Guide to Responsible Nano-business

How to use nanotechnologies for the benefit of business, customers, and society

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Content

Introduction

"nano" requires active responsibility

Companies involved in the development, production, processing, or trade of nano-technology-enabled materials, components, and applications face a number of challenges.

Challenges	
New products and lifestyles	▪ Far-reaching effects on society. ▪ Ethical implications. Low public knowledge
	▪ Companies are held accountable for 　▪ Impacts of production 　▪ Impacts occurring during use, disposal or recycling Companies' accountability ▪ Life cycle risk management & safety procedures
Public funding requirements	Funding institutions increasingly consider ▪ Ethical, legal, and societal aspects and ▪ Societal benefits and public acceptance
	▪ Awareness for emerging regulation needed ▪ Self-regulation mechanisms help to prepare for regulation Slowly emerging regulation
High attention of policy makers and media	▪ Transparent communication on benefits and challenges ▪ Better reputation through responsible technology management
Financial risks	Commercial success also depends on: ▪ The ability to manage life-cycle-wide risks ▪ User benefits and public acceptance ▪ The absence of critical incidents

About this guide

Aim

Broadened view and enhanced practice regarding responsibilities in companies applying nanotechnologies

Target users

Medium sized companies involved in the development, processing, production, or trade of nanotechnology-enabled materials, components or applications.

Users may have the following functions:
- R&D
- Product management
- Environment
- Sales
- Communication
- Safety
- ...

Benefits
- Practical step-wise guidance on responsible practices in a company
- Lists and check-boxes
- Good practice examples

How to use this guide

4 tools to identify and manage nanotechnology-related priorities:

Tool #	Coverage
Tool 1	Set priorities
Tool 2	Check and complement guidelines
Tool 3	Focus action
Tool 4	Inform transparently

Options
- Go from 1 to 4 or
- Pick single tools

Your comments

Please provide us with your comments, feedback & experiences:

info@triple-innova.com   Thank you!

Tool 1: Set Priorities

If you are involved in the development, processing, production, or trade of nano-technology-enabled materials, components or applications, nanotechnologies are important to your business. Even if "nano" is not yet the most beneficial business field of your company.

To make "nano" successful for a company means

- the responsible management of known impacts
- precautious actions and being receptive for emerging risks

With this tool you may frame priorities for responsibility measures in your company. The tool considers effects that the use of nanotechnologies may have on your company, and, additionally, on your company's partners, customers, and the society.

How to proceed (3 steps):

1. Tick the measures your company already applies

The following table shows common measures regarding nanotechnologies. The list is not exhaustive. Have a look at them and tick what you do already do inside your company:

Fields	Examples of nano-related measures	☑
Specification of "nano" used	Classification of used nanomaterials or -technologies according to:	
	▪ Available standards (metrology, nomenclature)	☐
	▪ Exposure potential / mobility	☐
	▪ Known/ unknown hazards	☐
Added value of "nano"	▪ Functional value resulting from the used nanotechnologies	☐
	▪ Social and / or environmental added value	☐
	▪ Quality assurance	☐
Occupational health and safety	▪ Monitoring of particle exposition	☐
	▪ Exposure control measures (technical and organisational)	☐
	▪ Use of safety data sheets and distribution to partners	☐
	▪ Staff training on safe handling	☐
	▪ Availability and use of personal protective equipment	☐
	▪ Substitution of harmful substances	☐
Efficiency	▪ Resource and energy efficiency	☐
	▪ Development of "nano"-enabled efficiency products	☐
Customer health and safety	▪ Product testing	☐
	▪ Use of material safety data sheets for customers	☐
	▪ Customer information and risk guidance	☐
	▪ Risk (and toxicity) assessment for use and recycling/disposal	☐

Consumer protection	▪ Compliance with regulation (consumer protection / marketing)	☐
	▪ Consumer information and risk guidance	☐
	▪ Voluntary labelling of nano-materials use and nano-contents	☐
	▪ Consideration and communication of ethical implications	☐
Environmental risks	▪ Environmental risk assessment	☐
	▪ Derived safety measures	☐
	▪ (Long-term) testing of exposition paths and uptake	☐
Risk govern-ance	▪ Co-operation with partners and suppliers on Environmental, Health and Safety (EHS) issues (esp. exchange of safety data)	☐
	▪ Defined Code of Conduct	☐
	▪ Company-internal clearly defined responsibilities for managing nano-related risks	☐
	▪ Sharing of information and best practices on EHS, risk as-sessment, etc. in forums such as committees, trade associa-tions, unions, working groups with governmental agencies, ...	☐
Please add fields of im-portance to your company	*Please add to this list what else your company is doing.*	

Please use the fields mentioned in the table's left column for framing you compa-ny's "nano"-responsibilities. The next step shows how to use them.

2. Identify experts

The notion of "experts" here is used for persons who hold a certain knowledge and expertise regarding the "nano"-activities of your company and activities linked to the use of "nano" in the value chain.

Internal experts know exactly what your company is doing and they are responsi-ble for existing routines and how they meet "nano"-requirements.

- Chief officers
- Product development and research staff
- Quality managers
- Environmental experts
- Internal "nano"-suppliers and / or "nano" purchasers
- OHS managers
- ....

External experts probably know part of what your company is doing, and they are aware of others' practices and /or sector developments, financial developments regarding "nano", upcoming regulation, etc. Very often they follow interests that are very different from your company's interests - and thereby have knowledge and perceptions that are worth having a look at also from your company's perspective. External experts are:

- Financial market experts, analysts, banks
- Networks of researchers and developers, e.g. international working groups or science associations
- European Union, state and sub-state / regional finance and subsidy providers
- Customers
- Suppliers – along the value chain
- Local / regional end of life-managers and end of life academic experts
- Trade unions
- Health and safety regulators and controlling organisations, maybe sector specific
- Environmental and consumer NGOs
- Ethicists and / or religious communities
- ....

The distinction between internal and external experts is an artificial one. Sometimes experts take on internal and external roles or perspectives at the same time. The distinction here was made only for practical reasons.

Experts have different views about what is important. These views may be a rich source for your company and can be used to amplify your company's views!

- Different perspectives can help you to become aware of actual "blind spots" and future issues.
- Exchange of knowledge and perception with experts may foster product and process innovations and may enhance trust and your company's reputation.
- But first of all: Experts may make you aware of some of your "nano"-related practices they consider to be risky or they think will become a risk in the future. Simply by looking at your company from their specific perspectives.

Make a list of the most important experts your company (or your department or working group) is in contact with.

Internal experts			
No.	Function / Group	Name	Field of expertise
1			
2			
3			
4			
5			

External experts			
No.	Function / Group	Name	Field of expertise
1			
2			
3			
4			
5			

3. Prioritize action fields using expertise

Please tick 3-5 fields from the list on pages 4&5 that are in your view the most important ones regarding your company's responsibility for the use of nanotechnologies, i.e. developing, producing, processing, selling, and distributing "nano" applications, components, or products.

Most important fields regarding responsibility of company _____ (your company's name):	☑
Specification of "nano" used	☐
Added value of "nano"	☐
Occupational health and safety	☐
Efficiency	☐
Customer health and safety	☐
Consumer protection	☐

Environmental risks	☐
Risk governance	☐
Please add fields of importance	☐

Show this list to the experts listed above and ask them whether they agree.
Let each expert give his / her feedback to the chosen fields.

Please use meetings, working group sessions, conferences, e-mails you normally use for contacting these experts (in the coming two months). If you do not contact them regularly, please contact them now with the explicit purpose of enhancing responsibility.

Now generate a 5-topics-list from all the answers.

You may do this strictly mathematically, but following our experience it is more suitable just to rethink your first choice and to integrate the others' views. If possible, discuss the others' choices within a working group or with internal experts.

The aim is to reduce topics to those 5 that are most likely to be of great importance. The list is not exhaustive. The list is open to changes in the future. Still, they are a starting point for prioritised action.

Fix the 5-topics-list and put it on your computer screen, in the intranet of your working group, on a wall.... And start mapping your company's responsibility activities from these topics with the next step.

Topic #	Important Topics
1.	
2.	
3.	
4.	
5.	

Good practice examples

- DuPont, a big player, entered into a partnership with the organisation "Environmental Defense" to develop the Nano Risk Framework. For the exploration of risks they involved an expert group with a view on "nano" that differed a lot from their own: http://www.nanoriskframework.com/

More

To gain a quick overview over relevant "nano"-related responsibilities please use the "NanoMeter" self-assessment tool that assists in identifying application-related opportunities and risks:
http://www.observatorynano.eu/project/questionnaire/nanometer

Tool 2: Check and complement guidelines

The "nano"-related regulatory framework on national and European levels is currently being developed or subject to changes. Meanwhile, companies have to use company specific mechanisms for responsibly managing their "nano"-activities.

The generic term "guideline" here is used in order to show that it is of no importance which form of mechanism for enhancing responsibility for the use of "nano" is implemented. The term guideline covers internationally agreed sector regulation, national laws, Codes of Conduct, implementation of (safety, environmental, quality,) management systems, company- or site-specific guidelines, in a group process agreed procedures, individually fixed plans or simply guidelines prescribed for a company department.

How to proceed

On the basis of tool 1, please now check your company internal guidelines and guidelines your company already follows and

- identify which of the prioritised topics they already cover
- check if these guidelines are "nano"-specific
- check if there are additional guidelines needed in order to take over responsibility in some of the prioritised topics

These aspects can help you to evaluate the guidelines. Are your company's guidelines:	☑
applicable to "nano"-related processes	☐
specific to guide concrete actions	☐
enhancing systematic risk management	☐
binding	☐
covering the activities inside your company and also your responsibility for customers, consumers & society	☐
complemented with a documentation and / or monitoring mechanism	☐

Using existing guidelines from other institutions may be an easy way to enhance your company's responsibility mechanisms.

Now please check other guidelines.

1. Have a look at guidelines that are used by your direct suppliers, partners or costumers.

2. Find out which Codes of Conduct are promoted by industry associations you work with. Decide if these or parts of them are suitable for your company in terms of scope and the inclusion of relevant life cycle phases.

3. Review and complement by identifying affected applications and processes, by adapting or setting targets and by installing mechanisms that allow the monitoring of results on a regular basis.

Good practice example

- BASF developed a company-specific nanotechnology-Code of Conduct: http://www.basf.com/group/corporate/en/sustainability/dialogue/in-dialogue-with-politics/nanotechnology/code-of-conduct

More

For an overview of nanotechnology-related Codes of Conduct see: http://www.observatorynano.eu/project/document/1576/

Please find the EC "Code of Conduct for responsible nanosciences and nano-technologies research" at: http://ec.europa.eu/research/science-society/document_library/pdf_06/nanocode-apr09_en.pdf (and revision document: http://ec.europa.eu/research/consultations/nano-code/results_en.pdf)

Tool 3: Focus action

Measures need to be put in place to assure the practical use of a guideline.

This tool gives hints how to ensure that guidelines fulfil their purpose in practice.

So-called key performance indicators (KPIs) measure the current performance and monitor the most relevant developments. They indicate if programmes and activities actually succeed or require further adjustments.

Most probably your company has key performance indicators (KPIs) in place. They may be included in controlling mechanisms, management systems, sustainability strategies or be used per business unit in order to meter the achievements of financial goals.

How to proceed

Please check the KPIs used in your company

- if they do already cover the prioritised topics from tool 1
- which of the prioritised topics they do not cover

Please check the guidelines identified in tool 2 which your company uses or which you plan to implement

- if they would need additional KPIs - or if those aspects from the guidelines go well without being continuously metered and checked.

Define max. 3 additional KPIs in order to cover the 5 most important fields:

- decide for indicators that describe your specific "nano"-performance and may guide internal processes and can be obtained with reasonable effort
- please assign responsibilities for the use and monitoring of the indicators.
-

#	Existing Indicators covering "nano"
1.	
2.	
3.	
4.	
5.	
#	New Indicators
1.	
2.	
3.	

Good practice example

- The Precautionary Matrix for Synthetic Nanomaterials provides a structured method to assess the "nanospecific precautionary need" of workers, consumers and the environment arising from the production and use of synthetic nanomaterials. Parameters / indicators help to characterise materials for a rough estimate of potential risks. It is provided by the Swiss Federal Office of Public Health (FOPH) and the Federal Office for the Environment (FOEN) and can be accessed at:
  http://www.bag.admin.ch/themen/chemikalien/00228/00510/05626/index.html?lang=en

More

- Ask partners from research networks and industry associations for indicator sets they use and about their experiences with the practical value of those sets.

Tool 4: Inform transparently

Transparent information about specific applications, about risk management and responsibility issues aims at satisfying the informational needs of important target groups. Additionally, transparent and reliable specific information may foster fact-based and constructive public discussions regarding "nano".

This tool helps you to enhance your communication regarding "nano" and to actively use communication as a precautionary risk assessment instrument.

For many companies, "nano" communication implies marketing messages on the one hand, and silence towards critical issues on the other hand. Partners, customers and parts of the public ask for communication that

- reflects on the current state of science and knowledge,
- includes potential uncertainties and risks,
- clearly states which mechanisms are in state to deal with uncertainty,
- provides reasons why you accept certain risks from "nano" applications,
- highlights product-related advantages,
- concentrates on fact-based information.

Communicating transparently and responsively also to groups objecting the use of nanotechnologies may help to increase trust in your company and your goals, but at least makes your communication trustworthy.

How to proceed

Please use the following principles for defining communication content and quality[1]. They will support you in assuring high credibility and transparency.

1. What to communicate? (Communication content)
   - Relevance: Corporate communication should focus on those topics that are most relevant for your company and for your partners.
     Completeness: Make sure that all relevant topics are addressed. If critical or pressing aspects are not commented, credibility may be reduced. It helps to comment on these aspects, even if full information or solutions can't be provided.

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[1] These principles are taken from the Guidelines on sustainability reporting issued by the Global Reporting Initiative (GRI). A more detailed overview of and guidance on the principles can be found at: www.globalreporting.org

2. How to communicate? (Quality of communication)
   - Reliability and Accuracy: You should be able to internally proof all facts and data communicated with original data and reference documents as well as disclose underlying assumption and calculation methods.
   - Balance: Relevance and completeness of communication implies that also critical aspects are covered, i.e. where your performance is negative, bears potential risks or is not yet quantified.
   - Clarity: Language and style can be relevant for the communication of technical information and "nano"-specifics to consumers or a wider public.

How to communicate also involves the question of the most appropriate and effective communication channel. The following table generically illustrates the match between important target groups and communication means (darker area = stronger match):

Communication means	Employees	Supply chain partners	Business customers	Wider public/ Consumers
Company website				
Press release				
Sustainability report (print, website)				
Safety Data Sheet				
Employee news, Internal newsletter				
Company newsletter				
Company brochure				
User manual, product website				
Product labels				

Good practice examples

- BASF runs a dedicated Nanotechnology website. Among others, it includes answers to frequently asked questions (FAQs) and publications of safety research: http://www.basf.com/group/corporate/en/sustainability/dialogue/in-dialogue-with-politics/nanotechnology/index
- The German Chemical Industry Association (VCI) has published a "Guidance for the Passing on of Information along the Supply Chain in the Handling of Nanomaterials via Safety Data Sheets": https://www.vci.de/Downloads/122301-Guidance%20SDS%20for%20Nanomaterials%20_06%20March%202008.pdf

More

Start collecting FAQs by customers on "nano". Prepare answers to these questions by following the guidance on content and quality above and make them ac-

cessible (e.g. on your company website). If facts or data are not yet available to answer a question provide a brief feedback on:

- What is your policy on this topic?
- What actions will shortly be implemented?
- When can results be expected?

Make sure to regularly update the information provided and try to constantly increase the portion of fact-based information.

Further readings

Bowman, D.M.; Hodge, G.A. (2009). Counting on codes: An examination of transnational codes as a regulatory governance mechanism for nanotechnologies. Regulation & Governance, Volume 3, Issue 2, pp. 145-164, June 2009.

BRASS – The Centre For Business Relationships, Accountability, Sustainability and Society, Cardiff University (2009): An examination of the nature and application among the nanotechnologies industries of corporate social responsibility in the context of safeguarding the environment and human health. Report for Department of Environment, Food and Rural Affairs.

RESPONSE (2007). Understanding and responding to societal demands on corporate responsibility, Fontainebleu, INSEAD report.

Schaller, S. (2008). Corporate social responsibility: A guiding concept for dialogue on nanotechnology.
http://www.electroiq.com/articles/stm/print/volume-8/issue-1/columns-and-departments/small-tech-exec/corporate-social-responsibility-a-guiding-concept-for-dialogue-on-nanotechnology.html.

ObservatoryNANO: The business tools

Nanotechnologies are a complex and rapidly changing field, which is a challenge to assess in terms of opportunities, challenges and risks. The observatoryNANO project was funded by the European Commission for 4 years under the Framework Programme 7 to address this. It assessed all aspects of the value chain from basic research to market applications in terms of scientific, technological and socio-economic developments and prospects. At the same time it observed and evaluated ethical and societal aspects; potential environmental, health and safety issues; and developments regarding regulations and standards.

The ObservatoryNANO business tools were designed to disseminate results towards companies. Furthermore, they provide guidance on relevant societal and ethical aspects (NanoMeter) and important instruments to actively take on responsibility (Guide to Responsible Nano-business).

www.observatorynano.eu – Business Tools

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triple innova, founded in 2002, is a training and applied research organisation on sustainability and corporate responsibility. Benefiting from a global network of players in UN organisations, science centres, NGOs, think-tanks, companies and consultancies; triple innova offers clients a competitive advantage by assisting them in focusing their sustainability strategies and implementing CSR practices, agendas and tools and by providing training programmes. By transfer of actual scientific results, and by workshops effectively pointing to practical action, triple innova enables persons and groups in organisations to actively follow their own sustainability strategies.