



ICT in FP7  
Work programme 2009-10

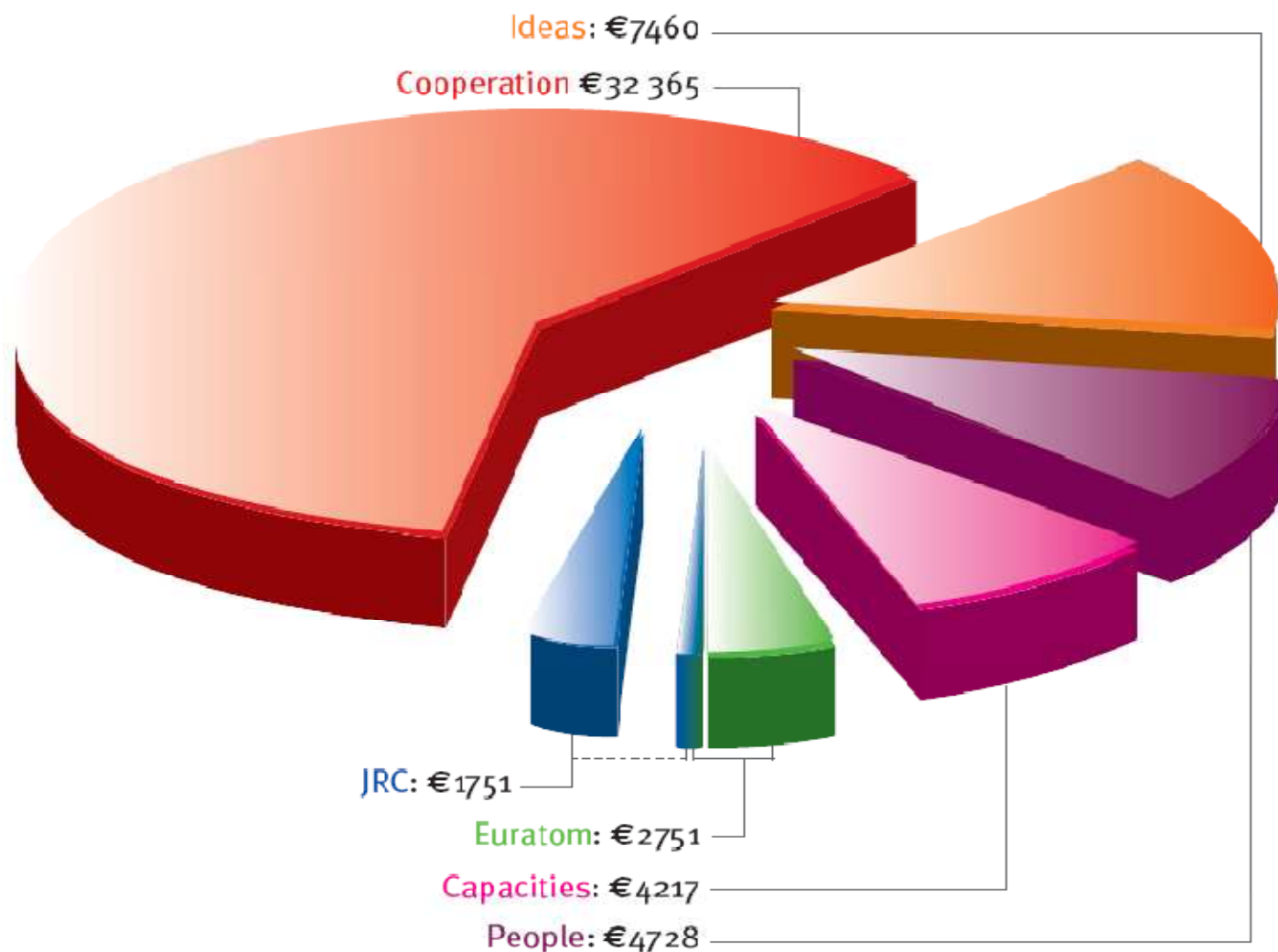
ICT Brokerage 2009  
**Czech Innovation Day**

Brno, 29 April, 2009



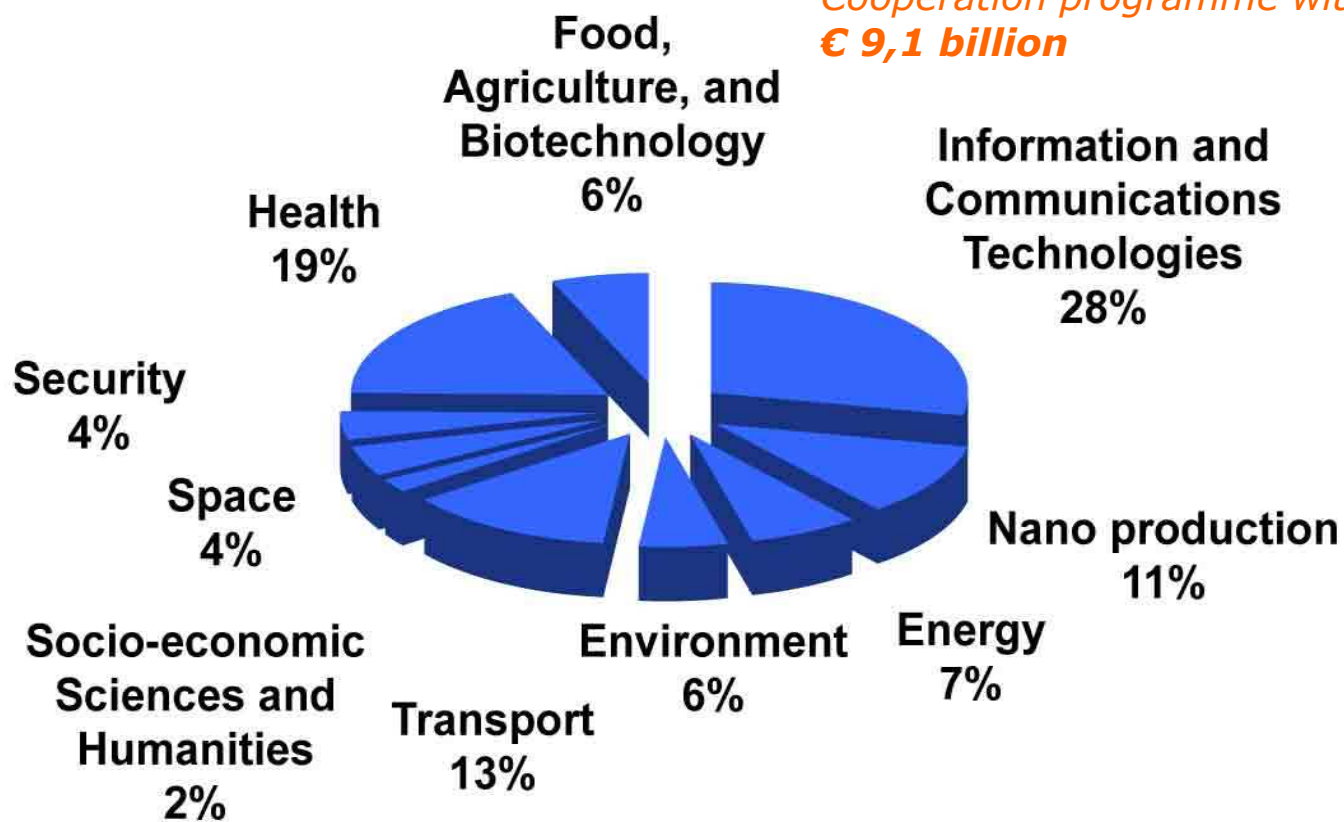
# Framework Programme 7 (2007-13)

The indicative breakdown (€ million) of FP7

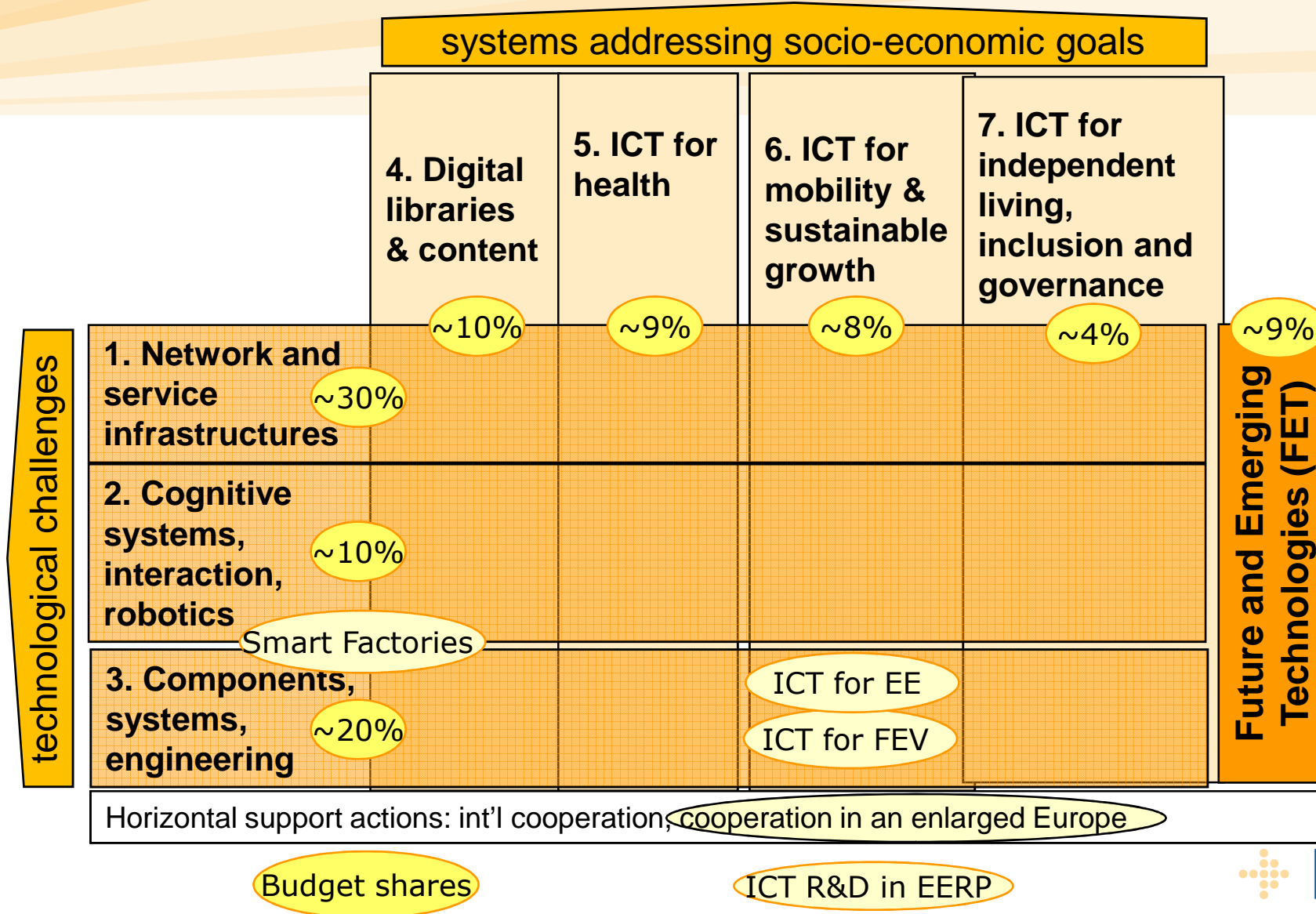


# FP7 Cooperation Programme

*The ICT thematic area is the largest in the Cooperation programme with a budget of € 9,1 billion*



# Programme structure



European Commission  
Information Society and Media



# Addressing synergies throughout the Programme

- ✓ Breakthroughs from **cross-overs** and **convergence** of technologies and disciplines
- ✓ Innovations from the **use** of ICT in demanding application contexts
- ✓ Synergies between objectives but always with a **center of gravity**



## Other important features

- Involving **SMEs** and feeding innovation
  - aim is to ensure that SMEs constitute an important part of the ICT research consortia
- Bringing the **user** in research cycles
  - proposers are encouraged to apply user-driven 'Open Innovation' methodologies
- Contributing to European and global **standards**
- Encouraging the use of **IPv6**



# Funding schemes

## Collaborative projects (CP):

- 'small or medium-scale focused research actions' (STREP): specific research objective in a sharply focused approach
  - 'large-scale integrating projects' (IP): comprehensive 'programme' approach / include a coherent and integrated set of activities dealing with multiple issues
- Both instruments play an important and complementary role
  - Objective is to support a balanced portfolio:
    - focused and agile scientific and technological exploration through STREPs
    - concentration of efforts - where needed - through IPs
  - Indicative budget distribution per instrument specified for each objective
  - Overall aim is to ensure that about half of the support for Collaborative Projects is delivered through IPs and about half through STREPS



# Challenge 1: Pervasive and Trustworthy Network and Service Infrastructures

## Challenges

- Current Internet: severe limitations in terms of capacity, mobility, flexibility, scalability, security, reliability and resilience of networks and services

Need to:

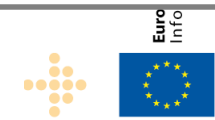
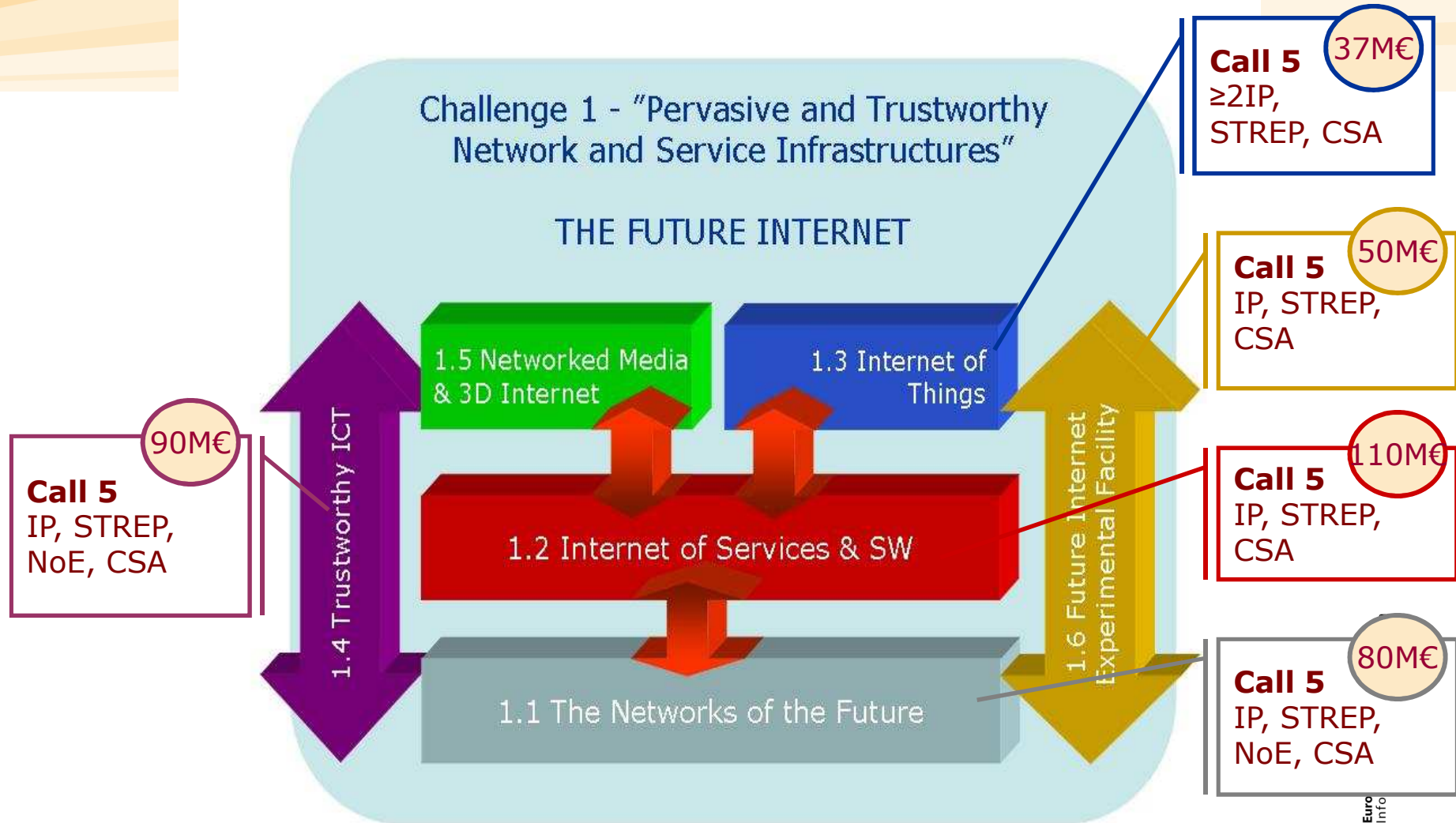
- rethink networking architectures
  - support an "Internet of Services"
  - support an "Internet of Things"
  - be trustworthy
  - support a "3D Media Internet"
- +
- bridge the gap between long-term research and large-scale experimentation
  - federate research activities across Europe

## Expected Impact

- Strengthened position of European industry
  - European leadership in supply of integrated business solutions
- +
- Wider market opportunities from new classes of applications taking advantage of convergence
  - Global standards, interoperability and European IPRs
- +
- Integrated large scale Experimental Facility
  - Improved coordination and integration of research activities in Europe

# Challenge 1: Objectives

557 M€ in total  
(~30%)



# Challenge 1: Objectives and Target Outcomes (I)

80M€

## 1.1 The Network of the Future

(IP, STREP)  
- Call 5 -

### "Future Internet" Architectures and Network Technologies

Networks of Excellence and  
Coordination/ Support actions  
(NoE, CSA)

110M€

## 1.2 Internet of Services, Software and Virtualisation

(IP, STREP)  
- Call 5 -

### Service Architectures and Platforms for the "Future Internet"

### Innovative Service / Software Engineering

Coordination and support  
actions (CSA)

37M€

## 1.3 Internet of Things and Enterprise environments

(≥2 IP, STREP)  
- Call 5 -

### Architectures and technologies for an "Internet of Things"

### Enterprise systems

International cooperation  
and coordination (CSA)

# Challenge 1: Objectives and Target Outcomes (II)

90M€

## 1.4 Trustworthy ICT - Call 5 -

**“Trustworthy Network Infrastructures”** (IP)

**“Trustworthy Service Infrastructures”** (IP)

**Technology and Tools for Trustworthy ICT** (STREP)

Networking, Coordination and Support (NoE, CSA)

50M€

## 1.6 “Future Internet” experimental facility and experimentally- driven research - Call 5 -

**Building the Experimental Facility and stimulating its use** (IP)

- **FIRE Components:** operational prototype facility
- **FIRE Users:** open calls; results of mutual interest

**Experimentally-driven Research** (STREP)

Coordination actions (CSA)



# Challenge 2: Cognitive Systems, Interaction, Robotics

## Challenges

### Artificial Cognitive Systems

- Robots operating in 'modelled', 'structured' and 'constrained' environments
- Basic understanding of computational representations of cognitive processes
- Human-robot interactions rather static/passive

### Translation Systems

- Machine translation of limited quality, human supervised
- Automatic translation in limited domains / language pairs
- Content / workflow management not automated

## Expected Impact

- More competitive robotics industry + more innovation capacity in application domains
- Robots, machines and systems exhibiting advanced behaviour: operating with gaps in knowledge, in changing environments
- Machines and systems that understand their users / context
- Robotic systems with rich interaction

- Higher quality automatic translation
- Faster human translation
- +
- Self-learning machine translation
- Progressive independence from topic and language pair
- Automated versioning and management of multilingual web sites

# Challenge 2: Objectives and Target Outcomes

80M€

## 2.1 Cognitive Systems and Robotics - Call 6 -

**Engineering of artificial  
cognitive systems (STREP)**

**Complete robotic systems  
(IP)**

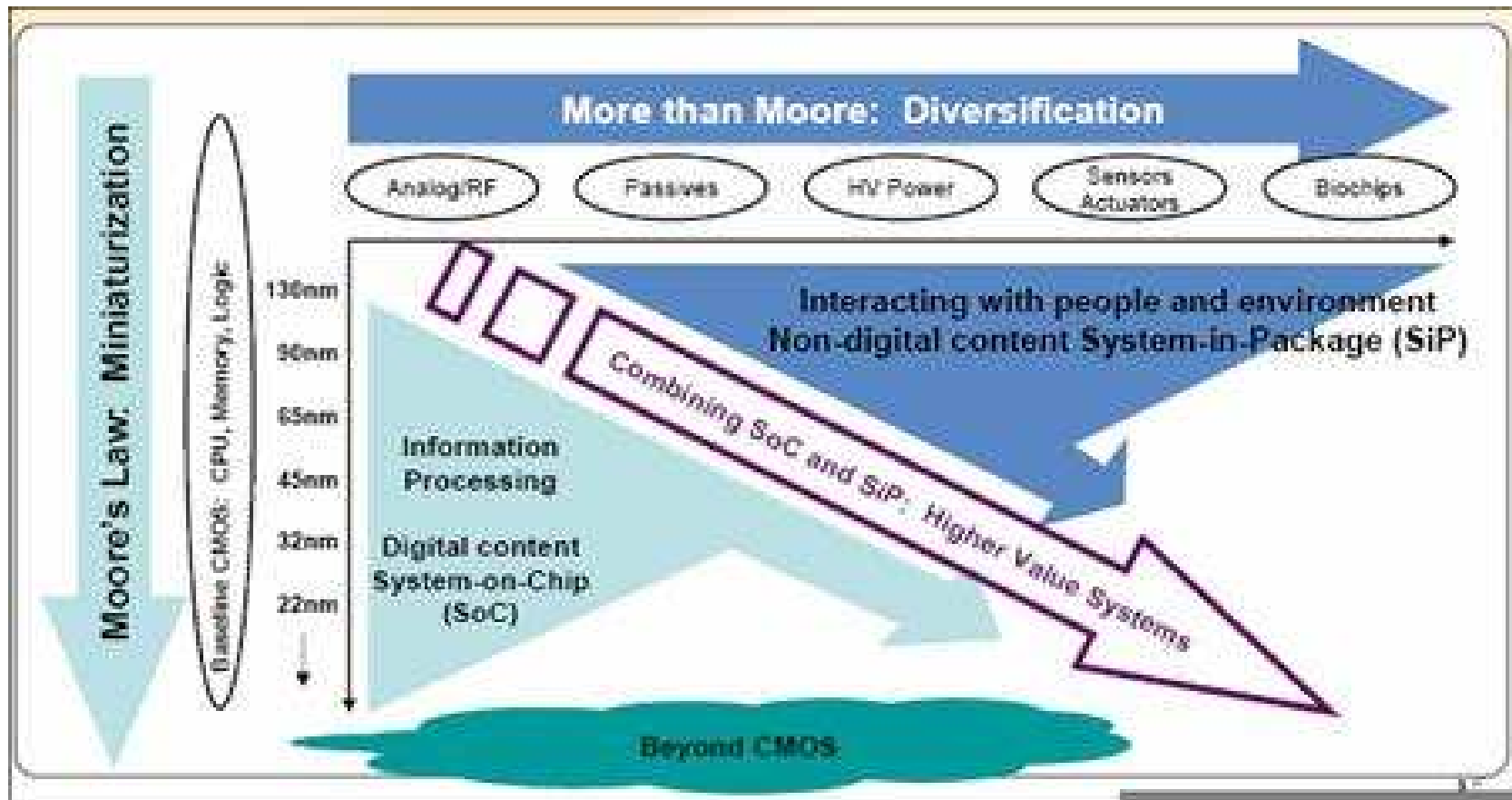
Facilitate **cross-fertilisation  
between academic and  
industrial research (IP)**

+

Coordination of artificial  
cognitive systems research  
community (CA)



# Challenge 3: Components, Systems, Engineering



# Challenge 3: Components, Systems, Engineering

## Challenges

**Trends:** miniaturisation, diversification, increasing software content and emphasis on a systems approach

### Challenges:

- Integrated hardware/software systems
- Heterogeneous micro-systems
- Widely distributed systems
- Multi-disciplinarity

Cross cutting issues:

- Efficient energy management
- Minimum environmental footprint

### Opportunities:

New types of devices & intelligent system

- nano-scale integration ...
- embedded ICT ...
- new materials, photonics, organic electronics ...

## Expected Impact

- Strengthened competitiveness of EU industry through risk sharing and pooling of resources in generic underlying technology developments
- Exploration of alternative paths, fostering of new types of collaborations, emergence and growth of new companies
- Higher attractiveness of EU to investments and skills
- Higher energy efficiency and lower environmental impact
- Maintained leading position of EU in product innovation and design
- Wider use of smart devices and systems in various application sectors
- Closer cooperation between Member States, and internationally

# Challenge 3: Objectives and Target Outcomes (I)

35M€

## **3.1 Nanoelectronics Technology**

- Call 5 -

### **Miniaturisation and functionalisation**

- Beyond 22 nm devices (STREP)
- Merging of 'Beyond CMOS' and advanced 'More than Moore' devices and processes (NoE)

### **Manufacturing technologies** (≥1 IP, STREP)

Support measures (CSA)

32M€

## **3.5 Engineering of Networked Monitoring and Control systems**

- Call 5 -

### **Foundations of complex systems engineering** (STREP, NoE)

### **Wireless Sensor Networks and Cooperating Objects**

- 1 IP: architectures and integration platforms
- STREP: specific issues or topics

### **Control of large-scale systems**

- 1 IP: architect, develop and demonstrate process automation systems
- STREP: specific issues or topics

International cooperation (CSA)

(Complementing ARTEMIS JTI)



# Challenge 3: Objectives and Target Outcomes (II)

60M€

## 3.7 Photonics - Call 5 -

### Photonics technologies, components and (sub)systems

- Lighting and light sources (IP/STREP)
- Imaging for Safety & Security (STREP)
- Biophotonics (STREP)
- Communications (IP/STREP)
- Integrated components for power lasers (STREP)

### Cost-effective versatile foundry processes for photonic integrated components (IP)

Coordination and support actions (CSA)

## 3.9 Microsystems and Smart Miniaturised Systems - Call 5 -

80M€

### Heterogeneous integration (IP, STREP)

- processing, comms, sensing, actuating ...

### Autonomous energy efficient smart systems (STREP)

- energy management
- communication solutions

### Application-specific microsystems and smart miniaturised systems (IP, STREP)

- Biomedical
- Telecommunications
- Environment and food/beverage
- Transport, safety and security
- Smart Fabrics and Interactive Textiles

Coordination and support actions (CSA)



# Challenge 3: Complementing the Joint Technology Initiatives

Two JTIs pooling public-private efforts and leveraging more R&D investments

## **Nanoelectronics**

- **ENIAC JTI**: Focus on *large application-driven industrial* developments in 'More Moore' and 'More than Moore' domains
- **ICT WP**: Focus on "Beyond CMOS", more advanced "More than Moore" and "heterogeneous integration" domains

## **Embedded Systems**

- **ARTEMIS JTI**: Focus on *industrial platforms* for design and implementation of Embedded Systems responding to *specific application requirements*
- **ICT WP**: Focus on *new concepts* for the design and engineering of *next generation* applications of Embedded Systems



# Challenge 4: Digital Libraries and Content

## Challenges

- Data volumes growing faster than manageable
  - interpreting data (real-time, multi-dimensional, semantics)
  - automating preservation
  - complex objects
- Content and cultural experiences are not sufficiently immersive, adaptive
- Learning tools do not exploit creativity, collaboration and independent experimentation



## Expected Impact

- Increased competitiveness in effective, intelligent information management systems
- Effective and reliable preservation and usability over time of digital objects
- New cultural experiences
- Personalised learning (through ICT) experiences



# Challenge 4: Objectives and Target Outcomes

4.1

69 M€

## **Digital Libraries and Digital Preservation**

- Call 6 -

### **Advanced preservation scenarios**

- complex objects (STREP)
- intelligent digital curation and preservation systems (IP)

### **Digital content preservation systems and services** (IP)

- end-to-end workflows
- demos in large-scale testbeds
- integrity and authenticity

+

### **Adaptive cultural experiences** (STREP)

- knwl tech, visu, interaction ...

### **Solutions for assembling multimedia libraries** (IP)

- collaborative use
- aggregate, annotate ... objects ...

Research Network (NoE)  
Uptake and roadmapping (CSA)

4.2

49M€

## **Technology-enhanced Learning**

- Call 5 -

### **Learning appliances** (STREP)

- e.g. virtual characters ...

### **Adaptive and intuitive systems** (STREP)

- e.g. game-based ...

### **Link between individual and organisational learning** (IP, STREP)

- embed in organisational processes ...

### **Learning in the 21st century** (IP)

- large-scale pilots for design of future classroom ...

Research network (NoE)

Awareness and knowledge management (CSA)

4.3

70M€

## **Intelligent Information Management**

- Call 5 -

### **Capturing tractable information** (IP, STREP, NoE)

### **Delivering pertinent information** (IP, STREP)

+

### **Collaboration and decision support** (IP, STREP)

### **Personal sphere** (STREP)

+

Coordination and networking (CSA)

# Challenge 5: Towards Sustainable and Personalised Healthcare

## Challenges

- Sustainable delivery of quality health care at affordable cost
- Demographic changes
- Chronic diseases
- Inefficiencies, inadequate safety and control
- Demand for best-quality care
- Demand for prevention as well as treatment
- Demand for skilled specialists



## Expected Impact

- Saving in lives and resources
- Improved productivity of healthcare systems
- Continuous and personalised care solutions
- +
- New ICT-based environments for biomedical research and predictive medicine
- Reinforced leadership of EU's eHealth and medical devices industries



# Challenge 5: Objectives and Target Outcomes

63M€

## **5.3** **Virtual Physiological** **Human** - Call 6 -

**Patient-specific computer based models and simulation**  
(≥1 IP, STREP)

- Integrating multi-scale models ...

**ICT tools, services and infrastructures for bio-medical researchers** (≥1 IP, STREP)

- sharing data and applications, collaborative environments ...

Support action (1 CSA) on evaluation and assessment

Observatories on achievements and evolution of Biomedical Informatics (1 CSA)



# Challenge 6: ICT for Mobility, Environmental Sustainability and Energy Efficiency

## Challenges

- Increasing demand for energy
- Need for energy efficiency in most energy-intensive sectors
- Need for climate change adaptation
- Need for environmental sustainability
- Need to increase safety
- Need to reduce CO2 emissions



## Expected Impact

- Reduced energy intensity
- Reinforced competitiveness in ICT-enabled energy efficiency technologies
- New environmental services
- Increased capacity to mitigate impacts of disasters
- Improved safety, security and comfort of transport
- European leadership in clean and intelligent vehicle systems and in cooperative systems



# Challenge 6: Objectives and Target Outcomes (I)

37 M€

## 6.2 ICT for "Mobility of the Future" - Call 6 -

**Field Operational Tests for  
Integrated Safety and Co-  
operative Systems**  
(≥2 IPs, STREP, CSA)

**ICT-based systems and  
services for Smart Urban  
Mobility and new Mobility  
Concepts** (STREP)

Coordination and support  
actions (CA)

International cooperation (CA)



171 M€  
(~9%)

# Future & Emerging Technologies – FET

An incubator and pathfinder for new ideas and themes for long-term research in the area of ICT

High risk research, offset by potential breakthrough with high technological and/or societal impact

## FET Open

- bottom-up approach
- exploring new and alternative ideas at the frontiers

61 M€



## FET Proactive

- top-down approach
- spearheading transformative research and supporting community building

110 M€

European Commission  
Information Society and Media



“FET-Open targets *foundational breakthroughs* that open the way towards radically new forms and uses of ICT”

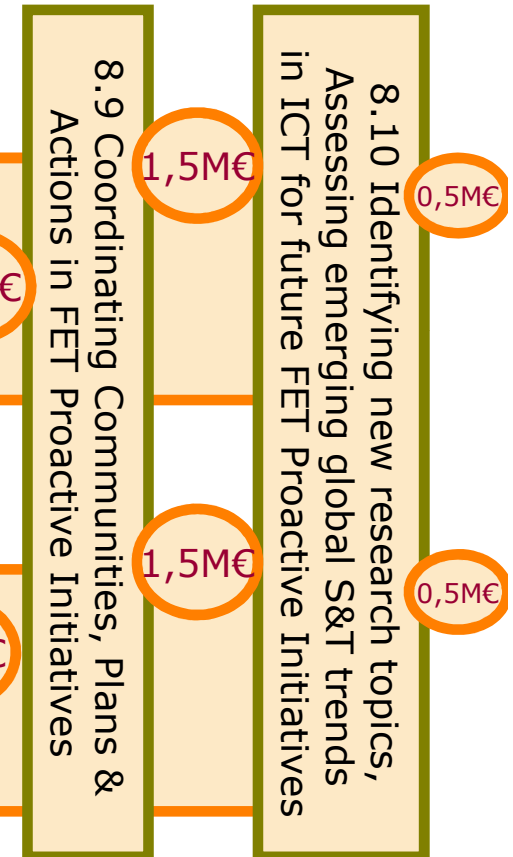
- **STREP: scientific foundations of future ICT that may be radically different from present day ICT**
  - **new avenues, paradigm shifts ...**
- **CSA: catalyse lasting and transformative effect on communities and practises for high-risk and high-impact research**
- **Continuously receivable**
  - **two step submission for STREPs**
  - **specific eligibility and evaluation criteria**
- **61M€**
  - **committed following cut-off dates**



# FET Proactive

CSA

CSA



## Call 5

**8.4 Human-Computer Confluence** (IP) 15M€

**8.5 Self-Awareness in Autonomic Systems** (IP, STREP) 15M€

**8.6 Towards Zero-Power ICT** (STREP) 7M€

## Call 6

**8.7 Molecular Scale Devices and Systems** (IP, STREP) 15M€

**8.8 Brain Inspired ICT** (IP, STREP) 15M€



# ICT contribution to Public Private Partnerships for R&D in the European Economic Recovery Plan

- 'Factories of the Future'
- 'Energy-Efficient Buildings'
- 'Green Cars'



# 'Factories of the Future'

- Combined envelope of ~€1.2 bn
  - *'to help EU manufacturers across sectors, in particular SMEs, to adapt to global competitive pressures by increasing the technological base of EU manufacturing'*
- R&D in production technologies, materials and ICT, including:
  - 'Smart' factories: agile manufacturing and customisation
    - process automation, control and optimisation, robotics ...
  - 'Virtual' factories: global networked operations
    - supply chain management, product-service linkages, management of distributed manufacturing assets ...
  - 'Digital' factories: optimised design of systems and processes
    - modelling, simulation, visualisation, lifecycle and knowledge management ...



Objective 10.1  
'Factories of the Future'  
in Call 5

10.1: Smart Factories: ICT for agile and environmentally-friendly manufacturing

35 M€

- a) **Integrated process automation and optimisation**
    - shopfloor-based platforms and systems ... (IP)
  - b) **Real-time monitoring of energy use and material flow**
    - context-aware ICT applications and scalable sensor networks integrated in machines and factory-level infrastr. (IP)
  - c) **Robotics-enabled production processes**
    - robotic prototypes in smart factory environments ... (STREP)
  - d) **Laser applications**
    - laser systems in processes and production ... (STREP)
  - e) **Coordination Action**
    - industrial learning and roadmapping across industries ... (CSA)
- a) – d): integration + validation

# 'Energy-Efficient Buildings'

- Combined envelope of ~€1 bn
  - *'to promote green technologies and the development of energy-efficient systems and materials in new and renovated buildings with a view to reducing radically their energy consumption and CO2 emissions'*
- Non-R&D measures
  - Regulatory and standardisation components;  
Procurement network of regional and local authorities
- R&D in energy, environmental, production technologies, materials, nanotechnologies and ICT, including:
  - Monitoring and control of energy consumption
  - Advanced lighting systems
  - Smarter and optimised interconnections with the power grids



Objective 10.2  
'Energy-Efficient Buildings'  
in Call 5

10.2: ICT for energy-efficient buildings and  
spaces of public use

15 M€

- a) **Integrated ICT-based management and control systems**
- governing lighting/heat exchange/air treatment subsystems
  - deployed in spaces of public use
  - interoperating with security/safety/comfort subsystems (STREP)
- b) **Coordination Action**
- reviewing needs, roadmapping ... (CSA)
- a): systems integration + validation



# 'Green Cars'

- Combined envelope of >€5 bn
  - *'to achieve a breakthrough in the use of renewable and non-polluting energy sources, safety and traffic fluidity'*
- Non-R&D measures
  - Loans to car producers and suppliers; Reduction of taxes for lower emission cars and for scrapping old cars; Procurement network of regional and local authorities to pool demand for clean buses
- R&D (~€1 bn) in transport, energy, environmental and production technologies, materials and ICT, including:
  - ICT for Fully Electric Vehicles
    - Battery management and power supply
    - Control mechanisms
    - Interconnections with the transport and power infrastructures



Objective 10.3  
'Green Cars'  
in Call 5

## 10.3: ICT for the Fully Electric Vehicles

20 M€

### Highly energy-efficient ICT components and solutions for FEVs

- a) Solutions for overall efficiency gains in electric vehicle
    - electrical and thermal management, electrified auxiliaries, closed-loop control and cooperative interaction ... (STREP)
  - b) Safe and robust subsystems
    - communication, sensors, actuators, distributed controls, power electronics, active safety and comfort ... (STREP)
  - c) Fail-safe systems and electrical architectures, vehicle-to-road infrastructure integration ... (STREP)
  - d) Coordination Action
    - reviewing needs, roadmapping ... (CSA)
- a) – c): optimisation at vehicle and system level  
+ simulation, testing ...

# International Cooperation

## Targeted opening

- Challenge 1. Networks and services
  - Future Internet (Japan, USA)
  - Internet of Things / RFID (North America, China, Japan, Korea)
  - Trustworthy ICT (Developed countries, BRICs)
- Challenge 3. Components, Systems, Engineering
  - Semiconductors, components, nanoelectronic technologies (Russia, India, Japan, USA, Taiwan,)
  - Embedded systems (USA, India)
  - Photonics (Canada, Russia, USA, Australia)
- Challenge 6: ICT for mobility, environmental sustainability.
  - ICT for Mobility of the Future (Japan, USA)
- **Objective 9.2: Supplements to ongoing projects**
  - Trustworthy ICT, Nanoelectronics, Micro-nanosystems, Embedded Systems, ICT for Mobility (100K€/project)



0.7M€

Calls 5, 6



# Horizontal actions for international cooperation

- 9.1b) Support to the uptake of EU ICT research results in developing economies
  - adapt to local requirements
  - STREP/SICA

5M€

Call 6



# Supplements to strengthen Cooperation in ICT R&D in an Enlarged Europe

- Reinforcing cooperation between research teams across the enlarged Europe 10M€
- Strengthening integration of the European Research Area in ICT Call 5
- Support to:
  - increase level of expertise
  - broaden scope
  - speed up developments

→ Additional funding to on-going FP7/ICT IP/STREP projects ending after April 2011



# Call 5: Open 31 Jul 2009, Close **3 Nov 2009**; 802 M€

(=722+80 M€)

Challenge	Objectives
<b>Challenge 1: Pervasive and Trusted Network and Service Infrastructures</b>	ICT 2009.1.1 The Network of the Future (call 5) ICT 2009.1.2 Internet of Services, Software & virtualisation ICT 2009.1.3 Internet of Things and enterprise environments ICT 2009.1.4 Trustworthy ICT ICT 2009.1.6 Future Internet Experimental Facility and Experimentally-driven Research
<b>Challenge 3: Components, systems, engineering</b>	ICT 2009.3.1 Nanoelectronics Technology ICT 2009.3.5 Engineering of Networked Monitoring and Control Systems ICT 2009.3.7 Photonics ICT 2009.3.9 Microsystems and Smart Miniaturised Systems
<b>Challenge 4: Digital Libraries and Content</b>	ICT 2009.4.2 Technology-Enhanced Learning ICT 2009.4.3 Intelligent information management
<b>Future and emerging technologies</b>	ICT 2009.8.4,5,6,9,10 FET-Proactive
<b>Horizontal support actions</b>	ICT 2009.9.2 Supplements to support International Cooperation, ongoing projects <b>ICT 2009.9.5 Supplements to Strengthen Cooperation in ICT R&amp;D in an Enlarged Europe</b>
<b>Contribution of the ICT Theme to Public-Private Partnerships for R&amp;D in the European Economic Recovery Plan</b>	<b>ICT 2009.10.1 Smart Factories: ICT for agile and environmentally friendly manufacturing</b> <b>ICT 2009.10.2 ICT for energy-efficient buildings and spaces of public use</b> <b>ICT 2009.10.3 ICT for the Fully Electric Vehicle</b>



# Call 6: Open 24 Nov 2009, Close **13 April 2010**; 286 M€

Challenge	Objectives
<b>Challenge 2: Cognitive systems, interaction, robotics</b>	ICT 2009.2.1 Cognitive Systems and Robotics
<b>Challenge 4: Digital Libraries and Content</b>	ICT 2009.4.1 Digital Libraries and Digital Preservation
<b>Challenge 5: Towards sustainable and personalised healthcare</b>	ICT 2009.5.3 Virtual Physiological Human
<b>Challenge 6: ICT for mobility, environmental sustainability and energy efficiency</b>	ICT 2009.6.2 ICT for Mobility of the Future
<b>Future and emerging technologies</b>	ICT 2009.8.7,8,9,10 FET-Proactive
<b>Horizontal support actions</b>	ICT 2009.9.1 International Cooperation ICT 2009.9.2 Supplements to support International Cooperation between ongoing projects





## Networking for ICT Calls

- After the ICT Proposers' Day 2009, networking continues via the event website:  
<http://ec.europa.eu/ictproposersday>
- What? Proposal ideas in the form of:
  - Research & Technology demands and offers
  - Presentations and comments
  - all linked to a specific Work Programme objective
- How?
  - Consult the available proposal ideas and get in touch with the authors (hundreds of ideas are already on line)
  - or
  - Submit your own proposal idea and be ready to be contacted

