

**Draft agreed by
Programme
Committee**

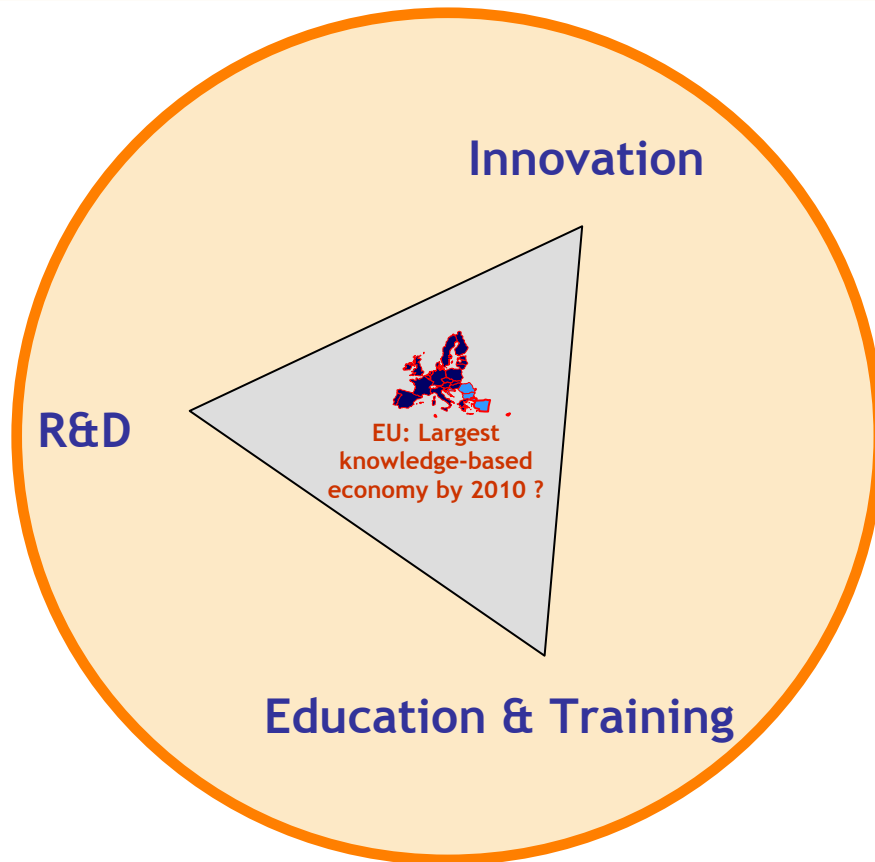
Introduction to FP7 and the ICT Workprogramme 2007 - 2008

Kostas Glinos

The renewed Lisbon strategy

- Markets & Competition: Europe - A more attractive place to invest & work
 - The internal market
 - Improve regulation
 - Competitive markets
 - Expand & improve infrastructure
- Knowledge & innovation for growth
 - Increase R&D investment
 - Facilitate innovation & uptake of ICT & the sustainable use of resources
 - Contribute to a strong industrial base
- Employment & Skills: Creating more & better jobs
 - Employment & social protection systems
 - Flexibility of labour markets
 - Human capital: Better education & skills

How can Europe achieve its Lisbon goals ?

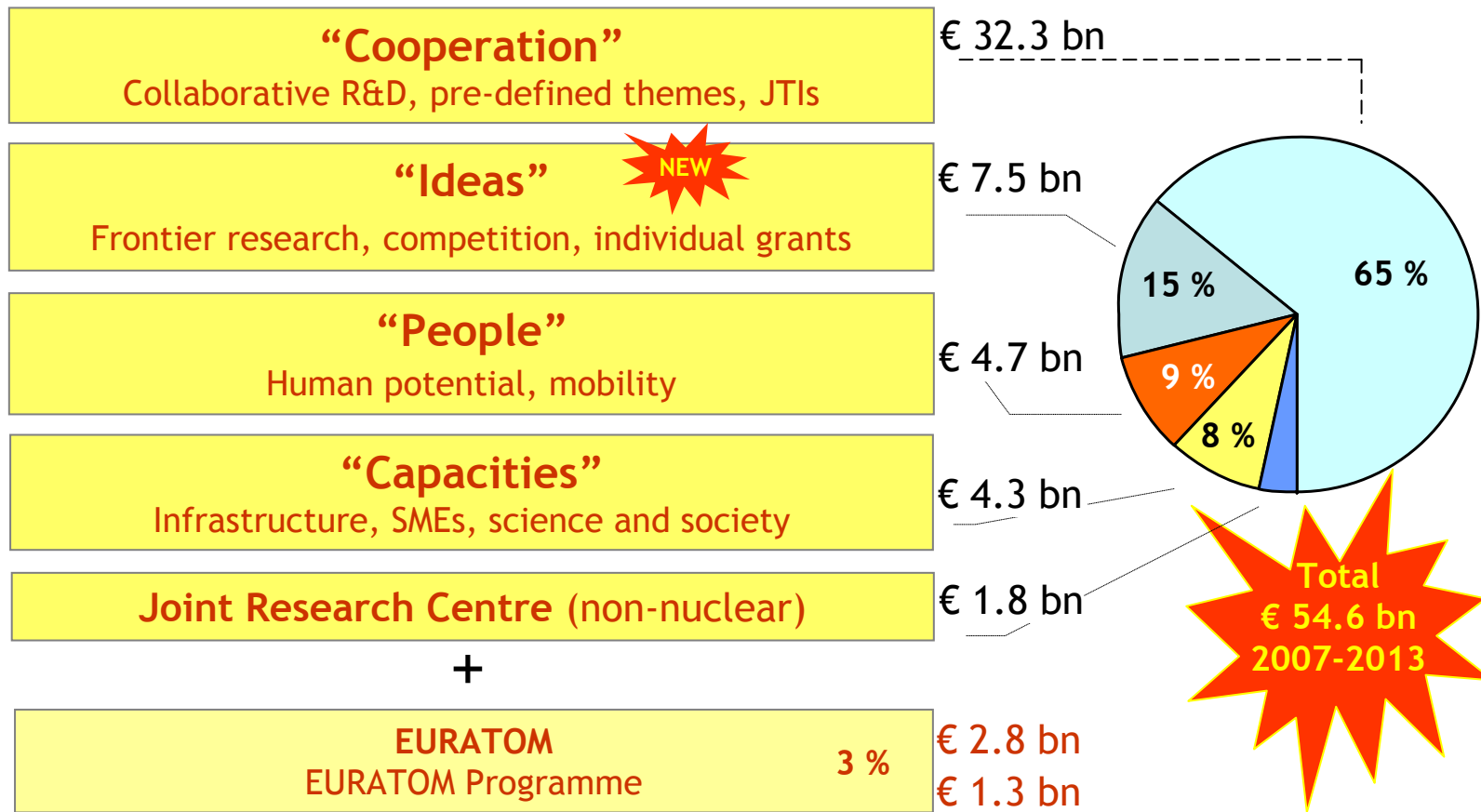


1. By building on its strengths
2. Public & private sectors investing in knowledge
3. By drawing efforts together
 - Creating synergies across Europe
 - Avoiding fragmentation & duplication of effort

Research policy

- Raise R&D investment (3% objective)
- Create a single “market” for research (ERA) and innovation
 - An area of free movement of knowledge, researchers & technology
- R&D excellence
- Improve human capital & skills base
- Build effective research infrastructures
- Aligning Framework Programme (FP) & national R&D programmes

FP7 Specific Programmes 2007 - 2013



FP7 “Cooperation”: Themes

	Budget [mn €]
1. Health	6,000
2. Food, Agriculture & Biotechnology	1,935
3. Information & Communication Technologies	9,120
4. Nanosciences, Nanotechnologies, Materials & new Production Technologies	3,505
5. Energy	2,300
6. Environment (including Climate Change)	1,900
7. Transport (including Aeronautics)	4,195
8. Socio-Economic Sciences & the Humanities	610
9. Space	1,430
10. Security	1,320
	32,315

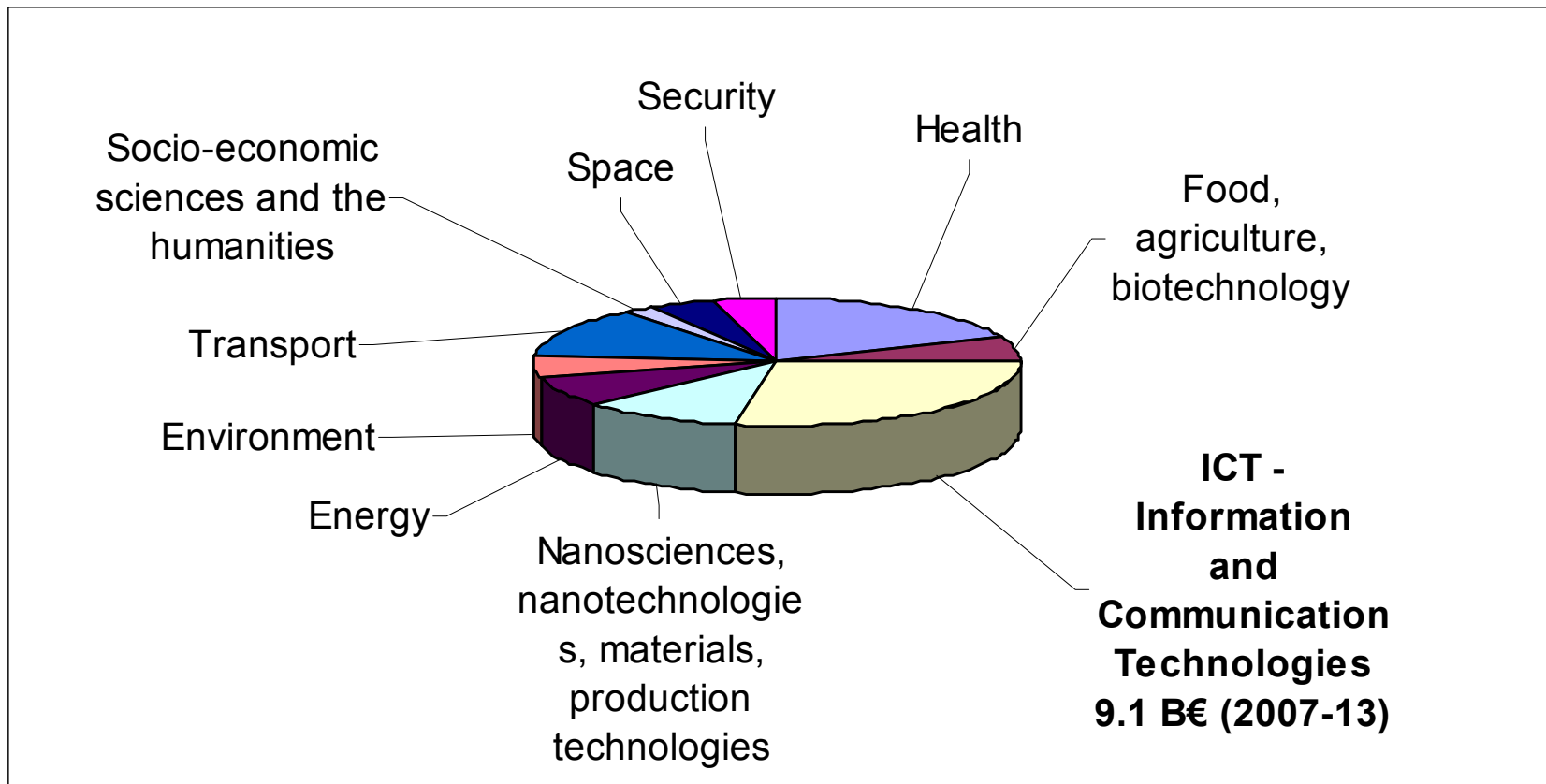
... including

Joint Technology Initiatives

ERA-Nets

International Co-operation

FP7 Cooperation Programme



ICT WP - Presentation outline

- Priority-setting for the ICT Work Programme
- ICT Work Programme 2007 Challenges
 - What's at stake and what can we build on
 - What are the targets
- ICT Calls for Proposal in 2007
 - Objectives and implementation details

Priorities based on wide consultations

- Reinforce Europe's strongholds
 - Europe's industry and technology position
- Seize new opportunities for Europe
 - (r)evolutions and potential impacts:
industrial competitiveness, socio-economic goals
- Ensure that interventions are significant and that Europe has the capacities to implement
 - high-risk, medium-to-long term, trans-national collaborative research

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 ...

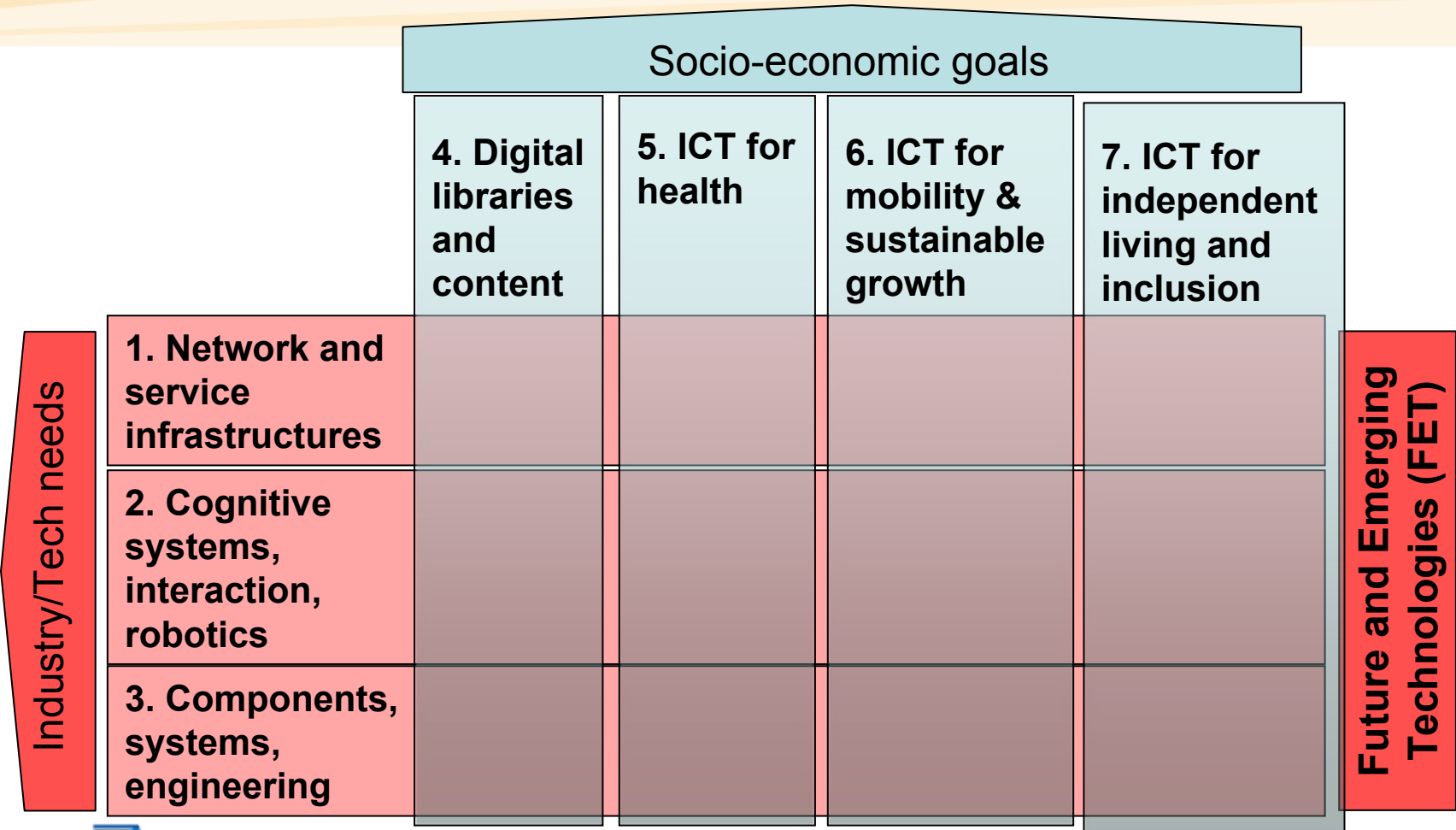
Seize new opportunities for Europe

- New technology paths
 - more “intelligent” technology: ICT systems that learn & reason, that contextualise & adapt, that interact & act autonomously
 - driven by developments in cognitive systems, sensing and interaction and advanced robotics
- Growing demand and new ways of using ICT
 - digital content and knowledge creation and use
 - sustainable and personalised healthcare
 - intelligent and safe transport, sustainable development
 - independent living and inclusion

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 *Challenges*



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

- “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

5 – 10 years

- 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

Challenge 1: Objectives in Calls for Proposals

ICT Call 1

1. The network of the future
 - mobile, broadband ... spectrum-efficient, high-speed ... managed ...
2. Service & software architectures, infrastructures & engineering
 - tools for service development, software design, virtualisation ...
3. ICT in support of the networked enterprise
 - Inter-enterprise operation and collaboration, integrated enterprise ...
4. Secure, dependable and trusted infrastructures
 - resilience in networks, trust in services, identity, privacy ...
5. Networked media
 - multimedia networks, platforms, services ...

ICT Call 2

6. New Paradigms and experimental facilities
 - advanced networking architectures, interconnected testbeds ...

Critical infrastructure protection

secure, resilient, always available information infrastructures ...



Challenge 2: Cognitive systems, robotics and interaction

- Today's ICT systems cannot learn from experience and reason, cannot contextualise and adapt, and cannot (inter)act based on observation and learning
 - many ICT applications cannot be developed further if there are no new breakthroughs in machine intelligence and systems engineering ...
- Overcoming such technology roadblocks opens the doors to a wide range of opportunities in new application fields
 - vision/sensing systems, service robots, health robots, industrial robots, multimodal and multilingual interactions ...
- Europe has key assets to build on
 - world leadership in industrial robotics and systems engineering
 - mastering of multiple disciplines: neuroscience, microsystems ...
 - excellent academic research in these fields

Challenge 2 targets

Today

- Robots operating in 'modelled', 'structured' and 'constrained' environments
 - industrial robots
 - 'programmed' service robots
- Basic understanding of computational representations of cognitive processes
 - first applications in cognitive vision
- Human-machine interactions that are rather static / passive
 - unable to adapt to human behaviours and to empower humans in their interactions

5 – 15 years

- Robots, machines and systems exhibiting advanced behaviour
 - operating with gaps in knowledge
 - operating in open-ended env.s
 - operating in dynamic / frequently changing environments
- Machines and systems that understand their users / context
 - learning from observation
 - adapting to context
- Systems that analyse and understand multimedia and multimodal digital information
 - all senses, gestures, natural language – 'human-in-the-loop'

Challenge 2: Objectives in Calls for Proposals

ICT Call 1

1. Cognitive systems, interaction, robotics

- engineering principles for intelligent, integrated systems ...; robots/agents that operate autonomously ...; human-machine interaction based on sensor data and human language ...

ICT Call 3

1. Cognitive systems, interaction, robotics

- as above

Challenge 3: Components, systems, engineering

- Electronic systems underpin trillion Euro ICT markets
- Electronic systems are embedded in all artefacts of life
 - 20-40% of the value of new products comes from embedded electronics
 - increasing demand for lower cost, higher performance components
- Europe is currently leading in embedded electronics in a number of industries
 - car safety, engine control, fly-by-wire avionics, telecom equipment, medical equipment, industrial automation ...
- European firms also among top semiconductor manufacturers and equipment companies
- Europe enjoys leading positions in emerging fields
 - photonics, plastic electronics, flexible displays, integrated micro/nanosystems ...

Challenge 3 targets

Today

- 45 nanometer node
 - 300 mm wafers
- Conventional CMOS Silicon dominate
 - 'homogeneous' integration
- Photonics applications emerging
- Design gap for embedded software
- Unable to analyse aggregate behaviours, predict and control systems

5 – 10 years

- Below the 32 nanometer node
 - 450 mm wafers
 - materials, processes, interconnects, design, manufacturing
- New materials, higher levels of integration
 - more heterogeneous (SoC, SiP)
- Wider use of advanced photonics
- Higher productivity in the design of embedded systems / software
- Higher control capacity of large-scale real time embedded systems
- Embedded computing

Challenge 3: Objectives in Calls for Proposals

ICT Call 1

1. Next generation nanoelectronics components and electronics integration
 - more Moore, more than Moore: Soc / SiP, beyond CMOS, ...
2. Organic and large-area electronics and display systems
 - for logic, memory and light-emitting fct ... visualisation systems ...
3. Embedded systems design
 - design methods, integrated tool chains ...
4. Computing systems
 - architectures for multi-core computing system, for embedded platforms ...

ICT Call 2

5. Photonic components and subsystems
 - core and application-specific components/subsystems ...
6. Micro/nanosystems
 - smart systems, nano/bio/ICT, smart fabrics, memory systems ...
7. Networked embedded and control systems
 - middleware platforms, cooperating objects, advanced control ...

Challenge 4: Digital libraries and content

- Growing load of information and content and increasing demands for knowledge and skills
 - in less than 10 years, the average person will be managing terabytes of videos, music, photos, and documents every day
 - digital content production | consumption: from “few-to-many” to “many-to-many” models
- Today’s technology provides limited tools for access/interaction, development/creation, delivery/diffusion and preservation of content & knowledge
- Europe, with its unique cultural heritage and creative potential, is well placed to take advantage of technology developments and their use

Challenge 4 targets

Today

- Limited access and usability
 - content not efficiently exploited
 - interactivity limited to smart menus
- Tools for capturing and editing still in their infancy
- Content is not personalised
- Learning tools primarily focus on the delivery of content

5 – 10 years

- “Digital libraries” widely available
 - easy to create, access, interpret, use and preserve content and knowledge
 - cost-effective, reliable, multilingual
- Advanced authoring tools
- Effective semantic-based systems and knowledge management
- Mass-individualisation of learning experiences with ICT (mid-term); adaptive and intuitive learning systems (longer term).

Challenge 4: Objectives in Calls for Proposals

ICT Call 1

1. Digital libraries and technology-enhanced learning
 - large-scale libraries, preservation, adaptive and intuitive learning ...
2. Intelligent content and semantics
 - authoring, workflow, personalisation, semantics, knowledge ...

ICT Call 3

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

Challenge 5: Towards sustainable and personalised healthcare

- Rising demands on healthcare
 - by 2050 close to 40% of the Union's population will be over 65 years
 - growing expectations of citizens for better care
 - increasing mobility of patients and health professionals
 - need to respond to risks for emerging diseases
- By 2010, ICT for Health spending may account for up to 5% of the EU's total health budget, up from just 1% in 2000
 - need to access, understand and securely manage huge amounts of health information
- ICT is also supporting progress in medical research and a shift towards evidence-based medicine
- European businesses have every opportunity to become leading global players in the new ICT for Health industry

Challenge 5 targets

Today

5 – 10 years

- Citizens, healthy or under treatment, cannot monitor their health
 - no access to comprehensive and secure Electronic Health Records
- Health professionals do not have fast and easy access to patient-specific data @ point-of-need
 - to support diagnosis or plan clinical interventions
- Health authorities do not make sufficient use of information processing systems

- Innovative systems and services for personalised health monitoring.
 - e.g. wearable/portable ICT systems
- Efficient systems for point-of-care diagnostics
 - e.g. alert and management support
- ICT-based prediction, detection and monitoring of adverse effects
 - e.g. data mining
- Tools for patient-specific computational modelling & simulation of organs or systems (longer term)

Challenge 5: Objectives in Calls for Proposals

ICT Call 1

1. Personal health systems for monitoring and point-of-care diagnostics
 - personalised monitoring/diagnostics, chronic disease management, preventive monitoring for people at risk ...
2. Advanced ICT for risk assessment and patient safety
 - computerised adverse event systems, risk prediction for large scale events ...

ICT Call 2

3. Virtual physiological human
 - patient-specific computational modelling and simulation, data integration, knowledge extraction, clinical applications/demos ...

Challenge 6: ICT for Mobility, environmental sustainability and energy efficiency

- Growing demand for transport services
 - more congestion, higher energy consumption, pollutant emissions
- Accidents causing fatalities and injuries
 - over 40.000 fatalities on the EU roads every year
- Increasing demand for natural resources
 - 1-2% per year for energy and growing water consumption
- Natural and industrial disasters has doubled in one decade
 - killing 500.000 people and causing 700 billion of damage
- Europe's industry is one of the most competitive
 - automotive, transportation, civil protection, equipment supply

Challenge 6 targets

Today

5 – 10 years

- Safety of vehicles and their energy efficiency have improved, but
 - the “zero-accident scenario” is still a distant goal
 - current vehicle active safety (driver warning, hazard detection ...) is still limited to stand-alone systems
- Risk management systems provide isolated solutions
 - no co-ordinated ICT-triggered alert of rescue and security forces
- Infrastructures are not sufficiently energy efficient
 - transport, buildings, production plants ...

- Intelligent Vehicle Systems
 - secure and reliable vehicle-to-vehicle and vehicle-to-infrastructure comm systems
 - optimised traffic management at large scale + mobility services
- Fully integrated management systems / shared data to monitor, warn and react to environmental and other risks
- Intelligent monitoring of energy production, distribution, trading and use

Challenge 6: Objectives in Calls for Proposals

ICT Call 1

1. ICT for the intelligent vehicles and mobility services
 - accident prevention, services for people and goods ...

ICT Call 2

2. ICT for cooperative systems
 - vehicle-to-vehicle, vehicle-to-infrastructure, field operational tests ...
3. ICT for the environmental management and energy efficiency
 - collaborative management systems, energy-neutral environments ...

Challenge 7: ICT for Independent Living and Inclusion

- Between 1998 and 2025 the proportion of the population classified as elderly will increase from 20% to 28%
 - more people with high disability rates
 - smaller productive workforce
- Need for a paradigm shift in health and social care and new requirements for inclusion, accessibility and usability
- Complexity and lack of accessibility and usability of many ICT-based products and services is a major barrier for many people
- A major economic opportunity for European industry

Challenge 7 targets

Today

5 – 10 years

- Research on technology for independent living is in its infancy
 - systems for inclusion
 - assistive technology
- Increasing complexity and limited usability of many products and services
 - eAccessibility
- Lack of interoperability between existing inclusive systems
- Lack of interoperability between assistive technologies and mainstream ICT

- ICT-based solutions extending independence and prolonging active participation in society
- ICT solutions that help reduce the 30% of the population currently not using ICT
 - user-friendly systems
- Cost-effective, interoperable solutions enabling seamless and reliable integration of devices and services

Challenge 7: Objectives in Calls for Proposals

ICT Call 1

1. ICT and ageing

- personal autonomy, participation in society ...

ICT Call 2

2. Accessible and inclusive ICT

- embedded generalised accessibility support, assistive systems ...

Future and Emerging Technologies

Objective

- To lay foundations of the ICT innovations of tomorrow
- To foster trans-disciplinary research excellence in emerging ICT-related research domains
- To help emerging research communities to organise and structure their research agenda

Impact

- Pathfinder role: prepare for future ICT directions in the WP
- Create new long-term competitive options for ICT
- Avoid 'tunnel vision' in FP7, by exploring unconventional 'minority' options and opportunities off the beaten track

FET structure and content

- FET Open Scheme

- Open to any foundational ICT-related research
- High-risk / high-potential impact
- To shape emerging research communities and agendas
- Coordination and international cooperation
- Continuous submissions

- FET Pro-active Initiatives

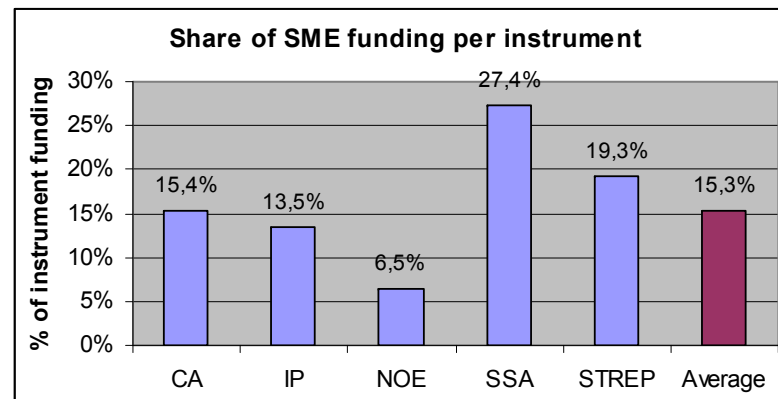
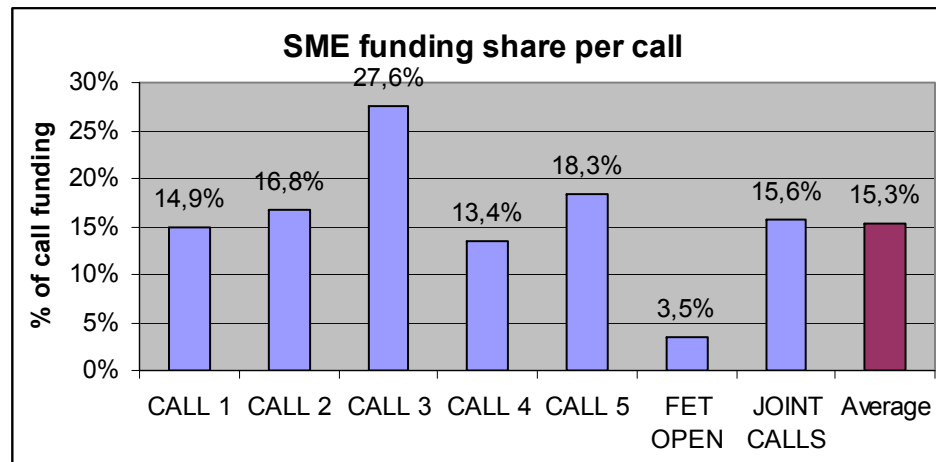
- Fundamental cross-cutting long-term challenges in ICT:
 1. Nano-scale ICT devices and systems
 2. Pervasive adaptation
 3. Bio-ICT convergence
 4. Science of complex systems for socially intelligent ICT
 5. Embodied Intelligence
 6. ICT forever yours

Horizontal support actions

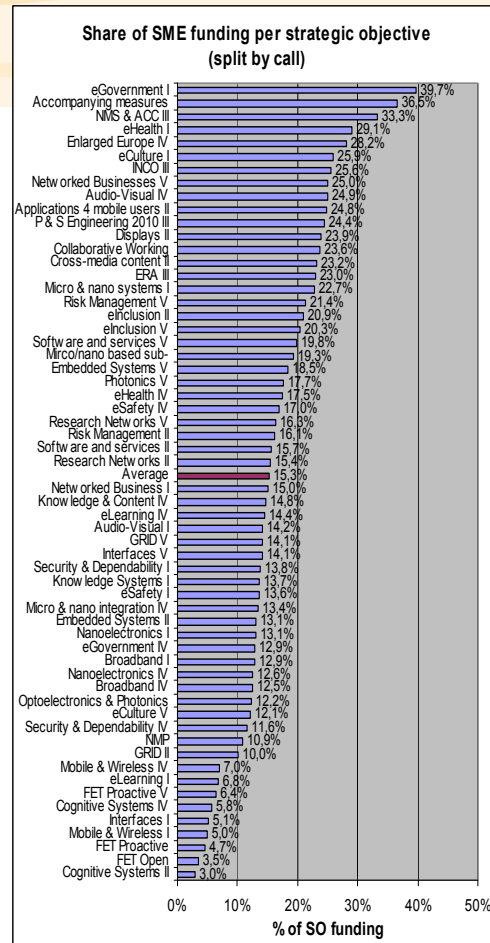
- International cooperation
 - To pave the way for strategic partnerships in view of developing global standards and interoperable solutions and strengthening EU competitiveness
 - To widen the diffusion of the information society, especially in developing countries and strengthened the EU policy for development
- Trans-national co-operation among National Contact Points
 - One proposal including officially appointed NCPs
 - To improve NCP service across Europe
 - To help to simplify access to FP7 calls
 - To lower the entry barriers for newcomers
 - To raise the quality of submitted proposals

IST statistics about SMEs in FP6 (1/2)

- IST Call1 to Call-5 (FP6)



IST SMEs statistics in FP6 (2/2)



IST Average 15.3% funding

Embedded systems among the top technology-driven IST areas wrt SMEs: 18.9 % in funding and 26.0 % in number of participants (*call5*)



SMEs in ICT in FP7

- SMEs are an important part of the ICT constituency
- SMEs participation in ICT in FP7 should be high
 - New opportunity fields
 - 75% reimbursement
 - Simplification: No CFV, limited audit certificates, ..
 - Balance between STREPs and IPs

ETPs and ICT WP

- ETPs are mechanisms for the constituency
 - To agree on common goals & common research agendas
 - To coordinate their RTD activities
- The ETPs SRAs are important input to the WP
 - Priorities identified by all major stakeholders
- But:
 - ETPs should be looking also for other sources of funding
 - National programmes, loans, etc.
 - ETPs should be active on other aspects
 - E.g. standardisation, IPR rules, etc.

Beyond the WP: JTIs and 169

- Two ICT JTIs are foreseen in FP7
 - ARTEMIS and ENIAC
- ARTEMIS to be proposed by the Commission in early 2007
 - ENIAC will follow
- Art 169: ICT for Independent living
 - To be launched in early 2007

ICT Call 1 – Open: 22 December 2006

Close: 8 May 2007

Challenge 1:

	Budget
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: 22 Dec 2006 - 8 May 2007 + FET Open – continuous, close 31 Dec 2008

Challenge 4:

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

Budget

52 M€
51 M€

Challenge 5:

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

72 M€
30 M€

Challenge 6:

1. ICT for the intelligent vehicles and mobility services

57 M€

Challenge 7:

1. ICT and ageing

30 M€

FET proactive:

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

20 M€
20 M€
20 M€

Horizontal support actions

International cooperation

7 M€

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

Budget

40 M€

Critical infrastructure protection (**open: 30 Aug, close: 29 Nov '07**)

20 M€

Challenge 3:

+20/security

5. Photonic components and subsystems

90 M€

6. Micro/nanosystems

83 M€

7. Networked embedded and control systems

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€

European Commission
Information Society and Media



Note: Budget allocations are indicative, implementation issues still under discussion **45**



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€

More Information

- FP7: <http://cordis.europa.eu/fp7/ict>
- FP6: <http://cordis.europa.eu/ist>
- FP7 ICT Proposers Day: **Cologne, 1 February 2007**