possibility of refusing nanotechnology research"[23] and as such, they are biased in favour of technological development. On the other hand, several scientists criticized the Nanoviv debates of being biased the other way; they were for them "exaggeratedly suspicious"[24]. Both sides agreed in saying that Vivagora was "selling public debates"[25] and as such, was trying to create a debate where there should not necessarily be one (position of the scientists) or was compromising with officials to get a contract (position of the activists). Officials for their part were divided: some

19 *Nanoviv* presentation leaflet. *Vivagora*, September 2006.

20 PMO, "Et maintenant le tsunami de la communication", published online in October 2006, www.piecesetmaindoeuvre.com/spip.php?page=resume&id_article=93

21 PMO, "La Métro tente de recuter PMO !", published online in April 2006 www.piecesetmaindoeuvre.com/spip.php?page=resume&id_article=56

22 PMO, "Et maintenant le tsunami de la communication"

23 Ibid.

24 The theme of the "exaggeratedly suspicious armosphere" was raised in interviews by scientists and city councillors

25 The same expression – "selling public debates"- was used by activists, scientists and officials in interviews. I will return to this similarity in the end of the paper.

criticized the suspicious atmosphere, whereas others saw *Nanoviv* as a good way to ensure public trust. However few of them came to the debates and the operational character of the outcome remains unclear at the time of writing. So far, the recommendations written at the end of the debate series have not led to political uptake.

3. Three visions of public engagement

Public engagement has been talked about in Grenoble, and several public engagement mechanisms were implemented. Yet everyone in Grenoble would agree that none of these mechanisms influenced the decisions related to technology about research priorities or funding policy of local administrations. Thus the Grenoble example can be seen as another account on difficulties encountered to design empowering public participatory attempts[26].

Although the particular features of each event could be detailed[27], I will analyze the failure to design empowering participatory events by making clear that different visions of public engagement compete between each other in Grenoble, not only that of officials and social scientists, but also that of the activists.

These competing understandings of public engagement are articulated through the use, the design or the critique of attempted participatory mechanisms. They are related to different framings of the issue at stake – namely nanotechnology research, but also different definitions of the role of the citizen in the relationships between science and policy. I will detail the visions of public engagement along these two levels of analysis, and thus define them as "models" for the understanding of both nanotechnology and the

26 Fung and Wright (2003) provide interesting examples.

27 For examples in France, see Blanc (1999) about participation of inhabitants in urban planning policy, and Joly and Marris (1999) about a citizen conference about GMOs. In both cases, the authors point at the difficulty encountered to ensure effective empowerment through the analysis of the relationships between actors during particular participatory events.

role of the citizen in science and technology governance.

a. The enlightenment model.

Except for *Nanodialogue* funded by the European Union, the attempts made in Grenoble to engage the public were directly sponsored by local administrations: the city council, the *Rhone-Alpes* region and the Grenoble metropolitan area council, *La Metro*, the latter being the most involved. Although *Nanodialogue* received almost no attention by local officials, the 2005 *Forum* led to the order of the Joly report by *La Metro*, which was followed by the *Nanoviv* debate series, strongly supported by *La Metro*. This support was financial, but has also other dimensions. For instance, scientists responsible for nanotechnology research programs were directly asked to participate by local officials[28]. The Joly report and the participatory attempts have led officials to recognize that there had been a lack of communication about the ways local administrations partner with CEA, and therefore have reinforced the discourse about the necessary "transparency"[29] of the science-related decisions. Thus officials continue to stress the need to pursue the dialogue with the public, in which "every concern should receive an answer"[30]. This vision of public engagement that sees it as an opportunity for the public to get answers to its concerns is linked with a particular framing of the issues at stake.

Public engagement occurs in a context where ground decisions are made. They are fundamental decisions that, for local officials, are not politically loaded, and are needed to be made to ensure local development in the Grenoble area. Indeed, officials in the Grenoble area characterize nanotechnology research as a powerful engine for economic development, both local and national. That justifies the public investment policy adopted by *La Metro*. This framing of nanotechnology as a leveraging tool for growth

[28] Interview with the person in charge of the *Nanobio* project for the Joseph-Fourier University, January 12, 2007

[29] See for instance the interview of Michel Destot, mayor of Grenoble, in "Réalités, Prévention", published by INRS (National Institute for Research and Safety), n°9, October 2005.

[30] Interview with a councillor at *La Metro*, January 17, 2006.

implies that initial public investment decisions cannot be challenged, but it also goes with the recognition of the possibility of "social impacts" that have to be taken into account: these are "ethical concerns" and "risks issues". The former is to be dealt with by ethics committees, the work of which being a tool that has to be integrated in a process. For the latter, it is necessary to focus on definite products (for instance various types of nanomaterials) and evaluate their environmental impacts in the context of particular production sites (for instance by studying the risk of materials release in the environment in case of flooding). Either ethical and risk issues are to be dealt with by particular expert knowledge. Some ethicists and social scientists "are well-recognized experts to address these issues" as the president of *La Metro* stated at the *Forum*. This framing does not question the rationality of technical, economic, social or ethical expertise, and sees it as the only way to address nanotechnology-related issues.

The governance model they articulate in Grenoble in response to anti-nanotechnology activism does not contest the dual model of political and technical delegations (Callon et al., 2001) but goes beyond it. This renewed delegatory model seeks to make the technical delegation clearer. The public is invited to understand the full process that leads to expert decisions, can ask questions and raise concerns during dialogues. Public engagement is thus a way to organize these dialogues, and as such a means to enlighten the public. The "public" in this "enlightenment model" should be as broad as possible, and comprise every citizen, since "modern society needs a real trust in progress, a technological, social and societal progress that we have to accompany collectively"[31].

For all technical matters (whether scientific, economic, ethical or social), the citizen must let experts make the decisions. Yet in the extended delegatory model, he or she is

[31] "Grenoble, symbole du débat public et de la confiance dans le progrès scientifique", Grenoble mayor's blog, published online on June 2, 2006. The title of this text alone ("Grenoble, symbol of public debate and of trust in scientific progress") is a good illustration of the enlightenment model. http://micheldestot.blogs.com/le_blog_de_michel_destot/innovation/index.html

able to understand it and can give his or her agreement. The question of what would happen if the expert decision were not agreed is not even mentioned, and cannot be, since the enlightenment model sees the scientific and economic rationalities as unambiguous ways to make decision, and more than that, to construct the public good independently from "ideological biases", the first of which being activism. Therefore, either the citizen accepts to be enlightened and, as a consequence, agrees with the definitions of the issues at stake and the expert delegations, or he or she refuses for reasons that can be nothing but ideological.

This vision of the rationality of the decision and the enlightenment of the citizen is articulated in response to PMO opposition. Its consequence is the labelling of PMO activism as irrational. The contestation of the framing of nanotechnology in terms of program of economic development and set of products with possible impacts leads to the contestation of the validity of rational arguments, whether economic (about the impact on competitiveness or employment) or scientific (about the risks of nanoparticule release for example). This contestation cannot be accepted, since the assumption that these arguments refer to an unambiguous reality is central to the stability of the enlightenment model. In the vision of public engagement that this model articulates, it is mere ideology that prevents activists from seeing rationality where it lies.

b. The critical inquiry model.

PMO, the most vocal of the activist groups, has continuously criticized public engagement of being mere alienation to ensure social acceptability. The framing of the issues at stake in public engagement as articulated by the officials receives strong

criticisms. Instead of seeing nanotechnology as a powerful engine for economic development, activists describe it as another example after nuclear energy[32] of strong connections between academic research, local administrations, industries and defence research institutions, which constitute the so-called *techno-gratin*, "techno top-brass" in PMO's slang. Such connections produce undemocratic decisions as the public is not involved and not even informed. The evaluation of the impacts of specific products is not accepted either. It leaves no room for the global contestation of the program of control that, according to PMO, underlies nanotechnology research. Public engagement as led in Grenoble is therefore seen as a way to ensure that these descriptions of nanotechnology will not be taken into account.

That no participatory mechanism has led to political decision has reinforced the critique of the undemocratic process. A sign of this is the fact that environmental or anti-globalization groups that were originally silent about nanotechnology research have become more critical in Grenoble[33]. However, even if the recommendations released at the end of the *Nanoviv* debate series had been seriously integrated in regulatory statements, PMO would probably not have changed its critical position. For the activists, public engagement is not accepted for a number of reasons. First, it is not a valuable information provider but a "communication tool"[34], biased in favour of the "official propaganda"[35]. The multiple interests prevent public engagement from providing trustful information. Politicians want to be re-elected, scientists want to continue their research and make money from it through partnerships with industry, NGOs like *Vivagora* "sell public debates", and STS scholars like Pierre-Benoit Joly are

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32 Activism again nuclear energy has been particularly vocal in the Grenoble area (Touraine, 1980). Leading members of PMO come from anti-nuclear energy groups.

33 For example, the anti-globalization group ATTAC had been hardly active about nanotechnology until 2006, when it refused to participate in the *Nanoviv* debate series with arguments very similar to PMO's.

34 See, among many other examples, "Et maintenant, le tsunami de la communication"

35 Ibid.

"mercenaries"[36] who sell their expertise. The multiple ties that attach actors with various interests not only prevent public engagement mechanisms from providing any trustful information, but they also prevent from designing any public engagement mechanism that would be accepted by activists.

The second reason why PMO will not accept public engagement lies in its fight for a certain purity of the social and political categories: science should not interfere with industry, politicians should not follow electoral strategies and even less economic interests, environmental groups should fight for the environment without compromising themselves through negotiations. New forms of organization or cross-boundary relationships cannot be accepted as they blur central distinctions, for instance between public good and private interest, or economy and science. Thus the notion of hybrid forum as basis for public engagement (Callon, 2003), which is central in the recommendations of the Joly report and used as references by *Vivagora,* cannot be accepted by PMO.

The last reason for PMO to reject public engagement is linked to the way activists see the role of the citizen in relation to science and technology. PMO's actions revolve around the notion of *critical inquiry*[37]: activists explore the connections between science and policy and illuminate the hidden links that lead to particular political decisions from an independent viewpoint that would be the one of every "simple citizen". The latter expression is used to sign PMO texts, which are careful analysis of the relationships between local politics, scientific research and industrial investments. PMO's anonymous identity of "simple citizen", which is strongly criticized by scientists and officials and labelled "undemocratic", is a way to construct the independent citizen

[36] PMO, "Migaud recrute un mercernaire", published online in May 2005, www.piecesetmaindoeuvre.com/spip.php?page=resume&id_article=39

[37] The following paragraph is based on two interviews with anonymous PMO members (January 15 and January 17, 2007) and on an unpublished text entitled "Pour l'enquête critique" (*For critical inquiry*).

able to critique the existing political situation of the Grenoble area. His or her duty is to reveal where contestable interests lie and to critique the mechanisms that are designed to make them acceptable. Activists labelled themselves "simple citizens" and expect the general public to be so. "Investigate by yourself" claims a leaflet from an activist group close to PMO: every citizen should engage in critical inquiry. Therefore participating in a public engagement mechanism, even in its most empowered sense, will never be accepted since it contradicts the independent position, "from nowhere" that activists want to adopt.

In a work he did partly in Grenoble, Touraine (1980) pointed at the difficulty encountered by anti-nuclear energy groups (in which some nowadays PMO members were active) to propose an alternative political model for the relationships of science and society. Indeed, PMO does not propose any political model for the integration of nanotechnology in society, but is far from being only an anti-nanotechnology group limited to cultural rejection. It defines a particular role for the citizen that is not limited to the critique of technology itself but encompasses the whole set of relationships between science and policy.

c. The constructivist model.

Another vision of public engagement is articulated in Grenoble, first of all through the interventions of STS scholars during the *Forum*, then in the Joly report and finally by *Vivagora*, the NGO in charge of the organization of the *Nanoviv* debate series. This vision defines public engagement as a transformation of the relationships between science and the public. It proposes a "collective management"[38] of emerging

[38] Interview with the general delegate of *Vivagora*, September 1, 2006.

technologies that will lead to construct regulatory frameworks and orientate research trajectories. The mechanisms suggested or actually designed are citizen conferences or public debates that are expected to produce recommendations, and eventually changes in political and technical decision-making.

This vision of public engagement in the Grenoble context implies a deconstruction of nanotechnology research into several projects. For each of them, the room for public action needs to be identified for the citizen to be able to give his or her inputs, in terms of research orientations or funding decisions. Thus nanotechnology in Grenoble is framed neither as a set of products nor as a global program of control, but as several projects connecting political decisions and technological choices, some of them irreversible and others still open. Locating the possibility for public intervention in these projects is one of the main issues of public engagement as understood in the constructivist vision.

Public engagement understood as such supposes that each participant recognizes his interests and presents them during a discussion, by reflecting upon his own subjectivities constructed by his multiple attachments (Gomart and Hennion, 1998). The public should represent the variety of competing opinions, thus including the activists (although they have continuously refused to participate). Contrary to the visions articulated by the officials or the activists, not all citizens are supposed to be part of the process, but rather those willing to be involved and interested enough in science and technology to participate in a public debate, to be member of a citizen panel or to be in the audience of a citizen conference. In other terms, the goal is not to lead the whole society to enlightenment, nor to transform each citizen into a careful analyst of unacceptable relationships between science, politics and the market, but to empower

those who will help constructing a more robust socio-technical system[39].

For this vision of public engagement to be implemented as it is intended to be, the support of political power is needed. However, as we saw, local administrations did not follow the recommendations of the Joly report and how they will use those formulated after *Nanoviv* is extremely unclear. On the other hand, PMO has continuously blamed the social scientists' position. Indeed, both groups have difficulty accepting public engagement as understood by STS scholars. For scientists and officials, it is needed as enlightenment tool to ensure a large social consensus on the technical and economic decisions, but it could not change the decision-making process since scientific and economic rationalities are seen as unique. The enlightened citizen cannot change the framing of nanotechnology in terms of engine for economic development with impacts that have to be evaluated by experts. For activists, the fact that major decisions are already made discredits public engagement in Grenoble. But more than that, the very notion of public engagement as defined by STS scholars can not be accepted by PMO, as it blurs the boundary between science and politics. Therefore, activists blame social scientists for being nothing but an attempt to legitimize decisions that mix science, politics, economy and possibly other domains (like the defence industry) without questioning the official vision of nanotechnology.

4. Synthesis and concluding remarks

The three visions of public engagement are summarized in the following table. The first two columns are the two levels of analysis that were used.

[39] See the notion of concerned group (Callon et al., 2001), and public formed around an issue that comes into being (Marres, 2005)

	Framing of the issues at stake: nanotechnology	Definition of the role of the citizen	Purposes of public engagement
Enlightenment model	Program of economic development. Set of products with potential impacts	An enlightened citizen gives an informed consent.	Enlightening society, building trust in existing institutions.
Critical inquiry model	Symbol of unacceptable relationships between science, politics and the market. Program of control.	A simple citizen exercises critical inquiry.	Alienating, legitimizing.
Constructivist model	Set of projects with specific possibilities for intervention.	An interested citizen participates actively in the construction of regulations and research orientations.	Constructing a robust socio-technical system.

These three positions are clearly articulated by particular actors, for example, the mayor of Grenoble and the president of *La Metro* for the first, the most active members of PMO for the second and the *Vivagora* leaders for the latter. However it is important to notice that not all the actors involved have clear positions. For instance the elected officials do not speak from a unique position. Some of them state that engaging a dialogue with the public is necessary while articulating the official vision of public engagement, whereas others are far less convinced by the virtues of dialogue and would rather pursue local public investment policies without risking impeding it.

A number of ecological groups, as *Friends of the Earth*, *Greenpeace*, or *FRAPNA*[40], have got closer to PMO position about the framing of nanotechnology, without articulating the notion of critical enquiry[41]. Local leftist political parties such as *ADES*[42]

40 "Rhône-Alpes Federation for the Protection of Nature", a local environmental group.

41 PMO criticizes this late move toward its positions, presenting it as a use of the anti-nanotechnology stance for the advancement of a particular agenda (e.g. the growth of a political group). This is another sign of PMO's quest for interest-free positions to construct the public good.

have been focusing on the critique of the funding of private scientific and industrial initiatives with public money without necessarily embracing the opposition against nanotechnology as program of control. Similarly, STS vision of public engagement is not clear for many of the organizers of public engagement mechanisms. The *Nanodialogue* event is a good example. Albeit designed to "bring concerns back to the European Union"[43], its role is uncertain for its organizer, the *Centre de Communication Scientifique, Technique et Industrielle* (CCSTI). Although the director of the CCSTI was also co-organizer of *Nanoviv* with *Vivagora*, he stressed the need for a better communication in Grenoble in a testimony before the Parliamentary Commission for the Evaluation of Scientific and Technical Choices (*Office Parlementaire d'Evaluation des Choix Scientifiques et Techniques*, 2005) that got close to the enlightenment vision of public engagement. Some officials adopt such complex attitudes, in which it seems that parts of discourses or practices of the same individual contradict each other, or at least can be interpreted differently. This would be analyzed as instrumentalism or cynicism by PMO, and described as ways to hide real interests - like social acceptability - by strategically adopting a certain posture. I would rather argue that such contradictions are signs of the uncertainties of the notion of public engagement for these actors themselves.

Among those who feel these uncertainties about public engagement in Grenoble are the scientists. Most of them adopt the enlightenment model of public engagement when they comment upon the attempted mechanisms. When they participate in these mechanisms, they stress the need to "explain", to "educate", to "inform about objective risks". Some of those who participated in the *Nanoviv* debate series criticized *Vivagora*

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42 "Association for Democracy, Ecology and Solidarity"

43 *Nanodialogue* press release (www.ccsti-grenoble.org/download/CP_nanodialogue.pdf)

of being "prejudiced against nanotechnology"[44]. However others are in favour of public debates about the meaning of their work. One of the Grenoble scientists in charge of the *Nano2Life* European network acknowledges their role, alongside ethical reflection, in making scientists reflecting upon their own work. However, he regrets that "the real issues are not discussed"[45], like problems of access of new technologies, and, as many other scientists in Grenoble, does not see any direct link between his everyday work and public engagement as it has been led in Grenoble. Here again appears the uncertainty about the meaning of public engagement, as well as the poor connexion of participatory attempts made in Grenoble with the local scientific context.

This paper has made clear that different visions of public engagement in nanotechnology can be articulated in the same context. It went further than the usual classification of motivations for public engagement (Fiorino, 1990) for three reasons. First, the visions presented here were based on an empirical study. Second, this paper presented the role of activists and showed that they articulate an extreme vision of public engagement as instrument of alienation. Third, these visions of public engagement were included in models of understanding of both nanotechnology issues and the role of the citizen in science and technology governance.

The Grenoble example shows the variety of meanings and expectations granted to public engagement in nanotechnology. Through this analysis appear differences in ways of understanding nanotechnology and the role of the citizen in science policy. In particular, we saw that anti-nanotechnology activists are more than simply nanotechnology opponents. They propose a particular role for the citizen, which should lead him or her to illuminate power relationships not necessarily made clear.

44 Interview with a Grenoble scientist, January 12, 2007.

45 Interview with the CEA representative of the *Nanobio* project, January 15, 2007.

Responding to activists' criticisms was one of the main reasons for the Grenoble area administrations to sponsor public engagement mechanisms. As we saw, they will have probably no chance to satisfy PMO.

This dynamics between Grenoble officials and activists is characterized by common features in the ways actors evaluate public engagement. In both the enlightenment model and the critical enquiry model, what matters is that the construction of the public good should be free from bias and interest. In coherence with the understanding of what the general interest is in France (Moody and Thevenot, 2000), neither activists nor officials would define the public good as something linked to a particular social group. When the connection is made, it is to criticize an attempt to corrupt the general interest. Scientists and officials see the public good as a product of scientific and economic rationality. For activists, the public good is gained through the respect of social categories and the independence from contestable interests.

This common way of evaluating public engagement manifests itself clearly in a criticism made to *Vivagora*. As scientists, officials and activists say, this NGO "sells public debate", it has particular economic interests in mind when it designed public debates and therefore cannot be entirely trustful[46]. The other part of the criticism of interests, which is formulated mostly by the activists, has to do with the nature of public engagement in the constructivist model. As it supposes that every actor recognizes its particular position and therefore its own interests, it does not follow the vision of necessary interest-free mechanism, and as such cannot be accepted by PMO.

The little success of the constructivist model in Grenoble can be explained by fundamental disagreements about ways of evaluating public engagement. There have been misunderstandings with scientists and officials who for most of them are not aware

[46] PMO formulated the same criticism about Pierre-Benoît Joly, who was described as a "mercenary".

of what the agenda of the constructivist model implies[47]. On the contrary, PMO is well aware of the purposes of public engagement as described by STS[48], and, as it does for the enlightenment model, rejects it while knowing what it would imply – the loss of the independent, free from interest position of the simple citizen.

The methodology mobilized in this paper led to focus on the framing of public engagement, and, connected to it, of nanotechnology and citizenship. I did not consider "public engagement", "nanotechnology" and "citizenship" as given, but I explored the dynamic processes through which these categories are constructed in discourses and practices. Therefore, my own position is by many respects close to the constructivist approach, and indeed, I regard positively the STS position on public engagement. That being said, this analysis makes clear that the implementation of the constructivist model is not straightforward. A first step to make STS vision of public engagement recognized by the other actors will be to understand what the competing visions of public engagement are in a particular context. This is necessary for STS scholars, not only to reflect upon their own positions on public engagement, but also to play an active role in science policy, either as advisors about public engagement or designers of participatory mechanisms.

[47] Although some of them, like the Grenoble metropolitan area councillor for research and high education, include statements that are close to the constructivist model in otherwise enlightenment discourses. This is another example of the uncertainties of the notion of public engagement.

[48] Indeed, PMO leaders demonstrate an elaborate knowledge of the STS literature about public engagement. Numbers of PMO's texts contains (critical) references to Callon et al. (2001), which is in France the main STS work related to public engagement.

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