

The logo for NIA (Nanotechnology Industries Association) is displayed in large, bold, blue letters. The background features a dark blue diagonal stripe, a light gray diagonal stripe, and a pattern of blue spheres on the right side.

# NIA

Nanotechnology  
Industries Association

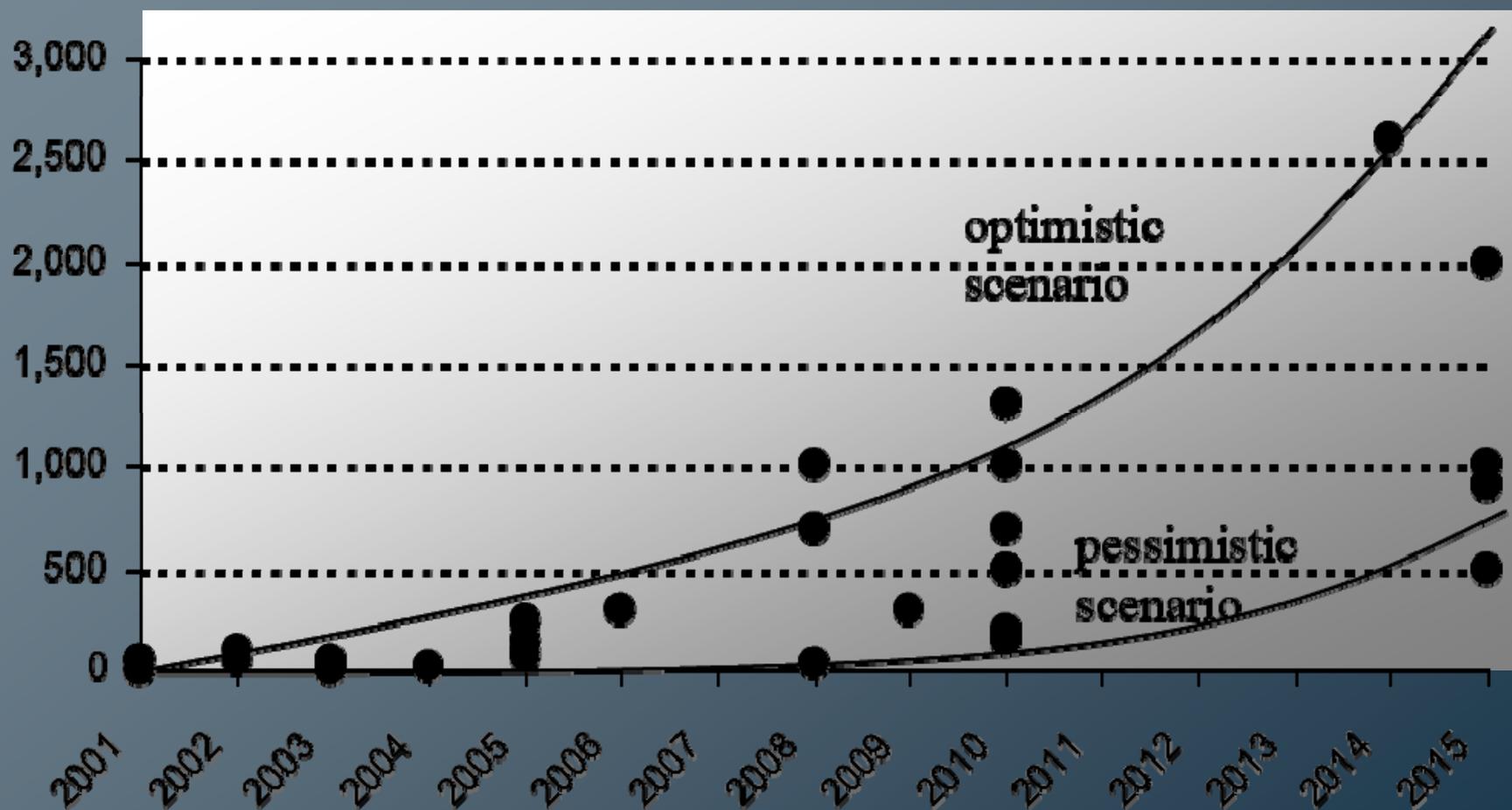
Social Dialogue:  
Working Group on Health & Safety and Responsible Care  
3<sup>rd</sup> March 2010

*Nanotechnology: what role for the  
European social partners in the  
chemical industry?*

*The industry's perspective*

# Nanotechnologies - The Promise

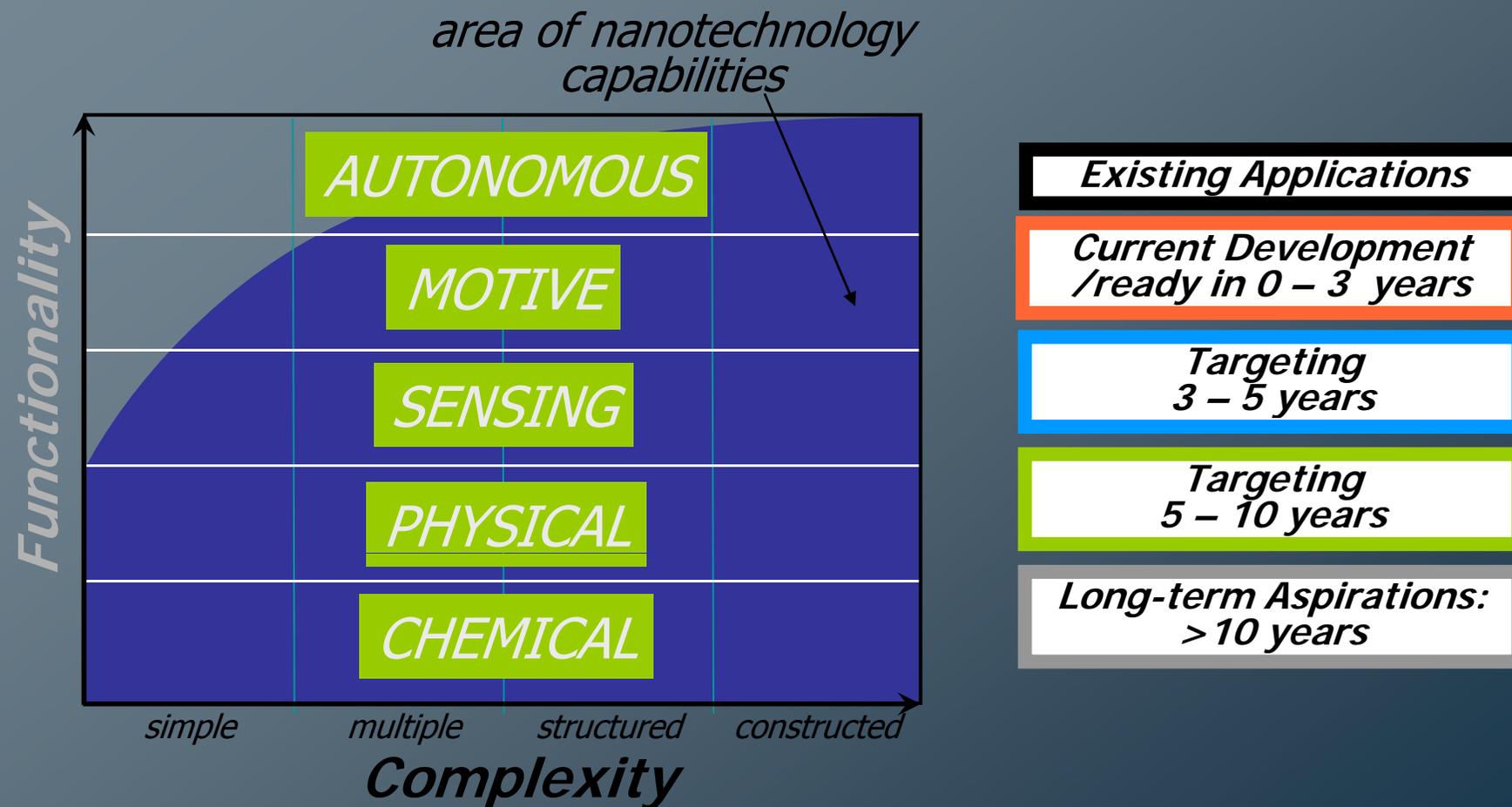
World market forecasts for nanotechnology [billion US\$].



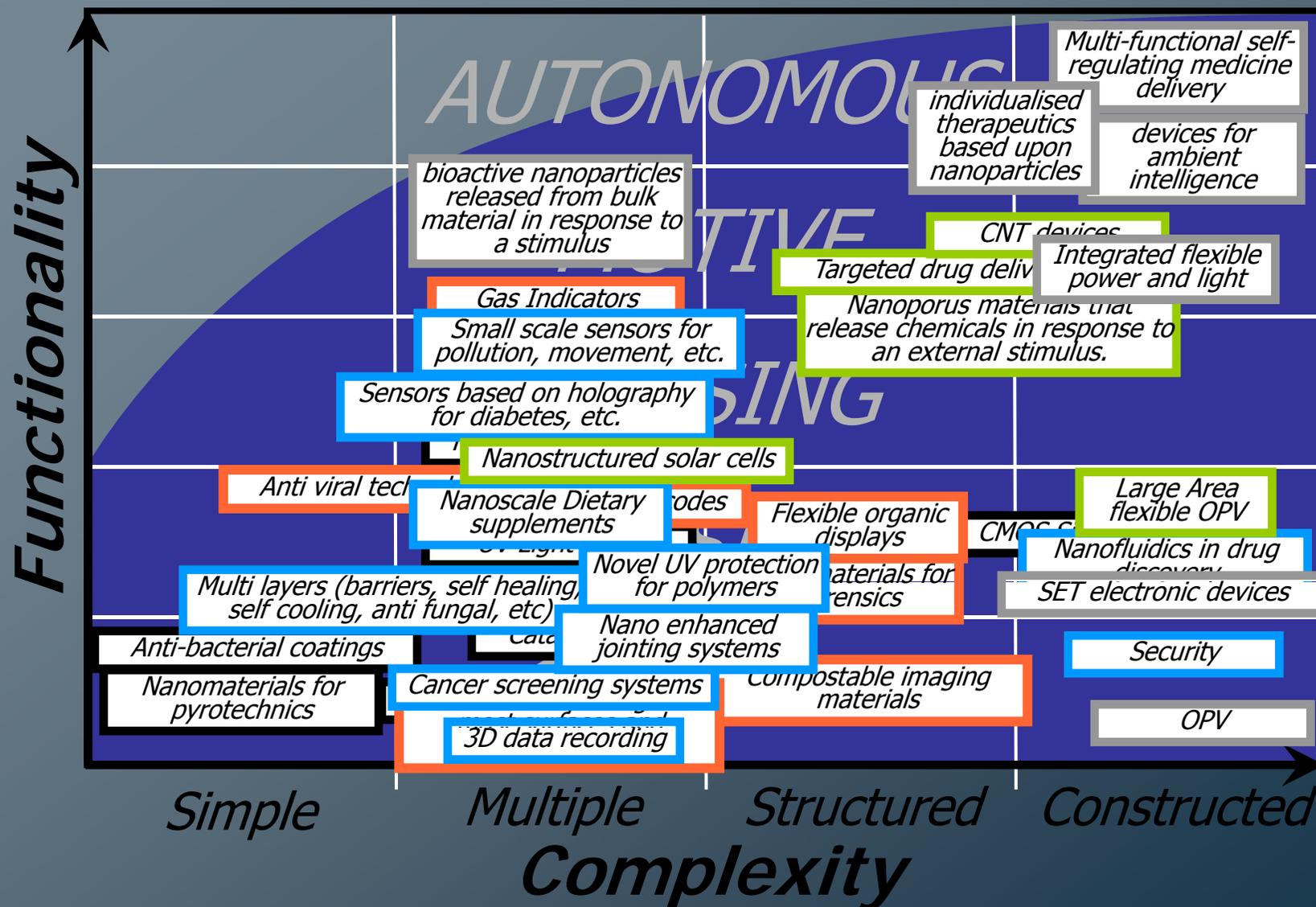
[The Economic Development of Nanotechnology, European Commission, DG Research, 28.11.2006]

# NIA Forecast of Emerging Technologies

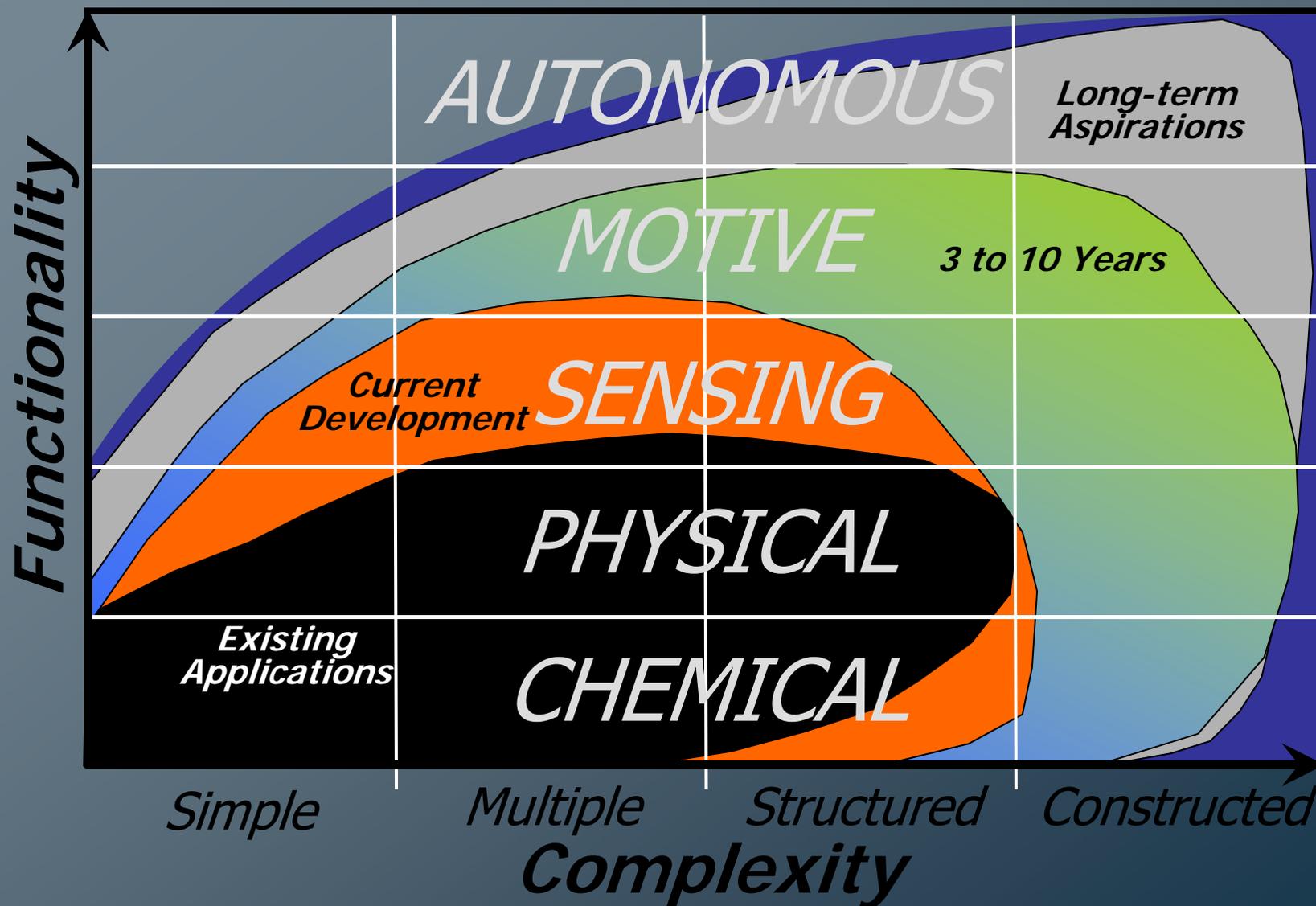
Level of functionality at the nano scale (cumulative)



# NIA Forecast – Technology Spread over Time



# NIA Forecast – Technology Spread over Time



# NIA Forecast of Emerging Technologies

free download: [www.nanotechia.org/content/activities2/techforesight/](http://www.nanotechia.org/content/activities2/techforesight/)

## NIA Forecast of Emerging Technologies Nanotechnologies

### Background

The Nanotechnology Industries Association (NIA) was formed in 2005 on the initiative of companies from a variety of industry sectors including healthcare, chemicals, automotive and consumer products. The NIA creates a clear single voice to represent the diverse industries' views in the multi-stakeholder debate on nanotechnology, by providing an interface with government, acting as a source for consultation on regulation and standards, developing timely technology forecasts, communicating the benefits of nanotechnologies and interacting with the media to ensure an ongoing advancement and commercialisation of nanotechnologies.

The NIA provides a purely industry-led perspective derived from the views of the collective membership, which is made up of many varied companies all at different stages of their life-cycle and with a variety of interests in the huge range of technologies that derive their benefit from the nanoscale. This enables those seeking comment from a single point of contact to the industries and avoids the need to liaise with individual companies for statements on specific issues. In addition the breadth of membership enables the NIA to put forward strong proposals to government and other stakeholders to promote an environment that supports the application and development of nanotechnologies.

As a result of an ongoing advancement of nanotechnology research, development and commercialisation is central to the NIA's role as a key-contact point between government, policy makers on one hand and the growing nanotechnology industries on the other. In identifying and forecasting unique areas of potential competitive advantage in nanotechnology, the NIA helps to secure the full economic and societal benefits of this exciting field of emerging technologies.

The *NIA Forecast of Emerging Technologies* provides a purely industry-led forecast, based on the exclusive use of data obtained from the industrial members of the NIA. It provides a clear outline of the industrial development path for nanotechnology over the next 15 years into more complex nanomaterials, structures and devices. The forecast examines the existing opinion of the economic potential for nanotechnology and provides a 2020-view of the emerging technologies' impact.

The *NIA Forecast of Emerging Technologies* is based on a flexible and dynamic approach that is not constrained by a rigid process-driven approach, but that can be used to compare widely differing technologies on the same graph and compare them. The

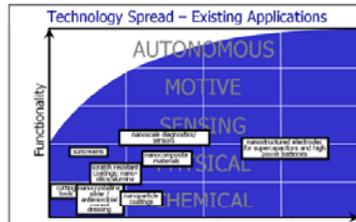


Figure 4a Spread of nanotechnologies in existing applications.

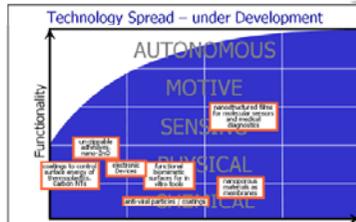


Figure 4b Spread of nanotechnologies currently under development.

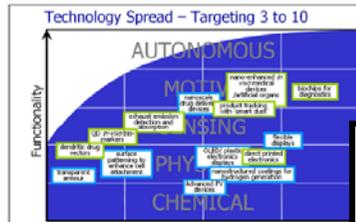
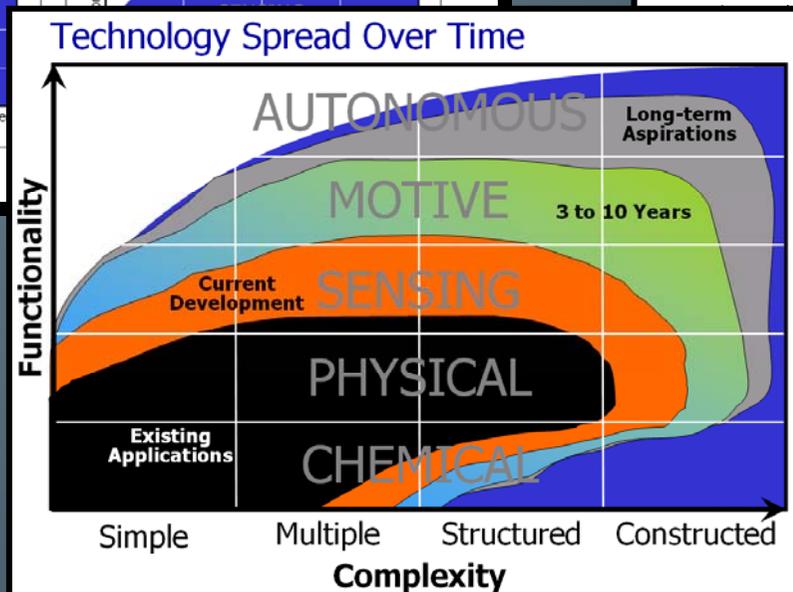


Figure 4c Spread of nanotechnologies realised in 3 – 10 years.

© Nanotechnology Industries Association 2007



# Nanotechnologies – the Story of Supply Chains

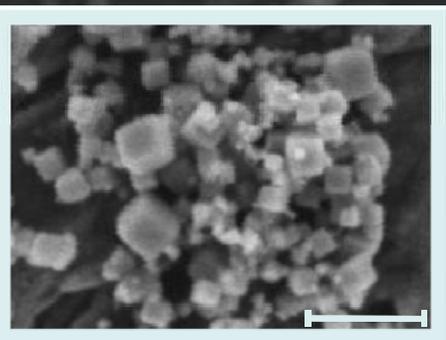
*Manufacture of  
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*Retail of  
nanoenabled Products*

*Instrumentation & Services:  
Characterisation , Analysis, Detection*

[source: Intrisiq]



[www.brimham.com]



02144LY

[source: Intertek  
Measurement Science Group]



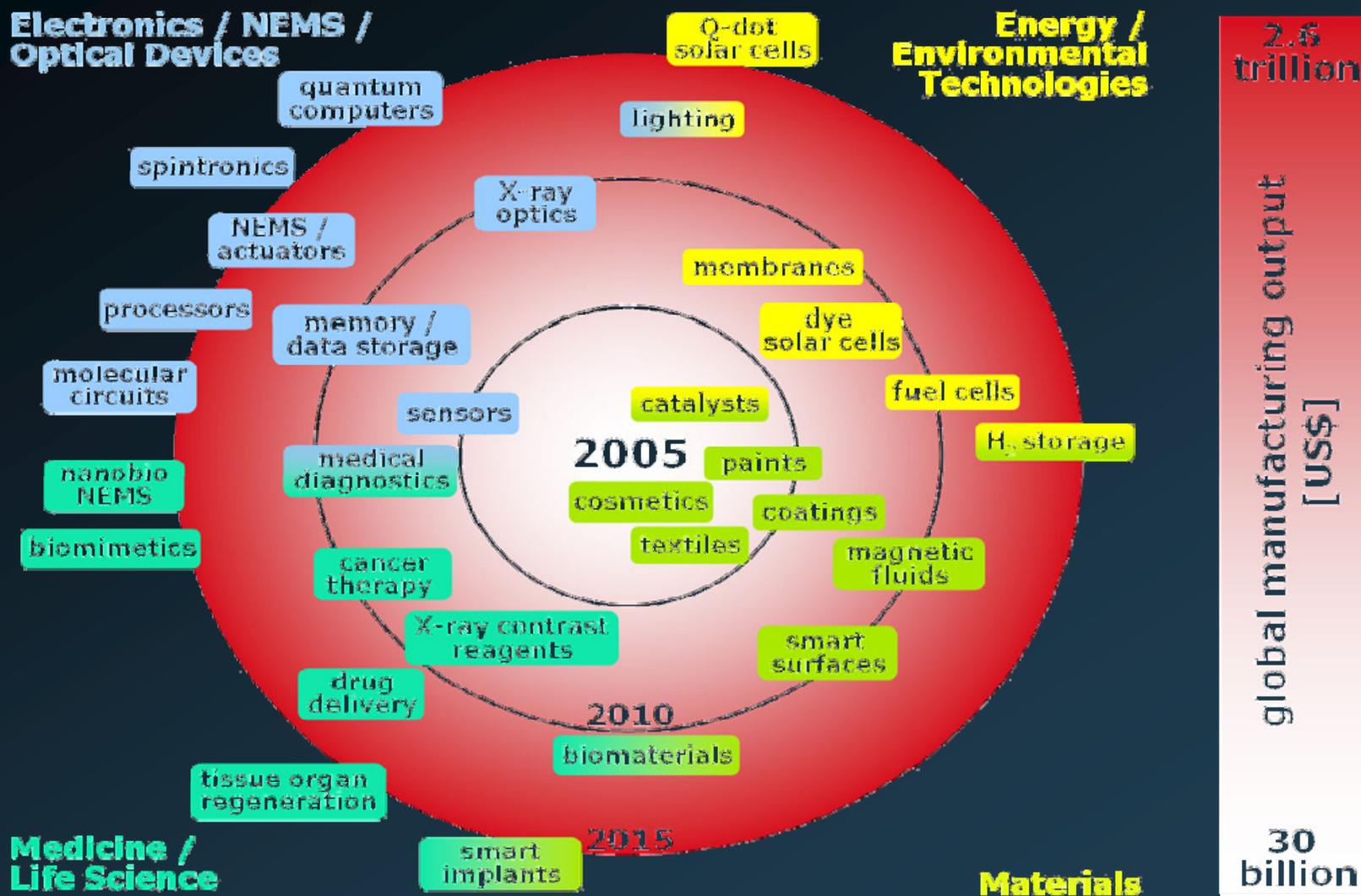
[source: Oxonica]



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*Associated Support Services (Insurance, Legal Representation, etc.)*

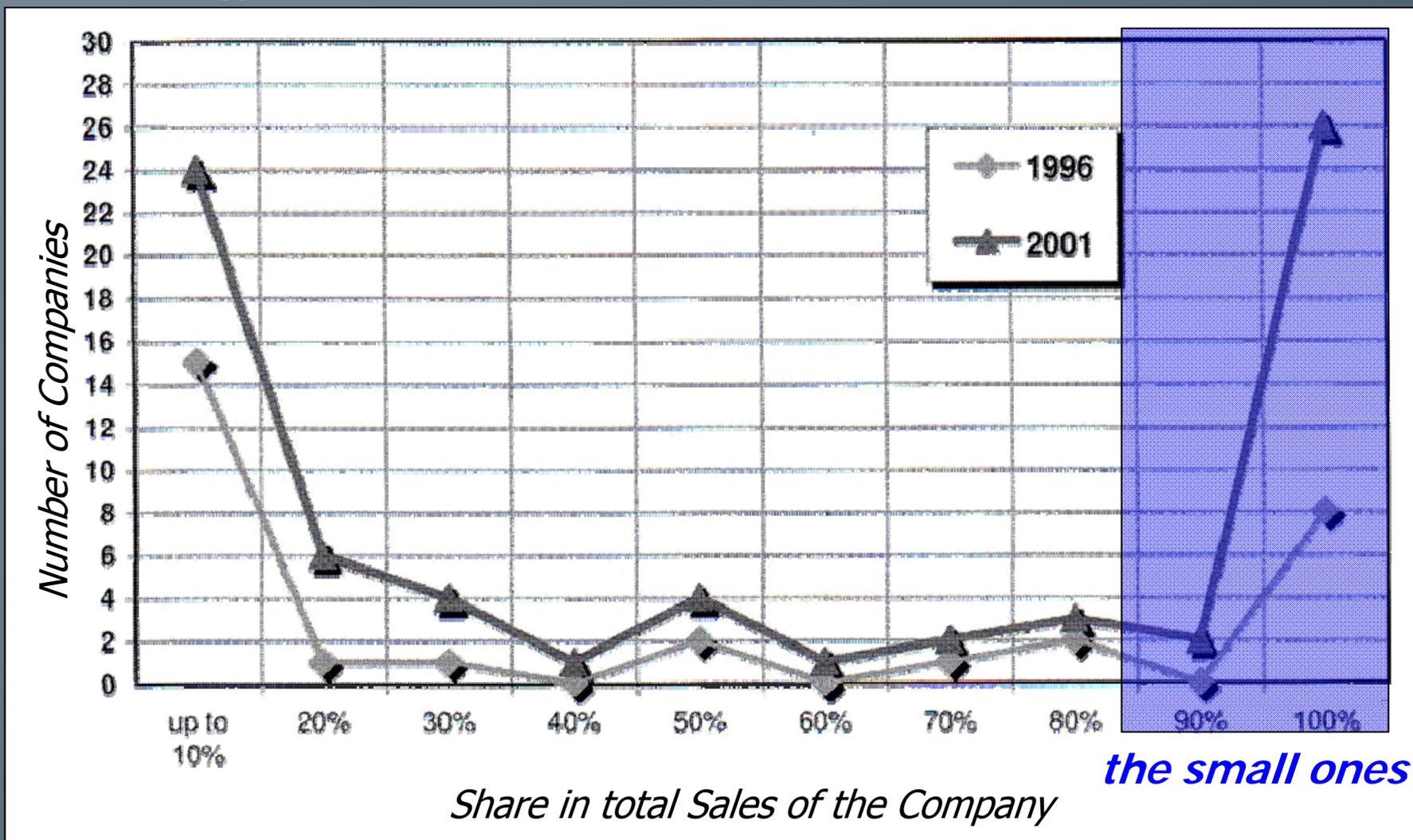
# Nanotechnologies – enabling Technologies



[S. Friedrichs & J. Schulte, *Sci. Tech. Adv. Mater.*, ISNEPP 2006]

# Nanotechnologies – Who's making money?

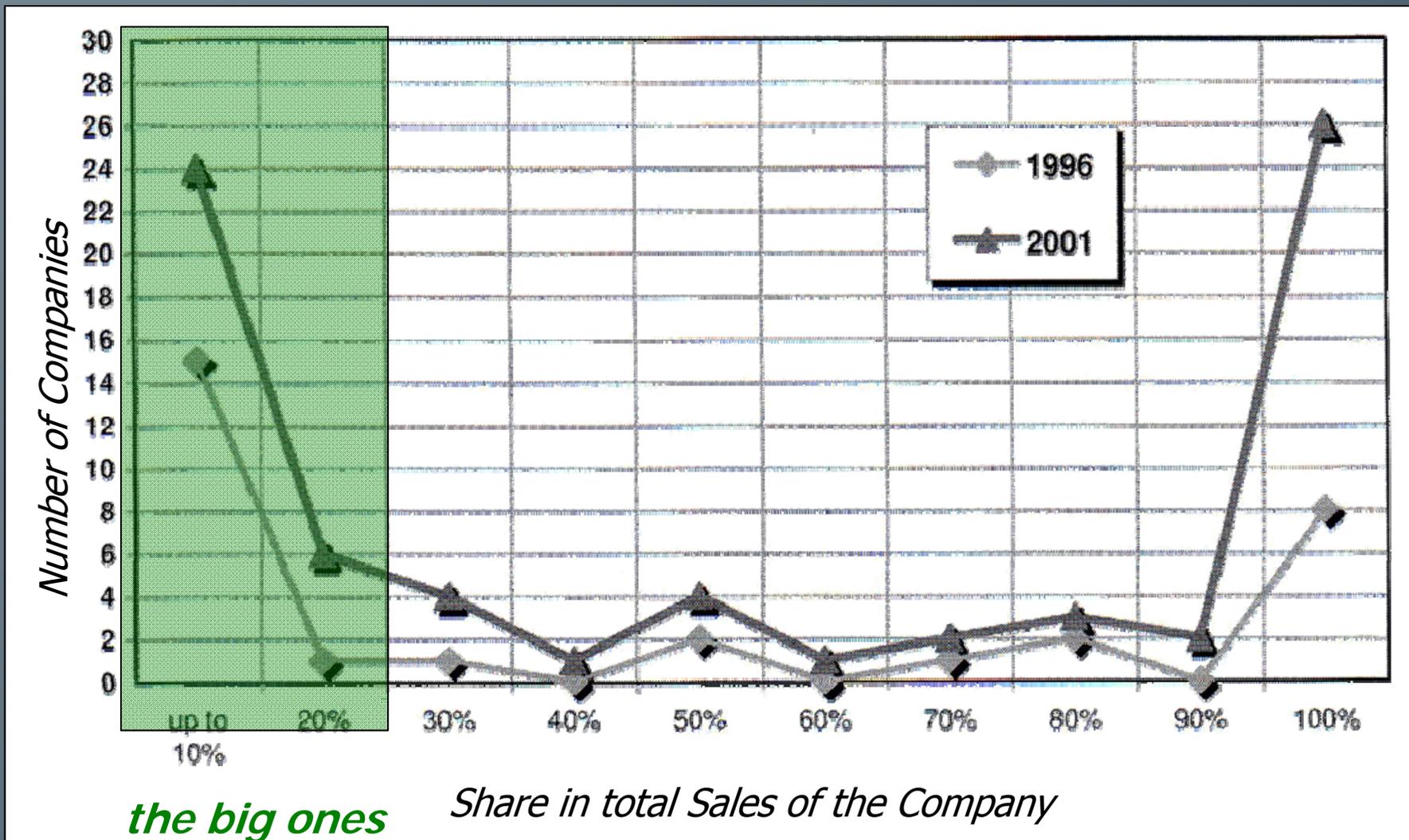
## Nanotechnology-related Sales Share



[source: Malanowski et al, Growth Market Nanotechnology, Wiley-VCH, Weinheim 2006]

# Nanotechnologies – Who's making money?

## Nanotechnology-related Sales Share



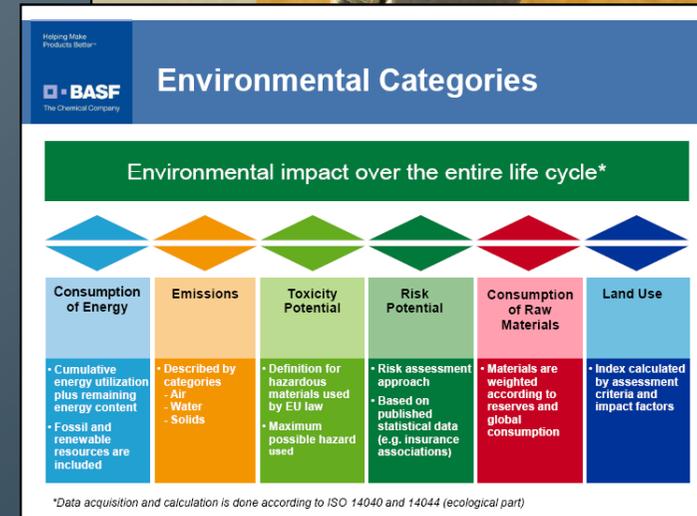
[source: Malanowski et al, Growth Market Nanotechnology, Wiley-VCH, Weinheim 2006]

# Nanotechnologies – not just for the sake of it!

No technology-push,

... but a market-pulled demand for sustainability (external & internal):

- *Environment, Energy, and Climate*
- *Safety*
- Meeting global market needs through science and innovation
  - Agriculture & Food
  - Building & Construction
  - Communications
  - Transportation
- Reducing DuPont's Footprint
  - Greenhouse Gas Emissions
  - Water Conservation
  - Water Conservation
  - Independent Verification
  - Fleet Fuel Efficiency



# Nanotechnologies – enabling Sustainability

... painting the bigger picture:

The European Sustainable Development Strategy deals in an **integrated** way with **economic**, **environmental** and **social** issues and lists the following seven key challenges:

- Climate change and clean energy
- Sustainable transport
- Sustainable consumption and production
- Conservation and management of natural resources
- Public health
- Social inclusion, demography and migration
- Global poverty



**OECD Nanotechnology**  
15-17 July 2009,  
OECD Conference Centre, Paris, France

**OECD Conference on  
Potential Environmental Benefits of Nanotechnology:  
Fostering Safe Innovation-Led Growth**

**BACKGROUND**  
Nanotechnology is an emerging technology which could significantly contribute to raising living standards and improving quality of life. It has already been applied in many products in areas including energy efficiency, healthcare, environmental protection, and information and communication technologies. Many more applications are expected in the future. Ways of maximizing the benefits of nanotechnology, along with ensuring human health and environmental safety with regard to nanomaterials, is becoming an important topic for discussion, a new source of economic growth and a potential "win-win" opportunity for both the environment and the economy. In this respect, the conference will significantly contribute to accelerating the OECD's current efforts in fostering safe, "green" and innovation-led growth.

**OBJECTIVE AND SCOPE**  
The conference will cover both the opportunities and the challenges of the use of nanotechnologies for potential environmental benefit. The aim is to learn from international expertise and to identify ways in which to improve, in a timely manner, policies with the potential to enhance both short- and long-term economic growth.  
The conference will provide an opportunity for governments, academia, industry, and non-governmental organisations to consider the state-of-the-art of nanotechnologies and their potential to bring environmental benefits and to address any potential human health and environmental safety concerns at the same time.  
In particular, the conference will address sustainability and life cycle aspects in a variety of sectors in which nanotechnology has the potential to give rise to environmental benefits.

<http://www.oecd.org/nanobenefits>

# *Nanotechnologies – enabling Europe*

Europe's new science & innovation strategies:

*'[...] clean technologies, biotechnology and nanotechnology will be as crucial for the economy as ICT was in the 1990s'*

(... Europe needs to lead the 'Green Revolution')

[Janez Potočnik, European Commissioner for Science and Research]

Barroso: *'In the next Commission, I want to set up a chief scientific adviser who has the power to deliver proactive, scientific advice throughout all stages of policy development and delivery.'*

## *NIA – The Mission*

*... the **sector-independent, responsible voice** for the **industrial nanotechnologies supply chains**;*

*... it **proactively supports the ongoing innovation and commercialisation** of the next generation of technologies and promotes their safe and reliable advancement.*

**globally the only industries-focused trade association in nanotechnology**

**NIA**

*Social Dialogue Chemical Industry*  
Brussels, 3<sup>rd</sup> March 2010

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# Nanotechnology Industries Association (NIA)

## Current Status

- advising federal & national Governments (e.g. member of DEFRA Stakeholder Nanotech Forum; member of EC's regulatory working groups (e.g. 'food' (DG SANCO), 'medical devices' (DG Enterprise & Industry))
- advising the OCED (WPMN & WPN) through BIAC\*
- Liaison status with standardisation bodies (i.e. BSI NTI/1; CEN/TC 352; (ISO/TC 229))
- Secretariat-support to the European Commission 'Industry Colloquium on NanoSafety Research & Management' (= 'Strategic NanoSafety Group')

## Projects:

- RAEng INGENIOUS Programme for Public Engagement '*Public Communication & Applied Ethics of Nanotechnology*'
- 50:50 public-private-partnership with the UK Government to support the OECD Sponsorship Programme on Manufactured Nanomaterials: £3.7 Million for in-depth characterisation, ecotoxicology testing and detection prototyping of nano-ZnO and nano-CeO<sub>2</sub>: '*Ecotoxicology Test Protocols for Representative Nanomaterials in Support of the OECD Sponsorship Programme*'

- \* OECD: Organisation for Economic Co-operation and Development  
WPMN: Working Party on Manufactured Nanomaterials (i.e. part of the OECD initiative on 'Chemical Safety')  
WPN: Working Party on Nanotechnology (i.e. part of the OECD 'Committee for Scientific and Technological Policy')  
BIAC: Business and Industry Advisory Committee to the OECD

# NIA & the OECD WPMN Sponsorship Programme

## OECD WPMN Sponsorship Arrangements

	Lead sponsor(s)	Co-sponsor(s)	Contributor
Fullerenes(C60)	Japan, US		China*
SWCNTs	Japan, US		Germany, Canada, EC, France, China*
MWCNTs	Japan, US	Korea, <a href="#">BIAC (NIA)</a>	Germany, Canada, EC, France, China*
Silver nanoparticles	US, Korea	Germany, Canada, Australia	<a href="#">BIAC (NIA)</a> , Australia, EC, France, China*
Iron nanoparticles	China*		Canada, US
Carbon black			Germany, US
Titanium dioxide	Germany	Canada, Spain, <a href="#">BIAC</a> , Korea, US	France, China*
Aluminium oxide			Germany , US
Cerium oxide	<a href="#">UK/BIAC(NIA)</a> , <a href="#">US(EPA)</a>	Netherlands, Spain	Australia, Germany, EC, Switzerland
Zinc oxide	<a href="#">UK/BIAC(NIA)</a>	<a href="#">BIAC(CEFIC)</a> , Australia, <a href="#">US(FDA)</a> , Spain	Germany, Canada
Silicon dioxide	EC*	<a href="#">BIAC(CEFIC)</a> , Korea	EC, France
Polystyrene			Korea
Dendrimers		Spain	US
Nanoclays			US

### PROSPEcT Project:

Industrial contribution: £1840840

Government contribution: £1840767

Total: £3681607

*BIAC: Business and Industry Advisory Committee to the OECD*

Start date: 1<sup>st</sup> January 2009

Duration: 3 years (36 months)



Social Dialogue Chemical Industry

Brussels, 3<sup>rd</sup> March 2010

# NIA & the OECD WPMN Sponsorship Programme



**PROSPECT**  
Global Nanomaterials Safety

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## Welcome

PROSPECT is a public-private-partnership dedicated to supporting the safe and responsible exploitation of nanomaterials, and developing a better understanding of their impact on humans, and the environment.

WPMN: Working Party on Manufactured Nanomaterials (i.e. part of the OECD initiative on 'Chemical Safety')

# Nanotechnology Industries Association (NIA)

## Projects (continued):

- *'Best Practices for IPR and Technology Transfer in Nanotechnology Developments'*
- *'Development of Exposure Scenarios for Manufactured Nanomaterials'*
- European Commission *'REACH Implementation Plans on Nanomaterials (RIP-oNs):\* Scientific and technical support on nanomaterials'*
  - *RIP-oN 2: 'Specific advice on fulfilling information requirements for nanomaterials under REACH' (aka 'REACH-NanoInfo')*
  - *RIP-oN 3: 'Specific advice on exposure assessment and Hazard/Risk Characterisation for nanomaterials under REACH (aka 'REACH-NanoHazEx')*
- *\* RIP-oN 1: Substance identification of nanomaterials: this RIP-oN is conducted by the IHCP (JRC) under consultation of additional experts*

# Nanotechnologies – the Story of Supply Chains

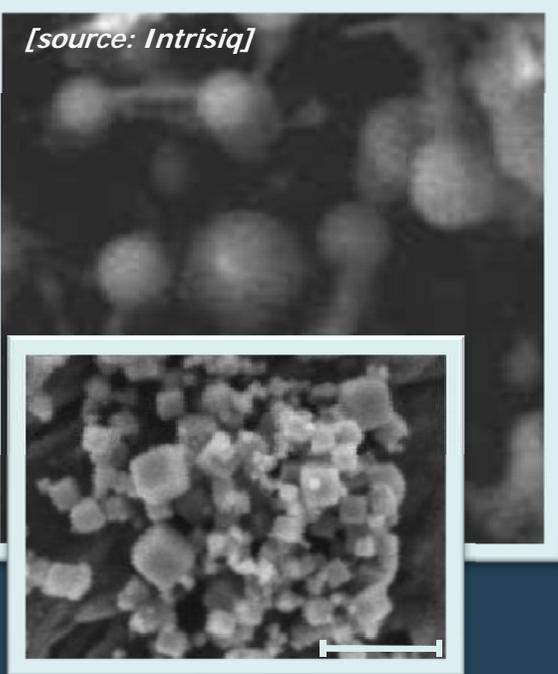
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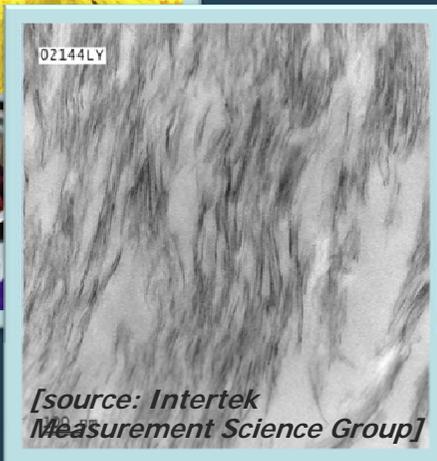
[source: Intrisiq]



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*Associated Support Services (Insurance, Legal Representation, etc.)*

*Magic Nano: The Story of Supply Chains gone wrong*



# *Magic Nano: The Story of Supply Chains gone wrong*

Monday, April 10, 2006

**"Nano" Safety Recall**

**Kleinmann pulls nano product**

*Six people hospitalised  
by nanotechnology.*

washingtonpost.com

**Nanotech Product Recalled in  
Germany**

# *Magic Nano: The Story of Supply Chains gone wrong*

Monday, April 10, 2006



News Release  
ETC Group  
April 7, 2006  
[www.etcgroup.org](http://www.etcgroup.org)

## **Nanotech Product Recall Underscores Need for Nanotech Moratorium: *Is the Magic Gone?***

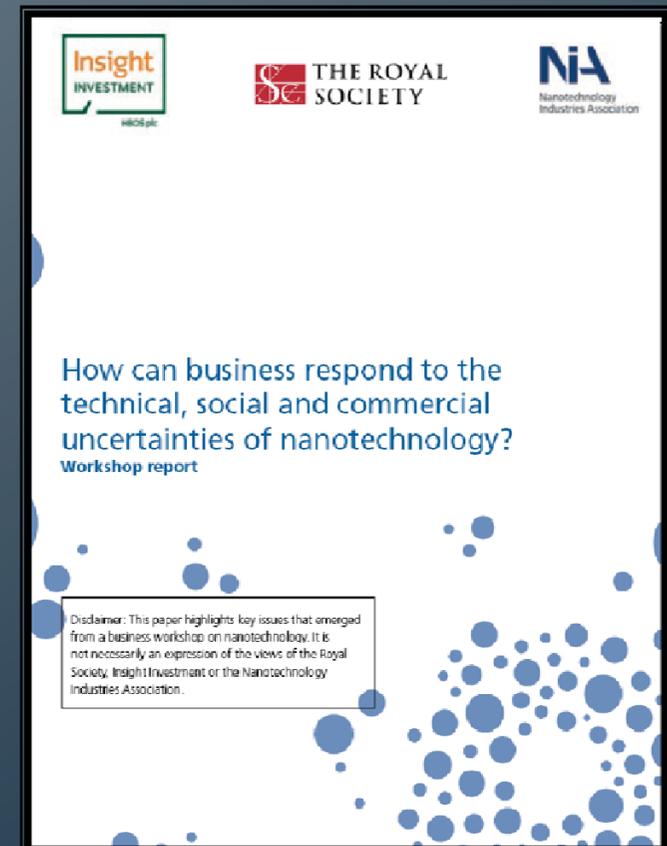
# NIA – Responsible Nano Code

## Background

- 2003/2004 Royal Society/Royal Academy of Engineering joint report on 'Nanoscience and Nanotechnologies: Opportunities and Uncertainties'

## Creation of the Responsible NanoCode (2006 – 2007)

- Royal Society felt there was a gap – industry not engaged
- Insight had identified potential investment issues
- RS & Insight jointly approached the NIA to enhance engagement with business
- November 2006: 'RS-Insight-NIA'-Workshop to discuss the businesses' opinion of uncertainties and risks (17 companies and other stakeholders)
- Main **workshop recommendation**: Develop a **Code of Conduct** and a forum to discuss issues relating to nanotechnology safety
- Creation of the Code of Conduct: **May – September 2007**
- International public consultation: **September – December 2007**



# *Responsible Nano Code – The Working Group*

## *Companies*

- *BASF*
- *Johnson & Johnson*
- *Johnson Matthey*
- *Oxonica*
- *Smith & Nephew*
- *Tesco*
- *Thomas Swan*
- *Unilever*

## *Unions / NGOs*

- *Amicus*
- *Practical Action*
- *Which?*

## *Academics / scientists*

- *Institute of Occupational Medicine*
- *Napier University*
- *University of Sheffield*
- *University of Cardiff*

## *Founding Partners*

- *Royal Society*
- *Insight Investment*
- *UK Knowledge Transfer Network*
- *Nanotechnology Industries Association*

# NanoSafety – The Story of Supply Chains

## ResponsibleNanoCode

Home

Progress and Public Consultation

Responsible NanoCode Working Group

Working Group participants

Draft work plan

Terms of Reference

Disclaimer

Contact

SCIENCE2BUSINESS

➔ Collaboration server login

### Background to the Responsible NanoCode

In November 2006, the Royal Society, Insight Investment and the Nanotechnology Industries Association (NIA) came together to explore the societal and economic impact of the technical, social and commercial uncertainties related to nanotechnologies.

The three organisations began this process by convening a business-focused workshop that stimulated companies to engage more fully with the broad spectrum of questions which affect the development of nanotechnologies; the workshop brought together seventeen European companies with a commercial interest in nanotechnology - from food and chemicals manufacturers to retailers of healthcare and fashion. The background of the workshop was laid out in the commissioned briefing paper: [An Uncertain Business: The technical, social and commercial challenges presented by nanotechnology](#).

One of the main outcomes of the workshop was a unanimous agreement on the requirements for a voluntary Code of Conduct for businesses engaged in nanotechnology. It was felt that such a Code should be principles based rather than standards based and would be developed through a process of engagement between a representative group of businesses from various stages of different supply chains and a wide range of stakeholders, including NGOs, government and consumer groups. Follow this link to download the full [Workshop Report](#).

Following the success of the workshop, the three organisations agreed to take forward one of the key recommendations that emerged from the discussions: and decided to facilitate the development of a voluntary **Code of Conduct for Responsible Nanotechnology ("Responsible NanoCode")**. The three organisations were joined by the Nanotechnology Knowledge Transfer Network - an initiative sponsored by the UK government's Department of Trade and Industry. These four organisations are now referred to as the [Founding Partners](#).

### Founding partners



HBOS plc



Nanotechnology Industries Association



[www.responsiblenanocode.org](http://www.responsiblenanocode.org)



Social Dialogue Chemical Industry  
Brussels, 3<sup>rd</sup> March 2010

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# Nano, Public Perception, & the laughing 3<sup>rd</sup>

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## Asbestos-like Nanotubes Pose Serious Health Risks

A major study has revealed some forms of carbon nanotubes are likely to pose health risks similar to asbestos. If inhaled in sufficient quantities, this stronger than steel, lighter than air technology can penetrate lungs and cause significant damage. The technology, being developed for use in new drugs, energy-efficient batteries and futuristic electronics, is made up of long, thin multi-walled carbon nanotubes that look like asbestos fibers, and act like asbestos fibers. It is likely that asbestos is the worst occupational health disaster in U.S. history and carbon nanotube technology could be right on its heels.

MAY-22-08: [[NANOPROJECT: CARBON NANOTUBES THAT LOOK LIKE ASBESTOS, BEHAVE LIKE ASBESTOS](#)]

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NIA

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\* Defendant:

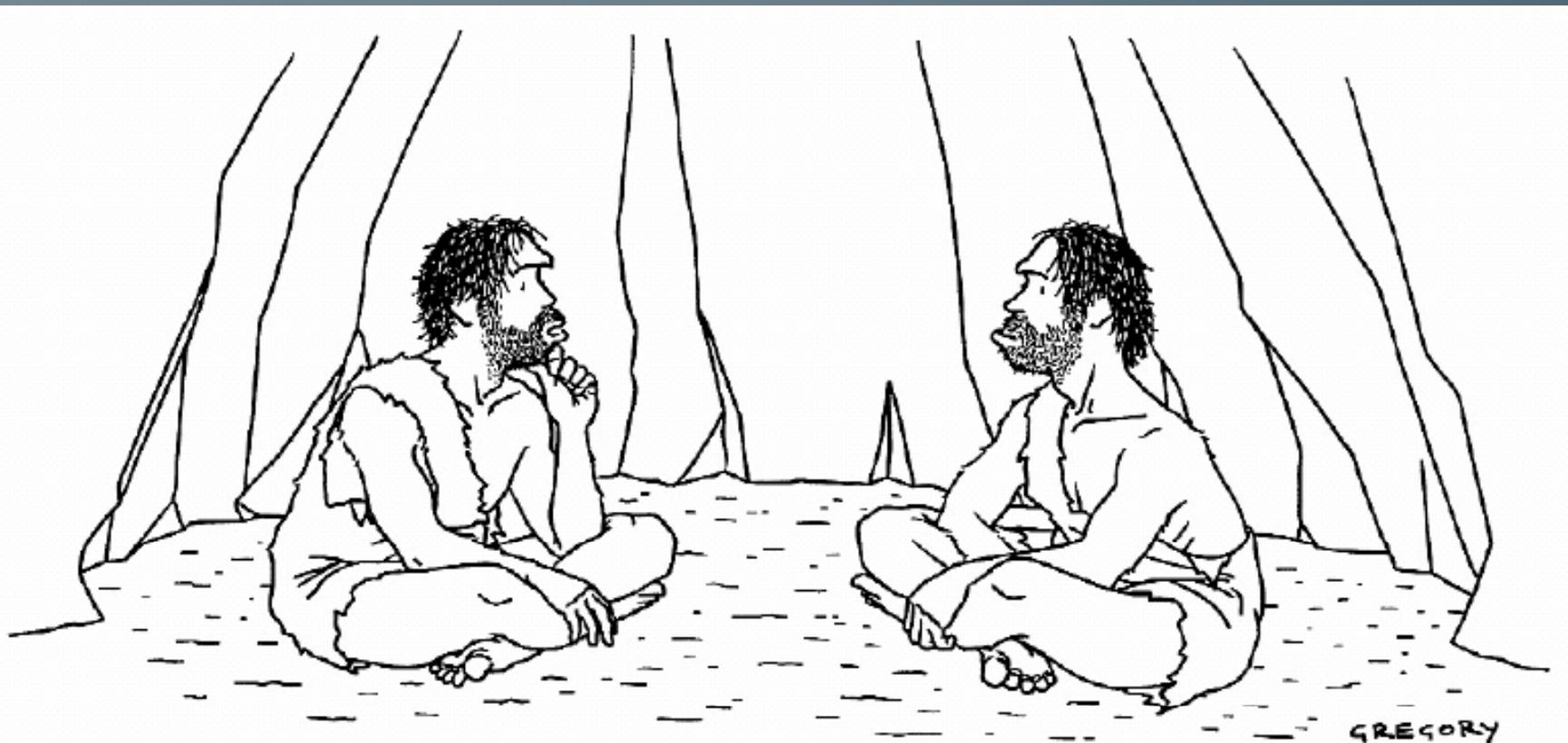
(who are you accusing?)

\* Describe your complaint in one short sentence:

\* Details of complaint:

(briefly describe the damages you have suffered)

# Nanotechnologies – Benefits & Risks



*“Something’s just not right—our air is clean, our water is pure, we all get plenty of exercise, everything we eat is organic and free-range, and yet nobody lives past thirty.”*

[New Yorker Collection 2006, Competitive Enterprise Institute Christmas card]

# Nanotechnology: what role for the European social partners in the chemical industry?

## *High safety measures*



# *NanoSafety – Stakeholder Responsibility*

## *High safety measures*



# NIA

Nanotechnology  
Industries Association

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# *Thank you!*