FINAL REPORT

1. Final publishable summary

Summary description of the Project context and objectives

The COM'N&N Project (Supporting N&N research communication, dialogue and engagement) aimed to evaluate communication activities developed so far on nanoscience and nanotechnology (N&N) at European and national level between 2007-2013 in order to identify future areas for improvement.

Nanosciences and nanotechnology (N&N) are already largely present in our daily lives. Since 2004, the European Commission adopted an action plan for Nanoscience and Nanotechnologies that aims to foster and integrate a safe and responsible strategy for Europe. The EC stated the "societal impacts need to be examined and taken into account. Dialogue with the public is essential to focus attention on real concern that rather than "science fiction" scenarios".

N&N are seen as allowing promised applications to improve our lives, but there may be some risks associated with it that should be openly acknowledged and investigated. At the same time, the public perception of nanotechnology and its risks should be properly assessed and addressed.

Consequently, dialogue and communication activities on N&N should address this objective and allow building a consensus on N&N based on a shared understanding of their benefits and risks associated.

The three main objectives established for the project are:

- Gaining direction for improving communication activities as it is developing;
- Determining communication effectiveness after it has had some time to produce results;
- Improving the quality, utility and effectiveness of communication actions through identification of potential problems and the acquisition of feedback to enhance quality.

Description of the work performed and main results

In order to achieve those objectives the consortium established the following work plan.

The first work package took care of the project coordination and the **fifth work package** coordinated the dissemination actions.

The three main work packages, with objectives, description of work achieved through individual task leading to deliverables are described below:

The Work package 2 'Evaluation model refining'.
The main objectives of the second work package was to finalize a list of criteria and indicators to be used, the development of the corresponding database model and develop the appropriate IT tools and finally to launch a web survey for a formative evaluation addressed to the stakeholder community.

The Work package 3 'Assessment'.
The third work package selected the type of messages, communication vehicles and audience among the different segments to be in-depth investigated. Evaluators were assigned to collect information and fill in the questionnaire forms. Persons to be interviewed were identified and finally 10 case studies were built with the support of the EVAN expert group and the ongoing workshop that took place in Dublin.

The Work package 4 'Analysis'.
Under the fourth work package it was identified the statistical tendencies from the 100 interviews. In base of this information, the consortium built a SWOT analysis of the N&N communication effort as seen from a bottom-up evaluation. Finally, an evaluation report was draft, including conclusions and recommendations that were presented during the final workshop in Rome.

What the consortium expected executing this work plan was to answer the needs of the European Commission. Outreach, dialogue, inclusiveness and public engagement are key elements of the European approach to nanotechnology. Information, communication and fostering societal debate have already become integral constituent of European initiatives.

The main results obtained in the project are:

- The EVAN Group was constituted in month 2 with 7 members. It was composed of 8 experts in N&N and provided feed-back and reviewed the project results
- The survey was designed, tested and circulated in specific N&N communities in February. 596 complete answers were received and analysed.
- The Ongoing workshop was executed taking advantage of the EuroNanoForum in Dublin. Important feedback was received from the four EVAN members assisting.
- 100 interviews with the different project targets in order to investigate achieved and expected outputs, results and impacts of a sample of communication actions, as well as identify their barriers and problems have been done in different events

and by phone. Desk study (project deliverables, questionnaires of evaluations, project websites, etc.) of the communication actions have been analysed.

- 10 case studies on relevant factors have been reported with the next titles:
  - Assessing the effectiveness of communication processes when communicating to the non-higher education institutions.
  - Building Trust-the perspective of the N&N industry.
  - N&N FP projects communication.
  - Communicating Nanotechnology during leisure time.
  - The evaluation of communication activities within N&N projects.
  - The communication of nanotechnology through artistic activities.
  - National initiative to communicate nanotechnology to the public – the Dutch experience.
  - The role of social media for enhancing N&N communication.
  - How communication activities help research exploitation, beyond initial focus of the research.
  - 'Translating' nanotechnology for various target audiences: the case of insurers.

- The Final Workshop was executed taking advantage of the NanoForum in Rome to present the results of the project and discuss a number of recommendations. Important feedback was received from the four EVAN members assisting and from other N&N stakeholders that attended.
- Recommendations were issued and addressed to the two main targets: project participants and public authorities.
- Specific dissemination oriented 3 leaflets were printed and distributed.
- The website was designed and operational since the second month of the project. Changes were done regularly to keep it update.

The project has implemented general procedures to ensure the best quality and the most relevant monitoring of the project's results. The work plan has been followed and the different members of the consortium have executed his tasks with quality.

Description of the main S & T results / foregrounds (25 pages)

The main results of the project can be grouped in:

- Case studies;
- Evaluation questions addressed and main conclusions drawn.

1. Case studies

One of the most important outcomes of this study was the in depth description and examination of ten distinct case studies / best practices which have shed light around raising awareness in the N&N field. The case studies were chosen based on the results of the web survey that has taken place as part of this study as well as on a consultation that the respective project team had with the EVAN expert group members which was appointed for assisting and guiding the results and outcomes of this study.

The ten case studies are presented in the table below highlighting the communication action that is being examined (whenever this is the case), the framework that a specific communication action has taken place (whenever this is the case), the target group that has been addressed and also the main conclusions and lessons learned.

Communicating to the lay public (non-higher education institutions)

The main goal of this case study was to compare and assess the effectiveness of some of the initiatives interacting with non-higher education institutions to communicate with the young people. To this end, three European projects were chosen because of their focus on junior and secondary schools. The first two are FP7-NMP projects and the third one is an Irish initiative within the research institute of Trinity College in Dublin.

Brief description	Understanding of nanotechnology can be rather difficult for the lay public. To this end many communication vehicles were followed aiming to make these technologies understandable for everyone. For instance interaction processes (such as the learning by doing, games, etc.) are a significant way to communicate about nanotechnologies. However, if finding communication processes that are addressed to the lay public is of great importance then making sure that these are proved to be efficient is also essential. The main goal of this case study is to assess the effectiveness of communicating nanotechnologies to the lay public and how the public is actually affected by the different communication processes employed.
Objective	Young people among the non-higher education institutions represent a significant part of the lay public. Finding ways to communicate accordingly with them is a key issue when it comes to communicating on

	nanotechnologies with the general public. Many NMP projects focused their communication goals on non-higher education institutions. In this case study we assessed the effectiveness of communication processes toward this very specific part of the lay public. Three European projects were in this way chosen to illustrate the means of communication towards 'youngsters'. The main objective was to analyse the communication channels employed in those projects and the difficulties they encountered. For that we evaluated the relevance, effectiveness and impact of their communication as a means of providing concrete recommendations for the specific type of communication vehicles employed.
Communication action	Any communication activity in N&N projects addressing lay public and especially youngsters.
Framework	Nanoyou FP7project, Time for Nano FP7 project, 'CRANN activities', a set of experiments was set up specifically for students including a special event called the 'nano week'.
Target group addressed	Teachers and students, lay public.
Main conclusions and lessons learnt	• Students have shown interest in the Nanotechnologies and are receptive to the messages sent. The communication tools used had been clearly address to specific age range and that explains the success of the actions. • However, the younger part of the students (below 10) is much difficult to reach. • Finding a way to involve teachers in the communication is by far the biggest difficulty.

Building Trust- the perspective of the N&N industry

Policy makers and scientists recognise that negative public opinion can impede future developments in the field and underline that for the successful introduction of nanotechnology into the market emphasis should be put on the interactions between the industry sector and the public. To this end industry organisations should develop specific communication strategies in order to engage the people, enhance trust in their products and increase the general public acceptance on nanotechnology.

This case study aimed to address the specific issue by highlighting the importance of trust and credibility for the future of nanotechnology and the development of the nanotech industry. Therefore, it sheds light on the communication strategies and communication methods used for building trust and credibility within an organisation from the industry sector.

Brief description	Given the current concerns related to the possible effects that nanotechnology could have on our health and other societal aspects, the industry sector should employ specific communication strategies in order to build trust and ensure the public regarding the safety of nanotechnology. The public acceptance of the nanotechnology products is almost equivalent to their commercial success and therefore to the success of the sector. Towards this end specific communication activities that will increase trust and credibility should be developed. Through the example of BASF, the specific case study tried to shed light on the DialogForum Nano, a stakeholder's dialogue process developed by the company and assesses the specific communication action it in terms of relevance and effectiveness for building trust.
Objective	Main objective of this communication action was to build trust, create transparency and contribute to the societal debate on nanomaterials.
Communication action	"DialogForum Nano" Stakeholders dialogue (workshops between the organizers and the target group).
Framework	Part of the communication actions conducted by the chemical company BASF.
Target group addressed	NGOs (e.g. environmental and consumer associations).
Main conclusions and lessons learnt	• The most important factors for a successful dialog are: openness, transparency, and consistency. • The dialogue should be organized by professional organisations with experience in communication actions and deep knowledge of N&N. • Cultivating and maintaining trust is an ongoing professional responsibility and it cannot be taken for granted. • An open communication creating a relationship between stakeholders is needed given that the public is more sceptical toward this technology. • A bottom-up approach based on constant dialogue seems to be an effective tool for building trust. For a successful dialogue it's important to listen to the perceptions, concerns and expectations of the stakeholders and engage into a discussion with them. • A successful dialogue engages the stakeholders and increases the public acceptance regarding the organisation activities. Moreover it strengthens the image of the organisation as a trustworthy nanotech manufacturer. • Finally the success of a dialog depends on the trust towards the whole nanotechnology industry. Therefore similar dialogues in different countries should be developed by the nanotechnology companies.

N&N FP projects communication

This case study compared the dissemination strategies between some European projects focused or not on the EC guidelines with the objective to understand why and how these strategies were chosen.

Its main goal was to identify the obstacles and difficulties in the process of communication and the more successful tools of dissemination in NMP FP projects' experiences with the aim to provide an estimation of the relevance of these guidelines and suggest some adjustments if required.

Brief description	Dissemination and communication is one of the key expectations from the projects. General guidelines are produced by the European Commission. On the other side, the survey ran by the Com' N&N project showed that many projects do not define a dissemination plan and very few monitor the impact of the implemented communication. Moreover, most of the respondent acknowledged the fact that they are not at all aware of the expectations of their targeted stakeholders. This case study focuses thus on analysing the extent to which communication and dialogue actions have been properly defined and implemented within FP projects in respect with the expectations of the different stakeholders and intends to provide insights on the adequacy of the existing EC guidelines to the need of the NMP thematic area.
Objective	This case study compares the dissemination strategies between some European projects focused or not on the EC guidelines with the objective to understand why and how these strategies were chosen. Its main goal is to identify the obstacles and difficulties in the process of communication and the more successful tools of dissemination in NMP FP projects' experiences resulting in an estimation of the relevance of these guidelines and suggesting adjustments if required.
Communication action	Different kind of communication activities were evaluated such as exhibitions, events, debates.
Framework	FP projects: o NanoDialogue (2005-2007) concerned with communicating about the role of scientists, ethics, legal practices and social aspects of nanotechnology. They wanted to create exhibitions, events and debates in Europe organised around activities and experts; o CarbonComp (2011-2015): The main objective of this project was for development, characterisation and up scaling of polymer nano-composites which are based on nanostructure carbon. The main role is to develop coating with improved mechanical performance, which in turn will improve the lifetime of vessels as

	they are resistant to corrosion; o The NAD (2008-2013) project is aiming at developing nanoparticles for Alzheimer's diagnosis and therapy. The goal, developed in the field of nanotechnologies, is to create nanoparticles able to cross the blood-brain barrier to reach the brain, principal site of Alzheimer's disease; o Magnifyco (2009-2013): This project is aimed at the assembly and the fabrication of a new generation of multifunctional nanostructures for performing combined hyperthermia and controlled drug release, specifically targeted to cancer cells; o ProMine (2009 -2013): Their main objective was to stimulate the extractive industry to deliver new products to manufacturing industry. It develops new, high value, mineral-based (nano) products. Enlarge the number of profitable potential targets in Europe and establish a new, cross-platform information group between the European Technology Platform on Sustainable Mineral Resources (ETP-SMR) and other platforms.
Target group addressed	Projects were selected taking into account a variety of target groups such as industry, lay public and researchers, all of which were concerned with communicating about nanotechnology.
Main conclusions and lessons learnt	• EC guidelines about Nanotechnology is efficient concerning the "mass media communication" tools but it should be more precise and specific for the "interpersonal communication" tools because it is important to adapt the tool of communication according to the target –researchers, lay public, industries- because the dissemination and the purpose of the communication are different for each target. • The main obstacle of the communication is the fact that in the dissemination process, the balance between the protection of IP and the communication must be struck in favour of the data and the IP protection because by protecting, the communication should be easier. • Policy must be geared to the quality of the research –in the communication addressed to the research- because the communication will be easier. For the communication addressed to the industry, there is a need to be more focused on the market and to propose final products which could be concretely interesting for the companies. • In any case, the dissemination in N&N FP project is efficient, evaluations allowed noticing changes in behaviour of people and industries, and the guideline represent a good tool to begin and build the communication process.

Communicating nanotechnology during leisure time

The main focus of this case study was to assess the effectiveness of two interactive websites which aim to communicate nanotechnology to the public during leisure time. Specific aspects such as the level of interactivity, content, presentation of the provided information etc., were investigated in order to provide a deeper insight on the most important characteristics that a website should have in order to stimulate the curiosity of the public and communicate nanotechnology more effectively.

Brief description	Nanotechnology is regarded to be as one of the most challenging technologies to effectively communicate and understand. To this end, appropriate communication actions that will reach effectively selected audiences are needed. The lay public is one of the audiences that should be reached. According to the EC, the specific audience is best reached during leisure time. Within this framework, this case study aims to assess the effectiveness of communication methods employed in order to communicate nanotechnology to the lay public and particularly during their leisure time. Emphasis is given on two interactive websites, Nanovirtualium and Nano&me.
Objective	The main objective of this case study was to assess the effectiveness of the two interactive websites and highlight the most important factors and characteristics for a web based tool in order to communicate nanotechnology to the lay public.
Communication action	Electronic Based Communication ("Nano&Me"-website and "Nanovirtualium"-virtual reality application).
Framework	**Nano & Me**: initially funded by the UK government and developed by a private organization. **Nanovirtalium**: developed within the FP6 project Nanocap.
Target group addressed	Nano & Me: the general public. Nanovirtalium : the general public and environmental NGOs.
Main conclusions and lessons learnt	For an effective web-based tool emphasis should be given on: o **The content** whereby the provided information should be balanced providing thus a combination of simplified and advanced information. Short texts, external links, references and updated information should be included; o **The Design** whereby emphasis should be given on graphics in order to ensure that the web based tool can stimulate the curiosity of the public. Interactivity is also important; o **The public involvement:** a successful communication tool should

	focus on the needs of the public by providing relevant information. It should also provide a hub for people to discuss, to ask questions and express their concerns ensuring the involvement of the public in the whole communication process.

The evaluation of communication activities within N&N projects

The main focus of this case study was to further investigate the internal evaluation process of different communication activities which are undertaken as part of an N&N project. According to the survey conducted in the framework of the Com'N&N project, such evaluation processes are mainly based on the feedback received by participants in an informal way whereby the results are usually **not** taken into account. Given that, our focus in this case study was to analyse a successful evaluation process followed by a project/organisation where the results and the feedbacks of the participants were actually used for the improvement of their communication actions.

Brief description	For an internal project evaluation procedure to be successful a number of factors should be taken into account. First of all, project participants should have the willingness to do it for enhancing their communication activities and results per se rather than doing it because they are required to by funding authorities. In this case, the evaluation must be integrated within the organizations strategic activities. The scope of the evaluation should be mainly for improving practice and not for attesting the 'success' of the communication actions. Evaluations should also be very clear on their scope and context. The minimum issues that should be taken into account are having clarity about project aims, target audience, the aims of the evaluation and how the data will be used. Finally, they should of course be a proactive and ongoing activity meaning from the initiation of the project and throughout its development. Taking all that into account, the current case study focuses on analysing a successful evaluation process followed by a project/organisation, more specifically the FP7 NanoYou(Nanotechnology education resources – Nano for youth) project, where the results and the feedbacks of the participants have been used for the improvement of their communication actions.
Objective	Given that this case study was not focused on a specific communication vehicle but on a specific internal evaluation process which took place within specific communication projects related to N&N issues, the main objective was to shed light on the main characteristics and steps followed as part of the specific evaluation process and also examine whether it has been successful and effective or not.
Communication action	The focus of this case study was not on the communication actions employed but on the internal evaluation process of the communication actions of a specific N&N related project.

Framework	Nanoyou FP7 project (Nanotechnology education resources – Nano for youth).
Target group addressed	No specific target group was addressed given that it was an internal evaluation process that has been examined in the specific case study.
Main conclusions and lessons learnt	• Another important aspect for the success of an evaluation process is to be able to know *how many people are actually using your resources and up to what point this information is being used*. It is very easy to know how many people are being supplied with your information. • Every feedback should be evaluated even it is good or not. In this way, the communication strategy could easily be evolved. • We need to have the right people for the right job. This has a twofold meaning. *A change in personnel can lead to a catastrophe.* On the other hand, those people involved in drafting and structuring a project's evaluation process needs to be well experienced in order not only to set up the right evaluation method and the right means to collect the data but also in order to know how to analyze and interpret the results. • The data collection process is always very difficult to handle (too many activities, different instruments and many people involved). Things become even harder when you work across different EU countries using different languages. • For an internal project evaluation process to be successful, you need time to be fully controlled and managed since we are talking about first hand evaluation data which are not always easy to achieve. • For an evaluation process to be successful that depends on both the target group and the communication action under evaluation. The main difficulty here is when you have the public as the main target group using social media, blogs and you try to make them react in a sense. This is very difficult to evaluate. The use of social media is not easy to be evaluated given that hardly anyone is making comments. What does 'like' means? How could this be translated in a satisfaction scale? There is a need to evaluate the success factor and what do we mean by that? Is it the comments? Is it the shares or the likes?

The communication of nanotechnology through artistic activities

This case study focused on how art can be used in raising awareness about nanotechnology and how it could easily be understood by the general public through the use of specific "artistic" activities. Our effort in this case study was to present some artistic events linked to

nanotechnology and examine the specific information that was communicated, identify the target group addressed and also the impact of the specific actions.

Brief description	Understanding the concept of nanotechnology can be difficult but also intrinsic for many people. The need to address and raise awareness towards nanotechnology and its benefits and risks was brought to the attention of many countries around the world. Apart from the traditional means of raising awareness around a specific subject and given that it is science that we are talking about, there is a more interactive way to approach this and make it more appealing and stimulating and that is through the use of various artistic activities. Art is considered one of the best ways of making something so miniscule and abstract to appear real to the ordinary eye. Taking all that into account, the main focus of this case study was to present two specific artistic events linked to nanotechnology - the national initiative in Ireland, NanoArt exhibition 2013 and "Nanodays" as part of the Time for Nano FP7 project and examine the information that was communicated, the target group addressed and also the relevance, effectiveness and impact of the specific actions.
Objectives	The objectives of the two distinct communication actions were twofold. On the one hand, the main objective of the NanoArt exhibition 2013 was to bring nanoscience to a wider audience; on the other, the main objective of the "Nanodays" was to inform the public and especially young people on several nanotechnology aspects.
Communication action	Event based communication actions.
Framework	A national initiative in Ireland, i.e. NanoArt exhibition 2013 and "Nanodays" as part of the Time for Nano FP7 project.
Target group addressed	**NanoArt exhibition 2013**: the general public. **"Nanodays"**: young people, general public, teachers.
Main conclusions and lessons learnt	• One of the most effective ways to raise awareness on NT is through self-directed exploration which can be found in innovative communication activities such as an art exhibition, a card game or a video contest. • The focus should be on: o actions that stimulate the curiosity and the interest of the public and enable the easy understanding of N&N; and also, o the content whereby emphasis should be given on the more

	pragmatic aspects of nanotechnology such as the risks and benefits for our everyday life.

National initiative to communicate nanotechnology to the public– the Dutch experience

The main goal of this case study was to highlight key findings and developments in raising awareness on nanotechnology issues taking into account the Dutch societal dialogue on nanotechnology which was held for two consecutive years. We were thus able to compare and assess the effectiveness of the specific national initiative and the communication actions that have been utilized as a means of raising awareness for nanotechnology's potential and its eventual risks.

Brief description	Particular focus in this case study was given to the Dutch experience of raising awareness regarding the potential and risks of nanotechnology through the initiative of the independent Committee for the Societal Dialogue on Nanotechnology that was installed by the Dutch government. The aim of this initiative was to organise a Societal Dialogue on Nanotechnology which ran from March 2009 until January 2011. Emerging issues were not discussed sufficiently but best practices in communication on ethical and societal aspects of nanotechnology have been identified and brought to the attention of policy makers.
Objectives	The main objective was: o for the public to acquire a general (and not only) knowledge of what nanotechnology is and what it entails; o to develop an agenda of nanothemes in order to build a dialogue and engage people; and also, o to stimulate the participation in this nanodialogue.
Communication action	It was mainly a national initiative towards raising awareness on N&N including various communication activities.
Framework	A national activity as already mentioned above.
Target group addressed	The whole society.
Main conclusions and lessons learnt	• This national initiative has been successful: people have shown interest in nanotechnology and are receptive to the messages send. In the beginning maybe there was a negative attitude but this was due to ignorance. • Communication tools used had been clearly addressed to a wide range of public (practically the whole society) and that explains the success of the different actions • As the final measurement has shown, there was indeed a raise in

	awareness around nanotechnology regarding its potential, advantages but also risks given that at the end of the dialogue only 36% of Dutch people indicated they had never heard of nanotechnology • The determining factors that made this dialogue a success was the variety of the communication channels, the variety of the activities, the ability to reach many people of different background and ages at once and giving the general idea, but most importantly the fact that people were let alone to shape the activities per se • Very intensive marketing and PR actions were recognized the most important factors in raising awareness. • The CieMDN report (2011) concluded that public perceptions of the innovation potential of nanotechnology were primarily positive, provided there is an adequate system for risk research, assigning permits and nano-oversight.

The role of social media for enhancing N&N communication

The main focus of this case study was on the social media strategy implemented as part of the Nanochannels project in order to raise awareness and stimulate a dialogue on nanotechnology issues. The main objective was to assess the effectiveness of social media as a communication channel for nanotechnology and underline the main advantages and disadvantages regarding their use.

Brief description	The increasing popularity of social media as a communication channel for scientific information has raised a number of questions regarding their effectiveness and appropriateness when communicating to the public. The specific case study focuses on the use of social media for communicating nanotechnology and investigates their advantages and disadvantages as well as those factors that can influence their effectiveness. In particular, emphasis was given on the social media strategy that was followed within the FP7 Nanochannels project and the results achieved in terms relevance, effectiveness and impact.
Objective	The main objectives of the specific communication action was to: o Inform and communicate with stakeholders and the lay public about N&N; o Encourage stakeholders and the public to participate in dialogues concerning the applications, risks, ethical, legal and societal aspects of N&N. o
Communication action	Electronic based communication (social media).
	Mainly within the framework of the FP7 project “Nanochannels”.

Framework	
Target group addressed	Lay public, young people, scientists and researchers, NGOs, opinion makers and educators
Main conclusions and lessons learnt	• Social Media should be interlinked with other communication channels in order to be effective and have a high reach and impact. • According to one interviewee, "*It's very important to understand that social media are not an additional tool in your communication strategy but they should be seen as central to it. You must not see social media as a separate communication channel but as an ongoing conversation".* o

Communicating N&N research results to be exploited

This case study aimed to highlight how communication activities help research exploitation beyond the initial focus of the research. Special focus was given on the communication tools for project dissemination, and following this an analysis of how different exploitations areas have been reached has taken place.

Brief description	When new materials or technologies are developed, typically this research is translated into a product, and exploited by the industry. The interdisciplinary approach of the research outcomes is also important at European level for reaching different markets. However technology transfer is not always a straightforward task during the project exploitation and it is therefore crucial to find ways to disseminate the research outcomes in order to successfully reach the market and the final users. This case study highlights how communication activities help research exploitation beyond the initial focus of the research. To do so, special focus was given on the communication tools that have been employed and utilized within different EU N&N projects for dissemination purposes.
Objective	As an enabling technology N&N research is expected to impact a number of areas. As far as exploitation is concerned, there is a need to further promote the technologies in new areas. This case study analyzed the influence of various communication actions on the project exploitation success and not only in the area targeted by the project. It collected key success factors and analyzed encountered problems to derive a set of best practices, regarding targets, channels and messages conveyed.
Communication action	Most of the interviewees used basic communication tools and mainly the ones recommended in the European commission guidelines such as: newsletters, conferences, workshops, websites, etc.

Framework	• **AINJornadas:** nanotechnology industrial application sessions bringing together researchers and entrepreneurs. • **Bioscent** project organized around a very formal dissemination strategy the consortium had established an exploitation board based on the votes of the members. • **AddNano** followed the commission guidelines (website, newsletter); and participated to a few events. However there were no other specific strategies. • **ProMine** aimed to create a niche for the product, that way it would be allowed to become successful. • **NanoFuture**: the ETP and its members are working together self organized regarding the communication. This constituted largely personal meetings at several events and workshops combined with skype feedback sessions. o
Target group addressed	Industry, lay public
Main conclusions and lessons learnt	• Industry was more interested in a final product rather than investing in the on-going research. • Actors mainly concerned in protecting their products (IP protection) without risking and 'giving up' their research due to their dissemination strategies. • Networking was the most effective factor which allowed for technology transfer. Some had pre-existing networks (typically provided by partners), other tried to 'foster' networks through workshops and events such as exhibitions.

"Translating" nanotechnology to non specialised target audiences: the case of insurers

During the last years nanotechnology has rapidly spread in our lives and is expected to provide several solutions to our economy and society as further scientific and technology advances are achieved. However, for its further development, insurability plays a pivotal role given that without insurance its long term sustainability and commercial potential is uncertain. At the same time, despite the ongoing scientific research the potential risks and future implications of nanotechnology are still unclear making thus the calculation of nanotechnology insurance risk premiums a difficult task.

The main objective of this case study was to discuss the implications of this knowledge gab between the underwriter community and the nanotechnology industry as well as to shed light on possible solutions for the accurate communication of the nanomaterial risks to the insurance sector.

Brief description	Insurability plays a critical role for the development of nanotechnology. However, given the lack of the right understanding of the insurers regarding the hazards and risks associated with nanomaterials, nanotechnology is only implicitly covered in insurance policies creating thus several challenges for its long term sustainability. The case study focuses on this communication gap between the Nanotech industry and the insurance sector. It aims to discuss its implications and to highlight the great need for accurate communication between the main stakeholders. Towards this end, the communication action suggested by the Sanowork project is the main focus of this study. It includes a combination of activities, namely the identification of insurers' perceptions, informal briefing sessions among insurance companies, adaptation of the associated risks into the insurers "language", and bilateral meetings. The main focus of these pilot actions is the development of a communication framework that will bridge the communication gap between the main stakeholders and will enable the transfer of nanomaterial risks to the insurance sector.
Objective	The main objectives of the employed communication action was: o to inform the insurers about key nanotechnology concepts and risks o to identify the insurer's perceptions and knowledge regarding nanotechnology o to develop a common language that will allow the transfer of the nanotechnology risks into the insurance sector.
Communication action	Organization of briefing sessions as part of the FP7 Sanowork project.
Framework	FP7 project Sanowork.
Target group addressed	Insurer community.
Main conclusions and lessons learnt	• The development of a three way dialogue process that will include bilateral meetings, direct networking, and formal seminars, seems to be the best possible solution for the development of a common language that will allow the communication between the main stakeholders and the transfer of the nanotechnology risks into the insurance sector.

2. Evaluation questions addressed and main conclusions drawn

In order to be able to properly assess how EC dialogue and communication activities on N&N are meeting their objectives, we have tried to translate the objectives of the evaluation, already mentioned in the first section of this report, into specific and straightforward questions on which the Com'N&N project has focused on.

The main evaluation question that this study addressed and further examined was formulated by the project team as follows:

"To what extent are the EC efforts in communication and public dialogue on Nanosciences and Nanotechnologies (N&N) effective to inform properly about N&N development by answering the needs, expectations and concerns of European stakeholders?"

In our effort to concretely answer this general question, a set of sub-questions has been developed aiming to highlight the judgment criteria that were analysed. These sub-questions refer mainly to three distinct factors: relevance, effectiveness and impact. Each of them is being analysed below shedding light to different aspects of the communication activities and general communication effort of the N&N field.

Another very important aspect that needs to be taken into account before moving forward is the fact that within the Com'N&N project, we have distinguished two types of projects upon which the respective evaluation has taken place: '*communication oriented projects*' and '*non communication oriented projects*' and which present different characteristics in terms of its targeted audience, communication tools utilized and also the way the expectations of their audience was taken into account. More specifically:

- The '*communication oriented projects'*, which develop focused and tailored communication activities but often lack of real communication experience, develop it by continuous improvement, leading to a waste of time at project start and a loss of expertise and sustainability at project end.
- The '*non-communication oriented projects'*, which mostly focused on scientific dissemination using their working habits and professional organisations managing scientific publications. Nevertheless, the survey identified a lack of market focus of the activities which are only present based on individual initiative of partners.

This factor was also taken into account while answering the different evaluation questions given that in some cases results were proved to be different.

Relevance

The relevance question aims at evaluating ***to what extent the way that communication and dialogue actions were shaped proved to be relevant in informing stakeholders and answering to their expectations?***

A set of different criteria have been taken into account as a means of answering this question and leading to concrete observations and findings regarding their uptake during the whole communication effort.

The different criteria that have been tested regarding the specific evaluation question were:

- There are dissemination strategies and plans on N&N both through FP7 projects and through EC communication in general.
- The public perception of N&N and their risks have been assessed
- The expectations of stakeholders have been taken into consideration in the dissemination strategies and dialogue actions
- The nature and vehicles of communication have been chosen to fit with the target audience and their expectations
- Communication and dialogue actions aimed at providing adequate information to adequate targets
- Networks with international initiatives exist in this area.

More specifically and according to the different data sources utilised, three of the abovementioned criteria provided clear and targeted insight to our study. In this framework, the main conclusions and observations which could be drawn, answering thus the relevance questions, include the criterion of whether the different communication actions employed actually addressed the different and various stakeholder's expectations, the nature and vehicles of communication actions which have been chosen according to the different target audience and finally, the adequacy of information provided through the different communication activities to the target audience.

Main findings and observations based on criteria

"The expectations of stakeholders have been taken into consideration in the dissemination strategies and dialogue actions"

On the one hand and as far as the *non communication oriented projects* are concerned, the target (as well as its expectations) is in general not precisely defined and the different communication activities employed are mainly focused on the dissemination of project outcomes, without real concern about who to get the information from and to which extent.

On the other hand, within *'communication oriented projects'* a "top-down" process is preferably used more than a "bottom-up" meaning that a specific group (insurers, youngsters) is targeted for a specific set of objectives from the start of the project. However, a feedback loop generally exists that allows taking into account the preliminary feedbacks from the audience and adapting accordingly the messages and communication means. It is in particular the case when the level of knowledge on nanotechnology is asymmetric between the communicators and the audience (toward youths, professional association or consumers association outside the field of nanotechnologies for instance). The process carried out to implicate the target follows several ways such as formal consultation (through web survey for instance), pilot activities, stakeholder dialogue or feedback requests.

The initiation of a communication activity is mainly coming from those who want things to evolve- mainly organisers of respective communication activities. By 'evolve' is meant to foster further development in a specific area of the N&N field or even to build a consensual agenda among different stakeholders. Another important observation was the fact that in many cases, people don't have expectations and even don't know a lot about N&N. In this case one or better to say, the main focus of the communication action is to increase the interest in N&N. In the *'communication oriented projects'*, importance is given to reach stakeholders expectations in the design of the communication tools and messages conveyed, in particular with respect to the adaptation of the level of information to the knowledge of the audience.

Finally, one important aspect that should also be taken into account is the fact that when addressing stakeholder's expectations through a specific communication activity, great importance is given to ensure transparency and impartiality of the communication to deliver a clear message but above all to avoid the possible confusion with selling activities. It is seen as a key success factor for the stakeholders and targeted audience, especially when they have poor knowledge and a high level of defiance towards nanotechnology. The best way to ensure such independence relies on a communication process undertaken by an external organisation-professional organisation (and not by the project/company itself).

"The nature and vehicles of communication have been chosen to fit with the target audience and their expectations"

According to the data sources utilised, we can classify the various communication channels in two main categories:

1. **Targeted communication**: in which people receiving the communication were specifically targeted. These actions include in particular workshops, events, conferences, meetings exhibition. This kind of action fosters the creation of community of common interests and enables discussion with various opinions (open debate) while getting feedbacks. This communications are relevant for small audience.
2. **Untargeted communication.** This includes website, newsletter, TV programme and is mostly used to provide generic information. To be effective, trust needs to be built by providing reliable sources of information. The content varies from the most simple to the most scientific. Only indirect feedbacks (through statistics for instance) is most of the time collected. This method is relevant when large audience are targeted.

3.

All the different data sources utilised in the Com'N&N project, i.e. survey, cases studies, interviews revealed a large variety of communication vehicles used within and by the different projects, in terms of vehicles used (web, paper, audio or video, games), content and means to reach a specific target (face to face or indirect link). In general, no specific analysis is carried out to define and select a specific communication action to be employed according to the expectations of the target audience. The communication action is mostly defined in the beginning of the project and before questioning the target expectations. Changes in the communication actions employed could take place after a first feedback loop.

However, even the expectations are not analysed preliminary to the design of the communications tools, specific attention is generally paid to design tools in coherence with the purpose of the communication (science popularization, scientific results dissemination, etc.) and especially in coherence with the targeted audience. Various vehicles such as communication 'set' for scientific dissemination (website, papers, conferences), or tool kits adapted for children have for instance been created. Moreover, in some cases, a mix of various activities has been designed in which the message conveyed has been adapted to the nature and the extent of participants. For instance the mix can cover a *'Science cafe'* or large exhibition in the street, TV programme to reach large audience or more restricted events to reach specific concern of NGO for instance, interactive website for leisure time, etc.

Even there is a lack of coverage of stakeholders potential expectations, in most of the cases, there is a good adaptation between the vehicles of message and the communication purpose, the target audience and their expectations, as demonstrated by the following points:

- There is generally a great satisfaction and positive feedback from the target audience. This point should be nevertheless marred by the fact that the different data collected contains mainly the 'communicator'[1] vision, and that the audience themselves were poorly reached in the conducted interviews.
- The ongoing adaptation to fit the best as possible to the target audience has also been successfully implemented and takes the form of additional communication activities (ex organisation of an additional workshop).
- Finally, the different activities showed a great involvement of the stakeholders, especially in the interactive activities (for instance the video contest organised in the *'Nanoyou'* project that showed a great success among students).

The case of social media should also be underlined. The use of social media as a communication vehicle was considered as a good way especially in reaching young people and non scientific communities. But the outcomes of such a communication action showed very poor results and appeared not to be relevant in terms of communicating about N&N. Towards

[1] *A Nano-communicator is a person who has acquired communication skills to facilitate understanding on aspects of N&N and interact with non-specialized public.*

that, the main barriers are linked to the shortness of messages in this kind of media that impede to share enough knowledge to non-educated people and make so difficult to enable a dialogue. Social media should not be used alone, but could support other communication channels which enable deeper content. Social media are considered being a communication action which could duplicate and circulate any sort of information after or in parallel with other exposures.

The case of students and scholars deserves also a particular attention; this audience is hard to reach directly and most of the projects that targeted young people used the *'teacher channel'.* Teachers are indeed the easiest way to translate knowledge to their classroom by introducing it into the academic program. The communication activities focused on teachers as an indirect and multiplier link to scholars. However, this way faced issues and in particular the confidence of the teacher was a hard point as it was a necessary condition to provide them with sufficient knowledge so that they are able to introduce N&N in their classrooms.

"Communication and dialogue actions aimed at providing adequate information to adequate targets"

There is a need to adapt the conveyed message to the target audience. In highly scientific fields such as N&N there is a need to distinguish between two levels of communication:

- **Scientific based communication,** using well established and shared channels (peer to peer reviewed magazines, conferences, etc.) which would thus be adapted to the respective targeted audience.
- **Non scientific based communication,** which needs to be adapted in with respect to the level of knowledge of the audience. In order for the conveyed message to be understood it has to be translated into a common language. Also, emphasis should be paid to what the target audience want to know regarding N&N. In this respect and according to some interviewees, "*emphasis should be paid on involvement*", "*build a bridge by providing impartial information in line with what the participants want to learn*".

Effectiveness

While the previous section tried to understand the extent to which the communication are shaped and filled to meet the expectations of the audience, this section is interested in **measuring the extent to which communication and dialogue actions have been properly implemented**.

A set of different criteria have been taken into account as a means of answering this question and leading to concrete observations and findings regarding their uptake during the whole communication effort.

The different criteria that have been tested regarding the specific evaluation question were:

- Projects have actually implemented the disseminations activities they planned
- **Expected targets have properly been reached by the communication actions**
- Adequate communication actions have been implemented with respect to the expectations of the different stakeholders
- **The diversity of viewpoints and perspective has been addressed through the communication activities**

According to the different data sources utilised, two of the abovementioned criteria provided clear and targeted insight to our study. In this framework, the main conclusions and observations which could be drawn, answering thus the effectiveness question, include the criterion of whether the expected target groups have properly been reached by the different and various communication actions employed and also whether the through these communication actions a diversity of viewpoints and perspectives has actually been addressed.

Main findings and observations based on criteria

"Expected targets have properly been reached by the communication actions"

Appropriate communication actions for reaching specific targets proved to be essential, i.e. young people could not be reached through specialised conferences but more through artistic activities or games. Another observation was the fact that some communication actions enable you to understand whether your targets have been reached, i.e. a conference is better in this case where you can communicate and interact with the participants than a website. Nevertheless, the survey showed that tools were not always effectively used (example of social media being updated quarterly) and that the communication learning process of the projects is limited by their strict time limits.

In the field of '*non communication oriented projects*', communications regarding peer based scientific dissemination is the most effective as being part of the researchers experience and supported by professional organisations such as IEEE.

"The diversity of viewpoints and perspective has been addressed through the communication activities"

The collected data showed that a number of communication activities, actually addressed people from different background and ages and that "*communication oriented projects*" made efforts to adapt the message and the channel to the different target groups.

Different communication actions and tools were employed. For instance, different social media platforms were used depending on the target groups, i.e. *LinkedIn* for professionals,

Facebook for lay public or specific programmes have been developed in cooperation with teachers to address the young scholars with adapted and appealing content.

Impact

The last evaluation question that this study aimed to address relates to impact and tried to examine the ***extent to which the communication and dialogue actions allowed to change believes and stereotypes ideas on N&N and to establish a shared vision of potential impacts, risk and ethical issues associated with N&N.***

A set of different criteria have been taken into account as a means of answering this question and leading to concrete observations and findings regarding their uptake during the whole communication effort.

The different criteria that have been tested regarding the specific evaluation question were:

- Belief and stereotype ideas of target audience have evolved
- Risks and ethical issues are better understood and shared among the different stakeholders
- N&N products are put on the market
- Consumers are confident to buy N&N products

Main findings and observations

Evaluating the impact of the communication activities has been an issue as all interviewees expressed and identified the difficulty to assess impacts, in part due to the lack of monitoring of the communication activities per se.

As a result, two levels of impacts have been identified:

- **Knowledge and information**: in most of the cases, the communication activities fill their goal that is to provide the knowledge and information required. Positive feedback was obtained from the participants and this was the case for both technical and non technical communications.
- **Changes in belief and attitudes**: there is a mixed feeling in this respect whereby interviewees mentioned on the one hand that they had a great knowledge of the N&N community and its implications and thus their belief and attitude did not evolve to a great extent and, on the other hand, some interviewees mentioned that they had no particular belief or attitude before the communication action.

Potential impact and main dissemination activities and exploitation results (10 pages)

The results of the project are the conclusions of the study carried out that:

- Provide direction for improving communication activities as it is developing;
- Determine the communication effectiveness after it has had some time to produce results;
- Explain how to improve the quality, utility and effectiveness of communication actions through identification of potential problems and the acquisition of feedback to enhance quality.

The results of the project show and explain how the communication actions done until today:

- Changed awareness, and social sustainability of technology.
- By the key stakeholders support these activities in dealing with controversial issues.
- Has contributed to the implementation of the EC's action plan for nanotechnology.

All the detail information can be found in the final deliverables report.

The N&N communication efforts that proved to be effective in informing properly about N&N developments were those that satisfied some specific criteria regarding the relevance and the effective implementation of the communication actions and the impact achieved.

In terms of **relevance** we concluded that when a group is specifically targeted (which is mainly usual within the communication oriented projects) their expectations are importantly taken into account and therefore the communication action is designed in a way that is relevant for the target group. The study also showed that the nature and vehicles of communication mainly addressed the organisers' expectations and the fact that organisers should not rely only on one specific communication channel but should rather combine different channels in accordance to their target groups.

In terms of **effective implementation** the study underlined the great importance of adapting the communication actions and the provided content to the viewpoints of the different target groups. This involvement of the target group in the development of the communication tools proved to be a success factor for the effective implementation of the communication action.

Finally, in terms of **impact** the study showed that the impact of the communication action is too difficult to be measured and that most of the times evaluations are not conducted. However, most of the N&N communication activities that were carried out managed to raise awareness regarding the benefits and the risks of N&N whereas no change in beliefs or stereotypes was recorded.

Based on the main findings and conclusions regarding the effectiveness of the N&N communication the following recommendations have been developed. The recommendations follow the three different evaluation levels – relevancy – effectiveness – impact and aim to provide suggestions that could be useful both for N&N project participants and public funding bodies. In other words, the recommendations target two distinct levels. The first level includes recommendations to projects participants that employ specific actions to communicate N&N whereas the second includes recommendations to the policy makers who support N&N research and communication through funding programmes.

A set of recommendations targeting two distinct levels has been drawn and disseminated to the project targets. The first level includes recommendations to projects participants that employ specific actions to communicate N&N whereas the second includes recommendations to the policy makers who support N&N research and communication through funding programmes.

Recommendations for N&N project participants

RELEVANCE: Given that the relevance of the communication action for the target group is essential for the effectiveness of the communication effort, the "communicators" should take into account the following factors:

- ✓ **Assure independence and trust.** Since the general public usually shows distrust when it comes to N&N (because of the concerns related to risks) emphasis should be paid either from an organisation or from a research project in building trust towards the target groups. To this end, the involvement of independent organizations for the communication of the research results is of great importance. The success story of the chemical company BASF highlights the importance of an independent organisation to be involved either as an organizer or as a moderator of the communication action. In particular, in the case of BASF the involvement of a professional, independent organisation with experience in communication actions and deep knowledge of nanotechnology proved to be a crucial factor for building trust towards the company's target group.

- ✓ **Assure the involvement of the different stakeholders, including the target group, in the definition of the communication action.** Usually, the communication strategies are planned within the restrictive framework of a project consortium. For designing a proper and effective communication action the expectations and the interests of the target group should be taken into strong consideration. Therefore it is recommended that before the definition and selection of a communication action, a dialogue/consultation (pre-evaluation) with the target group and other stakeholders to be conducted. The case of the Dutch Societal Dialogue on Nanotechnology is indicative given that the success of the initiative was attributed to the fact that the themes of the dialogue and the communication actions were developed in consultation with a wide range of individuals and organizations, including civil society organizations, researchers

and companies. The fact that the communication actions were shaped from the people themselves was very crucial and was one of the issues that made this initiative very relevant to fit with the target audience's needs and expectations.

- ✓ **Employ various communication channels: Interlink social media to other communication vehicles.** Despite the increasing popularity of social media as a communication channel, they proved to be insufficient to communicate N&N. In order to be effective, social media should be interlinked with other communication channels and not be seen as a separate communication tool but as central to the communication strategy. The example of the Nanochannels project that was analysed in one of the case studies proved that despite the formal social media strategy that was followed and the involvement of external social media experts, the specific communication channel didn't work in nanotechnology. Therefore it is recommended that social media should be used centrally in the communication strategy and not as a separate communication channel.

EFFECTIVENESS: The proper implementation of the communication action is a prerequisite for its success. Therefore the "communicators" should ensure that the communication action and the provided content are adapted to the target group:

- ✓ **By interacting with the participants.** The interest in designing bidirectional activities in which the target groups can intervene actively in the communication action (e.g., a seminar can have a Q&A slot, a workshop should be well balanced in order to effectively facilitate the exchange of views among participants, dialogue actions are open to different stakeholders categories, exhibitions should include examples in which the attendant could work with, activate a machine, etc.).

IMPACT: The impact of N&N communication is difficult to be measured either due to the lack of monitoring of the communication actions per se or due to the fact that the dissemination actions of research results do not go beyond the life span of the projects. The latter could also be an additional reason that the communication actions cannot have a long term impact such as the change in beliefs or stereotypes. Therefore emphasis should be given on the following:

- ✓ **By constantly evaluating the different stages of the communication action.** It was acknowledged that evaluations usually take place immediately after the end of the communication action. However, different evaluations should be conducted before, during and after a specific communication action takes place and especially after a long period in order to assess its impact. The NANOYOU FP7 project proved to be a very good case whereby its team has organised an evaluation strategy for the communication tools and activities that were developed during the project as well as an assessment of the project's impact on the three target age groups. Different NANOYOU knowledge and dialogue related tools and activities were developed and upgraded according to feedback received from the first stage of evaluation and outreach programme. The different communication tools were divided into knowledge

tools (videos, memory games, puzzles, time machine, etc.) and ELSA[2] tools (role-play, virtual dilemmas).

- ✓ **By enhancing the sustainability of the results after the end of the projects.** Usually, after the end of a project the communication activity stops. As a result, lots of interesting and useful information gets lost not contributing thus in the exploitation of the research results for the benefit of the society. Therefore it is important to conceive, in the sustainability or exploitation plans of N&N projects, at least some additional communication activities in order to ensure the continuity of the communication effort when the funded-phase of the projects finalize.

- ✓ **By creating a collaborative network.** N&N communication actors play in an unstructured environment where the know-how acquired is not visible, the dissemination materials developed for an exhibition are not circulating after to other events, nano-communicators and other experienced professionals have not an European agenda of events, etc. Communication actions can take advantage of local or specialized, formal or informal, networks collaborating in the planning, preparation of communication materials, implementation or evaluation of the communication activities. Transversal networks joining expertise in journalism, pedagogy, PR, design, teaching, etc. can give and added value at local level. Also networking can be valuable at European level facilitating in particular the benchmarking and avoiding the duplication of efforts.

- ✓ **By incentivising the involvement of multipliers such as teachers**. Communication activities with non higher education institutions have been successful so far: students have shown interest in the Nanotechnologies and are receptive to the messages sent. The communication tools used clearly addressed to specific age range and that explains the success of the actions. What was thus encountered as problematic was to find a way to involve teachers in the communication process. Stimulating the participation of teachers with training sessions, learning materials available and networking might be a good way forward to be explored. Two FP7 projects, the Time for Nano and NanoYou, are indicative examples of involving teachers in the communication process. These projects have focused so much on tools for the teachers given that they are considered as being the main interlocutors when communicating with non higher education institutions and also the best way to reach students. From the analysis of these projects they appear to be the first interlocutors for the students when it comes to N&N. This communication is commonly done through lectures on N&N, or experiments involving this technology or even class debate. The aim of the training sessions were to provide trainees with a basic knowledge on nanoscale and applications, to introduce discussion on the dilemmas around N&N, to allocate resources for fostering debate among youngsters, to assist teachers willing to implement nano in their school curriculum.

[2] Ethical, legal and societal aspects of nanotechnologies.

Recommendations for public authorities

RELEVANCE: Public authorities, in particular funding bodies such as national research agencies or the European Commission, that support the development of N&N should assure that the communication actions carried out by the funded projects are relevant for their target groups. To this end, specific focus should be paid in the following.

- ✓ **By putting greater emphasis on public engagement processes.** Public engagement activities proved to be very effective in reaching successfully the target groups. Therefore such activities should be further promoted (for instance through awards for the best public engagement actions) in order to be implemented by more organisations or projects. A very good example in this respect is the National Societal Dialogue, an initiative of the independent Committee for the Societal Dialogue on Nanotechnology that was installed by the Dutch government. One of the most important factors that made this dialogue a success was, apart from the variety of the communication channels used, the variety of the activities and the ability to reach many people of different background and ages at once, the fact that people were let alone to shape the activities per se. The scope of this initiative was to engage all stakeholders in a balanced and organised discussion. Engagement here means to make people understand of all the negative and positive aspects of nanotechnology and in a way make them talk more about it, lessen the fear around it. The fact that the knowledge around nanotechnology was very poor led to the fact that the public cannot discuss potential issues and problems.

- ✓ Dissemination and communication is one of the key expectations from the framework programme projects. Despite general guidelines on dissemination and communication being produced by the European Commission, the survey ran by the Com' N&N project shows that many projects do not define a formal dissemination plan, furthermore very few monitor the impact of the implemented communication. Moreover, most of the survey respondents acknowledged the fact that they are unclear about the expectations of their targeted stakeholders. There is thus the need to **develop more precise guidelines on N&N related communication activities**. The short EC guidelines about Nanotechnology are quite straightforward concerning the "mass media communication" tools but it should be more specific for the "interpersonal communication" tools. It is important to adapt the tool of communication according to the target –researchers, lay public, industries- given that the dissemination and the purpose of the communication are different for each target.

EFFECTIVENESS: The public funding bodies could enhance the effectiveness of N&N communication by highlighting and identifying the role of "nano-communicators". In particular:

- ✓ By making the '**nano-communicator' role more visible and recognised**. Specialised communicators are a key factor in the success of the communication actions. Visibility and public recognition of those communicators having skills in communication with

non-specialised targets and deep knowledge in N&N. A nano-communicator can be the difference between a message correctly transmitted and a message failed. A list of nano-communicators at European level in a web-based platform could be made available, specifying their background and availability. Nano-communicators are basically good speakers in N&N, but the list can also include additional skills such as abilities in the pedagogical design of exhibition products, writing of articles for mainstream press, etc.

IMPACT: The public funding bodies could increase the impact of the funded projects through the following suggested actions:

- ✓ **By creating a cluster of projects.** Clustering the communication activities of research projects is an effective way that can contribute in the achievement of project results and exploit synergies (e.g. through specific Support Actions topics). Clustering is also useful in a further stage, when projects are finished, in order to ensure a sustainable communication effort. Clustering of projects can also be the approach to measure the sequence of impacts (comprehension, changes in beliefs or attitudes, acquisition of skills, dialogue, engagement) of the communication actions carried out in a previous stage.

- ✓ **Through ongoing support to communication-focused projects.** Horizontal projects mainly oriented to the development of communication actions to non-specialized audiences proved to be useful and cover a gap that otherwise cannot be easily bridged. Even if these projects are financed within R&D framework, accompanying communication actions that are not directly linked to cutting-edge R&D aspects are contributing to provide a societal dimension to the R&D.

- ✓ **By making ex post-evaluation more attentive to impacts.** The current ex post evaluations are mainly focused on results but not on impacts (given that impact measurement is difficult to be achieved). Towards this end a continued effort in supporting studies devoted to the measurement of the impacts and carried out by professional independent organizations not directly involved in the research during a longer period is essential.

- ✓ **Through a supporting tool for evaluators.** It was acknowledged that the N&N stakeholders need better evaluation methods or better guidelines in order to assess the results of the communication actions they organize. Therefore, it is recommended that a repository with evaluation guidelines or an online evaluation tool/platform should be developed in order to facilitate the evaluation planning, data collection and analysis of data. The support tool can be updated and extended to become a repository of templates and instructions as well as the sharing and comparison of evaluation results taken into consideration for benchmarking exercises.

- ✓ **Through the involvement of "intermediaries"**: Given that researchers do not usually have the required time or skills to communicate their project results to the general

public and especially after the end of the projects, it is suggested that intermediary bodies (intermediaries between researchers and the public) should be appointed in order to continue the dissemination of the research results to the public. A good example is the “nanotechnology ambassadors”, an initiative launched by the Deutsches Museum.

- ✓ **By including clauses of dissemination in IP agreements** restricting and /or clarifying the extension of the communication actions. Dissemination can be very important in terms of letting the market know about what has been achieved but concerns about the loss of a commercial advantage during the communication actions exist among industry. In this way, specific clauses can be planned detailing the activities that project partners and their subcontractors may be involved or the need of prior and informed consent.

- ✓ **By prioritising more the communication of research results than the communication of the research processes**. For the communication addressed to the industry, there is a need to be more focused on the market and to propose final products which could be of the interest of the companies. Dissemination plans of research projects “as usual” tend to emphasize the development process and feel uncomfortable in presenting the results coming from a further stage of demonstration or market validation.

3. Use and dissemination of foreground

A1. List of scientific publications, starting with the most important ones										
No.	Title	Main author	Title of the periodical of the series	Number, date or frequency	Publisher	Place of publication	Date of publication	Relevant pages	Is open access provided to this publication?	Type

A2. List of dissemination activities								
No.	Type of activities	Main leader	Title	Date	Place	Type of audience	Size of audience	Countries addressed
1	Article published in popular press	Bantec	Evaluating communication activities in nanoscience and nanotechnology	14/04/2013	Nanotech IT newsletter	Scientific community (higher education, Research) - Industry - Civil society - Policy makers - Medias	500	Italy
2	Organisation of Workshops	Bantec	Com'N&N Final Workshop: Improving the communication of nanoscience and nanotechnology	18/09/2013	Rome	Scientific community (higher education, Research) - Industry - Civil society - Policy makers - Medias	40	Italy, European Union
3	Organisation of Workshops	Bantec	Com'N&N Ongoing Workshop	20/06/2013	Dublin	Scientific community (higher education, Research) - Industry	20	European Union

						- Civil society - Policy makers – Medias		
4	Flyers	Bantec	Presentation of the Com'N&N Project	07/02/2013	Brussels	Scientific community (higher education, Research) - Industry - Civil society - Policy makers – Medias	250	European Union
5	Web sites/Applications	Bantec	Com'N&N Website	03/12/2012	San Sebastian	Scientific community (higher education, Research) - Industry - Civil society - Policy makers – Medias	1000	European Union
6	Oral presentation to a scientific event	Bantec	Evaluation of communication activities in Nanoscience & Nanotechnology	20/06/2013	Education and Communication Workshop, ENF 2013, Dublin	Scientific community (higher education, Research) - Industry - Civil society - Policy makers – Medias	100	Ireland, European Union
7	Leaflet	Bantec	Evaluating communication activities on nanoscience & nanotechnology	03/09/2013	San Sebastian	Scientific community (higher education, Research) - Industry - Civil society - Policy	250	European Union

						makers – Medias		
8	Leaflet	Bantec	Case studies and good practices of communication actions carried out during the 2007-2013 period	30/09/2013	San Sebastian	Scientific community (higher education, Research) - Industry - Civil society - Policy makers – Medias	250	European Union
9	Leaflet	Bantec	Conclusions and recommendations of the Com'N&N Project	30/09/2013	San Sebastian	Scientific community (higher education, Research) - Industry - Civil society - Policy makers – Medias	250	European Union

4. Section B (confidential or public: confidential information marked clearly)

List of applications for patents, trademarks, registered designs, utility models, etc					
Type of IP Rights	Confidential	Foreseen embargo date	Application reference	Subject or title of application	Applicant(s)(as on the application)

5. Overview table with exploitable foreground

Type of exploitable foregro	Description of the exploitable foreground	Confidential	Foreseen embargo	Exploitable product(s) or measure(s)	Sector(s) of application	Timetable for commercial use or any	Patents or other IPR exploitation (licences)	Owner and Other Beneficiary(ies) involved

und			date			other use		