Integrative role of nanotechnologies and advanced materials

Mainstreaming Nanotechnologies and other KETs

The smart way
Policy Context

Convergence of knowledge, technology and society

- Tackle Europe's challenges
- Improve competitive position
- Support deployment of new technologies
- Enhance co-operation
- Innovative methods of access to finance
Convergence of knowledge, technology and society

Challenges

Our Impact on the Environment/Climate Change

- Falling Communications Costs
- Evolving Customer Needs / Global Markets
- Pace of Technological Change
- Ageing Population
- New World Powers
- Ever increasing world debt
Constructionist view of material society

Converging futures
Nanotechnologies and Materials societal role

NT and AM for sustainable future

Transformation process of knowledge and technology;
Merging of cyber-physical systems with physical structures into socio-economic solutions

Outcome to be integrated into Energy, Health, Food, Transport, Construction, mass utility markets
Global energy consumption needs

Sustainable nano-enabled solutions in:

- Solar (Photovoltaics, Thermal, Photocatalysis)
- Wind (Nanomaterials for WTG)
- Energy storage (Hydrogen, batteries, solar to liquid)
- Fuel cells
- Thermoelectrics
- Environmental catalysis
## Content

### Challenge 1
**Advanced Materials for Energy Efficiency**

- **Key Component 1**: Advanced Materials to increase the energy performance of buildings
- **Key Component 2**: Advanced Materials to make renewable electricity technologies competitive
- **Key Component 3**: Advanced Materials to enable energy system integration (energy storage, grids)
- **Key Component 4**: Advanced Materials enabling the decarbonisation of power sector

### Challenge 2
**Advanced Materials for a "competitive, efficient, secure, sustainable & flexible energy system"**

### INNOVATION TRACKS (non-exhaustive list)

<table>
<thead>
<tr>
<th>Track 1</th>
<th>Track 2</th>
<th>Track 3</th>
<th>Track 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Materials for high performance &amp; durable coatings</td>
<td>Advanced Materials for the weight reduction of structural and functional components in wind energy technology</td>
<td>Advanced Materials for lower cost, high safety, long cycle life &amp; environmentally-friendly electrochemical batteries</td>
<td>Advanced Materials for the affordable implementation of carbon capture &amp; storage</td>
</tr>
<tr>
<td>Advanced Materials &amp; new deposition processes for building-integrated photovoltaics</td>
<td>Advanced Materials to improve the corrosion resistance of structural and functional components in wind energy technology</td>
<td>Advanced Materials for lower cost storage of energy in the form of hydrogen, methane, other molecules (power to gas / chemicals)</td>
<td>Advanced Materials for the utilization of CO2</td>
</tr>
<tr>
<td>Advanced Materials for thermal energy storage</td>
<td>Advanced Materials and processes for high yield, large scale manufacturing of solar energy harvesting systems</td>
<td>Advanced Materials to facilitate the integration of storage technologies in the electrical grid</td>
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Building strong EU leadership in Adv. Mat. for energy requires a European INNOVATION PILLAR bridging the gap between the lab and the market

A well-designed Industry-driven Initiative (IDI) is the best option to

- Accelerate innovation by reducing the 3 innovation risks (execution risk, value chain / market adoption risk and co-innovation risk)
- Take into account the business dimension of innovation
- Best allocate public and private resources
- Develop in EU a strong portfolio of Advanced Materials Innovations
Industrial Partners

EMIRI is an Industry Community coming together ...

Supported by Research & Technology Organizations

With key Associations bringing in their expertise

EMIRI in 4 key numbers

> 4 billion €
Sales of Adv. Mat. for Energy

> 400 million €
Investment in R&I on Adv. Mat. for Energy

> 30,000 direct jobs
Manufacturing of Adv. Mat. for Energy

> 4,000 researchers
Human resources for R&I on Adv. Mat. for Energy

10/16/2015

CT/DGRTD/D3
Nano-medicine, *from molecule to personal health*

1. Nanodrug design
2. Drug delivery, Bioimaging (nanoparticles)
3. Cell-based therapies
4. Biofilms
5. Nano-biosensors
6. Implants, Scaffolds
7. Nanotoxicology, Nano-ethics
Need to explore new ways to stimulate innovation in healthcare

Industry Driven Initiative, with focus on SMEs as innovation drivers

Field of application: emerging and enabling technologies for innovation in healthcare
Vision

Make Europe the leading place to develop, manufacture and implement smart healthcare solutions
**Objectives**

1. **Facilitate the ideation phase between clinicians, engineers and business people**

2. **Accelerate the translation process of smart solutions**
   - Minimizing the innovation life cycle timeframe
   - Maximising added value of new technologies
   - Improving knowledge about market access conditions for SMEs
   - Helping the navigation through the regulatory framework

3. **Coordinate the implementation of Smart Specialisation Strategies in medical technologies**
Concept

- Open and flexible platform
- With participation of a wide range of organisations
- Reinforce policy in healthcare innovation
- Improve coordination
- Increase visibility
Stakeholders

- EFPIA: European Federation of Pharmaceutical Industries and Associations
- MedTech Europe: from diagnosis to cure
- Nanomedicine: European Technology Platform
- European Commission
- ESB (European Science Foundation)
- EPOS (European Public Sector Initiative for Health)
- European Medicines Agency
- EIT Health
- EUCOPE: European Confederation of Pharmaceutical Entrepreneurs AISBL
2014/2015 Pilot Calls Summary

- 23 projects approved, receiving a combined grant from the Commission of **130 M€ million**
- 58% of participants are SMEs or Larger Industry
- 70 pilot lines across the 23 projects
- Estimated over **10000** European jobs to be safeguarded/created.
- A combined income of **€566 million** by 2024 is predicted for the projects (& their partners)
SMEs participation

- 92 participants are SMEs & shall receive €41.4 million € in funding.

- These SMEs come from 20 EU member states and one from Switzerland, with the majority originating from the UK and Spain (31% combined share of SME partners and 45% combined share of SME grants).
Improving the conditions of Access to finance for KET companies

Methodology

Step 1
Identification of highly innovative KET ventures with a viable business model and experience with debt financing

- Patents-based approach to identify KET companies
- Assessment of business model to ensure commercial viability
  - Assessed revenue and growth
  - Qualitative assessment of business model
- Recent experience with debt financing

Step 2
Interviews with key decision makers on the lender and the borrower side

- KET companies: CEO/CFO interviews
  -质 "Business model, growth and financing strategy"
  -质 "Perceived show-stoppers, difficulties"
  -质 "Experience with public loan schemes"
- Lending institutions: Senior professionals interviews

Step 3
Semi-structured interview approach combining qualitative and quantitative insights

- Qualitative insights
  - Key figures on size (employees, revenue) and growth
  - Debt figures and ratios
EIB KET study – Overview of key findings

1. Access-to-finance: the market is favourable but only for relatively established KET companies.

2. Conservative financing eco-system not in favour of most dynamic innovators.

3. Knowledge of KET is key for financing decisions – and in short supply with many banks.

4. Big is beautiful – smaller KET companies face more difficulties.

5. Public support well suited to compensate for specific shortcomings.

6. Boosting growth will require smart, well targeted instruments.

Key findings of the study
Conclusions

**Fundamental principle for progress**

Convergence of knowledge, technology and society

**Fundamental principle for effective implementation**

Escalating and transformative interaction between seemingly distinct policies

**Outcome**

Increased creativity, innovation and economic productivity