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Governing nanosafety in Austria – Striving for neutrality in the NanoTrust project

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ABSTRACT

New and emerging technologies such as nanotechnology and advanced materials are characterized by manifold areas of application and high uncertainty, making the anticipation of effects difficult. Since 2007, the Austrian technology assessment project “NanoTrust” is dedicated to assisting policy-makers in issues surrounding the safety of nanotechnology applications. The choice was made early on to build and maintain a governance network and to take a more active role in contributing to pre-emptive risk management and the initiation of new processes. Characterized by a dominant risk frame and a broad scope, the Austrian nanotechnology discourse places a distinct focus on scientific expertise and strong interdisciplinary efforts. Ten years into the project, the Austrian nano governance network has shown signs of undergoing an institutionalisation process and we reflect on how we have sought to maintain our neutrality and independence as TA practitioners. This exercise in reflection seeks to gain insights on the strategies employed in practice when shaping technologies at stages of high uncertainty and engaging closely with actors in governance networks over longer periods of time.

1. Introduction

New and emerging technologies which are characterized by manifold applications and involve a high difficulty to anticipate effects pose a particular and fundamental challenge for endeavours to steer or regulate their development. These technologies tend to be defined by uncertainties rather than risks, with standard risk assessment methods oftentimes not being fully applicable. In the aftermath of the controversies surrounding genetically modified foods, nanotechnology faced calls for moratoriums¹ and the need for a different approach to regulating such new technologies had become apparent. Consequently, a new wave of early engagement can be observed in fields such as nanotechnology,² nanobiotechnology, enhancement technologies and synthetic biology (Grunwald and Achternbosch, 2013: 16). The self-regulatory cooperative approaches of actors in the field of nanotechnology can be summarized under the term “nano governance”, entailing a number of organised public and expert nano dialogues³ (Kurath et al., 2014: 102).

In Austria the nanosafety project NanoTrust of the Institute of

Technology-Assessment (ITA) at the Austrian Academy of Sciences (ÖAW) was an endeavour to foster such cooperative approaches. Having launched in October 2007, the project has always identified as primarily being dedicated to risk identification, assessment and management. Pro-active accompanying processes were established, such as: building networks, identifying research deficits, serving as an independent platform for safety debates, and providing reliable information on risk and safety issues. NanoTrust can be described as an expert-driven process, fulfilling the function of an early warning system and contributing to an attempt to steer developments with the purpose of avoiding risks. Accordingly, a strong connection to classical expert TA can be identified, with the objective of actively shaping technology borrowing elements from constructive TA (CTA).⁴

The project was conceived as a continuous accompanying process in lieu of a classic research project, this being a necessity born out of the need to develop a consultation process capable of addressing a moving target, seeing as the technology matures and the regulatory situation changes over time. The project team consequently adopts a role beyond that of being observers, taking an active role in contributing to pre-

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¹ A moratorium for products containing nanoparticles without suitable regulations or the ability to guarantee their safety was proposed among others by the Vienna Ombuds Office for

² For examples of nano dialogue processes in Germany, Switzerland and Austria see Hauser et al. (2011).

³ For an collection of dialogue projects on nanotechnology, see the European Commission webpage under http://ec.europa.eu/research/industrial_technologies/policy_dialogues_en.html (last accessed 27.09.2017).

⁴ For more information on TA frameworks see Grunwald and Achternbosch (2013).

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emptive risk management and as initiators of new processes. The strong focus of NanoTrust on building and maintaining a nano governance network has borne fruit, proving to be an effective way to navigate, adapt and contribute to the ever-changing state of knowledge and regulatory situation. Throughout the past ten years the project has been accepted as a provider of reliable and balanced information and as a productive supporter of the main governance activities in Austria.

The exercise in reflection undertaken within this paper is without question subject to the limitations pertaining to attempts of contemplating one's own work, as is described in methodological discussions surrounding the challenges of participatory observation (see for instance Kitchin and Tate, 2013: 29; DeLyser, 2001: 441). However, as insiders to the Austrian nano governance network we possess a great understanding of the examined project and network and are able to recount how the Austrian nano governance system “really” functions beyond its formal hierarchy and structures.

To aid our recollection of past events, we relied heavily on the internal documents and communications available to us, such as minutes of project meetings and preparatory notes developing new ideas. We divided the project into two main phases with the first phase consisting of the initiation of the project and the second phase addressing the continuous tasks we perform, primarily with regard to maintaining the nano governance network.

The following section is dedicated to the concepts of neutrality and independence in light of “politics of TA” and with regard to NanoTrust. The governance approach of technologies which are characterized by a dominant risk frame is then discussed. The subsequent section describes the structure of the Austrian nano governance system in order to briefly provide context for the evolution of the tasks and roles of our specific project. The “politics of TA” with regard to NanoTrust will first be examined for the phase of initiation, closer examining questions regarding motivations, the constellation of actors and strategies pursued to maintain neutrality and independence. Next we regard the project phase surrounding ongoing processes, where we primarily focus on the maintenance of the governance network before summarizing our experiences in the conclusions.

2. Neutrality – composing a working definition

The neutrality narrative has been a close companion of technology assessment since its beginnings in the 1970s. It has served to portray TA as an apolitical and independent entity, thereby providing a source of legitimization for the guidance of decision-makers. This neutrality claim has since come under scrutiny, as practitioners critically reflect their roles (see for instance Delvenne, 2017; Delvenne et al., 2015; Van Oudheusden, 2014). Next to questions on whether neutrality is achievable and how it can be put into practice, the question is raised whether neutrality forms the core of a “TA-ethos”, or if it is restricted to the role of “legitimiser”.⁵

Neutrality is by no means an unambiguous term and can be understood in a number of ways, the Oxford dictionary offering the following definition: “*the state of not supporting or helping either side in a conflict, disagreement, etc.; impartiality*”. Within the context of our work, we assert that this definition of neutrality is neither applicable nor is it desirable. Besides requiring a definition which reaches beyond conflict situations, the stipulation to not offer support lies in contradiction to our project goal of functioning as a supporting actor in nano risk governance. Over the years the dialogue processes NanoTrust facilitates have taken the shape of so-called “authentic” or “collaborative” dialogues, which are characterized by a more informal mode of interacting, close personal contacts and an open disclosure of aims and interests, as

opposed to rhetorical or ritualistic dialogues (as described in Hajer and Wagenaar, 2003: 37). To pave the way for this kind of dialogue between stakeholders, participants must feel comfortable and safe, recognize interdependencies and establish a sense of trust. Within this process our role cannot be passive in nature, seeing as risk management, the generation of safety and trust-building endeavours are all active undertakings. It should not be left unsaid at this point that trust can be regarded as “*an attempt to bind the ‘trusted’ into a relationship and attitude of responsibility – and thus perhaps to alter their behaviour – through the taking up of a position in a social ritual*” (as found in Åm, 2011: 119; Szerszynski, 1999: 239), which holds implications for our role as neutral actors.

The reference made by the Oxford dictionary to “impartiality” can refer to being non-partisan, or rather, all-partial, with our understanding of the term in context of our project translating to fair behaviour and goodwill towards all participants, irrespective of own values or preferences. We would like to clearly differentiate between “impartiality” and “neutrality”. While our working definition of neutrality certainly includes the aspect of “impartiality” in the sense of fair behaviour and goodwill, neutrality must be understood in a much broader sense. For us neutrality encompasses additional aspects such as interdisciplinarity and the demand for one's work to be fact-based and balanced. Good scientific conduct and the preservation of scientific integrity are indispensable for any research institute of the ÖAW, inevitably leading us to the ongoing discussion of neutrality of science as a whole. It must be stressed that even when working with scientific facts, experts will often interpret these facts in varying ways and experts from different fields will often hold different ideologies and values. This underlines the importance of being all-encompassing, illustrating the diversity of opinions and presenting the full scope of available knowledge and perspectives.

Neutrality is typically associated with a further requirement, namely the demand for holding no bias and being objective. Wynne has stated in his review of technology assessment back in 1975, that TA itself cannot definitively be neutral or objective, due to the fact that by its nature it is dependent on implicit assumptions (Wynne, 1975). By striving to contribute to socially responsible technology policy, TA is led by democratic values. These include the objectives of sustainable development, distributive justice and common welfare, none of which are free of social values and interpretations, which may also be subject to change over time. Delvenne (2017: 4) argues “[...] that TA has politics, and that this is a potentially good thing not to be ashamed or afraid of. Indeed, as we explain elsewhere (Delvenne et al., 2015; Van Oudheusden et al., 2015). TA is typically associated with a political preference for more participatory or deliberative modes of decision-making, supporting the ideas of publics’ ‘empowerment’, ‘policy enlightenment’, ‘healthier aging’ or ‘sustainable development’. These preferences are not neutral”. TA therefore cannot – and perhaps should not – be value-neutral.

So where does this leave us in our pursuit of neutrality? It is clear to us that we cannot meet the requirement of being free of normative values and that this is not an objective we wish to strive for. Instead, we choose to embrace our task of contributing to socially responsible technology policy. Consequently, we exercise our role as being “neutral” actors actively, by endeavouring to be all-encompassing, showing goodwill and fair behaviour towards participants, dedicating our resources to tasks serving common overarching goals and doing so all the while upholding the standards of good scientific practice. These common overarching goals are not to be understood as making attempts to homogenize the individual interests of participating actors. In order to qualify as being a “common good” and constituting as an overarching goal within the project context, an endeavour must hold nano-relevance, safety relevance, societal relevance and relevance for Austria. Examples for such “common good” tasks we have taken on include contributions to the formulation of a national Nano Action Plan or to the creation of a national network providing information on nano-safety for the interested public.

⁵ For instance, the 3rd European Technology Assessment Conference in Cork in May 2017 dedicated a session “Politics of TA” to these questions: <http://cork2017.technology-assessment.info/images/files/Call-for-Papers—The-politics-of-TA.pdf>.

Another term which must be addressed is that of independence. The protection of independence constitutes a priority in matters of advising the government (Gluckman, 2014), Grunwald (2006: 105) noting that “independence is, for certain forms of institutionalization, an absolutely fundamental initial institutional condition”. When speaking of scientific independence and the independence of advice, one is typically referring to the lack of interference by someone trying to further their own interests, often specified as political or partisan interests. Grunwald uses the term “autonomy” to describe this type of independence from external interests. In the sense of autonomy, independence enables the prevention of instrumentalization. Concerning policy advice commissioned by the parliament he writes: “In institutionalized policy advice, if the institutionalization model is to have chances of surviving changes of majority, it has to be ensured that the parliamentary base is as broad as possible and should, ideally, include all of the parties” (Grunwald, 2006: 105). This principle of broadening the basis of support can be considered a tactic to preserve independence when receiving funds from political bodies. Possessing a certain financial independence can also strengthen the ability to perform without political directives. Grunwald further points to the terms of “unprejudicedness”, which describes the openness of results and contains aspects of open-mindedness and being free of bias; “equity”, which involves fair behaviour towards all viewpoints with no preference being given and implies a requirement for inter- and transdisciplinarity; and “objectivity”, which concerns results and is often understood as representing the “truth”, free of ideology and values. These three terms show strong intersections with elements already discussed above concerning the term neutrality.

Lastly we wish to point out that independence in the sense of being an independent institute does not ensure being completely free of dependencies. The closure of technology assessment entities such as the Office of Technology Assessment (OTA) in the USA in 1995, the Flemish Institute Society and Technology (IST) in 2012, as well as the defunding of the Danish Board of Technology in 2011 are evidence that TA bodies are dependent on the support of the political system and there is a need for them to continuously be aligned with current policy discourses.

We have now discussed the often quite fuzzy term of neutrality in an attempt to articulate a more specific understanding for our particular project context. How we choose to interpret neutrality greatly influences what we perceive our roles as TA-practitioners to entail within the project. In order to critically reflect our own roles throughout the project duration, we must consider the project aims and needs in the formulation of a working definition. This working definition is in turn required to allow the identification of potential transgressions. The “authentic” or “collaborative” dialogues within NanoTrust represent a formative feature, greatly shaping our understanding of what a neutral role must encompass. Based on these considerations, we analysed NanoTrust with regard to the following dimensions of neutrality we have identified as crucial:

- Fair behaviour and goodwill towards all participants
- Good scientific conduct and focus on a factual basis
- Interdisciplinarity and the presentation of the full scope of available knowledge and perspectives
- Pursuing common overarching goals
- Maintaining independence

3. Approaching uncertainty and risk governance

Kurath (2010: 88) describes governance as “non-hierarchical, informal, network-oriented, and cooperative forms of ruling such as soft law and self-regulation”. The concept is characterized by an “inherent vagueness” (Offe, 2009: 553) and can adopt many different forms. It is typically associated with a departure from top-down decision-making and the inclusion of actors who do not traditionally hold decision-making power in the governing process. Consequently, the responsibility of decisions no longer lies solely with decision-makers: “Not least,

governance emphasises the voluntary involvement of relevant actors in shaping measures like guidelines or best practice agreements, which may enhance their commitment by assigning responsibility.” (Torgersen et al., 2013: 9–10).

Depending on the frame under which a technology is debated, the governance process will adopt different shapes. Torgersen et al. (2013: 3) define frames as “[...] principles that provide criteria for determining relevance and convey structures of orientation [...]”. They discuss three dominant frames in greater detail in which emphasis is placed on economy, ethics or risk. Realistically, elements of multiple frames are generally simultaneously present within technology discourses but a dominant frame can typically be identified. As indicated by the title of this paper, our main focus lies on governance in context of the risk frame, wherein a strong focus is placed on scientific expertise. The main objective is to prevent or mitigate negative effects on health or environment and consequently policy advice relies heavily on the reliability and objectivity of knowledge. As already discussed in context of neutrality, as soon as scientific facts require interpretation, ideologies and values of experts may enter the picture and interdisciplinary approaches gain relevance. In contrast to ethics governance, expertise from lay knowledge receives little attention in risk governance: “in risk debates rational expert opinion (‘sound science’) is considered relevant, while lay people constitutively are at a disadvantage due to their lack of specialised scientific knowledge. For risk governance, lay participation is therefore structurally incompatible with the dominant risk frame and often restricted or considered less relevant” (Torgersen et al., 2013: 12). The legitimacy of this stance within risk governance is, however, challenged by the European Environment Agency: “[...] the benefit of attending to lay knowledge rests in its complementary character, its sometimes firmer grounding in real world operational conditions [...] and the associated independence from the narrow professional perspectives that can be a downside of specialist expertise.” (Harremoës et al., 2001: 177). Within NanoTrust the term “expert” broadly applies to individuals who can contribute substantial knowledge to the analysis, assessment, or perhaps even the solution of a given problem. Seeing as lay participation is not covered within the project frame, the importance of complementary projects to incorporate lay participation is to be emphasized.

Governance processes of a technology characterized by a dominant risk frame are also shaped by the availability of risk-relevant knowledge. As mentioned, technologies like nanotechnology and advanced materials are defined by uncertainties rather than risks. When dealing with uncertainties, one cannot sufficiently provide valid data for the level of damage and probability of occurrence, which would be required for usual risk assessment methods. It is therefore important to ascertain what information is available of what quality. Inter- and trans-disciplinary deliberative expert dialogues can be a form of organising the process of knowledge creation and exchange when uncertainty is prevalent. Stirling (2008: 275) points to the various activities which are sensitive to bias when engaging in these deliberations, including for instance inadvertent bias, understanding the dynamics of deliberation and managing dissensus. Customarily the assessment of uncertainties or risks will also entail questions concerning what constitutes a risk or an adverse effect and for whom, whereby a strong consensus can usually be found when regarding risks for human health.

This characterization of uncertainty risk governance approaches serves to provide context for the project design of NanoTrust, as they define core project elements. While we have spoken of the project being in a constant state of adaptation, the extent of this change is bound by the prevalent governance frame applied. Ultimately, the strategies for maintaining neutrality within the project are also to be viewed within the context of NanoTrust being embedded into Austria's nano risk governance landscape, which greatly impacts motivations, involved actors and the format of dialogue processes.

4. NanoTrust – an Austrian TA-project in nano risk governance

NanoTrust was established in 2007, following the Austrian nanotechnology research program “NANOinitiative” of 2003. It was coordinated strategically by the BMVIT and on the operative level by the Austrian Research Promotion Agency (FFG), being funded by several ministries, federal provinces and funding agencies.⁶ The NANOinitiative was based on the three pillars of research funding, networking and education & training, and was meant to “*promote the qualitative and quantitative growth of the Austrian NANO sector, and to integrate it even further to the European community of researchers*” (FFG and BMVIT, 2007: 7). The Austrian Nano Action Plan was dedicated to issues surrounding the safety of nanotechnology applications and was adopted by the Austrian Federal Government in March of 2010, this testimony of political will being considered the beginning of coordinated political action. Within the Nano Action Plan NanoTrust is named as an existing structure to serve as a technical pillar of a communication platform between policymakers, ministries and social partners (BMLFUW, 2010: 18).

The project has gone through several extensions, its objectives and nature evolving over time. It has since developed into an organisational process embedded in the regulatory system; its role having expanded to include the tasks of initiating joint activities, coordinating and eliciting discussions and jointly organising the generation of new knowledge concerning subjects with relevance to risk and safety. Consequently, we must acknowledge that we no longer adopt the sole role of observers, but that these new roles clearly reach beyond the provision of reliable information and an evaluation of risk and safety relevant knowledge. Activities of this kind can only credibly be performed if the roles of the involved TA practitioners are independent, unambiguous and openly communicated. Additionally, the regulatory situation is ever-changing, entailing a demand for continuous re-examination of our roles. At this point we wish to briefly clarify some of the functions NanoTrust performs within the Austrian nano risk governance landscape (Fig. 1).

The Austrian Nano Action Plan (NAP) was published at the end of 2009 with NanoTrust having participated in all four working groups. The NAP was adopted by the Council of Ministers in March 2010 and thus entails political commitment. Central recommendations of the Nano Action Plan included the creation of a public information portal, the establishment of an independent national NANO-Environment Health and Safety (nano-EHS) research program (dedicated to filling knowledge gaps in the safety assessment of nanotechnology and establishing necessary expertise), the development of detailed worker safety guidelines for Austrian workplaces and the prolongation of the NanoTrust project. The recommendation for a public information portal led to the implementation of the Nano Information Platform (NIP) in 2010. The platform was designed to bring together experts from various fields to establish transparent public communication on the safe use of nanomaterials. NanoTrust produces information available over this interface. Currently the Nano Information Commission (NIK) represents the most formalized element of the Austrian nano risk governance landscape, having been founded in September 2013 as an advisory board for the respective members of the federal government responsible for the protection of consumers' health. The NIK consists of around 20 members from ministries, agencies, universities as well as two non-governmental organisations (NGOs). It convenes 2–3 times a year and is currently chaired by the project leader of NanoTrust.

4.1. NanoTrust's drivers, actors and dialogues in context of neutrality

The launch of the Austrian nanotechnology research program “NANOinitiative” in 2003 had prompted many involved organisations to take into account the need for accompanying technology assessment

of nanotechnology in Austria. The first communication and networking efforts to develop an accompanying research project of this kind were undertaken the same year, spanning several years before effectively placing nanotechnology as requiring systematic investigation of safety relevant issues. During the preparatory and initial phases of the project, many dialogues were held in the form of face-to-face conversations with representatives of the funding bodies and research institutions. Most of these conversations revolved around the question of how NanoTrust was to position itself in the existing landscape, whereby emphasis was placed on appearing and behaving as a neutral supporting actor. Keeping this in mind, specific tasks were considered and discussed for the project. Two advisory board meetings were held during this orientation period, accompanied by one-on-one conversations with representatives of the main funding bodies. These meetings were pivotal to building a basis of trust and a sense of reliability between the actors, setting the cornerstone for authentic dialogue. While a lot of common ground could fortunately be found between the NanoTrust project team and the funding bodies concerning the main orientation of the project (such as placing the focus on common good goals), some different stances concerning core tasks had to be settled through negotiations. One such example was the desire of the funding bodies for the project to encompass the task of public communication. Tensions arose, seeing as the project team considered it problematic to take on the mantle of main communicator to the public, being wary of the possibility of being repurposed or perceived as a mouthpiece. The argument that this could damage the credibility of our institute as well as the ministries was ultimately acknowledged and the issue could be resolved with the proposal of creating a network of multiple players responsible for the content of a public information website, wherein NanoTrust would be one of around a dozen contributors from different fields.

We have seen that initiating and maintaining a project like this requires a common understanding between the main actors concerning fundamental targets. If there had been no acceptance for us to pursue overarching goals, or if our stipulation to remain neutral actors had met with resistance, the project could never have commenced.

4.1.1. Motivations

An important driver of the project was the notion of building a network of experts with the capacity to produce and provide independent and reliable information on questions of safety and risk concerning the use of nanotechnologies and nanomaterials. The idea of applying “lessons learned” from biotechnology and genetically modified (GM) foods to nanotechnology was a common one, ranging from merely questioning ways of managing crises to questions of how one should regulate in the face of high uncertainty (Brown, 2009; David, 2008). While GM and nanotechnology differ in many ways, with one being an application and the other consisting of a multitude of products and processes, regulators also seem to have taken note of the need for adapting the way of approaching risk assessment, risk management and risk communication of new technological innovations. An indicator of the past negative experiences with GMOs playing a role in the funding of NanoTrust can in fact be found within the Austrian Nano Action Plan with an objective reading as follows: “*to objectivise a theme laden with emotions and anxieties and to present possible health and environment risks of nanotechnology by preparing scientific information*” (BMLFUW, 2010: 25). A project objective can therefore be considered as a way to prevent public controversy. This rationale is present in many TA studies, and is on occasion explicitly stated as a primary objective, such as is the case for Parliamentary TA: “*Parliamentary TA is not primarily about assessing (technical) risks. Its main political role is to help the democratic system to deal with (potential) public controversies on science and technology*” (van Est et al., 2011: 1070). However, when considering the fact that controversies are not necessarily born out of ignorance, but rather result from differing views on potential benefits, risks, desires and solutions, it must be questioned whether the prevention of controversies is compatible with a neutral stance. Furthermore, even if the attempt is made

⁶ For more details on the history of NanoTrust see Fuchs and Gazsó (2015).

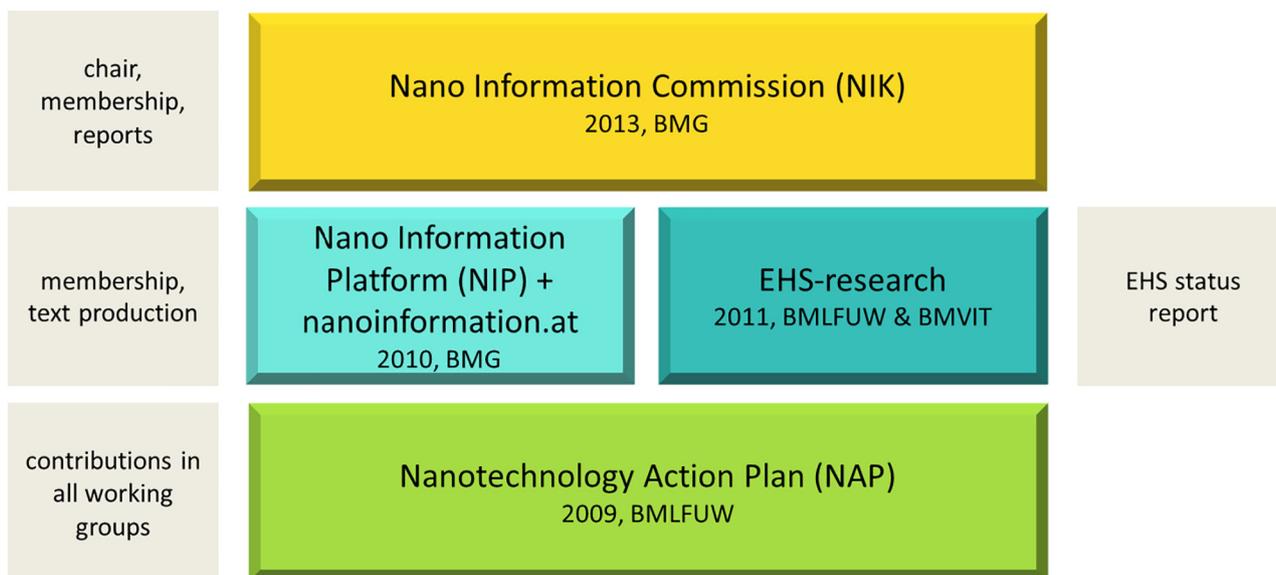


Fig. 1. Austrian nano risk governance landscape: Elements of the Austrian nano risk governance landscape are depicted with the corresponding contributions from NanoTrust and references to the responsible Austrian ministries (names according to time of element initiation): the Federal Ministry of Health (BMG), Federal Ministry of Agriculture, Forestry, Environment and Water Management (BMLFUW), and the Federal Ministry of Traffic, Innovation and Technology (BMVIT).

to prevent public debates by clarifying potential risks on a scientific basis, it is questionable whether this approach is an effective one, as [Torgersen \(2009: 12\)](#) finds: “[...] what is salient and worth debating from a public point of view is often held to be implausible hence irrelevant from a scientific standpoint”.

The project could also be used to showcase that everything was done with regard to environment health and safety in the case of an accident or the occurrence of adverse effects. In such an instance the responsible authorities can shield themselves from blame or criticism by demonstrating they have addressed the involved risks of the technology responsibly ([CEC, 2001](#); [Torgersen, 2009: 16](#)). This incentive can be understood as an inclination of regulators towards risk-preparedness.

Irrespective of what self-interests funding bodies may hold, it can be argued that benefits can be realized based on these motivations. For instance, NanoTrust has set processes into motion in which regulators have committed to participating in a network, ultimately leading to a process of institutionalisation of the Austrian nano risk governance network. By contributing to an anticipatory risk management strategy, identifying and responding to uncertainty and risk within nanotechnology and providing a discussion platform on risk and regulatory issues, added-value is produced for the public interest and a high impact could be achieved.

4.1.2. Actors

It has been mentioned above that the nano governance network NanoTrust has built and maintains is comprised primarily of academics, consumer organisations and representatives of various ministries. At this point it is worth pointing out that different ministries are seldom accustomed to close cooperation with each other and will seldom represent the same ideas and viewpoints. Depending on the orientation of the ministry, the focus points will differ, as ministries mirror or defend certain interests in society which may oppose each other, being subject to the respective remit of the department. This limits the set of common interests (such as the desire to prevent public controversy) and entails competition between the ministries over resources, competences and support by societal actors in efforts to support their institutional *raison d'être* (see also [Torgersen and Hampel, 2012: 137](#)). The industrial perspective is incorporated through umbrella organisations such as the Austrian Federal Economic Chamber (WKÖ), which represents Austrian

businesses, and the Association of the Austrian Chemical Industry (FCIO), representing Austrian companies manufacturing chemical products on an industrial basis. A conscious decision was made not to make special attempts to attract specific industries, but to have them be represented by the before mentioned umbrella organisations. The rationale behind this choice is that we do not wish to focus on particular individual interests, but focus on common overarching goals. The incorporation of NGOs beyond sporadic appearances has proven to be challenging, with only two NGOs being NIK members (one dedicated to consumer protection and the other to environmental protection).

The briefly addressed difficulties to integrate a broader spectrum of NGOs in a more involved manner beyond sporadic attendance warrants closer examination, as a stronger NGO presence could provide valuable additional perspectives and increase representativeness. As mentioned, only two NGOs are members of the NIK, with other NGOs having merely made sporadic appearances during past events. One such notable undertaking was the formulation of the Austrian Nano Action Plan (NAP), which was open to all stakeholders. While multiple NGOs were initially present, many quickly withdrew from the process. We can only speculate that the weekly NAP meetings over the course of 4–5 months were too resource-intensive for a long-term commitment. It is also feasible that the subject of nanotechnology may simply not be very salient for NGOs outside of selective examples, such as the use of titanium dioxide nanoparticles in sunscreen. [Torgersen and Schmidt \(2013: 48–49\)](#) observe: “Apart from occasional demonstrations mostly in France, technology critics did not succeed in mobilising significant parts of the public despite many speculations that nanotechnology might elicit concerns similar to green biotechnology”.⁷ Our experience has shown that NGOs will occasionally take advantage of the open nature of publically held events to collect information, but few actively participate or contribute. The appearance of NGO representatives at NIP meetings for the purpose of gathering information for an upcoming campaign had briefly stirred up negative sentiments from the other network participants, who felt that one must contribute actively if one wishes to profit from the work being produced. The fact

⁷ Even following an incident in Germany in 2006, where consumers who had inhaled a cleaning spray by the name “magic nano” (later shown not to contain any nanoparticles) had to be hospitalized, NGOs did not get engaged and the incident passed without much media interest ([Torgersen, 2009](#)).

that such a campaign runs counter to the desires of our funding bodies to prevent public controversies served to further aggravate the situation. Despite this conflict of interest, however, the consensual decision was reached to let the network remain as open as possible and not introduce any formal requirements or memberships to try and prevent this phenomenon. The main argument of the NanoTrust team lay in the fact that all knowledge produced by the project must be transparent and accessible to all, and common ground could be found on this basis.

The project design does not include direct participation of the general public, this of course not reflecting a lacking need for or importance of participatory public discussions and engagement on the subject of nanotechnology. This is rather a result from the project design, methods and available resources. As described in Section 3, the described constellation of actors can be considered typical for the governance of a subject dominated by a risk frame.

4.1.3. Dialogues

It is clear that the choices regarding who should take part in engagement activities are normative and have far-reaching consequences on the course and outcome of these events (Torgersen and Schmidt, 2013). Bauer and Pregernig (2013: 28) observe: “*whenever scientists, experts or stakeholders are sought, the selection is based on their professional positions and reputations but also on personal acquaintances, recommendations and (positive) experiences from previous collaborations*”. This observation accurately depicts the stakeholder-selection we conduct within NanoTrust for workshops and round tables conducted in smaller circles (between 5 and 20 participants). Generally three different modes of dialogue processes can be distinguished within the project:

- *face-to-face dialogues*: initially serving as a way for the involved actors to get to know each other and establish the role of NanoTrust. While roles and tasks must continuously be negotiated, the content of these face-to-face dialogues has shifted over the years, with the project team increasingly being consulted for support on safety issues from outside actors, such as universities. This may serve as an indicator that we are not perceived as competitors in the field but as neutral players.
- *small-scale meetings, workshops and round tables*: invitation-only events with 5–20 participants dedicated to specific tasks and questions. For instance: deliberations on topical subjects such as current trends in safety research or strategic meetings about collective enterprises which could be pursued together.
- *open events*: events which are open for the interested public and stakeholders to attend, such as NanoTrust conferences, conferences in collaboration with other organisations (such as the Ministry of Health) or sessions held in cooperation within other conferences

4.1.4. Strategies to secure neutrality & independence

From the onset, it was clear that the project team would be facing several challenges concerning the preservation of neutrality and independence through these new modes of interactions with regulators and attempts were made to pre-emptively address these during the design of the project.

We have already specified the following two potential problem areas which have to continuously be addressed:

1. *Instrumentalization*: e.g. by serving as a mouthpiece for funding bodies.
2. *Potential bias through lack of variety*: due to the great difficulties of incorporating new perspectives in established networks

Over the years another important question has arisen, related to the ever-evolving nature of the project and its tasks as well as the involved long-term trust-based networks: establishment of a group identity of which we as TA-practitioners are not excluded. This will be subject of

discussion within the next section concerned with the second phase of the NanoTrust project.

Strategies which were pursued since the initiation of the project to preserve neutrality and independence are as follows:

- a) *Expanding the basis of support*: while initially the project was funded exclusively by the BMVIT, it went on to include contributions of the Federal Ministry of Health (BMG), the Federal Ministry of Agriculture, Forestry, Environment and Water Management (BMLFUW), the Federal Ministry of Labour, Social Affairs and Consumer Protection (BMASK) and the Austrian Workers' Compensation Board (AUVA). These entities hold various differing protection mandates and therefore each place a different focus on nano environment, health and safety.
- b) *Introducing an external advisory board*: the NanoTrust advisory board was initially made up of three international (Germany, Switzerland) and two Austrian scientists as well as seven individuals representing ministries, agencies and interest groups. The advisory board convenes on an annual basis (twice annually during the first years) and is tasked with monitoring the development of the project.
- c) *Introducing an internal advisory board*: the internal advisory board allows the NanoTrust team to gain insight from colleagues within the institute when faced with strategic questions. Next to scheduled meetings these exchanges are often organised in a more spontaneous and informal manner.
- d) *Internal project seminars*: we take advantage of the custom of presenting the status of projects within our institute. The feedback from colleagues has been helpful in gaining input and guidance from the TA perspective.
- e) *Actively seeking participants*: networking efforts predate the NanoTrust project by three years, requiring strong pro-active engagement and representing a key characteristic of the project. The presentation of NanoTrust in various different fields and settings (nationally as well as internationally) plays an important role in this regard.
- f) *Open & transparent communication*: maintaining a culture in which it is possible to engage in open and collaborative dialogue is vital to ensure we can pursue our tasks appropriately. It is important to communicate our exact roles and functions to the network, allowing for transparency and accountability.
- g) *Official commitments to interdisciplinary work*: through cooperation in inter- and at times transdisciplinary teams, an attempt is made to encompass a broad scope of perspectives and options. Within the second paragraph of the Rules of Procedure of the NIK you can find the demand for dialogue to be interdisciplinary and fact-based, with the consideration of expertise from different disciplines explicitly being emphasized.
- h) *Focus on a scientific basis*: an example is provided by the NanoTrust dossiers, serving to disseminate fact-based information. The dossiers seek to summarize information on a specific topic in the area of nano-specific risks, primarily in the areas of health and environment. The dossiers provide literature for further reading and incorporate feedback loops and expertise from external professionals of the corresponding field.

4.2. New challenges for neutrality arising within long-term networks

Over the past ten years since the start of NanoTrust, nanotechnology has matured and the regulatory situation has consequently undergone some changes. Due to the proximity of the project to regulatory bodies, this has also resulted in changing tasks and roles for the project members. It can be said that the project has itself become an accompanying process for Austrian nano governance. While the tasks of NanoTrust are not restricted to networking efforts, we would like to place a focus on our observations regarding these specific activities.

In the previous section we explained how face-to-face conversations

held during the initial phase of the project mainly served the purpose of getting to know each other and establish what the role and content of the project was to be. To this day the project involves many one-on-one deliberations, but the content of these conversations has changed over time. Once NanoTrust was established within the nano risk governance landscape, it operated as an equal contributor in the pursuit of common goals. Lately another development has slowly started to crystalize: the project members are increasingly being contacted for advice and consultation by actors in the Austrian nano-research field. This shifting role must of course be reflected and consequences must follow suit when new functions are taken on. We would like to illustrate with a recent example: NanoTrust was asked to assist the process of choosing the subject of the next nano-EHS research program, a program which up to this point NanoTrust had participated for competitively, by providing a status report on past EHS projects. While it was established from the start of these negotiations that NanoTrust will not and can never be involved in the actual decision-making, our resources were made available to research and briefly present an overview of studies done in the nano-EHS field. This overview of current and recent activities serves as a basis for subsequent deliberation, which is also organised and documented by the project team. The decision regarding the subject matter and the formulation of the resulting tender are, however, out of the hands of NanoTrust. It was clear for the project team that despite only providing the preparation of information and organising the deliberation, continuing to compete for the nano-EHS tenders would not be an option. The involvement of the team in the process conflicts with our interest of being perceived as a neutral player. The trust we have managed to build with the other actors of the nano risk landscape needs to be treated as our most important asset, as it is what enables us to have the kind of dialogues required for the constructive and cooperative space we wish to maintain.

4.2.1. Trust and identities in long-term networks

Heidrun Åm hit the nail on the head with the title of her 2011 paper: “Trust as Glue in Nanotechnology Governance Networks”. Our daily observation of the role of trust within the Austrian nano governance network is reflected in Åm's observations stemming from interviews with participants in nanotechnology governance conducted in Germany. If we recall the interpretation of trust as “*an attempt to bind the ‘trusted’ into a relationship and attitude of responsibility [...]*” (Åm, 2011: 119; Szerszynski, 1999: 239), the relevance of trust for TA-practitioners closely engaging with the same actors of a network throughout multiple years becomes apparent. Åm (2011) exposes the often gradual and unnoticed side-effect of developing a common “we” mentality in governing, despite the networks typically consisting of a multitude of different stakeholders. It can be said that the Austrian nano network has over the years developed to constitute a community, from which follows the emergence of an identity as being part of this community. Throughout the years this network has also undergone an institutionalisation process, most prominently exemplified through the institutionalisation of the NIK. The emergence of not only an identity, but also an interest of any institution to maintain itself and grow is linked to such an institutionalisation process (see Tolbert and Zucker, 1999, as well as Lawrence and Shadnam, 2008 on institutional theory).

We regard trust-based governance networks as an efficient means to an end and not as a goal in and of itself. There is great value for all involved actors in the information not only shared, but also created within the network. Additionally, the exchanges have in our experience also contributed to a better understanding of the different working realities of actors from different fields, which in turn improves the ability to effectively work together. Solidarity has arisen between the actors of the network, for instance: participants will continue to represent their own interests within discussions, but will actively show consideration for and even vocalize the interests of other participants who could not be present. In the past years we have also witnessed dialogues to not only be about information sharing, but containing a

strong drive to combine forces and set common goals to be pursued together. Flexible solutions are sought for working around inflexible structures not designed for promoting research on multifaceted emerging technologies like nanotechnology and advanced materials. Hajer and Wagenaar (2003) describe very similar observations for closely-knit stakeholder groups engaging in collaborative dialogue.

With all the benefits which come with harmonious cooperation, this “we” mentality of a community and an institutional self-interest of the network comes hand-in-hand with unspoken commitments. Åm's statement with regard to nanotechnology governance in Germany serves to explain the connection between trust and potential problematic consequences: “[...] *through the members enacting deliberations on nanotechnology, the way of relating to each other changed to become relations between trustworthy partners. By exchanging information with each other that previously would have been disclosed only to certain members of the forum, it was not only acted upon the relation of trust, but the relation was at the same time extended to a relation of mutual responsibility. Individuals became bound within each other so that to pass on secretly told information would result in a serious disruption of any carefully accrued relation – this disruption would occur not only with the actor whose secrets one had been revealed, but might result in one being discredited beyond the group and indeed their organisation losing credibility as a partner in nanotechnology governance.*” (Åm, 2011: 120).

This problem is a fundamental one, tied to the very nature of trust-based systems and does not necessarily have to develop consciously. The more stable governance networks are, the more intimate and personal the relationships between participants tend to be. Within NanoTrust our relationships with other actors, including representatives of ministries, are clearly personal in nature. It is customary within this network to be on a first-name basis with one another, with friendships having even been formed over the years. While a companionable setting is beneficial in many respects, this development must also be regarded with a critical eye, for it can blind to the following things: Firstly, as the quote above describes, certain “taboo” topics can emerge, possibly limiting participants in performing their original roles. Secondly, while attempts in these types of networks are made to include a wide variety of actors, with time a stable core of actors can morph into a group of individuals who share similar ideas and dissenting voices are no longer perceived. Cumulatively, all these developments are related to certain shifts in identities which may occur within the network setting. One may adopt ideas and objectives discussed and developed during the course of deliberations, which are not one's own, all the while being under the impression that they are. This subconscious absorption of foreign objectives is particularly problematic. It is difficult and perhaps not even possible to ascertain whether – and to what extent – one is subject of this phenomenon without an outside perspective, which emphasizes the need for an ongoing process of reflection to accompany a project of this nature.

On the other hand, the described identity development can also be seen in another light. Hajer and Wagenaar (2003: 47–48) frame this identity development as conducive for system adaptations, explaining: “*Each stakeholder's identity becomes in part contingent on the identity of others as they do in a community where responsibilities and roles are simultaneously differentiated and linked together. [...] Developing and articulating linked and shared identities help to make possible the longer-term cooperation that happens in tightly knit communities.*” According to Hajer and Wagenaar, the development of shared meanings between individuals helps the system become more adaptive: “*Once stakeholders have developed shared meanings, they do not have to check in with each other all the time to coordinate, but act in concert because they understand issues in parallel ways and have shared purpose. Their networked relationships give each player feedback that allows them to act more intelligently and to have a beneficial effect on the workings of the system they all share [...]*”. The emergence of new practices and institutions, as we have seen within the NanoTrust project, is described by Hajer and Wagenaar as genuine innovation stemming from collaborative dialogue. We are

convinced that the longevity and high impact of the project are to a large part related to this mode of interaction.

4.2.2. Strategies to secure neutrality & independence

The following topics have to be addressed in regard to neutrality and independence within NanoTrust:

1. *Trust as a double-edged sword*: we have stressed the importance of trust in fostering effective governance networks, identifying it as a necessity for actors with different functions to cooperate. The emergence of possible “taboos” which could conflict with our roles must be taken into consideration.
2. *Birth of a new community with a common identity*: while we regard this development as positive, enabling us to articulate and pursue shared goals, awareness must be cultivated that views of different actors may homogenize and foreign objectives may unknowingly be adopted.
3. *Ongoing need to clarify roles & tasks*: in addition to the two points already discussed in greater detail, we have found that it is repeatedly necessary to negotiate with regulators when we perceive tasks to reach beyond what we should or could perform as independent TA practitioners.

Strategies which could be pursued are as follows:

- a) *Dedicating a working package to the reflection of the process*: an attempt to incorporate a systematic reflection of the process was made during preparations for the project but was unfortunately not successful in securing funding. Projects involving such elements of reflection such as NanoPOL (in cooperation with the Institute for Technology Assessment and Systems Analysis (ITAS) at the Karlsruhe Institute for Technology (KIT) and the TA-Swiss in Berne and the Programme for Science Research of the University of Basel) or the internal project Pol[ITA] offer valuable contributions in this regard, whereby it must be stressed that these endeavours are self-funded.
- b) *Placing a focus on common overarching goals*: it has never been an objective to harmonize or pursue the various existing individual interests of the network participants within the project. Instead, we have devoted our resources to defining and realizing common goals, such as the formulation of a Nano Action Plan, the creation of the NIP, or the formulation of Rules of Procedure for the NIK. By avoiding making individual interests the main topic of discussion and clearly differentiating between the common overarching goals and individual goals, the attempt is made to circumvent the risk of these objectives and identities bleeding into each other.
- c) *Seeking input from other perspectives*: feedback from various sources, such as the advisory board or colleagues not directly involved in the project help provide an outside perspective. Attending conferences, workshops and similar events from different fields offer additional opportunities to gain new viewpoints, as does cooperating in other projects dedicated to EHS and regulatory subjects.
- d) *Continuously introducing new players*: while a positive and efficient culture within the community is to be fostered and maintained, new actors must regularly be introduced to help counteract the homogenization of ideas and viewpoints throughout time.

While we pursue these strategies, they have not always been met with success. For example, it was not possible to incorporate the desired working package dedicated to process reflection.

5. Conclusions

NanoTrust enjoys close proximity to the Austrian nano governance system and engages in close cooperation with regulators. The conception of the project as a continuous process in lieu of a classic TA

research project was born out of the need to develop a consultation process capable of addressing a moving target. The field of nanotechnology is defined by uncertainties, with regulators and scientists struggling to keep pace with the production, compilation and application of risk relevant knowledge as innovation presses forward. The strong focus of NanoTrust on building and maintaining a nano risk governance network has proved to be an effective way to navigate, adapt and contribute to the ever-changing state of knowledge and regulatory situation. Throughout the past ten years NanoTrust has become an institution in and of itself, providing reliable and balanced information and being accepted as a productive supporter of the main governance activities in Austria.

The success of a pro-active accompanying TA process rises and falls with the willingness of participants to communicate and engage with each other, this format being highly communicative in nature and hinging on the ability to combine forces in a constructive manner. Consequently, one of the biggest weaknesses of this type of project is connected to lacking representativeness of participants in the network. In the case of NanoTrust, effective solutions for a stronger active engagement of NGOs have not yet been found.

What must be considered a success is the very positive environment which has been established by the members of the network. Participants frequently express satisfaction about the general experience of working with other individuals who are motivated to volunteer their time and efforts to jointly discuss subjects in a comfortable setting and about the prevailing “good chemistry”. With all the drawbacks which may accompany more informal styles of interaction, this is a benefit we believe is critical if one wishes to nurture closer combined efforts on an inter- and transdisciplinary level in the long-term and for the institutionalisation of the network, which is of course reflected in impact.

The longevity and continuity of the project has led us to contemplate about possible side-effects of trust-based networks – trust not being pursued as the main objective of the project, but rather as a necessary element and essential precondition for authentic dialogue and for governance to function smoothly. We refer to concerns on trust as binding individuals in a relationship of mutual responsibility, which can in the worst case result in compromised abilities to execute one’s tasks. Despite thankfully not having found ourselves in this sort of precarious situation to date, we nonetheless wish to underline the benefits to be found in the incorporation of a working package dedicated to reflection of the process within governance projects.

We have operated under the assumption that it is not possible for TA to be value-neutral, but have embraced the task of supporting “common good” goals, which are normative by nature. Consequently, we have defined a working definition of “neutrality” as an active endeavour in the pursuit of “common good” goals, based on the principals of good scientific conduct and encompassing fair and tolerant behaviour as well as goodwill towards all participants.

The creation and maintenance of trust-based networks and independent information platforms as described in this paper can only be performed by actors of independent institutes in order to preserve credibility. Additionally, the self-interest of a newly institutionalised network to maintain its existence and grow can be exploited to create a self-perception of that institution as an independent actor. Thus, institutionalisation becomes a prerequisite for gaining a certain amount of independence from the members making up the network – a “personality” of its own – elevating it above being a meeting point of diverging interests.

We believe that the benefits of closely-knit governance networks are considerable in that they can e.g. help foster long term commitment of ministries to a topic with safety relevance or contribute to the development of more formalized structures such as the NIK, public communication networks such as the NIP, working groups and research programs dedicated to environment health and safety. TA should not shy away from carrying more responsibility in this regard, as long as the

integrity of its status as a neutral actor can be maintained.

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