Nanotechnology Industries Association

Commercial nanotechnology in Europe

Nanotechnology Industries Association (NIA)

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Aim of today

- Picture of commercial development for nanotechnologies in UK and Europe
- Understanding commercial sector headwinds
- Public efforts to build a commercial environment
- Looking to the future – the Brexit in the room

NIA: the voice of nanotechnology industries

NIA **supports the development of nanotech innovations** that improve the lives of consumers, preserve our environment and advance our world

- Support for development of a robust regulatory framework
- Business and scientific networking and promotion for Members
- Working with the EC to build the nanotechnology ecosystem

Brussels Head Office

Team in Belgium, UK, France, Netherlands, Sweden/Portugal

Skills in regulatory development, project delivery, advocacy and communications

The NIA community – a few examples

Large companies

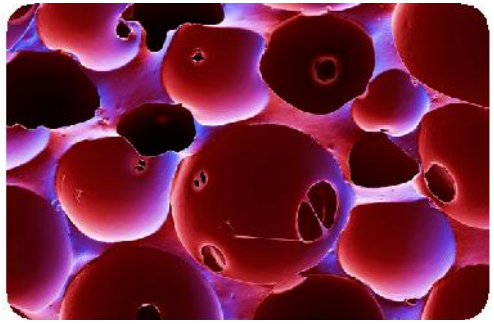
Small/mid-size companies

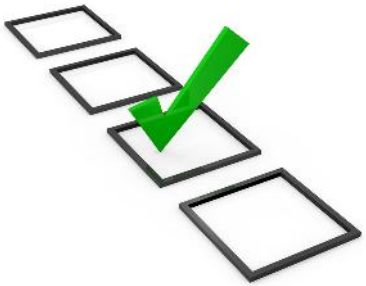
Research institutes

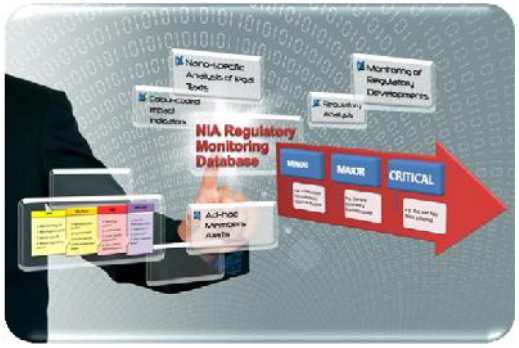
Specialist service providers

Associations & other

Regulatory support and advocacy







- Restricted briefings, reports, consultations, discussions and opinion pieces
- National, European and global monitoring
- Member support for regulatory preparedness
- Regulatory Monitoring Database tracks updates to nanotechnology regulations and policy worldwide
- Monthly Regulatory Digest
- Quarterly Regulatory Member Webinars
- Special topic webinars – e.g. US EPA
- Presence and representation through EC, OECD and National regulatory and standardisation forums
- Stakeholder to sectors e.g. EFSA

Funding, networking and promotion

Funding

Funding tracker
Project development opportunities

Inclusion of Members in NIA projects

Collaboration

Cross sector - Automotive (EUCAR)

Global Regulatory Working Group

Nanotechnology Innovation Council

Promotion

Expert speakers

Case studies

Publications

Webinars

Conferences

LinkedIn

Public webinars

Building a nanotechnology ecosystem and community

- **Key EU projects** for critical mass and alignment in:
  - Ecotoxicology testing
  - Regulatory support
  - Industry-developed SOPs
  - Data generation and sharing
  - Fully validated reference materials
- Interactive relationship with European Commission
- Strong project community of industry, research and regulators
- Interface between research and industry

NANOREG

NanoReg2

caLIBRAte nano risk governance

NanoDefine

INSPIRED

Example NIA – FP7 and Horizon 2020 projects

Nanotechnology as an economic driver

- Key Enabling Technology
- Recognised as critical economic tool
- EIB survey demonstrated KETs companies grew 12% compared with EU 28 at 0.3%
- Revenue per employee in SMEs same as large actors
- 2013 – demand for 3.25 million technical professionals, 43% increase by 2025
- Germany and Italy lead KETs commercial activity, followed by Spain and France
- UK mid-level performance ahead of Belgium and Austria

Nanotechnology in business

- Cross sectoral enabling technology
- Common definition and regulations create the link
- Impossible task to quantify commercial development across all sectors
- Commercial development push and pull:
  - ‘Pull’ from demands for increased performance or reduced resource use
  - ‘Push’ from increased understanding and manipulation of novel materials
- Hugely diverse composition, from biological materials to high volume carbon black
- Incidental and intentional increase of commercial nanomaterials
- Secondary business levels

Commercial operation

- Many SMEs producing innovative particles or materials
- Primarily feeding into value chain of larger product producers e.g. quantum dots into screens, fuel additives into fuel
- Scale of production can suit SMEs as allows small production of specialist products that stretch a long way in a final product
- However this creates dependance on large partner clients and also investment in ISO and regulations to secure sale

Sectoral impact

In Industry – reduced resources, functionalised, higher performance

- Inks and coatings – Lifespan, functionalised
- Agriculture – Reduced inputs and sources
- Cosmetics – Reduced resources, different behaviour
- Textiles – Increased lifespan, functionalised
- Food – Functional, reduced cost, extended lifespan
- Medicines/devices – see Endomagnetics
- ICT/electronics – Reduced size, increased performance
- Industrial processes – efficiency, performance
- Energy – Photovoltaics, energy management
- Chemicals – everything!

With the opportunity comes the challenge

- Largest production is in the first generation nanomaterials
- New materials more complex & present greater challenges for assessment for safety and regulatory compliance
- Not just materials as product but as coatings
- Being introduced to more complex environments e.g. food
- Development of regulatory testing runs behind the materials innovation
- Development of definitions & regulations runs behind testing…
- Shift in resource allocation from R&D to regulatory compliance
- Reduces certainty = reduces investment
- Differing regulatory requirements across countries

Where is Europe innovating?

- Tricky question - across all sectors and often not the USP, hard to track
- Focus on early stage industry – where is the SME focus?
- SME Instrument has a dedicated nanotechnology funding call – funded stage 1 and 2 projects for 18 months over multiple deadlines
- Eurostars funding also an indicator of SME focus
- 30 SME instrument projects and 12 Eurostars projects in nano area

SME focus

- Diverse industry focus across Europe
- Countries active via projects: Germany, Spain, Italy, Finland, UK, Denmark, Poland, Israel
- Medical: Separation, sensors, anti-bacterial, carriers
- Measurement of nanoparticles: Across sectors
- Industrial processing: Production, materials, coatings
- Food: sensors, tracking, packaging – no food content
- Environment: Monitoring, energy, clean up, nanomaterials from natural sources
- Nanoinks, lighting, batteries

Investment

- Different to sectors such as pharma
- More smaller companies generating sales and revenue rather than significant exit
- Privately owned, publicly quoted – less M&A
- Company profile need beyond start up:
  - Post start up: Beyond R&D, with revenues but high risk
  - Quantum leap: Needs scale up investment for facilities
  - Well-established market actors with stable revenues
- Recognition that greater access to finance beyond public for scale up and expansion particularly for younger actors
- Guarantees from public funds supports private investment

Investment (2)

- Security from banking investments on buildings, land and order pipeline
- EIB's InnoFin offers increasing sources of finance beyond grants, including SME guarantee, investment into VC funds, midcap guarantee, growth finance, large projects
- European Investment Plan aims to support private investment
- European Fund for Strategic Investment to mobilise €315 bn of public/private investment
- Aim for EIB to fund all co.s from post-start up

For the UK….

- Don’t get me started…..
- Advantages of traditionally industry-friendly ecosystem
- Brexit:
  - Reduced success to H2020 already being demonstrated
  - UK’s low spend in G7 more exposed without H2020
  - Will not continue as non-EU member without FoM
  - Significant questions over REACH post-Brexit
  - Potential WTO tarifs and customs paperwork
  - Global access under which current agreements?
  - Reduced access to skills
- Footprint within EU is safest option to scale up as needed and retain access to financial tools/skills
- NIA sits within Brexit committees and will support members as much as possible, in UK and EU

Looking ahead for commercial development

- Definition and regulatory requirements are major factor in sector growth
- Nanotechnology young compared with sectors such as pharma – indicates supporting ecosystem still to come:
  - Regulatory landscape needs to settle
  - Commercial services for regulatory compliance – CRO style and scale
  - Investment linked to certainty
- Significant potential for European-added value in niche lower volume production
- Consumer opinion – no signs of GM crop repeat as hard to grasp as single issue or product *caution always needed*

Nanotechnology Industries Association

Thank you

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