NANO2ALL

SOCIETAL ENGAGEMENT ON RESPONSIBLE NANOTECHNOLOGY

D2.3 Online Self-Assessment Tool

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Dissemination and uptake

The report is primarily aimed at the project partners and the EU project officer. It will be made publicly available, allowing other interested persons to read it as well.

Short Summary of results (<250 words)

This report discusses the development of the NANO2ALL Online Self-Assessment Tool that will be posted on the website www.nano2all.eu in seven languages (English, French, Spanish, Polish, Italian, Swedish and Hebrew). The aim of the tool is to assist participants in the project dialogues in establishing their personal training needs. This will guide the project team to adjust the content of the training sessions that will precede the dialogues in order to enable the participants to participate optimally in these events. This report also collects further information relevant for the organisation of the dialogues and related training activities.

Evidence of accomplishment

This report.

Contents

1. Introduction

This report, the Online Self-Assessment Tool, has been developed as part of the NANO2ALL (Nanotechnology Mutual Learning Action Plan for Transparent and Responsible Understanding of Science and Technology) project, which has received funding from the European Union Horizon 2020 programme under Grant Agreement number 685931. The Online Self-Assessment Tool represents Deliverable 2.3 of Work Package 2 (WP2) – Developing a Common Understanding that aims to assist participants in the project dialogue activities in establishing their personal training needs. This will guide the project team in adjusting the content of the training sessions that will precede the dialogues, thereby enabling the participants to achieve maximum participation in these events. The European dialogue will be held in English, while the national dialogues will be conducted in each country's national language. The online Self-Assessment Tool will be available on the www.nano2all.eu website in seven languages (English, French, Spanish, Polish, Italian, Swedish and Hebrew).

In addition to presenting the NANO2ALL Online Training Needs Self-Assessment tool, this report also collects further information relevant for the organisation of the dialogues and related training activities. These events and activities include the following:

National Citizen Dialogues

- Participants: local citizens
- For these sessions, the online self-assessment tool will not be used, since no personalized training will be applied;
- Self-study materials will be sent to the participants to prepare for the dialogues. Training material sources are listed in Chapter 5 of this report;
- A short training will be integrated in the dialogue set-up and exercises at the beginning of session.

European and National Multi-Stakeholder Dialogues

- Participants: Citizens, Policy Makers and Research Funders, Media, Civil Society Organisations, Academia, Industry.
- Participants will be asked to fill-in the online self-assessment tool, as soon as they are admitted to the dialogues. After filling in the tool, each participant will receive a personalized self-study training package to prepare for the dialogues;
- Self-study will be completed by webinars in English to cover some knowledge gaps in specific domains;
- A short training will be integrated in the dialogue set-up and exercises at the beginning of session.

This report has the following structure:

Chapter 1 – Introduction

This chapter give a general introduction to the report.

Chapter 2 – Review of earlier dialogues

This chapter reviews previous and current nanotechnology discussions in the dialogue countries (FR, ES, PL, IT, SE, IL) with the aim to provide a general context and identify an initial, non-exhaustive list of stakeholders in each country who may be interested in joining the NANO2ALL dialogue. The information presented in chapter 2 about stakeholders who have been involved in earlier dialogue on nanotechnology, and about their positions, will also be used in the training regarding topic v): their level of knowledge of other stakeholders' views.

Chapter 3 – Training survey results

The Training Needs Self-Assessment tool design has been tested in two short surveys among journalists and stakeholders, whose results are summarised in this chapter.

Chapter 4 – Outline of the Self-Assessment tool

This chapter provides an insight into the Online Self-Assessment tool content and the process to invite dialogue participants to fill-in the form.

Chapter 5 - Training Structure and Agenda

This chapter provides an overview of the structure and contents of the training programme

2. Review of Earlier dialogues

Actors in all six NANO2ALL dialogue countries have engaged in earlier dialogues of public engagement projects on nanotechnology. Results of these are summarised below. In addition, relevant stakeholders who could be interested in joining the NANO2ALL dialogues are identified.

2.1. France[1]

France has been among the most active countries in public dialogue on nanotechnology during the last decade or so. As a major player in this area, France has many organisations and networks committed to promoting and exploring nanosciences and nanotechnologies, while on an educational level the country is home to several universities offering research and educational opportunities in nanotechnology. With respect to the responsible conduct of nanotechnologies, there is a high degree of awareness of the concept of RRI and it is widely applied in the national science and technology system. The *National Research and Innovation Strategy* specifically refers to such approaches, as it expresses the need of "*maintaining the link between researchers and citizens especially by ethics and ethical reflection on the expertise and the social responsibility of scientists*" (RESAgora, 2014). Most funds for R&D into nanoscience and nanotechnologies (N&N) in France require researchers to investigate ethical and societal implications of nanotechnology. Regulations related to the responsible conduction of nanotechnologies include Articles L. 523-1 to L. 523-5 of the French Environmental Code. This is a Compulsory Registry of "Nanomaterials", according to which French entities that use (produce, import, distribute, or formulate) "*substances with nanoparticle status*"[2] are required to register this on an online platform[3]. This regulation follows the precautionary principle and facilitates the traceability of nanomaterials on the market. Furthermore, the National Public Debate Commission (CNDP), an independent body, is responsible for organising public debates and citizens' participation in policy-making in diverse fields. In the period of 2009-2010, CNDP implemented a national public debate on N&N.[4] The government responded in 2012, announcing a number of policy measures, most notably the registration of products incorporating nanomaterials brought into the French market. (French government, 2012)

The French Parliament has discussed nanotechnology policies on several occasions since the first report by Senator Claude Saunier on micro and nanoelectronics in 2003. In 2004, the Parliamentary Office for Technology Assessment OPECST studied the potential and societal aspects of Nanomedicine. Senators Jean-Claude Lorrain and Daniel Raoul analysed trends in nanobiotechnology research and potential medical applications, nanosafety, ethical as well as social-economic and educational aspects. (Lorrain & Raoul, 2004). In 2006, they organised a

[1] This section partly overlaps with the analysis of French policies fostering RRI in nanotechnology in NANO2ALL's report D2.1: Review of current RRI in nano policy landscape, edited by Foteini Psarra.

[2] http://www.cnbss.eu/index.php/editorial/item/84-compulsory-registry-of-%E2%80%9Cnanomaterial%E2%80%9D-in-france-part-1

[3] https://www.r-nano.fr/

[4] http://cpdp.debatpublic.fr/cpdp-nano/

public hearing on potential risks and ethical challenges, calling for a precautionary approach.[5] In later years, nanotechnology was addressed in discussions on risk governance, personalised medicine, innovation in micro-electronics, environmental legislation, European policies, etc. By 2011, the National Assembly had assessed the relevance of current regulations for a precautionary approach to emerging technologies, including nanotechnologies, stimulating innovation while addressing fears. The deputies Claude Birraux and Jean-Yves Le Déaut, proposed a wide range of measures including public awareness-raising and dialogue.[6] It is unclear how many suggestions have in fact been implemented. After 2011, the interest of French politicians moved to other emerging technologies, including synthetic biology, and specific applications such as personalised medicine, which are enabled by nanotechnology and converging technologies.

The bulk of the public debate on nanotechnology in France took place between 2003 and 2010. The French research council 'Centre National de la Recherche Scientifique' (CNRS) collected online materials in French and English published until 2008.[7] The debate centre Vivagora organised public debates on nanotechnology between 2003 and 2012.[8] The local government of Ile de France also organised dialogues before 2010. VeilleNanos continues to act as a clearing house for public information concerning nanotechnologies and nanomaterials. It is hosted by the 'Association de veille et d'information civique sur les enjeux des nanosciences et des nanotechnologies' (AVICENN).[9] The forum NanoRESP has been organising discussions about nanomaterials and nanotechnologies since 2013. It is funded by large industrial operators including: BASF France, EDF, l'Association technique de l'industrie des liants hydrauliques (ATILH), la Fondation du groupe SMABTP, le Laboratoire national de métrologie et d'essais (LNE), le Groupe Renault. The society Anthropocene organises the meetings. The steering group consists of representatives from research, citizens, industry, journalists and civil society associations.[10]

In the framework of NanoDiode, the Centre for Atomic Energy (CEA) organised two citizen dialogues on nanotechnology. The first focused on solar energy for housing and electric mobility applications in the town of Engins on 10 October 2014. This engaged the local government, a group of citizens favouring solar energy (Centrale Villageoise in Lans-en-Vercors), a local solar energy association, solar energy researchers from the National Solar Energy Institute (INES), and representatives from the 'Association pour une Gestion Durable de l'Energie' (AGEDEN), a civil society organisation (CSO) focusing on renewable energies. The second dialogue was held on 12 October 2015 at CEA MINATEC in Grenoble, together with the local Chamber of Business and Industry (Grobe, 2015).

[5] https://www.senat.fr/opecst/resume/4pages_nano1_anglais.pdf
[6] http://www.assemblee-nationale.fr/13/dossiers/innovation_epreuve_peurs_risques.asp
[7] http://www.cnrs.fr/cnrs-images/nano/index.html
[8] https://fr.wikipedia.org/wiki/Doroth%C3%A9e_Benoit_Browaeys#VivAgora
[9] http://veillenanos.fr/wakka.php?wiki=PagePrincipale
[10] http://www.nanoresp.fr/

The Region Nord – Pas de Calais funds the project NANOSCOOPE[11], which is organising stakeholder dialogues on nanotechnology from 2013 until 2017. The discussions focus on risks, benefits and ethical aspects of nanomaterials and nanoelectronics.

Opinion polls organised by Eurobarometer (TNS, 2010), NanoDiode (Grobe, 2014) and NanOpinion (Marschalek et al. 2014) indicate that French respondents are more aware of nanotechnology than the average European.[12] In 2010, they were also slightly more positive about future impacts of nanotechnology, and responded "don't know" to the question of whether to encourage nanotechnology, as often as their fellow Europeans.

2.1.1 Experienced stakeholder representatives in nanodialogue in France

Researchers and scientists:	Nanoscientists are working in nanotechnology centres of excellence in different regions in France, including some with recent experience in nanodialogue: - In Grenoble in CEA/LETI – MINATEC.[13] This includes 3000 researchers and 1200 students - Other nanoscientists are working at CNRS in different institutes across the country and in universities. An example is the L'Institut d'Électronique, Microélectronique et Nanotechnologie (IEMN) in the region Nord-Pas de Calais.[14] - The metrology institute Laboratoire national de métrologie et d´essais (LNE) is also engaged in nanotechnology measurements.[15] - A group of solar energy researchers from INES are also working on nanotechnology - Philosophers and social scientists also study nanotechnology.
Policy makers and research funders	Several ministries in France are engaged in governance of nanotechnology, such as the Ministry of Ecology, Sustainable Development and Energy[16]. Several regions have also registered smart specialisation in nanotechnology. In France, these include Ile de France (nanomaterials for eco-construction)[17], Haute Normandie (nanotechnology for reliability of systems and components in embedded systems in manufacturing and automotive)[18], Bourgogne

[11] http://nanoscoope.iemn.univ-lille1.fr/
[12] Summarised in NANO2ALL report D2.2: Online Training Needs Survey Report
[13] http://www.minatec.org/en/
[14] http://www.iemn.fr/
[15] http://www.entreprises.gouv.fr/metrologie/club-nanometrologie
[16] https://www.r-nano.fr/
[17] http://s3platform.jrc.ec.europa.eu/regions/fr10?s3pv=1
[18] http://s3platform.jrc.ec.europa.eu/regions/fr23?s3pv=2

	(nanotechnology for advanced materials and production processes)[19], France-Comte (nanotechnology and nanomaterials in diagnostics and sensors for different sectors, as well as in jewellery)[20] and Poitou-Charentes (nanotechnology in advanced materials and reduction of environmental impact in transport systems)[21] The region Nord-Pas de Calais funds dialogue on nanotechnology (NANOSCOOPE). Région Rhône-Alpes, Protection Departmental Committee of Nature and the Environment of the Loir et Cher (NSHRC)
Media	- Via EUSJA - French media participating in earlier EU funded projects on nanotechnology, via http://cordis.europa.eu/projects/home_en.html
Industry	Many companies active in R&D in nanotechnology are located close to each other in regional nanotechnology clusters. A leading cluster in France is MINATEC (already mentioned), home to 600 industrialists. Other companies are engaged in nanodialogue through the NANORESP Forum[22]: BASF France, Electricite de France, ATILH, SMABTP and Renault.
Civil Society Organisations	Recently active CSOs are Vivagora, Veillienanos (Avicenn) and AGADEN (nano-enabled solar energy), Helio International, CREPAN, ASPAS - Association Pour La Protection Des Animaux Sauvages, Foundation Sciences Citoyennes (FSC, France), Réseau Semences Paysannes (RSP, France), WECF (Women in Europe for a Common Future) France, Consommation, Logement Et Cadre de Vie – CLCV, UFC-QUE CHOISIR, France Nature Environment, Générations Futures, Perfect Union, “RESPIRE", Reseau Environnement Sante, SOS - Loire Vivante (European River Network), SEPANSO, FNE - France Nature Environnement, CNIID - Centre National D'information Indépendante Sur Les Déchets, Agir pour l'Environnement (APE), Générations Futures, Zero Waste

[19] http://s3platform.jrc.ec.europa.eu/regions/fr26?s3pv=1
[20] http://s3platform.jrc.ec.europa.eu/regions/fr43?s3pv=2
[21] http://s3platform.jrc.ec.europa.eu/regions/fr53?s3pv=2
[22] http://www.nanoresp.fr/

2.2. Israel

Relative to its size, Israel has invested a lot in nanotechnology and has organised a large number of activities targeting dialogue and awareness-raising of nanotechnology. Former Israeli President Shimon Peres put nanotechnology on the political agenda in 2003, and raised funding for Israel's National Nanotechnology Initiative (INNI).[23] This initiative stimulated the development of nanotechnology in Israel through international cooperation. From the beginning, ethical and societal issues have been addressed, including potential contributions to water purification and food preservation as well as military applications (c.f. Malsch, 2011). INNI was funded over two consecutive periods: the first ran from 2007 until 2012, the second covered the subsequent five years. INNI mainly fosters collaboration in the triple helix (academia, industry, government) aiming at nano-innovation.

Israel has been an Associated Country to the EU Framework Programmes for Research and Technological Development (RTD) and Horizon 2020 for many years. Partners from Israel have actively participated in EU funded projects on nanotechnology in general and on responsible nanotechnology development in particular. A frequent player is the Israeli School Net ORT,[24] which participated in the NanoYou, NanoChannels[25], NanoEIS,[26] and NanOpinion[27] projects. Israeli respondents to the NanOpinion poll were well aware of nanotechnology (scoring 6.4 out of 10 compared to a European average of 4.69), and were more supportive than respondents from other countries including Spain and Italy.[28]

Tel Aviv University has participated in a number of EU projects discussing ethical, legal and societal aspects (ELSA), including Nano2Life with the first ELSA board[29]. ICTAF (Interdisciplinary Centre for Technological Analysis and Forecasting, Tel Aviv University) led an EU project (FESTOS) exploring potential security threats of emerging technologies, including nanotechnology.[30] The Center for Nanoscience and Nanotechnology at Tel Aviv University promotes education and outreach to the general public.[31] The Hebrew University Center for Nanoscience & Nanotechnology[32] engages in nano-education and outreach, including the recent NanoArt project.[33]

[23] http://www.nanoisrael.org/
[24] http://en.ort.org.il/
[25] http://www.nanochannelsfp7.eu/
[26] www.nanoeis.eu
[27] http://nanopinion.eu/
[28] http://results.nanopinion.eu/
[29] http://cordis.europa.eu/project/rcn/74335_en.html
[30] http://cordis.europa.eu/project/rcn/89978_en.html
[31] http://nano.tau.ac.il/ , https://english.tau.ac.il/priorities/nano
[32] http://www.nano.huji.ac.il/
[33] - no, that is another initiative. I http://nano.huji.ac.il/page/Nano_art_Huji

2.2.1 Experienced stakeholder representatives in nanodialogue in Israel

Researchers and scientists:	- Tel Aviv University (ICTAF / Center for Nanoscience and Nanotechnology).[34] - ORT (network of secondary schools), projects on nanotechnology education and dialogue - Hebrew University Center for Nanoscience and Nanotechnology.[35]
Policy makers and research funders	- Israel's National Nanotechnology Initiative INNI
Media	- Via EUSJA - Israeli media participating in earlier EU funded projects on nanotechnology, via http://cordis.europa.eu/projects/home_en.html
Industry	The "Start-up Country" Israel has many high tech companies developing and applying nanotechnologies. Several have started as spin-offs from academic nanotech centres. Larger companies are cooperating with TAUs nanotech centre including HP, Johnson & Johnson, Merz Pharma and RAFAEL.
Civil Society Organisations	- Via ORT - Israel Consumer Council

2.3. Italy[36]

Several Italian organisations have been engaged in dialogue on nanotechnology at national and European levels. The importance of nanotechnology for the development of products with applications in various key fields and sectors is widely recognized in Italy. A significant amount of funding has been provided over the last few years for nanotechnology research and development. The main governmental instrument for R&D planning and funding in Italy is the National Research Programme (PNR) 2014-2020. Under the theme of Industrial Leadership, there is a specific funding stream for nanotechnology and nano-electronics R&D.

In line with international trends and European priorities, there are also some initiatives at sectorial/institutional levels with regard to responsible nanotechnologies: for instance, the certification standard for the business world,

[34] http://nano.tau.ac.il/

[35] http://www.nano.huji.ac.il/

[36] This section partly overlaps with the analysis of Italian policies fostering RRI in nanotechnology in NANO2ALL's report D2.1: Review of current RRI in nano policy landscape, edited by Foteini Psarra.

the System for the Responsible Management of Nanomaterials in Consumer Products, or other measures that are based on the precautionary principle, such as the National Federation for Chemical Industry (Federchimica), which established a Nano Product Stewardship working group. In addition, the Istituto di Fotonica e Nanotecnologie (CNR-IFN) is in charge of carrying out, promoting, spreading, transferring and improving research activities in the main sectors of knowledge growth and its applications on the scientific, technological, economic and social development of the Country. In 2011, the Italian Workers' Compensation Authority (INAIL) published a White Book on the occupational health and safety effects of engineered nanomaterials. The Industrial association AIRI hosts the national focal point for nanotechnology and key enabling technologies Nanotec IT.[37] This organisation is very active in national and European projects fostering Responsible Research and Innovation in nanotechnology, including Nanodiode and the Satori project.[38] In 2015, they organised a public dialogue on nanotechnology[39] together with the national science museum Leonardo Da Vinci in Milan[40] and researchers from the companies Saes Getters/ETC[41] and Tec Star[42] (Grobe, 2015).

AIRI NanoTec IT is currently cooperating with the Superior Institute for Health (ISS) in the project InnovaRe Nano on responsible nanoinnovation. This is funded by the region of Lazio.[43] The Istituto Nazionale Assicurazione Infortuni sul Lavoro (INAIL) is funding the project Nano-lab[44]: developing risk management instruments for nanomaterials. The project is coordinated by the Laboratory NEST of the Scuola Normale Superiore (SNS) in cooperation with the Istituto Nanoscienze del Consiglio Nazionale delle Ricerche (CNR-NANO), the Center for Nanotechnology Innovation dell'Istituto Italiano di Tecnologia (CNI-IIT) and the Associazione Italiana per la Ricerca Industriale (AIRI-Nanotec)[45].

The environmental NGO Legambiente has developed a position "Towards a sustainable and responsible development of nanotechnologies"[46] as partner in the EU funded project NanoCAP, aiming to build capacity among civil society organisations for participating in stakeholder dialogue on nanotechnology. In 2015, they published a report on innovation and sustainability in the construction sector, including a discussion on nanosafety. (OISE report 2015)

The Universities of Bologna and Palermo, and the Museum of Bali have developed a hands-on secondary school teaching module for RRI on nanoscience and nanotechnology in the framework of the EU funded project IRRESISTIBLE (2013-2016).[47]

[37] http://www.nanotec.it/public/
[38] http://satoriproject.eu/
[39] http://www.nanotec.it/public/2015/03/esplora-il-nano-mondo-dialoghi-sulle-nanotecnologie/
[40] http://www.museoscienza.org/english/leonardo/
[41] https://www.saesgetters.com/group/saes-group
[42] http://www.tec-star.it/en/
[43] http://www.nanotec.it/public/2016/03/progetto-rinnovarenano-sviluppo-responsabile-dei-nanomateriali-ed-opportunita-per-il-sistema-industriale-regionale/
[44] http://www.nanotec.it/public/2016/03/progetto-nano-lab-gestione-dei-nanomateriali-nei-laboratori-di-ricerca-metodologie-operative-di-control-banding/
[45] http://www.nano-lab.it/
[46] http://www.nanocap.eu/Flex/Site/Download4648.pdf?ID=4214
[47] www.irresistible-project.eu

2.3.1 Experienced stakeholder representatives in dialogue about nanotechnology in Italy

Researchers and scientists:	- University of Bologna, University of Palermo (nano-education). - Ca'Foscari University Venice (nanosafety) - Istituto di Fotonica e Nanotecnologie (CNR-IFN) - Laboratory NEST of the Scuola Normale Superiore (SNS) - Istituto Nanoscienze del Consiglio Nazionale delle Ricerche (CNR-NANO), - the Center for Nanotechnology Innovation dell'Istituto Italiano di Tecnologia (CNI-IIT) - ISS (nano-health)
Policy makers and research funders	- INAIL (nanosafety)
Media	- Via EUSJA - Italian Union of Science Journalists, http://ugis.it/cms/ - Science Writers in Italy, http://www.sciencewriters.it/wp/ - Italian media participating in earlier EU funded projects on nanotechnology, via http://cordis.europa.eu/projects/home_en.html
Industry	- AIRI Nanotec IT, the National Federation for Chemical Industry and associated companies. (e.g. Saes Getters/ETC and Tec Star) - Federchimica
Civil Society Organisations	Legambiente, ALTROCONSUMO, Consumatori Italiani Per L'europa (CIE), CieloBuio, Genitori Antismog, Cittadini Per L'aria, Fondo Ambiente Italiano, Federazione Nationale Pro Natura

2.4. Poland

Several initiatives on responsible nanotechnology research and on dialogue on nanotechnology have taken place in Poland in recent years. The Foundation for Nanoscience and Nanotechnology Support (NANONET)[48] has coordinated nanoscience and nanotechnology in Poland since 2006. It fosters research and innovations as well as governance-related aspects, including standardisation, legal, social and ethical issues and public communication. NANONET has participated in the EU funded project NanoDiode, and has trained Polish labour inspectors in nanosafety issues. In the framework of NanoDiode, NANONET organised a dialogue in Katowice on 8 June 2015,

[48] www.nanonet.pl

engaging local government representatives, industry and researchers, and the Polish Normalisation Committee. Citizens, students and journalists were also invited. The discussion targeted the relevance of nanotechnology to the local economy and business-to-science collaboration (Grobe, 2015). More recently, NANONET co-organised the conference InterNano Poland 2016, bringing together nanoscience and business.

In 2011, the Polish Academy of Sciences organised an international conference on Nanoethics, discussing the EU Code of Conduct for Nanotechnology Research.[49] During the period 2007-2013, the Strategy for the Reinforcement of Polish Research and Development Area in the Field of Nanosciences and Nanotechnologies was validated, issued by the Interdisciplinary Committee for Nanoscience and Nanotechnology, Ministry for Science and High Education.[50] By the end of this period, a foresight study on nanotechnology in 2020 was carried out, but there is no available information on any follow-up.[51]

The Bureau of Research of the Sejm (the Polish parliament) published a report on governance of science and technology in 2015.[52]

The Jagiellonian University and its University Museum have developed a secondary school teaching module on nanotechnology (catalysis) as part of the EU funded project IRRESISTIBLE (2013-2016).[53]

The Jerzy Haber Inst. On Catalysis, PAS and the AKADEMIA GORNICZO-HUTNICZA IM. STANISLAWA STASZICA W KRAKOWIE were partners in the project NanoEIS, which involved nanotech education for industry and society.[54]

Bialystok University of Technology (BUT) is also an experienced stakeholder in the field of nanotechnology.

2.4.1 Experienced stakeholder representatives in nanodialogue in Poland

Researchers and scientists:	Jagiellonian University / Museum Polish Academy of Sciences Jerzy Haber Inst. On Catalysis, PAS Akademia Gorniczo-Hutnicza IM. Stanislawa Staszica W Krakowie Bialystok University of Technology (BUT)
Policy makers and research funders	- Bureau of Research, Sejm - Ministry for Science and Education - Nanotechnology is included in the smart specialisation strategy in the following Polish regions: Slaskie (ICT: Micro/Nanoelectronics) , Lubelskie (Medicine & Health: Nanotechnology & engineering (tissue engineering, advanced materials, regenerative medicine) and Podkarpackie (Nanotechnology) .

[49] http://cordis.europa.eu/result/rcn/162481_en.html
[50] http://statnano.com/country/poland / http://www.nauka.gov.pl/g2/oryginal/2013_05/7791ff66320648e61f4836f6eb598b4a.pdf
[51] http://ntfp2020.pb.edu.pl/
[52] http://eptanetwork.org/database/policy-briefs-reports/article/152328-bas-2015-infos-17-200-governance-of-science-and-technology
[53] www.irresistible-project.eu
[54] http://cordis.europa.eu/project/rcn/105496_en.html

Media	- Via EUSJA - Polish Science Journalists Association, http://www.naukowi.pl/ - Polish media participating in earlier EU funded projects on nanotechnology, via http://cordis.europa.eu/projects/home_en.html
Industry	- Organised by Nanonet - Polish normalisation committee
Civil Society Organisations	Association of Polish Consumers – SKP, Polish Consumer Federation – Federacja Konsumentów, Polski Klub Ecologiczny, ISD - Institute for Sustainable Development, CPE - Centrum Prawa Ecologicznego

2.5. Spain[55]

A number of organisations in Spain have engaged in awareness-raising and dialogue on nanotechnology as part of European and national initiatives. The main Spanish policies on research, development and innovation are discussed in the NANO2ALL deliverable report D2.1: Current RRI in Nano Landscape Report. According to current policy documents, the nanotechnology field is identified as a priority. The Spanish government agreed with the regions to design and implement research and development policies on nanotechnologies in a coordinated way that suggests the high relevance of this field in Spain and the need for such policies (OECD, 2013). The policies include several principles of RRI, such as ethics, open access and public participation in general terms. As for the latest aspect, the Science Act[56] refers to the societal participation from the point of view of the promotion of science, its social acceptability, and states that one of the roles of the Advisory Council for Science, Technology and Innovation[57] is to introduce evaluation mechanisms to "measure the social effectiveness of public resources used" (RESAgora, 2013). Moreover, the National Plan emphasises that a new model of R&D&I policies is needed that will help anticipate future demands, thus enabling the adoption of policies based on such demands.

Over 3000 nanoscientists in 360 research groups have been organised by the association la Red Española de Nanotecnología (NanoSpain).[58] They collaborate in working groups in different scientific fields. Concerning risk assessment procedures on nanotechnologies, there are a few examples of public laboratories implementing it. Some centres have developed their own codes and guides for nanosafety. Additionally, there are some regional level initiatives in Spain, such as the Competence Centre for Environment, and Health and Safety Issues on Nanotechnology by the Basque government. The network Red "José Roberto Leite" de Divulgación y Formación en Nanotecnología (NanoDYF) organises Spanish and other Ibero-American research groups interested in

[55] This section partly overlaps with the analysis of Spanish policies fostering RRI in nanotechnology in NANO2ALL's report D2.1: Review of current RRI in nano policy landscape, edited by Foteini Psarra.
[56] Spanish National Plan for Scientific and Technical Research and Innovation 2013-2016
[57] http://english.awti.nl/
[58] http://nanospain.org/nanospain.php?p=h

education and awareness-raising on nanotechnology since 2010. Since 2015, it has been hosted by the Spanish society of physicists, the Colegio Oficial de Físicos (COFIS).[59] The Spanish member organisations are: Asociación Gallega de Comunicación de Cultura Científica y Tecnológica, Pontevedra; Universidad Autónoma de Barcelona; Escuela Técnica Superior de Ingeniería of Universidad Pontificia Comillas (ETSI-ICAI); Instituto de Ciencia de Materiales de Barcelona; Consejo Superior de Investigaciones Científicas; Universitat Politècnica de València; Universidad de Santiago de Compostela; Universitat de Barcelona (Laboratorio de Medios Interactivos); Universidad Carlos III de Madrid; Instituto de Microelectronica de Madrid; Universitat Jaume I, Castellón.

2.5.1 Experienced stakeholder representatives in nanodialogue in Spain

Researchers and scientists:	- Organised by NanoSpain - Education and outreach is organised by NANODYF - CIC nanoGUNE
Policy makers and research funders	- Nanotechnology is included in the smart specialisation strategy of the Principado de Asturias (Advanced and sustainable materials - Materials for industry, Sustainable materials, Nanomaterials and Graphene)
Media	- Via EUSJA - Spanish Association of Science Communication, http://www.aecomunicacioncientifica.org/ - Catalan Association of Science Communication, http://www.accc.cat/ - Spanish media participating in earlier EU funded projects on nanotechnology, via http://cordis.europa.eu/projects/home_en.html
Industry	- NanoSpain includes around 50 industrial members (out of 368): www.nanospain.org
Civil Society Organisations	Confederación De Consumidores y Usuarios – CECU, Organización De Consumidores y Usuarios – OCU, Ecologistas en Acción, Fundacion Nueva Cultura Del Agua – FNCA, VIVOSANO, "ECO-UNION", IIDMA - Instituto Internacional De Derecho Y Medio Ambiente, Federacio Ecologistes de Catalunya (EdC), ECODES - Ecology and Development Foundation, ADEGA - Asociación para a Defensa Ecolóxica De Galiza, Agaden, Innovació Ambiental Al Servei de la Societat

[59] http://www.nanodyf.com/

2.6. Sweden

While Swedish universities and other organisations have been active in nanotechnology for some time, the umbrella organisation gathering the nanotechnology actors (SwedNanoTech) was founded later, in 2010. This association aims to promote nanotechnology in the country and to stimulate stakeholder dialogue on the sustainable development of nanotechnology and nanosafety.[60] In May 2016, they organised a Nano Forum for businesses in Stockholm.

In 2008, the research council VINNOVA published a review of nanotechnology in Sweden, including policy recommendations (Perez & Sandgren, 2008). In 2011, the Evaluation and Research Secretariat at the Swedish Parliament prepared a fact sheet on nanotechnology and health, and organised a Futures day discussing emerging technologies including nanotechnology[61]. Currently, nanotechnology research and education is still ongoing at several universities, including Lund University[62], Chalmers University[63], and Uppsala University[64]. The Swedish Chemicals Agency (KEMI) published a report Mapping R&D in nano in Sweden, in 2012.[65] They found that researchers at Lund University, Chalmers University of Technology and the Royal Institute of Technology (KTH) were most active in nanomaterials research, while the Karolinska Institute was most active in research on nanosafety. They also identified 82 companies with R&D in nanotechnologies in Sweden. Most of the activity was in life sciences and medicine, energy and clean technology and electronics.

KEMI also reviewed nanotechnology activities at Swedish ministries and government agencies, identifying relevant activities at 20 organisations, and published a report on it in 2012.[66] The public bodies which were engaged at that time include 16 which submitted information on their activities. These are listed in the table under sub-section 2.6.1

On 1st December 2015, KEMI proposed to the government to impose new requirements for companies to register nanomaterials in products. The responsible person at KEMI is Victor Björkgren.[67] Within six months, KEMI was formulating the proposal.[68]

Sweden's capital Stockholm is home to the European Chemicals Agency (ECHA)[69], which will host the new EU Nanomaterials Observatory EUNO. This observatory will organise European stakeholder dialogue on nanomaterials.

[60] http://swednanotech.com/in-english/
[61] http://eptanetwork.org/database/projects/article/8468-nanotechnology-and-health
[62] http://www.nano.lu.se/
[63] http://www.chalmers.se/en/areas-of-advance/nano/Pages/default.aspx
[64] http://www.teknik.uu.se/nanotechnology-and-functional-materials/
[65] http://www3.kemi.se/Documents/Publikationer/Trycksaker/Rapporter/Rapport5_12.pdf?epslanguage=sv
[66] http://www3.kemi.se/Documents/Publikationer/Trycksaker/PM/PM4_12.pdf?epslanguage=sv
[67] http://www.kemi.se/en/news-from-the-swedish-chemicals-agency/2015/the-swedish-chemicals-agency-proposes-reporting-requirements-for-nanomaterials/
[68] http://www.kemi.se/nyheter-fran-kemikalieinspektionen/2016/forslag-till-ny-foreskrift-om-nanomaterial-remitteras-i-host/
[69] http://echa.europa.eu/

2.6.1 Experienced stakeholder representatives in nanodialogue in Sweden

Researchers and scientists:

Researchers and scientists:	- Lund University, - Chalmers University of Technology - Royal Institute of Technology (KTH) - Karolinska Institute (nanosafety) - Uppsala University - VINNOVA
Policy makers and research funders	KEMI coordinates government activities on nano in 20 ministries and authorities, including: - The Foundation for Strategic Environmental Research (MISTRA), The Medical Products Agency (MPA), The National Food Agency (NFA), The National Veterinary Institute (SVA), The Swedish Agency for Non-Proliferation and Export Controls (ISP), The Swedish Chemicals Agency (KEMI), The Swedish Civil Contingencies Agency (MSB), The Swedish Defence Research Agency (FOI), The Swedish Defence Materiel Administration (FMV), The Swedish Environmental Protection Agency (NV), The Swedish National Board of Housing, Building and Planning (BOVERKET), The Swedish National Council on Medical Ethics (SMER), The Swedish Patent and Registration Office (PRV), The Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning (FORMAS), The Swedish Transport Administration (TRAFIKVERKET), The Swedish Work Environment Authority (SWEA).
Media	- Via EUSJA - Swedish Association of Science Journalists, http://www.vetenskapsjournalistik.org/ - Swedish media participating in earlier EU funded projects on nanotechnology, via http://cordis.europa.eu/projects/home_en.html
Industry	- Swednanotech coordinates industrial network on nanotechnology.
Civil Society Organisations	Sveriges Konsumenter, The Swedish Consumers' Association, Nature and Youth, Swedish NGO Office for Nuclear Waste Review,

	Naturskyddsföreningen, AIRCLIM - Air Pollution and Climate Secretariat, CHEMSEC - International Chemical Secretariat

3. Training survey results

This report builds upon the results of two surveys, testing the initial version of the Online Self-assessment tool (both available at www.nano2all.eu). These explored training needs of journalists and other stakeholders, respectively, regarding i) Nanotechnology, ii) Responsible Research and Innovation (RRI), iii) Techniques for effective dialogue and stakeholders' engagement, iv) How to anticipate the future, and v) The level of knowledge of other stakeholders, as well as objectives, views and concerns on nanotechnology on a national level [70]. The surveys were distributed among the European Society of Science Journalists (EUSJA)'s contacts and across Nanofutures Association (NfA) contacts. The aim of the surveys was to confirm and complement the training needs identified in the literature, and provide possible inputs into and be the basis for the Online Self-Assessment Tool to be built in the project. Results from these surveys will also feed into the content of the training sessions that will be implemented to empower participants of the future dialogue activities with knowledge that is considered relevant for them to effectively engage in these events.

The surveys were posted online between 27th May and 10th June 2016, and email invitations were disseminated to the respective journalists and researchers, business people, other members of the NfA, and nanotechnology stakeholders. In total 41 (10+31) responses were received.

The responses to the first survey, returned by the EUSJA's contacts, suggests that most respondents understand what both nanotechnology and Responsible Research and Innovation mean. It also suggests that they have been involved in dialogues about science and technology. Foresight techniques are the least known about: 40% of the respondents had not heard about it. The majority are well aware of the positions of three or more stakeholder groups on nanotechnology. In the framework of the NANO2ALL project, we intend to include journalists as one of the stakeholder groups and gather data on their training needs through the NANO2ALL Online Self-Assessment Tool.

The second online survey, distributed across NfA contacts, covered all nanotechnology stakeholder groups apart from journalists. While more responding scientists demonstrated an advanced knowledge about nanotechnology than the other responding stakeholder groups, these scientists tend to be less aware of positions of different stakeholder groups on nanotechnology. This suggests that training for scientists could include more information on these positions, while training for the other stakeholders should focus on transferring more knowledge about nanotechnology and related issues. As less than half of all respondents declared that they had advanced knowledge on RRI, dialogue and foresight techniques, some information about these aspects should be covered

[70] see also report D2.2: Online Training Needs Survey Report at www.nano2all.eu

by the general training. Almost half of the scientists responded “I work or study in Responsible Research and Innovation”, but some of them may be natural scientists trying to conduct R&D in a responsible way, while others may be social scientists developing theories and methodologies for RRI. To accommodate the knowledge needs of both groups, the training should include information on practical methods for carrying out nanotechnology research in a responsible way, as well as on the state of the art of RRI theorising. The purpose of the training offered in NANO2ALL is to prepare participants for the dialogues. We will include links in the ‘training’ section on the website to relevant materials for self-study as a service to visitors of the website. Training on foresight techniques appears to be most in demand, so enough time should be devoted to it in the general training offered to participants in the dialogue, introducing them to the techniques that will be used in the dialogue and explaining the rationale behind them.

4. Outline of the Self-Assessment Tool

In chapter 2, information was collected that will enable us to identify stakeholders who may be interested in participating in dialogues organised by NANO2ALL. It also gives an overview of topics previously addressed in nanotechnology dialogues in the six countries where we will organise these events. In chapter 3, we summarised the relevant outcomes of two earlier surveys conducted among journalists and members of NfA. These surveys have been used to test the Online Training Needs Self-Assessment Tool outlined in the present chapter. The questions in this self-assessment tool are similar to those used in these earlier surveys. The considerations in chapters 2 and 3 lead us to suggest the following outline for the Training Needs Self-Assessment Tool that will be incorporated in the NANO2ALL website. The tool will only be accessible to selected participants who will receive an email with the link.

4.1. Email invitation

[The following invitation will be sent to potential participants who have already expressed their interest in joining the dialogue, and invites them to use the online self-assessment tool to determine their training needs before entering the dialogue].

Dear (insert name),

We understand that you are willing to participate in the dialogue on nanotechnology that we are organising within the project NANO2ALL. This project aims to put responsible research at the core of its methodology to create a climate of dialogue and engagement. NANO2ALL will allow researchers and decision-makers to engage with each other, as well as with other stakeholders. We will use the feedback from your interaction to develop a roadmap identifying research concerns and opportunities for innovation enabled by nanotechnology. The project has received funding from the European Union's Horizon 2020 Research and Innovation programme, under the Grant Agreement Number 685931. Please visit www.nano2all.eu for more information.

We aim to go beyond the usual exchange of formal position statements and stimulate mutual learning among all participants. Accordingly, before starting the actual dialogue, we would like to get everyone to at least a common basic level of knowledge and understanding, making sure that opinions from everyone will be heard and contribute equally to the debate'. We expect citizens and other stakeholders with less prior knowledge to feel confident that they have something relevant and useful to contribute to the dialogue, and not feel intimidated by the participants with more nano-related expertise. To accomplish this, we offer targeted training by identifying your individual requirements for more information and practical skills. To assess your personal training needs, please complete the short online survey via this link: (insert link). It should take a maximum of 5 minutes. We will then send you a report on your recommended individual training package.

Your personal details will be treated confidentially and will not be shared without your prior written consent. Please see the NANO2ALL informed consent form at the end of the survey.

Please feel free to contact Ineke Malsch if you have any questions or comments: postbus@malsch.demon.nl

Kind regards,

The NANO2ALL team.

4.2. Online Self-Assessment Tool design

[The online self-assessment tool will include the following introduction and questions. It should be translated into the languages of all the countries where a national dialogue will take place.]

Thank you for your interest in participating in the dialogue on nanotechnology we are organising within the NANO2ALL project (www.nano2all.eu). We hope you have a positive experience, and have every opportunity to contribute your ideas and opinions. At the same time, we hope you learn more about the views of other participants in the dialogue and that you acquire useful new dialogue skills. To optimise training, please fill out the following short self-assessment tool. This will only take about 5 minutes. This will help you and us compile your individual training package.

Your personal details will be treated confidentially and will not be shared without your prior written consent. Please see the NANO2ALL informed consent form.

i) Identification:
   - Name:
   - E-mail address:
   - Country:
   - Gender:
   - Age:

ii) Which option best represents your interest in nanotechnology? (tick one box)
   - Personal interest (Broad public and Citizens)
   - I am a natural scientist, engineer or student engaged in nanotechnology research (researcher)
   - I am a social scientist, humanities scholar or student studying aspects of nanotechnology (researcher)
   - I work in a company involved with nanotechnologies (Industry)
   - I work in a non-governmental organisation on nanotechnology issues (Civil Society Organisations)
   - I work in a Trade Union on nanotechnology issues (Civil Society Organisations)
   - I work in a government or political body involved with nanotechnology policy (Policy Makers and Research Funders)
   - I am a journalist covering nanotechnology (Media)
   - Other (please specify)

iii) How familiar are you with nanotechnology? (tick one box)

- I have never heard of it, or I have heard about it but can't give a definition (-> basic)
- I understand what it means (-> average)
- I work or study in a nanotechnology related field (-> advanced)

iv) How familiar are you with the concept Responsible Research and Innovation investigated by social scientists and humanities scholars? (tick one box)

- I have never heard of it, or I have heard about it but can't give a definition (-> basic)
- I understand what it means (-> average)
- I investigate or study the concept and methods for Responsible Research and Innovation (-> advanced)

v) How aware are you of initiatives to carry out nanotechnology research and innovation in a responsible way?

- I am not aware of these initiatives (-> basic)
- I have heard a lot about such initiatives (-> average)
- I practice Responsible Research and Innovation in my work or study (-> advanced)

vi) How familiar are you with techniques for effective dialogue and stakeholders' engagement regarding science and technology? (tick one box)

- I have never or hardly been involved in discussions on science and technology (-> basic)
- I have been involved in organised discussions on science and technology (-> average)
- I have organised effective discussions on science and technology (-> advanced)

vii) How much do you know about techniques to anticipate the future? (tick one box)

- I have no knowledge of these (-> basic)
- I have read or seen some foresight scenarios (average)
- I have used foresight techniques in my work or study (-> advanced)

viii) Are you aware of the objectives, views and concerns related to on nanotechnology held by representatives of one or more of the following groups? (tick all boxes you know):

- Natural scientists and engineers
- Social scientists and humanities
- Industry
- Government bodies
- Politicians
- Trade unions
- Environmental movements
- Consumer associations
- Other (please specify)

[zero - one box: basic; two boxes: average; more boxes: advanced]

Nano2all informed consent form

I, the undersigned, confirm that (please tick box as appropriate):

1.	I have read and understood the information about the project, as provided in the Information Sheet	☐
2.	I have been given the opportunity to ask questions about the project and my participation.	☐
3.	I voluntarily agree to participate in the project.	☐
4.	I understand I can withdraw at any time without giving reason and that I will not be penalised for withdrawing nor will I be questioned on why I have withdrawn.	☐
5.	The procedures regarding confidentiality have been clearly explained to me (e.g. that my personal information will be anonymised and restricted from public access).	☐
6.	No personal information will be published, no activities recorded via sound or video and no data will be shared outside of the project.	☐
7.	All data collected during this project will respect the European Union Data Protection Directive: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31995L0046:en:HTML	☐
8.	I understand that other researchers within this project may have access to this anonymised data only if they agree to preserve the confidentiality of the data and if they agree to the terms I have specified in this form. At the end of the project, all collected data will be destroyed.	☐
9.	If I wish to be contacted for follow-up or to receive further information on the project results, I can provide my email address knowing full well that it will be stored in a secured database, apart from my results and with the guarantee that it will not be shared outside of this project	☐
10.	I, along with the Researcher, agree to sign and date this informed consent form.	☐

Participant:

_____ _____ _____

Name of Participant (optional) Signature Date

Researcher:

_____ _____ _____

Name of Researcher Signature Date

The outcome of the tool will be sent to the coordinator of the training, Malsch TechnoValuation, who will manually prepare a tailored advice on a training package for each participant. The reason for this is that each participant will attend dialogue on two out of four preselected topics, which can vary by country. Because of this variety, it is too complicated to automatically generate standard advice on personalised training packages for all participants.

General training which is common to all participants will be integrated in the programme of the dialogues. Citizens interested in learning more about nanotechnology or Responsible Research and Innovation, will be pointed to some online videos and popular articles resulting from earlier projects, as much as possible in their own language.

For participants in the national multi-stakeholder dialogue, the specific training will be provided partly as suggested videos and documents developed in earlier projects, and partly through webinars addressing specific knowledge gaps related to the topics discussed in each national dialogue.

5. Training Structure and Agenda

In the NANO2ALL project, training will be offered to participants in the citizen dialogues (integrated in the dialogue programme, and as recommendation for voluntary self-study) as well as the national and European stakeholder dialogues (as recommended self-study and participation in selected webinars, as well as integrated in the dialogue programme). This training should be personalised to address each participant's own gaps in knowledge and skills that inhibit his or her fruitful participation. It should also be targeted to the issues on the agenda in the related dialogue, which will be decided later. More information is provided below about the national multi-stakeholder dialogues, in which the differences in levels of knowledge among the participants are expected to be considerable.

National Multi-stakeholder dialogue[71]

. The participating citizens will have the advantage that they have already been engaged in their national citizen dialogue, which has given them a good basis for the second stage of the dialogue. Based on their training needs self-assessment, each participant is recommended to use a selection of the materials collected at www.nano2all.eu/training for self-study. Depending on the agenda of each multi-stakeholder dialogue, some more targeted webinars can be offered, which can be followed live or watched afterwards.

The participants in the national multi-stakeholder dialogues are expected to be drawn from the following communities:

- Citizens. We assume that some of the participants in the local citizen dialogue will be delegated to the national multi-stakeholder dialogue. Then, they will already be trained to some extent. They will have some knowledge about nanotechnology in the selected applications, and about definitions and policies governing Responsible Research and Innovation.
- Policy Makers and Research Funders. We assume that they will be responsible for science policy / funding governing nanotechnology or for the application sector. The general stakeholder survey mentioned in chapter 3 suggests that some of these people may need some individual training on nanotechnology.
- Media. The expected participants are science journalists, and perhaps also general media. The survey among science journalists suggests that most of them already are aware of nanotechnology, while others may need individual training.
- Civil Society Organisations. Some of these organisations have had prior engagement in nanotechnology dialogue, while others need personalised training.
- Academia. The invited academics will be nano-experts, including a mix of natural and social scientists. The general stakeholders' survey suggests that they may need more information about the relevant positions of other stakeholders, in addition to academia and industry (about whose positions they tend to be well-informed). The science centres will decide who to invite.

[71] The training programme sketched here is targeted to the national dialogues.The programme for the European dialogue is at this stage too uncertain to plan for relevant training

- Industry. The two invited industry representatives will be nanotechnology manufacturers as well as producer of the end product incorporating nanomaterials or nanotechnologies . Their backgrounds should be different, e.g. one person from a small company and one from a larger one, or one from a start-up and one from any other (well) established company.

These participants should aim to achieve the following during the dialogue:

- Try to align values and concerns of citizens and other stakeholders
- Improve mutual understanding
- Discuss responsibilities of the different stakeholders for the future

The training is split into personal (online) training to fill the knowledge gaps of the individual, and common preparation for the multi-stakeholder dialogue. The personal knowledge gaps should be identified through the online self-assessment tool. The common part should be integrated in the programme of each multi-stakeholder dialogue by the organising science centre.

The common training programme should include information on the following aspects:

- Aspect 1: Overview of relevant positions of the different national stakeholder groups on nanotechnology in general. The Science Centres should compile this overview as most materials will be in the national language. A brief overview of relevant positions identified in earlier projects is included in section 5.5.
- Aspect 2: What is Responsible Research and Innovation? This includes some current definitions and policy trends, as well as the adapted Crash Course in Do-It-Yourself Ethics of Nanotechnology, giving equal attention to the roles of the represented stakeholders. This course has been developed by Ineke Malsch, based on earlier projects stimulating Responsible Research and Innovation in nanotechnology. A brief outline is included in section 5.2.
- Aspect 3: Why do we work with scenarios? This consists of some information on the applied SES and techno-moral scenario methodologies. The EC JRC and Athena Institute teams should instruct the Science Centres about this. Suggestions are included in section 5.4.
- Aspect 4: Do's and don'ts in fruitful dialogue. This may include a short role play to sensitize the participants to positions of people with different opinions /backgrounds, if such a role play is not part of the dialogue itself. Otherwise, the training may be limited to a listening exercise. The Science Centres may already be familiar with a suitable methodology. If not, they may use the suggestion described in section 5.3.

A selection of the following materials will be used in the training, or recommended to participants in the dialogue. The final choice of relevant materials will be made once the programmes of the dialogues have been finalised.

5.1. Nanotechnology

In earlier projects, a wide variety of videos and popular articles explaining nanotechnology as well as its applications and concerns have been developed. The training of participants in the NANO2ALL project will incorporate suitable materials in the respective national languages. Online introductory materials can be found following the listed links. The national citizen and stakeholder dialogues will take place in the national language, while the European stakeholder dialogue will be held in English. The available materials listed below are grouped by language.

5.1.1 English and other languages

NanoYou includes videos, posters and presentations, images and art and other materials in English, Spanish, Catalan, French and Italian plus some other languages: http://www.nanoyou.eu/

NanOpinion includes a Multimedia repository of 150 materials in English, French, Italian and Dutch: http://nanopinion.archiv.zsi.at/en/about-nano/multimedia-repository.html

NanoChannels has developed relevant materials in English, French, German, Spanish, Italian, Hebrew and Romanian: http://www.nanochannelsfp7.eu/

Time for Nano has developed materials and a video context in different languages including English, Dutch, Italian, Turkish, German, Polish, Finnish, French and Portuguese: http://www.timefornano.eu/

NanoToTouch has exhibited Nanotechnology labs in Science Museums. http://www.nanototouch.eu/

NanoDiode has published 35 100 second video interviews with scientists, engineers, futurists, ethicists, policy-makers and artists around Europe about nanotechnology at YouTube: https://www.youtube.com/user/nanodiode

Luisa Filipponi and Duncan Sutherland (eds., 2013) NANOTECHNOLOGIES: Principles, Applications, Implications and Hands-on Activities A compendium for educators. EUROPEAN COMMISSION, Directorate-General for Research and Innovation, Industrial technologies (NMP), Brussels. http://ec.europa.eu/research/industrial_technologies/pdf/nano-hands-on-activities_en.pdf The National Informal STEM Education network (NISE) in the USA has also developed relevant materials in English: http://www.nisenet.org/ This includes the Explore Science: Zoom into Nano kit: http://www.nisenet.org/explorescience-nano

The Journal Nature Nanotechnology has a special section “In the classroom” covering issues related to education and outreach in nanotechnology: http://www.nature.com/nnano/archive/categ_inclass_012016.html?lang=en

The European Commission has also archived a collection of materials explaining nanotechnology to youth and the general public in all EU languages. This can be accessed via http://cordis.europa.eu/nanotechnology/ Brochures and films: http://cordis.europa.eu/nanotechnology/src/pe_leaflets_brochures.htm The contents may be somewhat outdated.

5.1.2 French

NanoYou includes videos, posters and presentations, images and art and other materials in French: http://www.nanoyou.eu/

NanOpinion includes a Multimedia repository of 150 materials in French: http://nanopinion.archiv.zsi.at/en/about-nano/multimedia-repository.html

NanoChannels has developed relevant materials in French: http://www.nanochannelsfp7.eu/

Time for Nano has developed materials and a video context in French: http://www.timefornano.eu/

The European Commission has also archived a collection of materials explaining nanotechnology to youth and the general public in all EU languages. This can be accessed via http://cordis.europa.eu/nanotechnology/ Brochures and films: http://cordis.europa.eu/nanotechnology/src/pe_leaflets_brochures.htm The contents may be somewhat outdated.

5.1.3 Italian

NanoYou includes videos, posters and presentations, images and art and other materials in Italian: http://www.nanoyou.eu/

NanOpinion includes a Multimedia repository of 150 materials in Italian: http://nanopinion.archiv.zsi.at/en/about-nano/multimedia-repository.html

NanoChannels has developed relevant materials in Italian: http://www.nanochannelsfp7.eu/

Time for Nano has developed materials and a video context in Italian: http://www.timefornano.eu/

The European Commission has also archived a collection of materials explaining nanotechnology to youth and the general public in all EU languages. This can be accessed via http://cordis.europa.eu/nanotechnology/ Brochures and films: http://cordis.europa.eu/nanotechnology/src/pe_leaflets_brochures.htm The contents may be somewhat outdated.

5.1.4 Hebrew

NanoChannels has developed relevant materials in Hebrew: http://www.nanochannelsfp7.eu/

5.1.5 Poland

Time for Nano has developed materials and a video context in Polish: http://www.timefornano.eu/

The European Commission has also archived a collection of materials explaining nanotechnology to youth and the general public in all EU languages. This can be accessed via http://cordis.europa.eu/nanotechnology/ Brochures and films: http://cordis.europa.eu/nanotechnology/src/pe_leaflets_brochures.htm The contents may be somewhat outdated.

5.1.6 Spanish / Catalan

NanoYou includes videos, posters and presentations, images and art and other materials in Spanish and Catalan: http://www.nanoyou.eu/

NanoChannels has developed relevant materials in Spanish: http://www.nanochannelsfp7.eu/

The European Commission has also archived a collection of materials explaining nanotechnology to youth and the general public in all EU languages. This can be accessed via http://cordis.europa.eu/nanotechnology/ Brochures and films: http://cordis.europa.eu/nanotechnology/src/pe_leaflets_brochures.htm The contents may be somewhat outdated.

5.1.7 Swedish

The European Commission has archived a collection of materials explaining nanotechnology to youth and the general public in all EU languages. This can be accessed via http://cordis.europa.eu/nanotechnology/ Brochures and films: http://cordis.europa.eu/nanotechnology/src/pe_leaflets_brochures.htm The contents may be somewhat outdated.

5.2. Responsible Research and Innovation (RRI)

Most participants in the citizen and multi-stakeholder dialogues are not sure what is meant by Responsible Research and Innovation. Several projects have developed definitions and introductory materials, mostly in English, with two notable exceptions, including Polish materials produced in the IRRESISTIBLE project, and a French version of the EC code of conduct for nanoresearch.

The IRRESISTIBLE project aims to engage youth in RRI. They have materials in English, Dutch, Greek, German, Polish, Portuguese and Turkish: http://www.irresistible-project.eu/index.php/en/

The RRI-Tools project has collected some definitions and a practical toolkit. The homepage opens with a short introductory video in English. The toolkit database includes materials in many different languages: http://www.rri-tools.eu/

The SPARKS project has videos and materials to engage citizens in RRI: http://www.sparksproject.eu/node/3

The Res-Agora project developed a Responsibility Navigator: http://responsibility-navigator.eu/navigator/

The Progress project hosts short videos with RRI experts: http://www.progressproject.eu/category/video/

The Responsibility RRI project has posted videos of their conference: http://responsibility-rri.eu/media-centre/responsibility-related-videos/

The European Commission Recommendation on a Code of Conduct for Responsible Nanosciences and Nanotechnologies Research (2008) (English, French, German): http://ec.europa.eu/research/industrial_technologies/the-policy_en.html#code

The European Commission also published a leaflet on RRI: https://ec.europa.eu/research/swafs/pdf/pub_public_engagement/responsible-research-and-innovation-leaflet_en.pdf and other publications on RRI: https://ec.europa.eu/research/swafs/index.cfm?pg=library&lib=rri

A number of organisations developed the Responsible NanoCode for Business (2008): http://www.nanoandme.org/social-and-ethical/corporate-responsibility/responsible-nano-code/

The National Nanotechnology Infrastructure Network in the USA (NNIN) has developed posters explaining Responsible Research in Action: http://www.nnin.org/spotlights/responsible-research-action-laboratory-posters

5.2.1 Crash Course Do-It-Yourself Ethics of Nanotechnology

Responsible Research and Innovation presupposes contributions of all engaged stakeholders. However, many individual stakeholders are not aware of their responsibilities. Even people who feel responsible may not have the knowledge and skills needed to contribute their share in the common responsibility. A "Crash Course on Do-It-Yourself Ethics of Nano- and Emerging Technologies" has been developed in earlier projects. A version that is adapted to the citizens and stakeholders in the dialogues organised by NANO2ALL consists of the following elements:

- Introduction: What, why? Some common definitions of Responsible Research and Innovation, current EU and national policy maker's concerns.
- Who? Responsible Research and Innovation presupposes a collective and forward-looking responsibility. This is distributed over many different stakeholders, and aims to explore and govern potential future consequences of technologies that currently exist only at laboratory scale. What contributions can be expected from each of the stakeholder groups engaged in the NANO2ALL dialogues?
- How? In earlier projects, tools have been developed to assist each stakeholder group to contribute its share. Some relevant tools will be presented in the form of interactive discussion of illustrative cases relevant to the issues discussed in the dialogue itself.
- Conclusion: Responsible Research and Innovation is easy: you can Do-It-Yourself.

This crash course will be offered to the participants in the national multistakeholder dialogue by the Science Centres. These trainers will be trained accordingly by Ineke Malsch during the NANO2ALL consortium meeting in December 2016.

5.3. Dialogue

The training focuses on engendering a listening attitude, to stimulate participants to engage in mutual learning and fruitful dialogue. The training on dialogue techniques should therefore be short and practical rather than attempting to cover a lot of theory about dialogue methodologies.

A role play is a useful tool to sensitize participants to the perspectives of others. The NanoYou project developed several such role plays:

http://nanoyou.eu/en/decide/role-play6bf8.html?view=alphacontent /
http://www.slideshare.net/NANOYOUproject/role-play-cancer-treatment-nanotechnology
http://www.slideshare.net/NANOYOUproject/role-play-cancer-diagnostic-nanotechnology
http://www.slideshare.net/NANOYOUproject/role-play-super-human-brain-nanotechnology

Listening exercise: to avoid an overlap with the dialogue itself, the Science Centres may prefer to use sensitizing exercises with which they are familiar, or use a simple listening exercise, as follows. The participants are asked to

listen to someone reading a text related to the nanotechnology application on the dialogue agenda, and take notes. The participant who has noticed the most relevant issues wins eternal fame.

5.4. Foresight

The two surveys concerning stakeholders´ needs for nano-training indicate that most people are not very familiar with foresight techniques. As the NANO2ALL dialogue methodology leans rather heavily on scenario methods, some introduction will be required about the specific methods applied in the dialogues, and about the reasons why we apply these tools. Depending on the choice of methodologies, the following resources could be useful.

The Scenario Exploration System developed by the EU Joint Research Centre will be used during the multi-stakeholder dialogues: https://ec.europa.eu/jrc/en/research/foresight/ses

Vignettes and techno-moral scenarios are also expected to be used: https://www.rathenau.nl/nl/page/synbio-scenarios

The DEMOCS card game is also a useful tool for stimulating dialogue about current and future implications of nano and emerging technologies: http://edinethics.co.uk/scisoc/scisoc.htm

5.5. Stakeholder views

The level of knowledge of other stakeholders' objectives, views and concerns on nanotechnology on national level, etc. varies considerably between different stakeholder groups, according to the surveys summarized in chapter 3. Relevant materials to help the participants learn more about other stakeholder views are included in an inventory made in the NANO2ALL D2.1. report.[72]

In addition, ublic views on nanotechnology have been collected in the NanOpinion project: http://results.nanopinion.eu/

The Journal Nature Nanotechnology has published an analysis of public perceptions on nanotechnology: http://www.nature.com/nnano/focus/public_perceptions.html

[72] http://nano2all.eu/e-resources/NANO2ALL_685931_D2.1.pdf

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