

# The Network of the Future

European Research in Framework Programme 7

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**European Commission**  
**DG Information Society and Media**



# Contents

- Lisbon Strategy and ICT Policy
- FP6 Project Portfolio
- FP7 Overview
- ICT Work Programme 2007/2008
- Challenge 1: Pervasive and Trusted Network and Service Infrastructure
- Objective 1.1: **The Network of the Future**

ICT: Information and Communication Technologies

FP: Framework Programme



# Lisbon strategy, the i2010 initiative

- **The Lisbon European Council (3/2000) emphasized**

- the potential for growth, competitiveness and job creation of the **shift to a digital, knowledge-based economy**
- the importance of the access to an **inexpensive communications infrastructure** and a **wide range of services** for Europe's businesses and citizens

- **i2010 initiative**

- Objective: to ensure that Europe's citizens, businesses and governments make the **best use of ICTs** in order to
  - improve industrial competitiveness
  - support growth and the creation of jobs
  - help address key societal challenges

# i2010: Three priorities (3 I's)

- A Single European Information Space

- i. The completion of a **Single European Information Space** which promotes an open and competitive internal market for information society and media

- Innovation and investment in research

- ii. Strengthening **Innovation and Investment** in ICT research to promote growth and more and better jobs

- Inclusion, better public services and quality of life

- iii. Achieving an **Inclusive European Information Society** that promotes growth and jobs in a manner that is consistent with sustainable development and that prioritises better public services and quality of life



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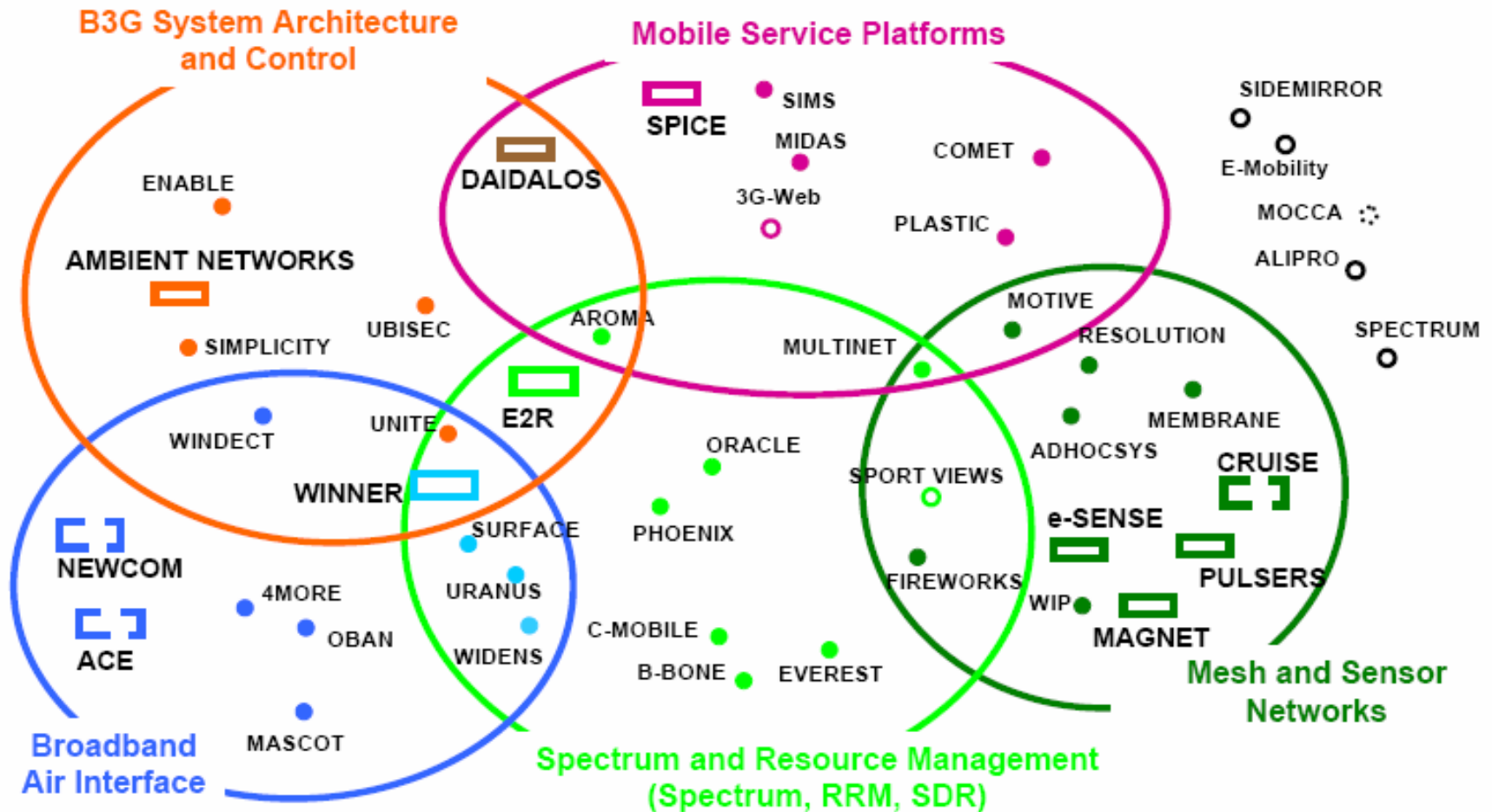
# FP6 Activities: Mobile and Wireless Systems beyond 3G

- Ensure technology leadership for the **next-generation mobile broadband air interface**
  - after the world-dominating European standards GSM and UMTS
- **Develop “Ambient Networks”**
  - By integrating local, cellular and broadcast access networks,
  - Developing new architectures for Sensors, Personal and short range networks
- Enable the **take-up of UMTS** services on the European market
  - UMTS+ : providing higher-speed data and better spectrum-efficiency technologies
  - enabling service providers to create innovative and interoperable mobile services and multimedia content for the user

# FP6 Activities: Broadband for All

- Optical technologies offer **unlimited transmission bandwidth** ( $n \times 10\text{Gbit/s}$ ) in the core
  - EU industry is leader supported by academic excellence.
  - Optical switching and full deployment is coming soon.
- **Low cost access for all**
  - Development of full range of access technologies (DSL, radio, satcom, etc..) including alternative solutions like powerline.
  - Tackle digital divide (ex: rural, NMS..)
- Network **convergence**
  - Integration of networks
  - IP is deployed everywhere to offer Internet, voice, video

# Project Portfolio - Mobile



Instruments :

**Integrated Project (IP)**

**Network of Excellence (NoE)**

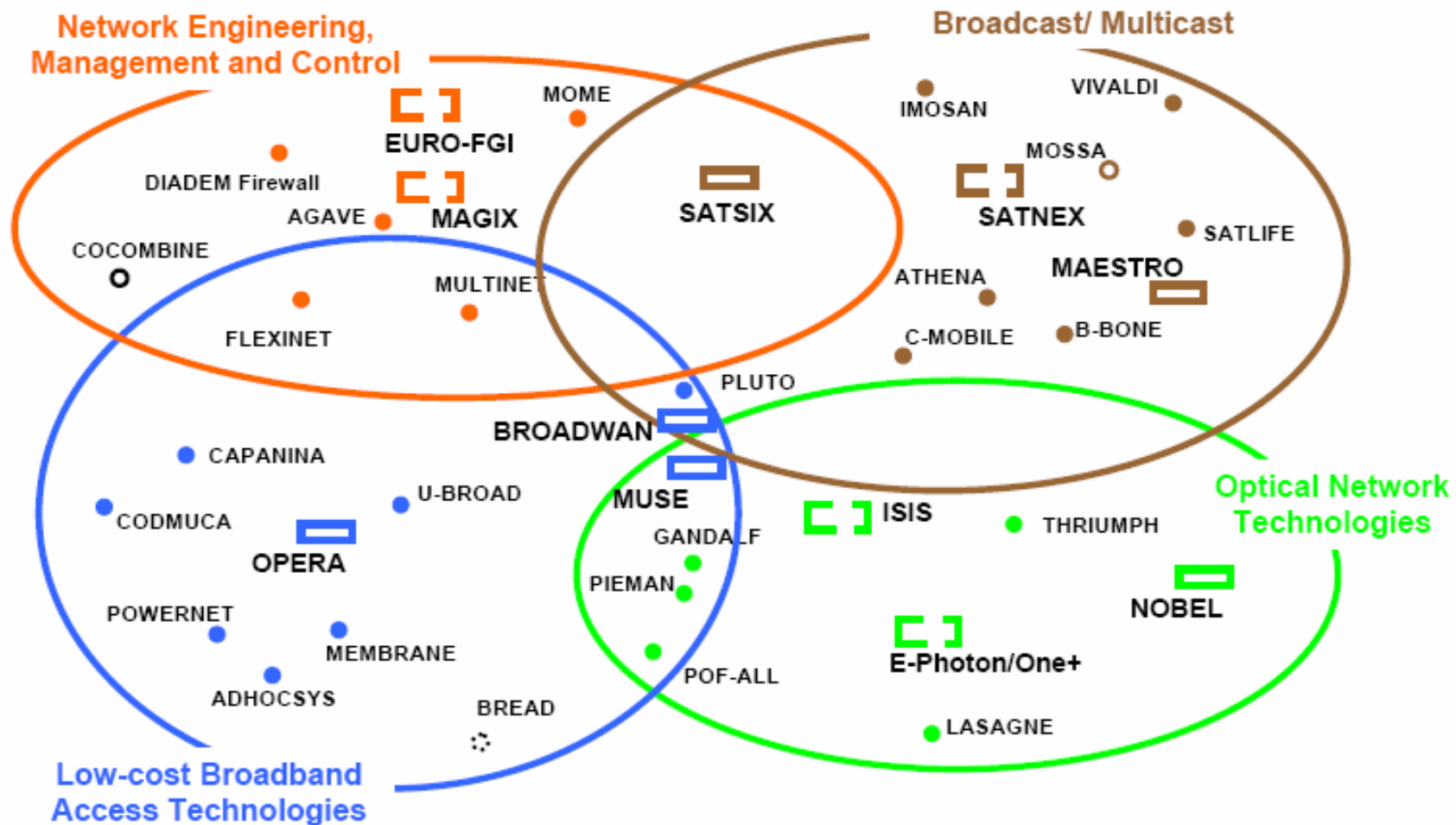
● Specific Targeted Research Project (STREP)

○ Specific Support Action (SSA)

⊙ Coordination Action (CA)



# Project Portfolio - Broadband



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# 7<sup>th</sup> Framework Programme (2007-2013)

€32 B	COOPERATION	10. Space								
		9. Security								
		8. Socio-economic Research								
		7. Transport								
		6. Environment								
		5. Energy								
		4. Nano, Materials, Production Techn.								
		3. ICT								
		2. Food, Agriculture Biotechnology								
		1. Health								
€7.5 B	IDEAS	European Research Council								
€4.7 B	PEOPLE	Marie Curie Actions								
€4.2 B	CAPACITIES	Research Infrastructures	Research for the benefit of SMEs	Regions of Knowledge	Research Potential	Science in Society	International Co-operation			

# Ideas – Frontier Research (1)

- Frontier Research is a key driver to innovation and economic performance
- Establish European Research Council (ERC) – the first pan-European funding agency for Frontier Research
- Support investigator-driven frontier research over all areas of research
- European added-value through competition at European level

# Ideas – Frontier Research (2)

- Budget ~ €1bn p.a.
- Autonomous scientific governance (Scientific Council)
- Support projects of individual teams
- Excellence as sole criterion
- Simple, user-friendly

# Ideas – Frontier Research (3)

- ERC Launch Strategy provides for two streams of funding activities starting in 2007:
  - ERC Starting Independent Researcher Grant scheme (ERC Starting Grant)
  - ERC Advanced Investigator Researcher Grant scheme (ERC Advanced Grant)

# People – Marie Curie Actions

- Initial training of researchers
  - Marie Curie Networks\*
- Life-long training and career development
  - Individual Fellowships
  - Co-financing of regional/national/international programmes
- Industry-academia pathways and partnerships
  - Industry-Academia Knowledge-sharing Scheme\*
- International dimension
  - Outgoing & Incoming International Fellowships
  - International Cooperation Scheme
  - Reintegration grants;
  - Support to researcher 'diasporas'
- Specific actions
  - Mobility and career enhancement actions
  - Excellence awards

# FP7 Capacities Programme ICT-related Research Infrastructures

- ICT based research e-infrastructures
  - high-capacity and high-performance communication and grid empowered infrastructures, distributed supercomputing facilities, data storage and advanced visualisation facilities
  - Calls early + late 2007
- Integrating Activities
  - To provide research services for ICT experience and application research, nano-electronics and integrated micro-/nano-systems research, and embedded systems research



# FP7 2007-2013 'Cooperation' budget

I. Cooperation	Budget (€million, current prices)
1. Health	6 100
2. Food, agriculture and biotechnology	1 935
3. Information and communication technologies	9 050
4. Nanotechnologies, materials and production	3 475
5. Energy	2 350
6. Environment	1 890
7. Transport	4 160
8. Socio-economic research	623
9. Security and space	2 830
<b>Total</b>	<b>32 413*</b>



\* Not including non-nuclear activities of the Joint Research Centre: €1 751 million  
*Dr.-Ing. Peter Stuckmann – European Wireless 2/4/2007*



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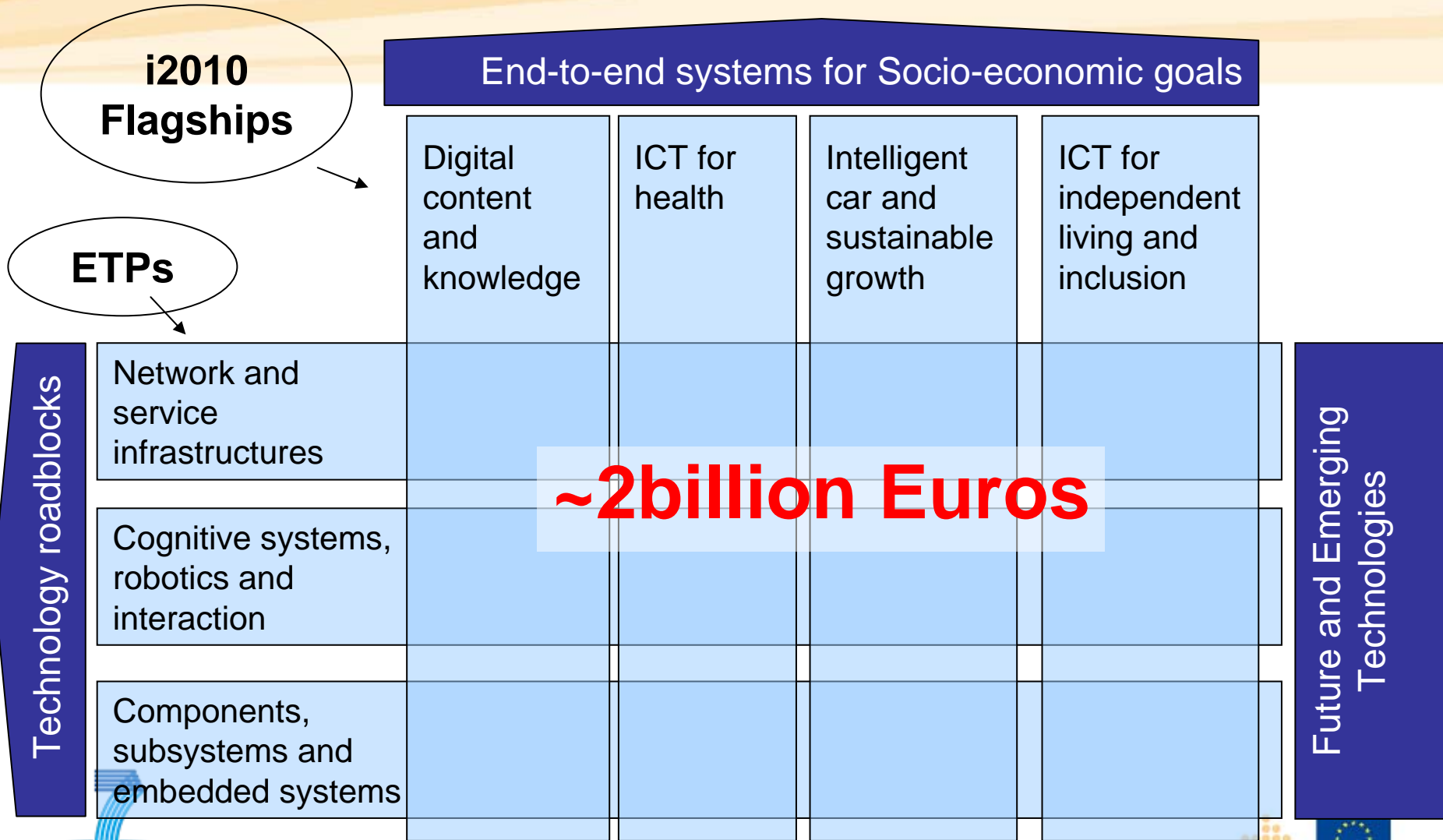
# Reinforce Europe's strongholds

- Network and service infrastructures
  - communication equipment and services, business software, security solutions ...
- Components and embedded systems
  - semiconductors, equipment, photonics, plastic electronics, integrated micro/nano systems ... embedded systems in vertical markets: cars, planes, medical, telecom ...
- A strong academic research community
  - in core ICT fields and in other disciplines relevant for ICT: biotech, materials, cognitive sciences ...

# Work Programme approach and structure

- A limited set of **Challenges** that
  - respond to well-identified industry and technology needs and/or
  - target specific socio-economic goals
- A *Challenge* is addressed through a limited set of Objectives that form the basis of Calls for Proposals
- An Objective is described in terms of
  - target outcome - in terms of characteristics
  - expected impact - in terms of industrial competitiveness, societal goal, technology progress
- A total of 25 Objectives expressed within 7 *Challenges*

# ICT Work Programme 2007-2008



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# *Challenge 1: Pervasive and trusted network & service infrastructures*

- Network and service infrastructures underpin economic progress and the development of our societies
  - 2 billion mobile terminals in commercial operation, 1 billion Internet users, 400 million internet enabled devices
- A growing and changing demand
  - for increasing user control of content/services
  - for networking 'things' - TV/PC/phone/sensors/tags ...
  - for convergence: networks/devices/services - video/audio/data/voice/.
- Current technologies can be, and need to be improved significantly
  - for scaling up and more flexibility
  - for better security, dependability and robustness
  - for higher performance and more functionality
- Europe is well-positioned: industry, technology and use
  - networks equipment and services, business software, middleware, security, home systems ...

# Challenge 1 targets

Today

5 – 10 years

- “Convergence” emerging but:
  - user handles separate networks
  - a multiplicity of devices
  - disparate services
- Billions of devices connected
- Security and trust are “added on”
- Robustness/dependability a key hurdle
- Difficulty to cope with the fragmentation of the value chain

- Anywhere, anytime, any device
  - seamless, ubiquitous
  - broadband, mobile
  - reconfigurable to load/use/context
- Trillions of devices connected
- “Built-in” security and trust
- Highly dependable software and systems
- Full support to distributed value chains and to the networked enterprise



# ICT Call 1 – Open: ~Jan 2007

## Close: 8 May 2007

### **Challenge 1:**

	<b>Budget</b>
1. The network of the future	200 M€
2. Service & software architectures, infrastructures & engineering	120 M€
3. ICT in support of the networked enterprise	30 M€
4. Secure, dependable and trusted infrastructures	90 M€
5. Networked media	85 M€

### **Challenge 2:**

1. Cognitive systems, interaction, robotics	96 M€
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### **Challenge 3:**

1. Next generation nanoelectronics components and electronics integration	86 M€
2. Organic and large-area electronics and display systems	63 M€
3. Embedded systems design	40 M€
4. Computing systems	25 M€

# ... ICT Call 1: ~Jan-May 2007 + FET Open – continuous, close 31 Dec 2008

## **Challenge 4:**

	<b>Budget</b>
1. Digital libraries and technology-enhanced learning	52 M€
2. Intelligent content and semantics	51 M€

## **Challenge 5:**

1. Personal health systems for monitoring and point-of-care diagnostics	72 M€
2. Advanced ICT for risk assessment and patient safety	30 M€

## **Challenge 6:**

1. ICT for the intelligent vehicles and mobility services	57 M€
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## **Challenge 7:**

1. ICT and ageing	30 M€
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## **FET proactive:**

1. Nano-scale ICT devices and systems	20 M€
2. Pervasive adaptation	20 M€
3. Bio-ICT convergence	20 M€

## **Horizontal support actions**

International cooperation	7 M€
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## **FET-Open (separate Call for Proposals)**

65 M€

# ICT Call 2 – Open: May/Jun 2007 Close: Sep/Oct 2007

## **Challenge 1:**

### **6. New paradigms and experimental facilities**

Critical infrastructure protection (open: Sep, close: Dec 2007)

**Budget**

40 M€

20 M€

## **Challenge 3:**

5. Photonic components and subsystems

6. Micro/nanosystems

7. Networked embedded and control systems

+20/security

90 M€

83 M€

47 M€

## **Challenge 5:**

3. Virtual physiological human

72 M€

## **Challenge 6:**

2. ICT for cooperative systems

48 M€

3. ICT for environmental management and energy efficiency

54 M€

## **Challenge 7:**

2. Accessible and inclusive ICT

43 M€

# ICT Call 3 – Open: Dec 2007 Close: Mar 2008

## **Challenge 2:**

1. Cognitive systems, interaction, robotics

**Budget**

97 M€

## **Challenge 4:**

1. Digital libraries and technology-enhanced learning
2. Intelligent content and semantics

50 M€

50 M€

## **FET**

4. Science of complex systems for socially intelligent ICT
5. Embodied intelligence
6. ICT forever yours

20 M€

20 M€

20 M€

## **Horizontal support actions**

International cooperation

5 M€

Trans-national co-operation among NCPs

3 M€

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# Objective 1.1 The Network of the Future

## • **Ubiquitous Network Infrastructures and Architectures**

- Convergence and interoperability of heterogeneous network technologies
- Flexible and spectrum-efficient radio access
- High-speed end-to-end connectivity with optimised protocols and routing
- Context awareness
- Support of trillions of connected devices

## • **Optimised Control, Management and Flexibility of the Future Network Infrastructure**

- Seamless end-to-end network and service composition and operation across multiple access technologies, operators and business domains
- Reconfigurability, self-organisation and -management
- Management in real-time of new forms of ad-hoc communications with intermittent connectivity requirements and time-varying network topology

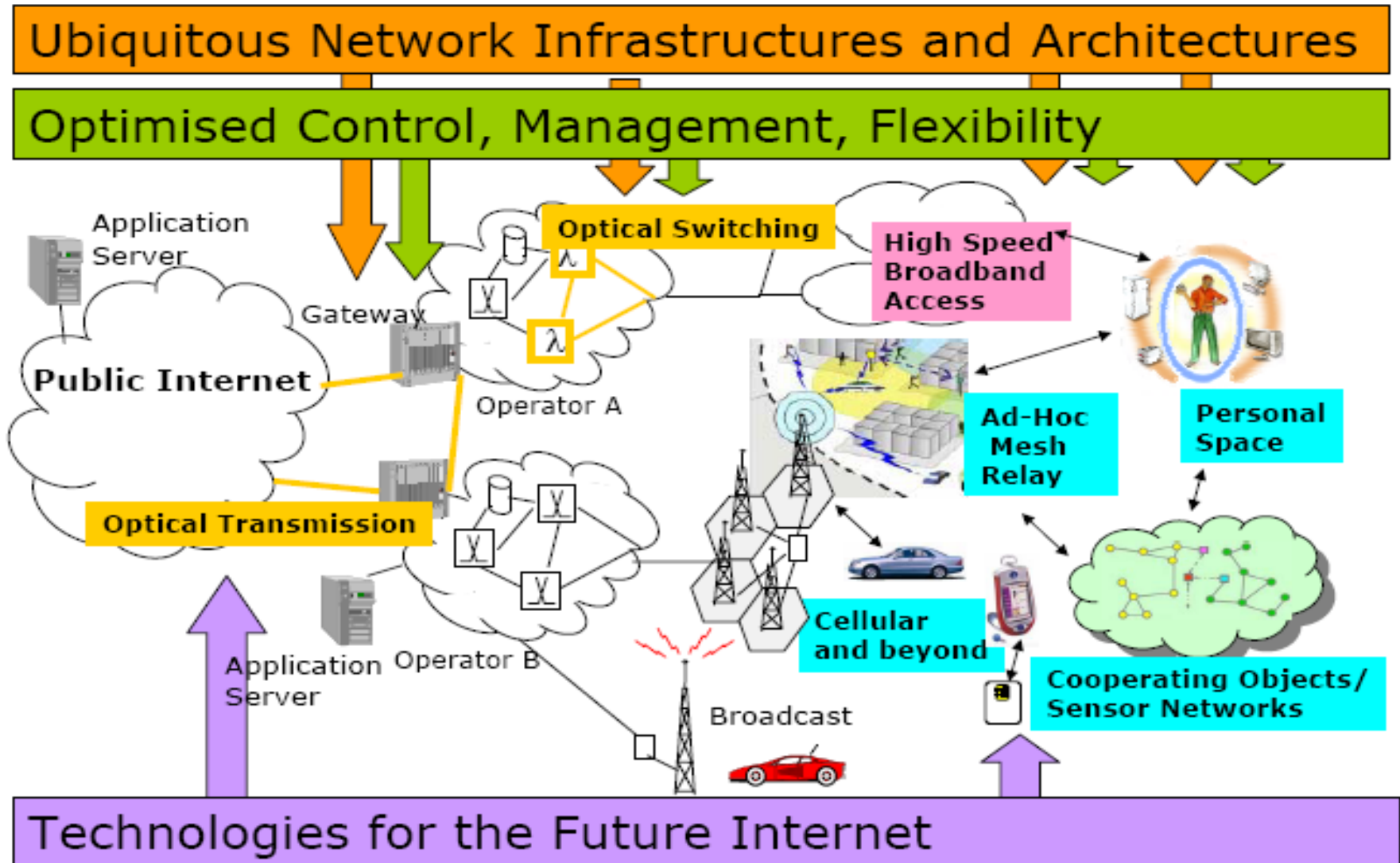
## • **Technologies and System Architectures for the Future Internet**

- Overcoming the expected long-term limitations of current Internet technology
- Scalability from a device, service attributes and application environments perspective
- Security and trusted domains
- New forms of routing and content delivery in a generalised mobile and wireless environment

# Expected Impact

- Global standards,
- Reinforced European industrial leadership in wired and wireless networks,
- New industrial/service opportunities in Europe
- Lower capital expenditures and lower operational expenditures

# System Approach





# Future Internet Research

**Where do we play?**

Leading the Future Internet Network Standards

**How does success look like?**

**What is the prize?**

- Successful technology platform (global standard) for internet services development in Europe
- Major market shares for European companies in mobile Internet equipment and services
- 30% of Internet equipment and services IPR value for European companies

**How do we win?**

- FP7 Research Program and funds
- European Technology Platforms (ETP)
- Technologies and system architectures for the Future Internet

# Objective 1.1 The Network of the Future

## Funding schemes

CP, NoE, CSA (SSA for roadmapping and conference support, CA for co-ordination with related national or regional programmes or initiatives)

## Indicative budget distribution

200 M€:

- CP 180 M€ of which a minimum of 84 M€ to IP and a minimum of 42 M€ to STREP;
- NoE 14 M€;
- CSA 6 M€

**Call:** ICT Call 1 (Deadline 8 May 2007)

# More Information

- FP7 web site with **ICT WP 2007/2008 for download**  
<http://cordis.europa.eu/fp7/ict>
- The IST Communication Technologies web site  
<http://cordis.europa.eu/ist/ct>
- Our bi-monthly newsletter:
  - Distributed via email (by subscription - free of charge);
  - Contains info on all activities in the field including calls for proposals, conferences, publications, etc.)

# Prepare of the best ever proposal in history!

