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**
- **Innonative methods of acces 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

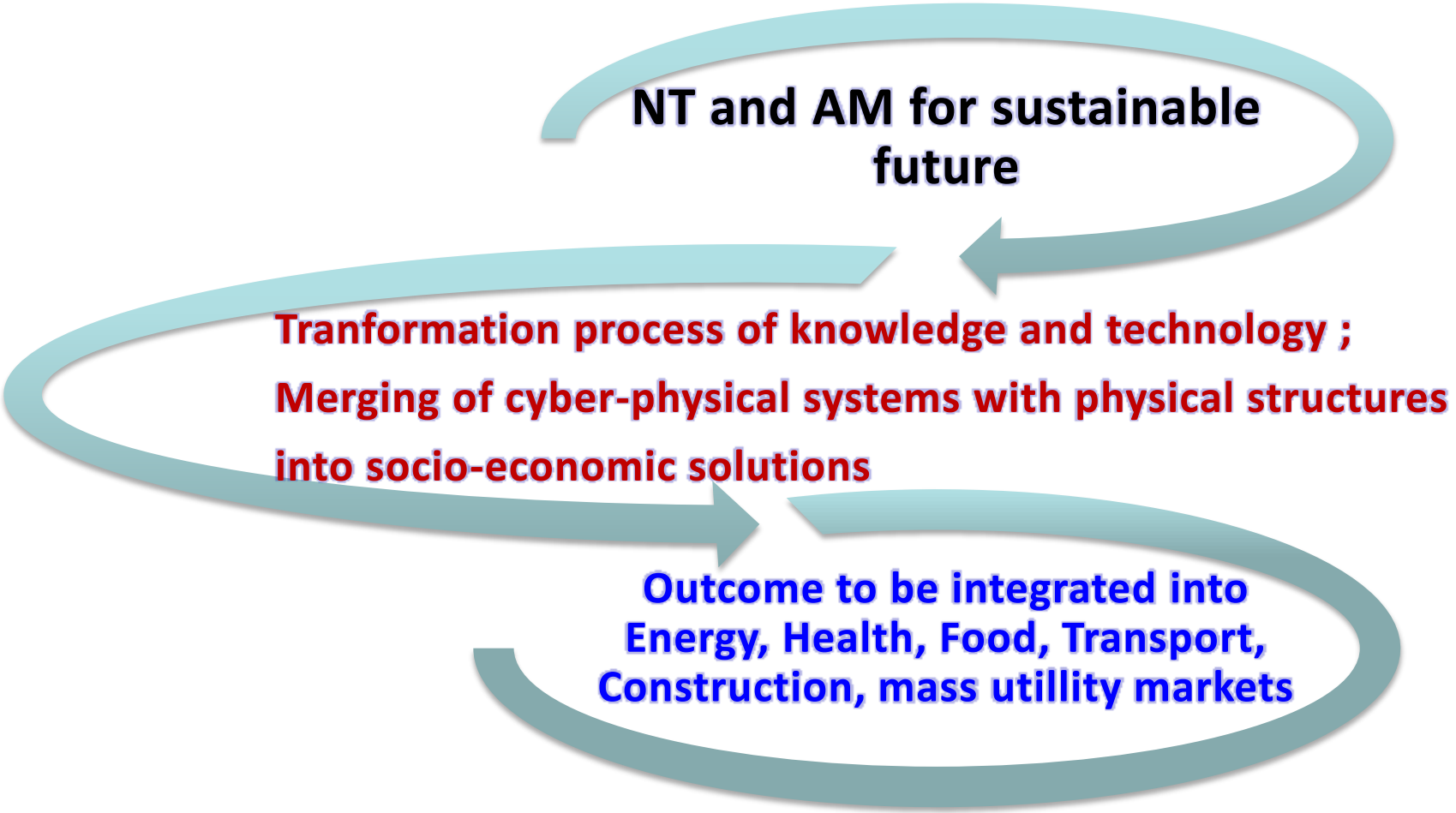
New World Powers

Ever increasing world debt

Constructionist view of material society

Converging futures

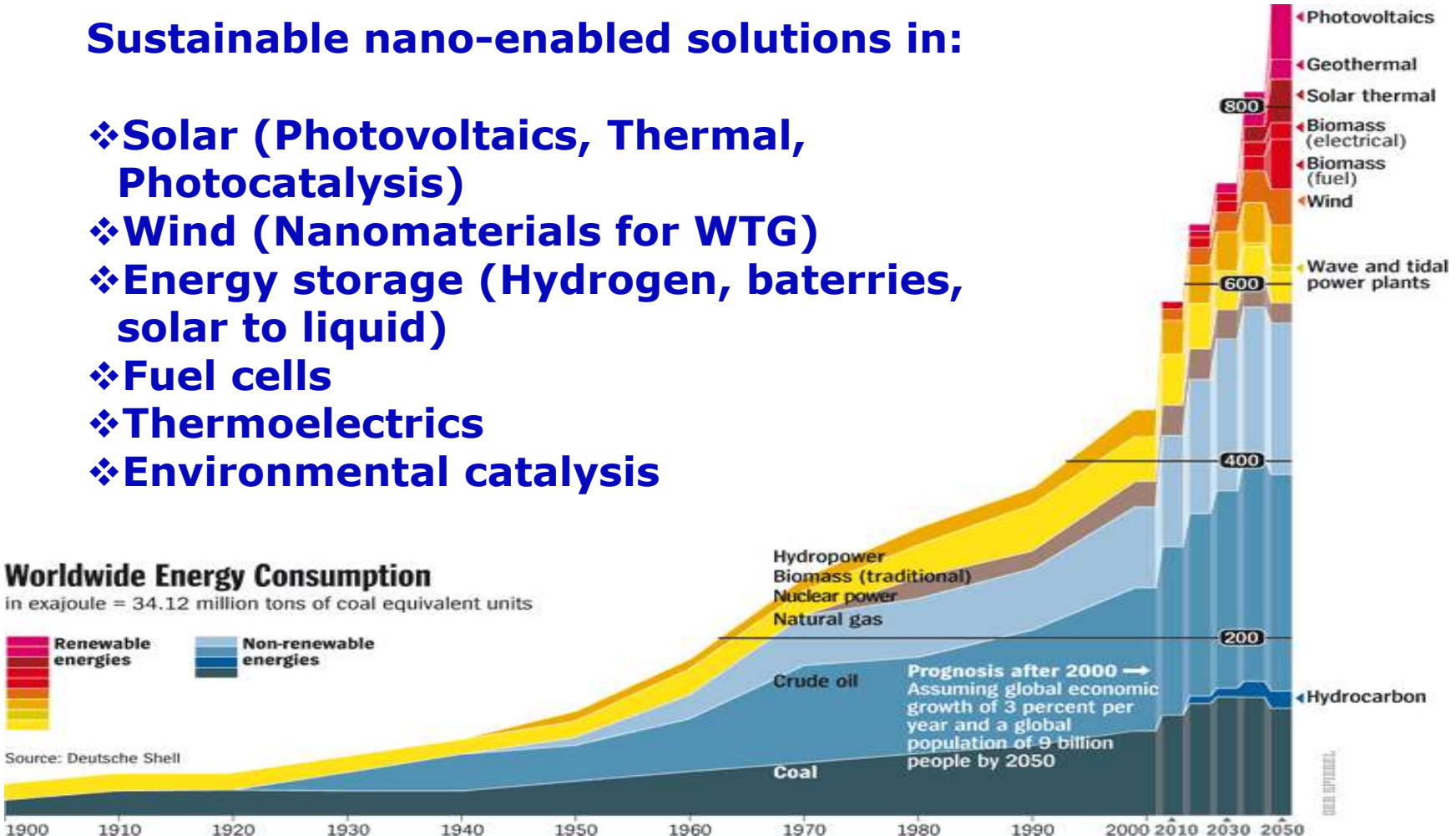
Nanotechnologies and Materials societal role



Global energy consumption needs

Sustainable nano-enabled solutions in:

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

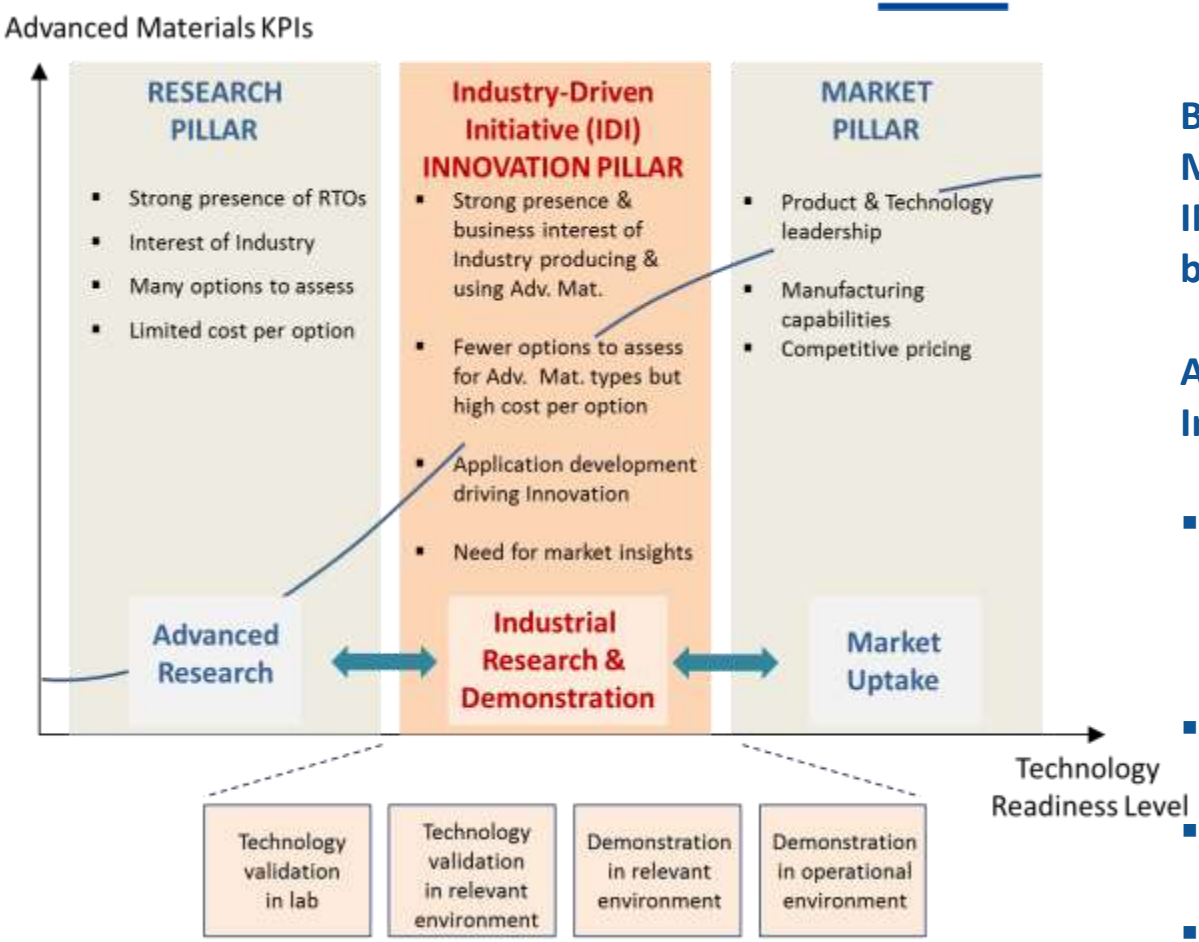


Content

Advanced Materials as "key enablers" tackling EU Energy Challenges

Challenge 1	Challenge 2		
Advanced Materials for Energy Efficiency	Advanced Materials for a "competitive, efficient, secure, sustainable & flexible energy system"		
Key Component 1	**Key Component 2**	**Key Component 3**	**Key Component 4**
Advanced Materials to increase the energy performance of buildings	**Advanced Materials to make renewable electricity technologies competitive**	**Advanced Materials to enable energy system integration (energy storage, grids)**	**Advanced Materials enabling the decarbonisation of power sector**
INNOVATION TRACKS (non-exhaustive list)			
Advanced Materials for high performance & durable coatings	Advanced Materials for the weight reduction of structural and functional components in wind energy technology	Advanced Materials for lower cost, high safety, long cycle life & environmentally-friendly electrochemical batteries	Advanced Materials for the affordable implementation of carbon capture & storage
Advanced Materials & new deposition processes for building-integrated photovoltaics	Advanced Materials to improve the corrosion resistance of structural and functional components in wind energy technology	Advanced Materials for lower cost storage of energy in the form of hydrogen, methane, other molecules (power to gas / chemicals)	Advanced Materials for the utilization of CO2
Advanced Materials for thermal energy storage	Advanced Materials and processes for high yield, large scale manufacturing of solar energy harvesting systems	Advanced Materials to facilitate the integration of storage technologies in the electrical grid	
	Advanced Materials and processesfor high efficiency solar energy harvesting		

Implementation



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**

Technology to market translation needs

Industrial Partners

European Commission

EMIRI

EMIRI is an Industry Community coming together …

3M, AGC, ArcelorMittal, Bekaert, Bosch, Danish Power Systems, Dow Corning, DSM, H.C. Starck, Heraeus, Laborelec, Plansee, Sabic, JSR Micro, Saft, Siemens, Solvay, Topsoe Fuel Cell, Umicore, voestalpine

Supported by Research & Technology Organizations

bay, CEA, CIC energiGUNE, Cranfield University, Centro Sviluppo Materiali, ECN, ENEA, Jülich, IK4 Tekniker, IFE, imec, IREC, ISQ, itme, KU Leuven, LEITAT, RSE, SINTER, DTU, tecnalia, TNO, UNINOVA, Université de Liège, SIM, vito, VTT, Universiteit Hasselt, Fraunhofer Gesellschaft

With key Associations bringing in their expertise

E-MRS, C2B, ENERGYIN, ESTEP, EUMAT, EUREC, FEMS, IOM3, KMM-VIN, Jernkontoret, NanoFutura, SusChem, cefic

EMIRI in 4 key numbers

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

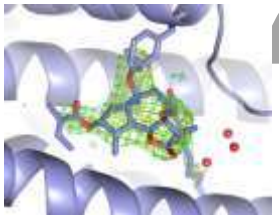
> 400 million €
Investment in R&I on Adv. Mat. for Energy

> 30.000 direct jobs
Manufacturing of Adv. Mat. for Energy

> 4.000 researchers
Human resources for R&I on Adv. Mat. for Energy

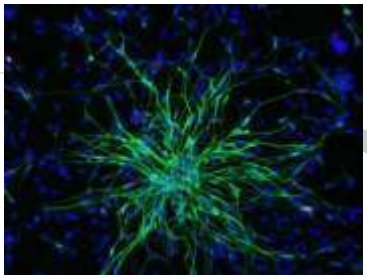
Nano-medicine, *from molecule to personal health*

1.Nanodrug design

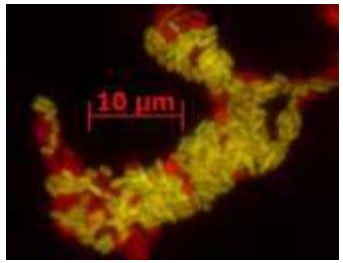


2. Drug delivery, Bioimaging (nanoparticles)

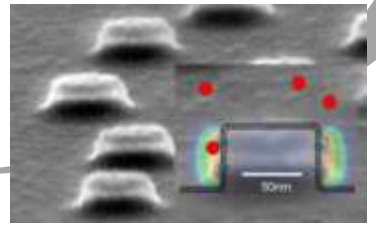
3. Cell-based therapies



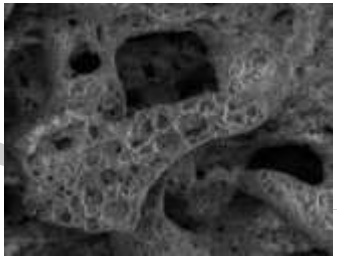
4. Biofilms



5. Nano-biosensors



6. Implants, Scaffolds



7. Nanotoxicology, Nano-ethics

Context

- 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 betwen 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

European Commission

Stakeholders

efpia
European Federation of Pharmaceutical Industries and Associations

MedTech Europe
from diagnosis to cure

nanomedicine
EUROPEAN TECHNOLOGY PLATFORM

European Commission

ESB

EPoSS

EUROPEAN MEDICINES AGENCY
SCIENCE MEDICINES HEALTH

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

A. KET companies: CEO/CFO interviews

>

B. Lending institutions: Senior professionals interviews

Step 3

Semi-structured interview approach combining qualitative and quantitative insightse

A. Qualitative insights

> Business model, growth and financing strategy
> Perceived show-stoppers, difficulties
> Experience with public loan schemes

B. Quantitative 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

Key findings of the study

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

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