

# *Building the Europe of Knowledge*

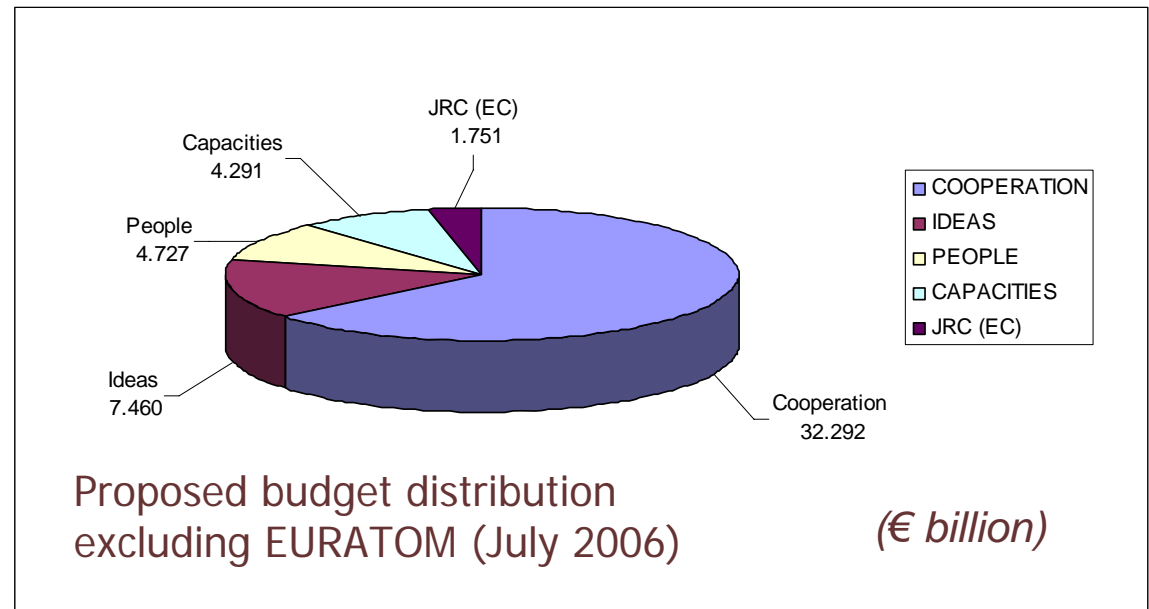
7<sup>th</sup> Framework Programme

2007 - 2013

*“Nanotechnology”*

! All information preliminary !

1. Capacities: Infrastructures
2. People: Erasmus, Marie-Curie
3. Ideas: ERC
4. Cooperation: Projects following calls



# Themes of “Cooperation”

1. **Health ( ca. 6 b€)**
2. Food, agriculture and biotechnology
3. **Information and communication technologies (ca. 9 b€)**
4. **Nanosciences, nanotechnologies, materials and new production technologies (ca. 3.5 b€)**
5. Energy
6. Environment (including climate change)
7. Transport (including aeronautics)
8. Socio-economic sciences and the humanities
9. Security and space

+ Euratom: Fusion energy research, nuclear fission  
and radiation protection

# FP6 -> FP7

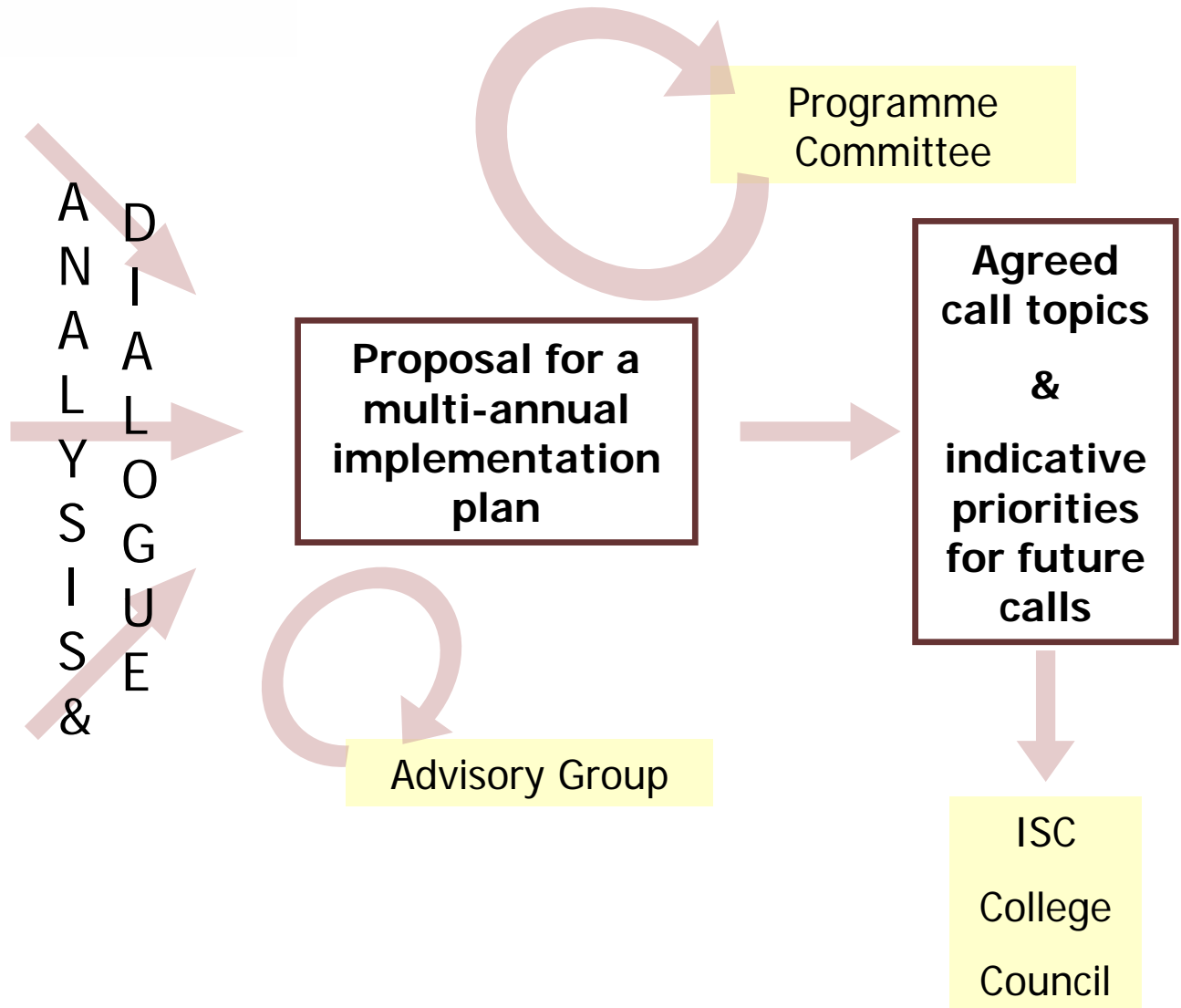
- Continuity
- Emerging needs
- Evolution

# Developing a Work Programme

FP 6 project portfolio  
(including foresight)

Strategic Research  
Agendas of ETPs

Other materials &  
requirements



# FP 7: Flexible Priority Setting

## -> European Policy Development

- connect to POs
- be active in ETPs
- take part in events
- evaluate
- communicate with Liaison Offices

# EC Policy - Key Objective

## Improve the Competitiveness of EU Industry

*trough:*

- generation of breakthrough, applicable knowledge
- transition from resource-based to knowledge-based industry
- strengthening EU leadership
- integrating technologies and disciplines across many sectors

...

# A Glimpse on some Programmes

- Industrial Technologies
  - Health
  - ICT
- } DG RTD
- DG INFSO

! All information preliminary !

# Directorate “Industrial Technologies”

- Nanosciences & -technologies & Converging Technologies
- Materials
- New production
- Integration of technologies for industrial applications

indicative budget 3 467 million € for 7 years

# DRAFT of the NMP Work Programme

## Nanosciences and converging sciences

- Nano-scale mechanisms of bio/non-bio interactions (Small or medium-scale focused research projects)
- Self assembling and self organisation (Small or medium-scale focused research projects)
- Support to ICPC (\*) researchers in Nanotechnology and creation of a free and open European electronic archive of nanosciences and nanotechnologies scientific and technical publications (CA and SA)
- Development of methodology
  - ... risk assessment
  - ... observatory (CA and SA)
- Support to Member States' research programmes in nanosciences (ERANET-PLUS)

(\*) ICPC: International Cooperation Participating Countries

# DRAFT of the NMP Work Programme

## Nanotechnologies and converging technologies

- Pilot lines to study, develop and up-scale nanotechnology-based processes from the laboratory (Large scale integrating projects)
- Equipment for nanotechnology (SME targeting projects)
- Analysis of the ethical, regulatory, social and economic environment of nanomedicine (CA and SA)
- Coordination in nanometrology (CA and SA)
- Examining capacity building in nanobiotechnology (CA and SA)

# DRAFT of the NMP Work Programme

## Health and Environment Impacts

- Specific, easy-to-use portable devices for measurement and analysis (Large scale integrating projects)
- Impact of nanoparticles on health and environment" (Small or medium-scale focused research projects)
- Critical review on the data and studies on the potential impact on environment and health of nanoparticles (CA ad SA)
- Creation of a critical and commented database on the impact of nanoparticles (CA and SA)
- Coordination in studying the environmental and health impact of nanoparticles and nanotechnology based materials and products (CA and SA)

# DRAFT of the NMP Work Programme

## Mastering nano-scale complexity in materials

- Nanostructured polymer-matrix composites (Large scale integrating projects)
- Nanostructured coatings and thin films (Small or medium-scale focused research projects)
- Characterisation of nanostructured materials (CA and SA)

## Knowledge-based smart materials with tailored properties

- Organic materials for electronics and photonics (Large scale integrating projects)
- Nanostructured materials with tailored magnetic properties (Small or medium-scale focused research projects)
- Advanced material architectures for energy conversion (Small or medium-scale focused research projects)

# DRAFT of the NMP Work Programme

## Novel biomaterials and bioinspired materials

- Highly porous bioactive scaffolds controlling angiogenesis for tissue engineering (Large scale integrating projects)

## Advances in chemical technologies and materials processing

- Flexible efficient processing for polymers (SME-targeted projects)
- Nanostructured catalysts with tailor-made functional surfaces (Small or medium-scale focused research projects)
- Renewable materials for functional packaging applications (Small or medium-scale focused research projects)

# DRAFT of the NMP Work Programme

## Using engineering to develop high performance knowledge-based materials

- Novel materials tailored for extreme conditions and environments  
(Large scale integrating projects)
- Modelling of microstructural evolution under work conditions and in materials processing  
(Small or medium-scale focused research projects)

## Integration of technologies for industrial applications

- Development of nanotechnology-based smart multi-tasking targeted agents for diagnosis, therapy or "theranostics"  
(Large scale integrating projects)

# DRAFT of the HEALTH Work Programme

# DRAFT of the HEALTH Work Programme

## Predicting Suitability, Safety and Efficacy of Therapies

- Alternative testing strategies for the assessment of the toxicological profile of nanoparticles used in medical diagnostics. Research should focus on mechanistically-based in vitro models relevant to health risk assessment. (Small or medium-scale focused research projects)

## Cancer

- Improving targeted drug delivery to cancer cells for cancer therapeutics other than gene therapy (using for example innovative nanotechnology-, peptide- or antibody- based targeting strategies). (Small or medium-scale focused research projects)

# DRAFT of the HEALTH Work Programme

## Detection, Diagnosis and Monitoring

- Novel optical methodologies for detection, diagnosis and monitoring of disease or disease-related processes. The methodology should provide in vivo functional information or quantitative analysis of disease progression. (Small or medium-scale focused research projects)
- Novel targeted imaging probes for early in vivo diagnosis and/or evaluation of response to therapy. The proposed procedure should be preclinically tested, including assessment of biodistribution. (Large-scale integrating project)
- Image-guidance for cell therapy. Develop and validate imaging tools for novel cell therapies allowing tracking of cells and assessment of cell fate and therapeutic effects. (Large-scale integrating project).

# DRAFT of the HEALTH Work Programme

## Regenerative medicine

- Stem cell lines for cell-based therapies. Projects should adopt a comparative approach to evaluating cell sources in order to identify and validate the best source for specific and safe applications. Means should be developed for controlling cell proliferation and differentiation, and optimizing cell survival and function after transplantation. Clinical application needs to be established from the outset.  
(One or more Large-scale integrating projects)
- Development of stem cell culture conditions. Projects should support progress in stem cell therapy through the development of common tools and standards for culturing stem cells, such as serum-free media, supporting biomaterials, cell amplification and differentiation techniques, surface markers for recognition, protocols for screening, separation and banking. GMP standards should be a particular goal.  
(Small or medium-scale focused research projects)

# DRAFT of the ICT Work Programme

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## Micro/nanosystems

- Next-generation smart systems: sensor and actuator systems, miniaturisation, networking, autonomy. Higher performance at lower cost/lower power consumption. Very high density mass storage (solid-state semiconductors, micro/nanodevices, mechanics, optics, electronics and magnetism)
- Micro/nano/biotechnologies' convergence for environmental monitoring, food quality management, security, biomedical and lifestyle applications (bioMEMS, biosensors, lab-on-chip microsystems and autonomous implants). Research will also address packaging, multilevel interfacing, manufacturing, as well as ethical and societal issues
- Integration of smart materials: Integration of micro-nano technologies and smart systems into new and traditional materials

# DRAFT of the ICT Work Programme

## Bio-ICT convergence

- Bidirectional interfaces between electronic or electro-mechanical systems and living entities, at or close to the cellular level, with adequate control and/or signal processing algorithms, enabling direct interfacing to the nervous system or to other types of cells.
- Biohybrid artefacts, involving tightly coupled ICT and biological entities (e.g., neural or other types of biological tissue) for new forms of computation, sensing, communication or physical actuation or adaptation.

# DRAFT of the ICT Work Programme

## Personal Health Systems for Monitoring and Point-of-Care diagnostics

- Personalised Monitoring: Innovative systems and services aimed at health status monitoring for persons at risk or with chronic health conditions, including those associated with ageing
  - 1) Chronic disease management (avoiding hospitalisation )
  - 2) Preventive monitoring
- Point-of-Care diagnostics: (multi-analyte screening at primary care level)

# Next steps

- Today to next week: details of draft workprogrammes
- Next week to January: develop ideas, consortia
  - > January to April: „propose, peer or evaluate“
  - > After the evaluation: prepare 2nd stage, analyse/emphasise
  - > Results: late 2007 (prepare CA, etc.)
- Spring: take part in events, ETPs
- Summer: offer factual input for FP7

# European Technology Platforms

- Define a Common Vision
- Mobilise a Critical Mass of Resources
- Define and Implement a Strategic Research Agenda
- EC: Facilitating & Guiding, not Leading or Owning

# European Technology Platforms

- NanoMedicine, Sustainable Chemistry
- Innovative Medicine
- ENIAC, EPoSS, PHOTONICS21 and ARTEMIS

# Reference

- <http://ec.europa.eu/research/fp7>
- <http://cordis.europa.eu/nanotechnology>

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Thank you very much for your kind attention !

# DRAFT of the ICT Work Programme

## For digital libraries

- Large-scale European-wide digital libraries with innovative access services
- Radically new approaches to digital preservation, such as those inspired by human capacity to deal with information and knowledge
- Network of centres of competence for digitisation and preservation

## Intelligent Content and Semantics

- Advanced authoring environments, Collaborative automated workflow environments
- Architectures and technologies for personalised distribution, presentation and consumption of self-aware, adaptive content
- Semantic foundations: