Nano-Business Development

NANOFORCE Infoday
Vienna, 5. June 2013
### Nanotechnology Industries Association

**NIA Membership includes companies active in:**

<table>
<thead>
<tr>
<th>Manufacture of (Nanomaterials &amp; nanoenabled Products)</th>
<th>Trade &amp; Manufacture of intermediate nanoenabled Products</th>
<th>Retail of nanoenabled Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instrumentation &amp; Services: Characterisation, Analysis, Detection</td>
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**Associated Support Services (Insurance, Legal Representation, etc.)**

- [source: Oxonica]
- [source: Inrisiq]
- [source: Beneq]
- [source: RAS Materials]
- [source: Naneum]
- [source: BASF]

**NANOFORCE Infoday**

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Nanoscience & Nanotechnology: What is it?

Locations of inter/multidisciplinary research areas on the science map, 2008

[source: OECD Measuring Innovation, 2010]
Patents citing non-patent literature (NPL) and average citations received per patent cited, by technology field, 2005-10

Share of NPL citations indicates a technology’s reliance on science (‘prior art’)

Number of forward citations (i.e. number of citations received by a patent from other patents (for up to 5 years after publication) indicates the importance of a patent for the development of other technologies.

[source: OECD Science & technology Innovation Scoreboard, 2011]
Quality of Nanotechnology Performance (or: ‘What’s it worth?’)

Patent quality index by technology field, 2000-10: 
*Composite index based on patents granted by the EPO*

The **patent quality index** is a composite indicator based on six dimensions of patents’ underlying quality:
- Forward citations (number of citations a patent receives),
- backward citations (number of patents and scientific papers a patent cites),
- patent family size, i.e. the number of countries in which the patent is taken,
- number of claims,
- generality index, measuring the dispersion of citing patents over technology classes, and
- grant lag.

[source: OECD Science & technology Innovation Scoreboard, 2011]
Nanotechnology Commercialisation

... a Supply-Chain Issue!?

Commercialisation of technology is SLOW:
- Printing Press
- Steam engine

... & UNPREDICTABLE:
- VHS (versus Betamax)
- QWERTY (versus Dvorak) Keyboard
- ... iPad versus Samsung Galaxy
Nanotechnology Commercialisation

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Conclusion:
• There is such a thing as ‘being too early’ on the market
• ... Wild West movies taught us what happens to pioneers:
  … they get shot in the back (or, at least, some of the do).
Nano-Business: What is a nano-business and why?

Nanotechnology-related Sales Share

Number of Companies

Share in total Sales of the Company

the big ones

Nano-Business: What is a non-Business and why?

Nanotechnology happens NOT by technology-push, ... but by **market-pulled** or **policy-enforced** demand for sustainability (external & internal):

- Consumption of Energy (i.e. manufacture, processing, fleet fuel efficiency)
- Emission:
  - air (e.g. CO₂-emission)
  - water (e.g. detergent use)
  - solid (e.g. waste)
- Water Consumption
- Toxicity Potential
  - Nanomaterials as replacements of proven toxic substances (e.g. nickel powder (cf. 5-year authorisation limit under REACH))
- Consumption of Raw Material
- Safety (i.e. nano-enabled monitoring- and detection-equipment)
Nano-Business: What is a nano-business and why?

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the small ones
Nanotechnology: Global Market Projection

Annual Growth Rate 2011 – 2017: Facts & Forecast

- Nanomaterials
- Nanotools
- Nanodevices

[Source: BCC Research 2012]
Nanotechnology: Market Growth Rate

... compared with the growth rate of other enabling technologies

[Source: Midwest Research Institute (biotechnology); Aberdeen Group (informatics); BCC, Inc. (nanotechnology).]
Nanotechnology Commercialisation: Nano-specific ‘Problems’

Nano-specific ‘problems’ and solutions in a typical technology innovation chain:

**Research & Development**
- Basic Research & Discovery
- Proof of Concept
- Market Identification

**Demonstration & Scale-Up**
- Patent
- Proto-type
- Scale-up, Pilot Plant

**Commercialisation & Market Uptake**
- Approval, Registration
- Market

**Governments / Regulators**
- R&D- & Innovation Support, IP-Protection Policies, Exploitation Policies/Support
- nano-specific OHS-Policies/Regulation
- nano-specific EHS-Policies/Regulation

**Global policy-informing - & -making Community**
- OECD Working Party on Nanotechnology (OECD WPN)
- OECD Working party on Manufacture Nanomaterials (OECD WPMN)

- Standardisation (ISO, CEN, BSI, DIN, etc.)
  - Certified Reference Materials
  - Metrology Standards
- • nano-adapted OECD Test Guidelines (OECD TGs)
- • Mutual Acceptance of Data
- • OECD Harmonised Templates (OECD HTs)

**Industry**
- R&D Support
- Networks IP- & TT-Studies
- Advocacy Public-Private-Partnerships

OECD Working Party on Manufacture Nanomaterials (OECD WPMN):
- • nano-adapted OECD Test Guidelines (OECD TGs)
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- • OECD Harmonised Templates (OECD HTs)
NEW NIA Website:

- Increased functionality for NIA Members’ input
- Increased information content
Nanotechnology & Nanosafety: The Importance of shared Responsibility

What’s our message to the public?
NIA Members: Input & Information

NIA Meeting Report:

NIA Symposium: Mandatory Reporting Schemes & Databases of Nanomaterials

(limited number of copies available today)
Thank you!

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Nano-Business: What is a nano-business and why?

Nanotechnology-related Sales Share

Nano-Business: Reflected in NIA Membership
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NIA Members: Input & Information

NIA Consultations, Events, Event Reports, Briefings, etc.

NIA Support with Definitions & Nomenclature

Since the start of discussions regarding terminologies and definitions of nanoscience, nanotechnology, and nanomaterial, NIA has closely monitored the developments in public standardisation and policy-making committees, as well as in industrial groups, and alerted its Members on upcoming consultations and decisions.

NIA regularly holds symposia on topical issues, in order to allow for direct exchange between regulators and industries representatives; on the 30th November 2011, NIA held a timely workshop on 'Defining Nano! - Compliance Requirements & Market Impact of the EU Definition of 'Nanomaterials'.

Detailed analysis of proposed regulatory definitions and insight into the resulting implications are regularly provided in the form of 'NIA Members Briefings', such as:

- NIA Members Briefing on the 'Measurement Requirements of the European Commission Definition of 'Nanomaterial'', published December 2012.
EU Definition of ‘Nanomaterial’

... what does it mean for my business?
Nanoscience & Nanotechnology: What is it?

Hot research areas on a science map, 2008

[source: OECD Measuring Innovation, 2010]
NIA Activities:

OECD WPMN Sponsorship Programme