Nano Risk Governance: The Austrian Case

DANIELA FUCHS* and ANDRÉ GAZSÓ

Institute of Technology Assessment, Austrian Academy of Science, VIENNA

(Received on January 28, 2015 and revised on August 12, 2015)

Abstract: We examine the role of the Technology Assessment in Austrian nanotechnology governance. Within the Austrian debate on nanotechnology focusing mainly on environmental, health and safety issues within the limits of regulation practise, TA fulfils its role as a facilitator of multi-stakeholder dialogues and a communicator of relevant information on nanotechnology to several interest groups, mainly authorities. As integral part of most of the safety relevant nanotechnology activities in Austria, the role of TA - in form of the specific project NanoTrust - can be characterized as tool for anticipatory risk management according to national and international risk management standards, as element in conducting responsible research and innovation (RRI), and as representing an “honest broker” of scientific information.

Keywords: Nanotechnology, risk governance, regulation, technology assessment, science and risk communication.

1. Introduction: Governance of Emerging Technologies

Emerging technologies pose specific challenges to technology governance due to their inherent uncertainty, unpredictable behaviour and a lack of long-term experiences. In the specific case of nanotechnology and nanomaterials, a pro-active approach was favoured by most European countries to provide safe and responsible innovation and to avoid controversies which are often expected to resemble previous conflicts over genetically modified organisms (GMOs).

2. Nanotechnology Governance in Austria

The definition of nanomaterials and of the borders of nanotechnology are not yet finalized, though considerable steps – such as the definition of nanomaterials by the European Commission [1] among many others - have been achieved during the last couple of years. Keeping in mind the fluidity of definitions, and the consequences for implementation and daily practice, the field of nanotechnology seems less technologically coherent than socially constructed for the use of desired economic or innovation potential. [2] To deal with this fluid field of nanotechnology and more specifically with nanomaterials, Technology Assessment (TA) took on different approaches, from participation via future-oriented approaches to a “classic” role to facilitate dialogue processes and to mediate between different groups and stakeholders. [3]

Speaking of the specific technology governance of nanotechnology and nanomaterials in Austria, a network of different actors and stakeholders has developed and stabilized during the last couple of years. This process has strongly been supported by several ministries and agencies in cooperation with industry, science and NGOs. Regulative authorities chose a pro-active approach concerning nanotechnology and nanomaterials consisting of close actors’ cooperation, thus linking different expertise due to previous deviating risk perception by and miscommunication of risks to the public in case of former technology debates (genetically modified organisms - GMOs). Theses cooperation...

*Corresponding author’s email: daniela.fuchs@oeaw.ac.at
processes can be interpreted as an analogous, though a little bit delayed, development to the formation of the German Nano Commission [3].

In the case of Austrian Nano risk governance, TA - namely taking place in form of the TA-project NanoTrust [see 4] - follows a stakeholder-based approach operating on the interface between mostly politics and science, therefore mediating between the needs of both realms with particular respect to environmental, health and safety issues of nanomaterials and balancing somehow organized interests of stakeholders[5]. Most important tasks are the detection of new issues relevant for science and regulation, the identification of existing competences and their concentration by improved cooperation, as well as the facilitation of dialogue between different realms [6].

3. Risk Governance Framework

A discussion about risks, understanding ‘risk’ as a however constituted combination of uncertainty and effects on what humans value [7], is especially important in context of emerging technologies since here knowledge about hazards and their implications is quite limited. In order to assess and balance different possible ways for a comprehensive risk evaluation, one needs to consider legal, institutional, social and economic contexts for risk evaluation and the involvement of actors and stakeholders. Risk governance is engaged with the mechanisms beyond the collection of risk information, analysis and communication, which requires knowledge about contextual factors of risk decisions (e.g., different forms of risk perception, political environment etc.) [7].

Taking the risk governance framework of [8] as a starting point for further analysis of Nano risk governance in Austria, TA takes on a variety of tasks in different phases of the process. Theoretically, TA can be active in all four spheres of the framework [8], covering pre-assessment, risk appraisal, risk characterization and risk management (excluding implementation tasks) with particular attention to communication tasks accompanying all of these phases (in Fig. 1, marked by grey background).

Operating mostly on the interface between the systems of politics and science, TA fulfills specific tasks in Austrian Nano risk governance: As an independent platform, it ensures the discussion and exchange of different opinions on risk issues while offering structured knowledge for all participants of the debate. Therefore, TA is involved with communication and processes of all different phases of risk governance, but directly involves only in a couple of specific tasks (shown in black in Fig. 1).

Establishing TA as a risk management measure within the Austrian Nano risk governance system, meaning the implementation as well as funding by several ministries with different areas of responsibility (protection of health, protection of the environment, social affairs and innovation), shows a certain awareness towards possibly emerging risks beyond their respective field of activity. This awareness is reflected in the phase of pre-assessment (Fig.1) by opening up the framing of the problem definition beyond authorities’ requirements in terms of including input from specific scientific fields of knowledge, such as TA. In order to enable regulative actions in time, TA’s very tasks of early warning and screening for new arising topics - within the field of nanomaterials, as well as in adjacent fields (such as converging technologies) – support anticipatory actions within this system.
4. Nano Risk Governance: the Austrian Model

In Austria, the begin of implementing a Nano governance system, was the funding of the TA-project Nano Trust of the Austrian Academy of Science (by the Ministry for traffic, innovation and technology) which was based on a status report on Nano scientific accompanying research. Almost simultaneously, the foundation of the informal association of the Nano-Platform of the Ministry of agriculture, forestry, environment and water management (BMLFUW) took place. Both these developments in October 2007 mark the beginning of a close inter- and transdisciplinary cooperation, bringing together experts from a wide variety of fields and exchanging of information on a steady basis. While scientific findings and political actions were connected, this process finally culminated in the formulation of the Austrian Nano Action Plan (NAP 2010), which defines core issues and provides guidance for future priorities regarding Nano safety research and regulation. [9/10] Looking back, the NAP can count as a starting point of coordinated political action and still remains at its centre. Building on already existing foundations, it joined together Austrian nanotechnology activities and focused on tighter coordination of evolving ones (e.g., EHS research program). Concerning public communication, one of the recommendations of the NAP was the launch of a website.
to ensure a continuous information flow between experts and the interested public and to give people the option to interact with regulatory authorities and experts in case of questions and concerns. This webpage is rooted in the activities of the Nano Information Platform (NIP), which developed from the Nano-Platform and was funded by the Ministry of Health, which is still entrusted with its coordination.

In order to intensify and consolidate these processes between ministries, authorities and science, the Austrian Nano Information Commission (NIK) was founded in 2013. Serving as interdisciplinary advisory board for the Minister of Health, who is responsible for the protection of consumer’s health concerning societal relevant aspects of nanotechnology, it also ensures a strengthening of interdisciplinary risk evaluation representing the diversity of opinions and the state-of-knowledge of various scientific expertise.

Providing one member and the Chair of the NIK, TA fulfils a twofold function: Once as facilitator of discussion, and secondly, as contributor to an independent and interdisciplinary risk evaluation.

5. Role of TA in the Process and Challenges

Generally speaking, TA’s core competence is giving scientifically sound policy advice, but, contrary to more academic fields, also to “make a difference” thus admitting its responsibility to have an influence on the actual political decision-making processes. For these processes, scientific knowledge must be complemented by relevance decisions, evaluations and development of criteria, which is at least partially normative and value loaded. Therefore, TA needs to provide orientation between different kinds of knowledge, to identify possible challenges for regulation and to foster general enlightenment, democratic deliberation and public debate.

As shown in Fig. 1, the task of communication plays a central role within the risk governance system, accompanying all tasks throughout the whole process. Concerning Nano risk governance in Austria, TA is concerned with collecting, structuring and evaluating information by experts of all phases of the risk governance framework (marked by light grey writing in Fig. 1). Thus, it provides reliable and concise information as basis for communication within the stakeholder network and towards a broader public.

Reference lists different criteria to enhance the efficiency of risk communication; according to them, we would like to discuss a few challenges we came across during the process.

5.1. Risk Communication

Generally speaking about risk communication, the translation of scientific findings into non-scientific language always comes with a trade-off; nevertheless, being clear and accurate about the information (and its limitations) is crucial in order to facilitate the classification of the message by the audience. It’s important not to overload scientific findings and to be clear about what they can provide and what they can’t in order to establish a trustful communication between stakeholders of different spheres. Having the manifold connections between policy and science in mind (e.g., mutual dependence concerning knowledge and funding) this can sometimes be quite challenging. When communicating to broader public, an easy access to information must be provided to keep processes transparent; this is especially important with regard to specialized information (such as the Austrian Nano webpage nanoinformation.at) since here people tend to specifically look for information and usually don’t stay longer than necessary.
5.2. Dependency on Information
As stated in [4], the access to reliable and free information is crucial in order to enable transparent communication processes. This poses challenges since the open-access of science doesn’t apply equally for other actors of the risk governance system. Bound to their own rationalities, ministries and other political actors can sometimes be reluctant providing information. Also thinking of other actors of governance systems, this seems to apply even more for economical actors such as industry which usually don’t provide free access to their data. This poses a challenge for reliable assessment of quantities of nanomaterials on the market and in industrial processes.

5.3. Credibility
According to [15], performance determines institution’s credibility. In the case of TA, one has to be aware that its performance has to serve several purposes: most importantly, it has to provide independent policy advice, but at the same time to make sure it meets official necessities in terms of thematic scope and usability of results. In order to balance these to demands, a clear working definition and a balance regarding external expectations of usability and scientific openness has to be ensured.

As illustrated above, TA can provide different options as basis of decision-making, but should never be included in final decision-making processes. In the Austrian Nano governance system, this is strengthened by TA’s institutional affiliation to an official, independent science institute which ensures freedom regarding thematic scope and scientific openness combined with a certain structural flexibility to take up and promote emerging issues.

Concerning nanomaterials in Austria, TA is organized in form of a specific project, namely NanoTrust [4]. Fulfilling its role as facilitator of communication poses certain requirements for project-bound activities:

First of all, within the risk governance system, the independence of this project is crucial in order to be taken seriously both as provider of independent information as well as facilitator. Independence of projects such as Nano Trust is fundamental, comprising different aspects such as institutional (being situated in the Austrian Academy of Sciences), content-related (ensuring autonomy in choosing topics) or economic (being funded by public money) independence in order to be able to fulfil all required communication tasks.

This independence is closely linked to projects’ ability to enable development of trust between different actors. Building, fostering and assuring trust between different actors can be considered one of the core functions of TA in such a risk governance process.

Especially since Nano Trust is still dependent on project funding (though being publicly funded) and not established as a constant, long-term establishment, transparent communication and the compliance with its limitations are crucial in order to maintain its credibility towards all actors.

5.4. Enhancing the Social Climate
When it comes to social climate, [15] state that intentional improvement exceeds a single actor’s abilities. In the case of Austrian Nano Risk Governance, a close cooperation of several ministries and regulative authorities stretching over different fields of responsibility (protection and innovation) can be observed (e.g., by cooperating at the NAP), including actors from other fields (such as TA). Thus, collective instruments such
as the Nano Information Commission as an arena for negotiating risk evaluation or communication instruments such as the consensus based nanoinformation.at-webpage might contribute to enhanced credibility both of information and actions, as well as a general trustful and reliable social climate for risk governance.

6. Conclusions

Derived from a precautionary approach, the notion of responsible research and innovation (RRI) [16] integrates ethical notions within engineering and governance issues [12]. According to [17], RRI should provide normative orientation of innovation as well as concrete recommendations for actions and strategic orientation at the same time integrating anticipation, reflection, inclusion and responsiveness to innovations. [17] It especially highlights “transparent and interactive processes by which societal actors and innovators become mutually responsive to each other with a view to the (ethical) acceptability, sustainability and societal desirability of the innovation process and its marketable products”[16]. As [17] point out, nanotechnology and related risk governance can be seen as an attempt for translating an abstract RRI concept into practice while at the same time being one of its original sources. In context of societal learning process of stakeholders and technical innovators mentioned in [16], the Nano risk governance process shortly described in this paper can be understood as a step towards responsible nanotechnology governance. By corresponding to all five steps [see 16] to fully implement a RRI scheme, it might contribute to a more responsible handling of emerging technologies such as nanotechnology.

Within daily risk governance practice, its function as implemented standards of risk management, such as the international ISO 31000 [18] and the derived Austrian ONR 49000 [19] comes clear. Both of these standards stress the importance of integrating risk measures in external and internal contexts and processes of systems and demand early developed plans for communication and consultation.

As discussed in detail above, the role of TA is facilitating interaction processes between science and politics and aims at giving responsible policy advice by offering a variety of options based on a literature review and expert information. Therefore, it corresponds to the idealised typology of the Honest Broker [20]. In this model, science gets involved in political action by gathering as many as possible different evaluations of feasible courses of action. [21] The described occurrence of science as formal, authoritative committee or assessment representing a diversity of perspectives in order to expand and clarify the scope of choice [21] can be confirmed by referring to the foundation of the NIK. The facilitation of the process linking existing information to the need of decision makers and thus presenting multiple ways to frame issues as problems [21], can be considered a core competence of TA within the Austrian Nano risk governance system.

References

Nano Risk Governance: The Austrian Case


Daniela Fuchs and André Gazsó


Daniela Fuchs works as Junior Scientist on the ITA project NanoTrust. She analyses the integration and distribution of knowledge on Nano issues as well as the Quality of Science Communication within the complex field of Nanotechnologies. In her master thesis (M.Sc.), she analysed the possible application of green design principles to, and the importance of sustainability issues for Nanotechnologies in selected research facilities in Austria and Germany.

André Gazsó is Chair of the Austrian Nano Information Commission since 2013. He holds degrees in Biology and Philosophy and completed his postgraduate training in risk communication (2001, Brussels) and risk management (2004, Vienna; accredited at the Austrian Standards Institute since 2005). A member since 2003, he became vice chair of the Standards Committee on "Risk and Crisis Management" at the Austrian Standards Institute in 2006. Since 2002, he was a member of the NoE "Trustnet2" and its successor "Trustnet-in-Action", a European network for risk management and risk governance.