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Leveraging European Investment in Nanotechnologies R&D and Innovation

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SEVENTH FRAMEWORK PROGRAMME

Leveraging European Investment in Nanotechnologies R&D and Innovation

Need

for a European Nanotechnology strategy

- **which supports the timely development of a broad portfolio of targeted nanotechnologies;**
- **in combination with responsible and supportive governance;**

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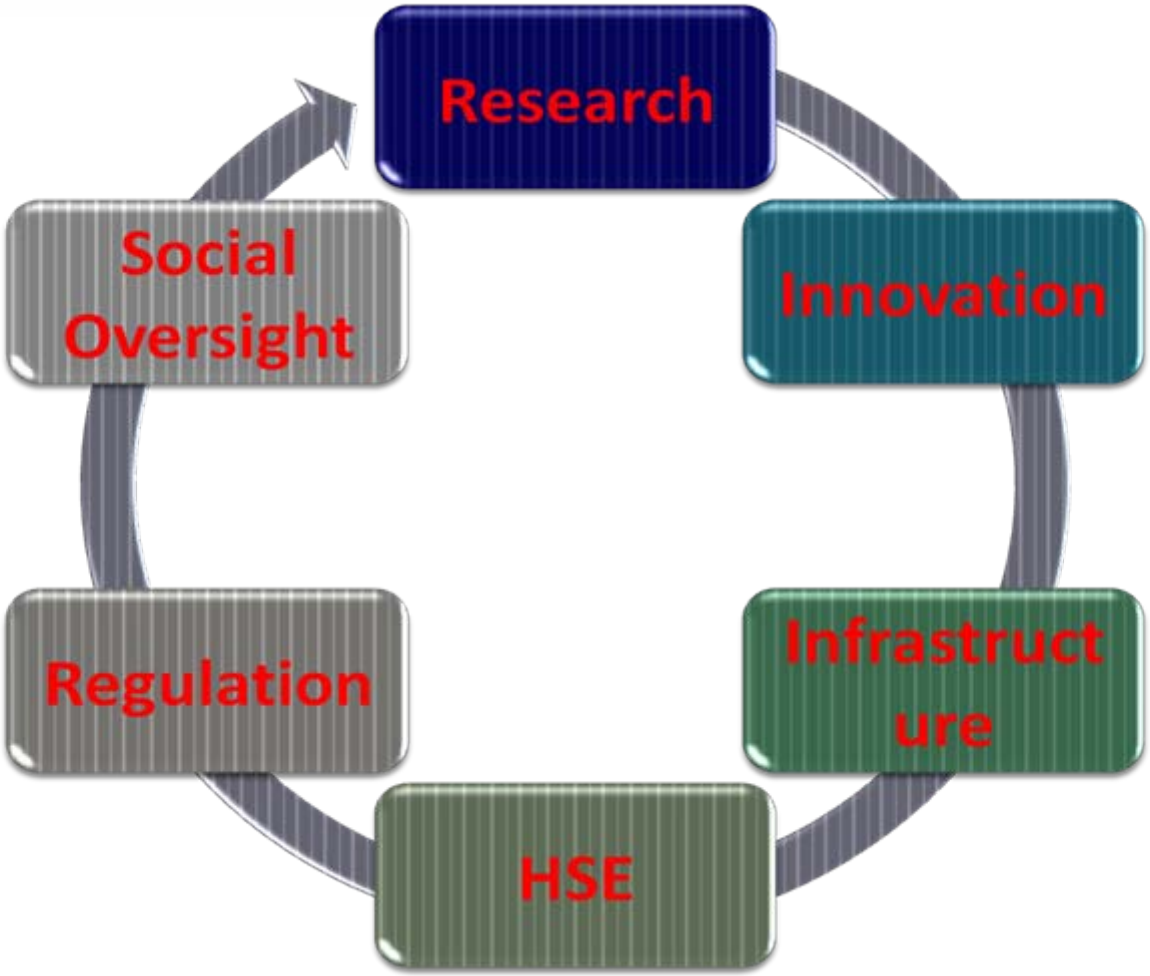
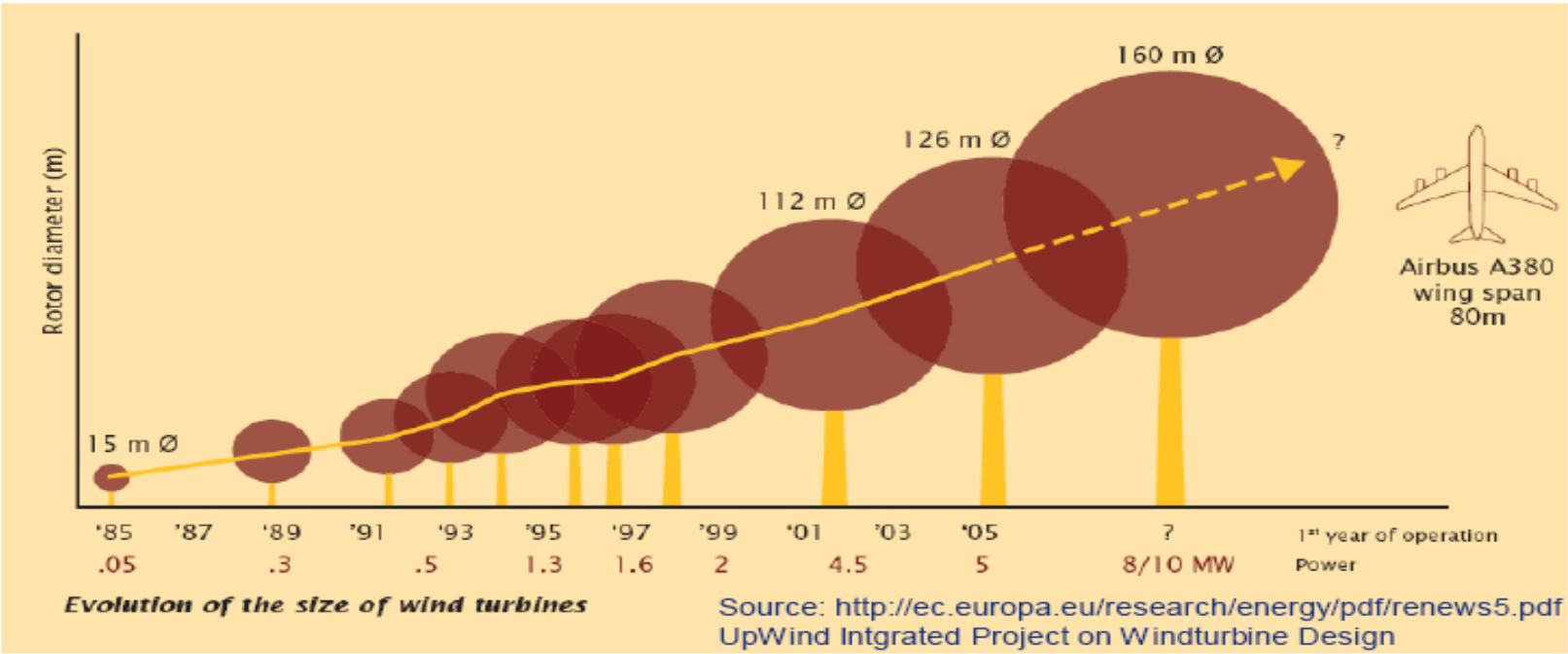
With Resources for all phases of NT development for every part of the value creation network



Example of Value Network to meet grand challenges (i)

Improved energy efficiency by increased span of rotor blades



Evolution of the size of wind turbines

Source: http://ec.europa.eu/research/energy/pdf/renews5.pdf
UpWind Intgrated Project on Windturbine Design

Courtesy of BAYER

Dr. Peter Krüger
Bayer MaterialScience AG

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Example of Value Network to meet grand challenges (II)

Approach to address technology challenges for sustainable energy conversion: Wind turbines

Value chain

Example: Innovation alliance CNT,
www.inno-cnt.de

Inno.CNT

Courtesy of BAYER

Dr. Peter Krüger
Bayer MaterialScience AG

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But certain conditions for investment must be in place

1. **barriers** for business growth need to be identified and removed
2. **real innovation** needs must guide R&D output
3. **fragmentation in R&D and Innovation** efforts has to be eliminated
4. **market fragmentation** for Nano-based Innovations has to be combated
5. **opportunities** for European leadership must be identified and seized
6. Strategic role of Nanotechnology in **recovery** from the economic downturn must be rationalised
7. **funding** mechanisms have to be simplified

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1. Identifying and removing the barriers that need to be removed for business growth

Some of the major barriers…

- **The inefficiency of the current technology transfer process;**
- **The necessity of risk assessment guides and risk protocols for industry;**
- **The costs for environmental, health, life-cycle analysis and safety testing;**
- **The commercial viability question related to nanotechnology-based products;**
- **Consumer issues, media and public perception;**
- **Unmet training needs;**
- **Gaps in policy and infrastructure;**
- **Gaps in support mechanisms (financing, IP, etc.);**
- **Gaps in metrology, standards, and investment into tools.**

… identification is the easy part

1. Identifying and removing the barriers that need to be removed for business growth

The European approach of integrated, safe and responsible development

of Nanotechnology is the right one,

but progress must be accelerated in many areas !

2. Link R&D output to real innovation needs

Nanotechnology innovation process is complex and therefore:

- **Long lead times to market threatens their adoption**
- **Infrastructure investment supportive of growing business is delayed**
- **Dominant position of traditional technologies and actors**
- **Diverse market incentives**
- **Supply network challenges**

And the nature of the technologies themselves:

- **enabling, indirect market appetite**
- **expensive but with big benefits**
- **accrual of benefits take long for companies but even longer for society**

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2. Link R&D output to real innovation needs

We need a seamless link
between research and the innovation process
for bringing out flagship nano applications
to lead the way…

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3. Eliminating fragmentation in R&D and Innovation efforts

- Better co-ordination of policies; concentration and specialisation of resources –emergence of world class poles of excellence; not only for research but …
- Stronger collaboration between Community, MS, Regions, industry, academia with Community as facilitator

3. Eliminating fragmentation in R&D and Innovation efforts

- *First level of co-operation is the development of shared strategies and policies across EU;*
- *Second level is strengthening collaboration of stakeholder groups;*
- *Third level is pooling of resources together to solve problems demanded by grand challenges.*

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4. Tackling market fragmentation for Nanotechnology Innovation

- Incomplete or ill-defined value creation networks
- Unstable market conditions and support schemes
- Isolated attempts at first entry to gain market share early

Lead to

- Incoherent business strategies and target setting
- Un-coordinated innovation plans for product launch

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4. Tackling market fragmentation for Nanotechnology Innovation

We need:

- *More intense collaborations to open up new EU-wide markets for innovations with dedicated infrastructure;*
- *General policy measures creating more favourable conditions for business developments (single stop shop for research and innovation e.g. Safety);*
- *Streamlining Commission's plans with that of Member states in collaboration with industry and social partners.*

5. New opportunities for European leadership, if…

- both public and private investments efficiency is improved, level raised and their use better targeted
- the setting-up of dedicated Nanotechnology infrastructure/assets is accelerated
- regulatory initiatives and environment are streamlined
- the level of social awareness and engagement is raised; consumer protection is reinforced
- international Co-operation is strengthened

Billion €	2005-2006			2007-2008		
	public	private	TOTAL	public	private	TOTAL
EU	3.4	1.9	5.3	3.8	2.5	6.3
US	2.8	3.1	5.9	2.6	4.1	6.7
Japan	1.5	2.4	3.9	2.5	5.8	11.4
Others	1.5	0.9	2.4	1.5		
Russia				0.8		
China				0.8		
TOTAL	9.2	8.3	17.5	12.0	~13	~25

Global nanotechnology research funding (public and private) in 2005-2006 and 2007-2008

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6. Assisting the recovery from the economic downturn

- Stressing Nanotechnologies role as a vital tool for bringing efficiencies and cut rising costs
- Considering that the combination of shrinking user markets and protracted adoption cycles devalue research and innovation plans in emerging technologies such as NT
- Realising that economic downturn effects remain longer after recovery
- Public policies must assist in the markets RTD effort to stay on course maintaining their innovation momentum

7. Simplifying funding mechanisms and schemes

- Variety of funding sources
  - Community, MS, Industry
- Variety of funding schemes
  - Community, MS, Industry
- Simplification and streamlining of mechanisms and schemes across Europe would attract further investment especially if the rest of the issues are in place

First Nanotechnology Action Plan
Conclusions of the Second Implementation report 2007-2009(i)

Progress has been achieved in most areas. Future emphasis is on:

- **Deepening the research efforts and roadmaps for key nanotechnology sectors, to enhance innovation, competitiveness and safety. Life-cycle approaches should be taken into account.**
- **Developing infrastructures and the educational system further, consistent with the multidisciplinary character of nanotechnology.**
- **Strengthening the mechanisms available for industrial innovation, stressing the concept of open innovation and facilitating technology transfer.**

First Nanotechnology Action Plan 2005-2009
Conclusions of the Second Implementation report 2007-2009 (II)

- Implementing a more direct, focused and continuous societal dialogue; and monitoring public opinion and the issues related to consumer, environmental and worker protection.
- Continuing to review the adequacy of regulation, building where possible on international developments.
- Surveying the market for products of nanotechnology, including safety aspects.
- Stepping up the research effort on safety assessment throughout the product life-cycle, including the further development and validation of nanomaterial characterisation and test methods.

The Commission is considering proposing a new Nanotechnology Action Plan 2010-2014

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Information on Nanotechnology in EC

- **Commission Nanotechnologies homepage**

  http://cordis.europa.eu/nanotechnology

  http://ec.europa.eu/nanotechnology/index_en.html

  - Second Implementation Report
  - Staff working document
  - Public consultation

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