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Dissemination Strategy for the NanoSafety Cluster 27.09.2011, Extra Deliverable 4.12 .NanoImpactNet Report

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Final Evaluation Report

Stakeholder dialogue: achievements, lessons, deployment, further work, recommendations

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CONTENTS

- 1.0 Stakeholder communication – what has NanoImpactNet learned?**
- 2.0 What use are the lessons?**
- 3.0 What has NanoImpactNet achieved?**
- 4.0 What work still needs to be done?**
- 5.0 Recommendations**
 - 5.1 Discussion**
 - 5.2 Dissemination**
 - 5.3 Coordination**

1.0 Stakeholder communication – what has NanoImpactNet learned?

NanoImpactNet's stakeholder database, dialogue and interactive events have shown that a wide range of parties from very diverse areas of social and economic life are very interested in - and concerned about - the health and environmental impacts of manufactured nanomaterials. This interest and concern will grow as nanotechnologies enter into wider areas of consumer applications, manufacturing and energy-production processes, as well as fields such as medicine and pharmaceuticals. It certainly cannot be said that it is an esoteric field of minor concern.

Interested stakeholders include major industries, small and medium-sized enterprises (SMEs), business consultants, entrepreneurs, venture capitalists, intermediate manufacturers, shareholders and investors, industry associations, consumers, consumer associations (both governmental and voluntary/independent), non-governmental organisations (NGOs) concerned with health and environment, trade unions, the media, the science and engineering education sector, the healthcare sector, medical equipment manufacturers, pharmaceutical companies and research laboratories, academic researchers, policy-makers, government funding bodies, insurance companies, regulatory bodies, lawyers and law firms, professional bodies in science, technology and engineering, the security sector, the food and agriculture sector, waste management specialists and many others. This complex diversity is no doubt due to the *enabling* character of nanoscience and its technologies, which means that it cuts across all scientific disciplines – the physical, chemical, biological, medical, ecological and so on.

NanoImpactNet has learned that communication and shared learning in the complex panoply of diverse and converging nanotechnology interests is an issue that needs special attention. A failure to continue supporting this issue will hinder technical and industrial development. For example, regarding nanomedicine, NanoImpactNet has learned through a survey that one-fifth of the sampled participants thought it likely that the risks of therapeutic nanomedicine (in areas such as cancer) are too great for it to be allowed to proceed, while four-fifths did not think this was the case. In the same survey the participants were divided about 50:50 on the question whether nanomedicine should be subject to special regulation? The findings of the survey were published in the 4th NanoImpactNet Report on Stakeholders and their Interests in Nanomedicine, Characterisation and Communication (Geoffrey Hunt, Luigi Cazolai, Darren Hart and Juan Riego-Sintes, 09.09.2011, Deliverable 4.1d).

2.0 What use are the lessons?

Nanotechnologies represent a paradigm-shift encouraging technological convergence and innovation. Due to this fundamental nature of nanotechnology's impact on technology, engineering and hopefully the economy there is an attendant widespread concern about broad and uncertain impacts on biological systems at all levels, from human to bacterial, from sub-cellular to ecological.

To take advantage of the promise of nanotechnologies in facing the challenges of moving towards a sustainable, high-efficiency, low-waste, alternative-energy economy it is imperative that industrial policy and innovation develop hand-in-hand in an accountable and transparent manner with all stakeholders. Dislocations in understanding, trust and communication between the different stakeholders can only hinder the exploitation of the benefits of nanotechnologies.

Once the NanoImpactNet project comes to an end, its database of stakeholders across Europe and beyond will be maintained, administered and utilised by QNano and the NanoSafety Cluster dissemination working group. What can we do with the database....?

There can be no doubt that NanoImpactNet stakeholder events and communication activities are having and will continue to have an influence on regulation and legislation, and such issues as standardisation, and the labelling of nano-products.

3.0 What has NanoImpactNet achieved?

NanoImpactNet has achieved its aim of generating strategies for involving very diverse stakeholders, keeping them involved, and engaging in a two-way and transparent learning process. It has succeeded in creating a consensual bloc around considerations on the health impacts of nanomaterials. Over four years NanoImpactNet has achieved these aims through conferences, workshops, web links, newsletters, reports, surveys utilising Delphi, questionnaires, debates, electronic polls and other methods.

Importantly, NanoImpactNet was able to establish, by means of a survey of expert stakeholders (n=92), priorities for the development of nano-safety. Organised around a conference in Prague in late 2010, a modified Delphi Method was used to determine the opinions of a range of experts from academia, industry and government in the field of nanotechnology, mainly those working in the areas of safety, occupational and environmental health, and nanotoxicology. The focus was on uncertainty and complexity. The participants identified the following ten priorities in the development of nano-safety:

- the need for realistic exposure scenarios,
- better established dose-response relationships,
- improved extrapolation from *in vitro* to *in vivo*,
- identification of the most relevant assessment parameters,
- understanding the dynamic biological interfaces,
- long term studies,
- information about stability and reactivity,
- understanding the behaviour of the protein corona,
- having test guidelines adapted to manufactured nanomaterials,
- and the development of more advanced statistical and computational methods.

The discussions also investigated the basic nature of the uncertainties and how to distinguish between mere lack of data and intrinsic uncertainties that are a consequence of the complexity of living systems. The findings of the survey were published in *Nanotechnology Perceptions* 7 (2011) 82–98 and widely distributed as part of the ongoing stakeholder dialogue process.

As the project comes to a conclusion, the initial 24 consortium partners have been joined by hundreds of members, with over 3,500 stakeholders reading the regular NanoImpactNet e-newsletter. By coordinating research between scientists from over 40 countries, NanoImpactNet is helping to harmonise methodologies and communicate results, leading to increased consensus on best practice and priority research areas. NanoImpactNet also communicates with over 1,300 company representatives involved with safe and responsible development or application of nanomaterials. These contacts will become the responsibility of the NanoSafety Cluster (NSC) and QNano Research Infrastructure project (QNano), with a goal of deepening the quality of the contacts already developed.

4.0 What work still needs to be done?

In the field of nanotechnology there is no monopoly of knowledge, priority-identification or problem-resolution; so its development depends on the nurturing and facilitation of communications between stakeholders at various levels with differing expertise and conceptual frameworks.

There are many opportunities arising at the end of the NanoImpactNet project. Work still needs to be done to develop and continue stakeholder communication. Some of this work could be done in the context of NSC and some aspects in QNano too.

If each future NSC project has its own communications work group, newsletter and dissemination deliverables, certain stakeholders risk being flooded with overlapping communications, but with each email having only a narrow focus, lacking in overall nanosafety depth and breadth. The other side of the coin is that many stakeholders will not receive pertinent information because they are not on every distribution list.

NSC provides an opportunity to bring together and consolidate stakeholder data and nanosafety data, concepts and emerging problem areas in thematic hubs to be explored in more focussed workshops, publications, policy recommendations and media reports. Reaching the right people for such exercises can sometimes prove problematic, especially in Europe's peripheral countries. Finding a toxicologist in Lithuania, a health policy official in Greece or an interested journalist in Portugal is exceeding difficult, unless you are based in those countries. Via the NSC - a coordinated, unified group, rather than as a series of small projects - the EC could, for example, make the proactive expansion of the stakeholder database and the centralisation of nanosafety data project obligations.

To some extent the same could be done in QNano to involve some of the more significant second-tier parties - such as educationists, manufacturers with specific problems, production process innovators and instrument designers - in particular access arrangements and exchanges.

5.0 Recommendations

Based on the discussions and observations above, the WP4 Communication team recommends that:

- With the slightly confusing NanoSafety Cluster name little-known outside its own restricted circle, NSC should rapidly rebrand itself to use an existing and relatively well-known one: the European Network on the Health and Environmental Impact of Nanomaterials, or NanoImpactNet. If this is deemed impossible, it should drop *Cluster* in favour of EC NanoSafety Network.
- The work and achievements of NanoImpactNet should be fully utilised in the development of NSC.

5.1 Discussion

- Lists of contacts developed by NanoImpactNet should be maintained and updated by FP7 project QNano and used to continue regular spreading of Environmental Health and Safety (EHS) knowledge about manufactured nanomaterials, developments in nanosafety best practice, the activities of the NanoSafety Cluster and the European Commission's Action Plan on Nanosciences and Nanotechnology;
- More attention to be paid to the communication and consideration of the 10 priorities in nanosafety development identified by a large group of experts at a NIN event in Prague in late 2010 (see 'What has NanoImpactNet achieved?' above);
- Nanosafety regulation and EHS events should be attached to more of Europe's most important commercial nano-conferences to encourage industry participation and interaction with academic researchers;
- More attention should be given to generating dialogue on the issues of commercial confidentiality and possible mandatory reporting in relation to safety data held by companies in Europe;
- Within the ambit of NSC and QNano, there should be more effort in concentrating on qualitatively deepening and consolidating rather than simply widening the network of stakeholders;
- Regular Delphi-style expert opinion surveys should be carried out to get feedback from stakeholders for analysis and consensus-building;
- Setting up thematic hubs of stakeholder dialogue to deepen well-informed dialogue between significant parties (e.g. liability and insurance).

5.2 Dissemination

So as to reach a wider European nanosafety audience, all NSC project members should be encouraged to proactively inform the NSC Dissemination working group (WG7) of their:

- Meetings, conferences, training schools and workshops so as to build up a comprehensive European nanosafety events calendar for the web and newsletter;
- New published peer review articles, scientific protocols, publically available reports to the Commission, training video and video presentation recordings and other relevant documentation and reports so that they can be promoted via the newsletter and stored on-line on the NSC web site;
- Contact lists including all project members and other parties interested in nanosafety;

This requirement should be clearly defined in the formulation of all new EC sponsored, nanosafety-related projects and should be strongly encouraged in existing NSC projects. The Dissemination working group should proactively subscribe all possible relevant stakeholders to the newsletter.

5.3 Coordination

So that the widest possible group of European nanosafety stakeholders are able to meet, interact, benefit from the work of NSC project members and work using reproducible methods using the same terms, there must be coordination. The following requirements should be clearly defined in the formulation of all new EC sponsored nanosafety-related projects and should be strongly encouraged in existing NSC projects:

- To minimise travel costs and save time, training schools and workshops should be arranged to immediately precede or follow important conferences, such as the QNano training events after the final NanoImpactNet conference;
- All scientific protocols used in or derived during NSC projects should be sent to NSC Database working group (WG4) so as to build an important resource for nanosafety researchers;
- The NanoImpactNet glossary should become the NSC glossary, to be updated and expanded, for more homogenous use of terminology within the NSC and beyond.

These recommendations and more can be found in the Dissemination Strategy for the NanoSafety Cluster (Nathalie Boschung, Iseult Lynch, Darren Hart, Gordon Chambers, Sonja Grossberndt and Bryony Ross, 27.09.2011, Extra Deliverable 4.12).