Responsible nanotechnology R&I – Societal engagement practices
NanoDiode

Introduction

NANO2ALL is an initiative funded by the European Union's Horizon 2020 Research and Innovation programme under the Grant Agreement Number 685931. It supports the establishment of Responsible Research and Innovation (RRI) policy and governance on nanotechnologies. NANO2ALL also aims to identify RRI practices, with a focus on societal engagement in nanotechnology research and innovation (R&I) across Europe and beyond, with the purpose to share knowledge, experience and recommendations with other nanotechnology stakeholders and motivate a wider application of such mechanisms in Europe.

RRI is an approach that anticipates and assesses potential implications and societal expectations, with regard to R&I, with the aim to foster the design of inclusive and sustainable R&I[1]. As a dimension of RRI, societal engagement implies interactions between relevant stakeholders (companies, research organisations, policymakers, civil society organisations, consumers, affected citizens and others) in order to align research, development and innovation with the values, expectations and needs of the society. Such interactions can take various shapes, such as brainstorming, scenario workshops, user committees, online forums, dialogues, informal / formal meetings, or other formats.

This short report provides brief insights into the **NanoDiode** project (Developing Innovative Outreach and Dialogue on responsible nanotechnologies in EU civil society), which was funded under FP7 – NMP. Data for this report were gathered via desk research as well as through an interview with Dr Daan Schuurbiers, Director of De Proeffabriek, a consultancy for responsible innovation centrally involved in the NanoDiode project.

The European FP7 project NanoDiode, launched in July 2013 for a period of three years, aimed to establish an innovative, coordinated programme for outreach and dialogue throughout Europe to support the effective governance of nanotechnologies. NanoDiode combined '**upstream'** public engagement (by way of dialogues that integrate societal needs, ideas and expectations into the policy debate) with '**midstream'** engagement (by organising innovation workshops at the level of the R&D practices that are at the heart of the research and innovation enterprise) and '**downstream'** strategies for communication, outreach, education and training. The project also sought to provide **policy feedback** to Horizon 2020, by assessing the impact of the project's activities. Out of the several vital engagement activities integrated by NanoDiode along the innovation value chain, the Nano2All team, in this report, chose to focus on a single component of the upstream engagement endeavour of the project: **the Multi-stakeholder dialogues**. Our aim is to provide, in a nutshell, the main points of the practice, in terms of preparation, process and outputs/results in order to inspire and motivate a wider

---

[1] https://ec.europa.eu/programmes/horizon2020/en/h2020-section/responsible-research-innovation

application of such mechanisms. Further to that, we tried to capitalize on the overall achievements of the NanoDiode project, through a findings&recommendation section - at the end of this report - providing valuable insights on the broader integration of societal engagement in the R&I system.

The Multi-stakeholder dialogues

NanoDiode organised a series of citizens' dialogues in Austria, France, Italy, Germany, the Netherlands and Poland in 2014-2015 complementing the project's objective to develop a coherent picture of how public perceptions can be fed into research and policy processes. Lay citizens were invited to discuss together with researcher, industry representatives, CSOs and public authorities what kind of nanotechnology innovation is desired, how ethical, social and environmental concerns could be addressed and the risks and benefits of the technologies communicated to the public.

The events in the six NanoDiode partner countries varied in terms of size – from smaller dialogue groups of 20

Source: NanoDiode (Multi-stakeholder Dialogue in Germany)

participants to citizens' conferences with up to 80 participants, involving a total of 250 people. They were organized in ministerial buildings or town halls, science museums, showrooms, universities or even theatre buildings. They included presentations, moderated workshops and dialogue stations, poster exhibitions, videos and possibilities for informal networking. Despite this multitude of settings, the dialogues followed a previously agreed concept that allowed non-expert citizens first to inform themselves on the technologies and then discuss these with local stakeholder communities. The core of the concept consisted of moderated dialogue stations: After pitches by researchers and SMEs, the citizens were invited to discuss the applications they were most interested in

directly with the people working with them. The citizens were encouraged to bring forward their own views, preferences and recommendations for nanotechnology innovation, which were picked up by the moderators.

Despite the variety of approaches used for invitations, the NanoDiode partners organising the dialogues faced difficulties in getting their primary target group – citizens with little or no experience of nanotechnologies – to participate and the numbers of citizen participants remained in all countries relatively moderate. With the exception of the Netherlands[2], the citizens were not remunerated for their participation. As a consequence, technology affiliated citizens formed a large part of the audiences and different population groups ended up being over or underrepresented. However, a balanced representation in terms of age and gender could be achieved in most countries.

Recommendations for organising citizen&stakeholder dialogues

NanoDiode's citizen & multi-stakeholder dialogues succeeded in creating a space for direct dialogue between citizens, technology developers and representatives of different stakeholder groups. Through the events

---

[2] In the Netherlands, citizens were first introduced to nanotechnologies via an online panel and offered gift vouchers for taking part in the dialogue

organised in the six countries, NanoDiode partners identified and discussed a number of characteristics of meaningful and attractive dialogue with citizens and stakeholders which they translated into **ten recommendations for organising citizen & stakeholder dialogues**: Rather than advocating a one-size-fits-all method, NanoDiode invites different organizations interested in engaging in a dialogue to develop their own approach for accommodating these key issues:

1. Make sure that the dialogue can have a role in the development of technologies, products, communication or policies; Although citizens' recommendations cannot always be directly implemented, the meaningfulness of a dialogue can be measured with its openness in terms of results and the responsiveness of technology or policy developers.

2. Choose the location and time of the dialogue carefully, accommodating the needs of the dialogue's principal target groups; Whereas town halls or ministerial buildings can as venues stress the significance of an event, choosing locations such as libraries, neighbourhood centres or malls – locations that citizens know and already frequent – can make participation easier, especially for those not accustomed with these kinds of dialogues.

3. Invest resources in inviting different groups of participants via multiple communication channels;

4. If possible, partner with museums, schools, universities or public authorities for increasing the legitimacy and visibility of the dialogue;

5. Communicate the possibilities and boundaries of the dialogue in a transparent way;

6. Provide the participants balanced information on general risks and benefits of the technologies – link the technologies and the dialogue to societal challenges;

7. Link the dialogue to developments or applications that could play a part in people's lives;

8. Make sure the participants get enough time and space to bring forward their own ideas;

9. Pay attention to professional moderation and documentation of results – engage professional moderators if possible;

10. Document the implementation of dialogue results in a transparent way – if the results are not implemented, the need for transparent communication (why?) is even higher.

Source: NanoDiode (Multi-stakeholder dialogues in the Netherlands

On the whole, the windows of opportunity for productive stakeholder engagement need to be more accurately defined in terms of the mandate (embedding in formal processes), added value for participants, organisational settings and expected impact.

Citizens' and multi-stakeholder dialogues are most useful in early stages of technology development or regulatory policies: at this stage, products and policies can still be attuned to the needs and concerns of citizens and stakeholders.

To encourage uptake, dialogues should be **specific enough to affect the decisions of the actors**. This applies to the topic at hand (what problems are we addressing? What sort of change do we want?), but also with respect to possible courses of action (who is the problem owner? What actions can address the issues identified during

the meeting?). At the same time, **stakeholder dialogues should not focus on 'factual' information** only **but on the underlying normative questions as well**: why stakeholders feel they need certain types of information to make an informed decision, why they think that matters, and what solution would be considered satisfactory. Thus, the discussion is lifted to a level where the underlying worldviews are discussed. This creates room for **mutual learning** which can engender better understanding of the underlying concerns.

Overall, dialogues will have a more lasting impact if they are set up as **integral elements of formal policy processes**, organised by central stakeholders on a longer timeframe, spanning several meetings.

Steps towards the integration of societal engagement in R&I

The NanoDiode project identified both **opportunities and challenges** for strengthening stakeholder engagement in research and innovation. Its diverse engagement activities created a space for open dialogue at different stages of the research and innovation process. They strengthened the role of stakeholders as political actors by facilitating direct, application-focused contributions and allowing a deeper understanding of public preferences. They also presented opportunities to adjust the direction of research and innovation in light of societal considerations, with the potential to enhance both the quality of the outcomes and their social acceptability.

Through a comprehensive study of the NanoDiode experience as a whole, we chose to synopsise here some key findings and recommendations considering the broader integration of societal considerations in the R&I system:

To unlock the potential of nanotechnologies to effectively address the global societal challenges we are facing today, we have to **put societal considerations at the forefront of the research and development system**.

In terms of application-driven research funding, we need to rethink the cultural norms that govern R&I practices. To that end, several European projects are currently focusing on societal engagement and responsible research and innovation. Collectively, these endeavours highlight the necessary conditions for productive stakeholder engagement and strengthen the role of stakeholders at different stages of the innovation process. However, **the lack of integration of these insights within technological programmes limits their capacity to enhance responsiveness of research and innovation in the long term.** While Responsible Research and Innovation (RRI) is formally integrated as a cross-cutting issue in Horizon 2020, it is not always clear what exactly this implies for specific programmes and projects. **There is no clear structure or systematic approach at the project level that defines, when, where and how stakeholders are to be engaged.**

This suggests that further experimentation is required along the following main lines:

Considering that public confidence in nanotechnologies is ultimately a function of the responsive capacities of the research and innovation system, the effective governance of nanotechnologies will require that **measures to incorporate different viewpoints are structurally embedded in decision making processes on nanotechnologies**. A continuous platform, bringing together research, industrial, policy and societal actors, would enable mutual learning within the platform of what works and what doesn't, gathering expertise on effective governance mechanisms.

Additionally, the functionality and applicability of stakeholder engagement need to be clearly presented to those wishing to invest in the field. Existing experience should be made more accessible and actionable through the **creation of concrete, ready-to-use tools that people can work with for each of the possible different types of stakeholder activities, suggesting where they have been employed, by whom and with what concrete outcomes**. For example, citizens' panels or deliberations can be useful to assess public views in

the early stages of emerging technologies with a disruptive potential, while user committees are more appropriate in highly applied research contexts where industrial users or consumers can express their interests. This endeavour would require **support from those with experience in organising the different activities which could be offered** for example through an expert service on societal stakeholder engagement along the lines of the Exploitation Strategy and Innovation Consultants (ESIC) service within the European Commission's NMBP programme.

Experience within the NanoDiode project shows that the effective integration of societal considerations in research and innovation requires **a culture change, where the success of research and innovation - and the career opportunities of researchers - is also determined by the societal benefit of the outcomes.** This change will involve – together with nanospecific education inclusion in (pre-) university level - rethinking academic reward structures. This extends to the assessment criteria for awarding research proposals, to the peer review of research papers, to the criteria for career advancement, and to the criteria by which researchers evaluate each other's work. It will also require compelling examples of how the integration of societal considerations demonstrably led to new opportunities for researchers.

Buy-in from all stakeholders will be essential for the transition towards a research and innovation system where societal considerations become part of the innovation drive rather than a problem to be addressed.