

National FP7 Launch Event Bonn, 15-16 January 2007

The ICT Theme of FP7

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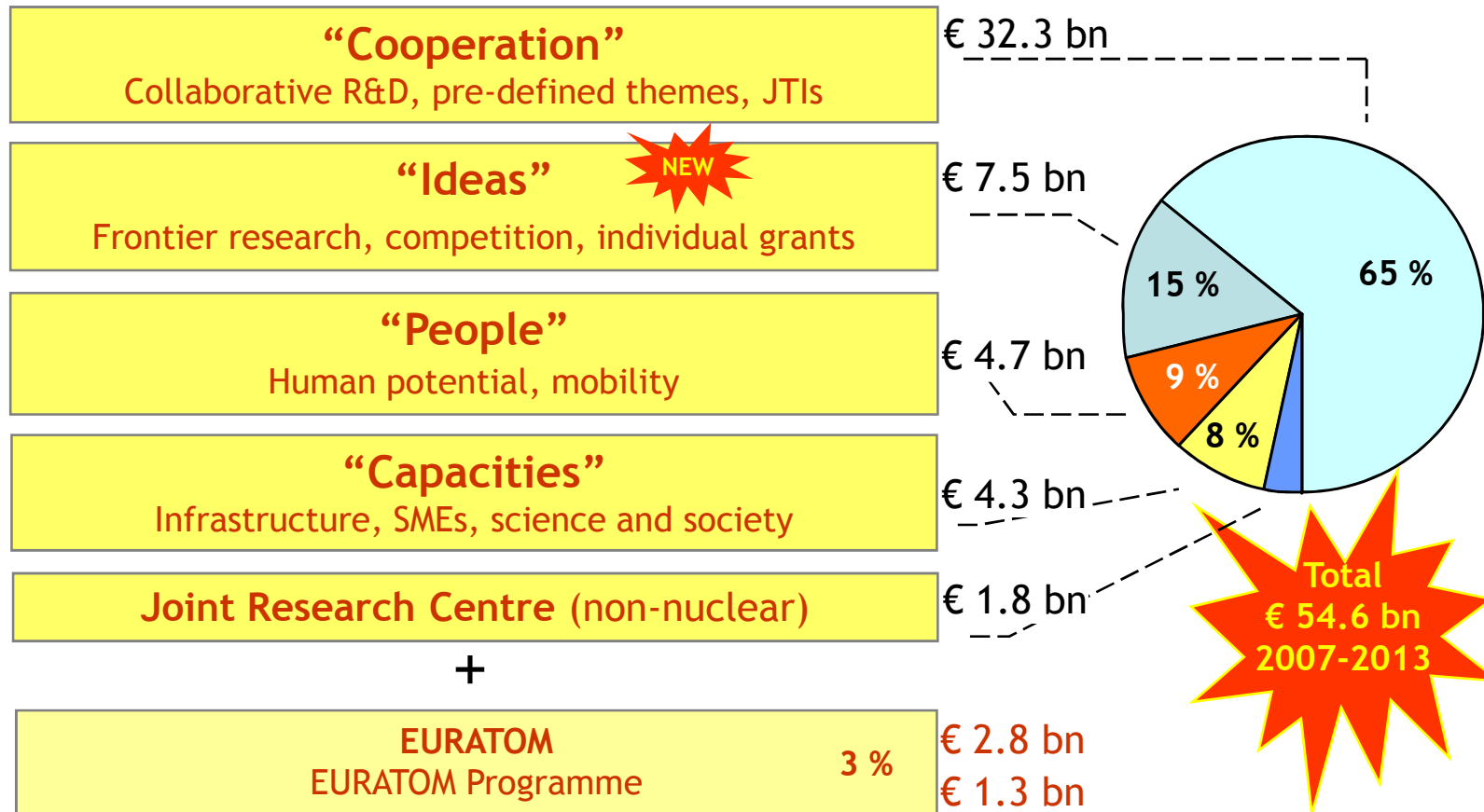


Presentation outline

- ICT collaborative research in FP7
- The ICT Work Programme 2007-08
- Calls for Proposals
- Outlook



FP7 Specific Programmes



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

Joint Technology Initiatives

... including

ERA-Nets

International Co-operation



ICT - The largest theme in FP7

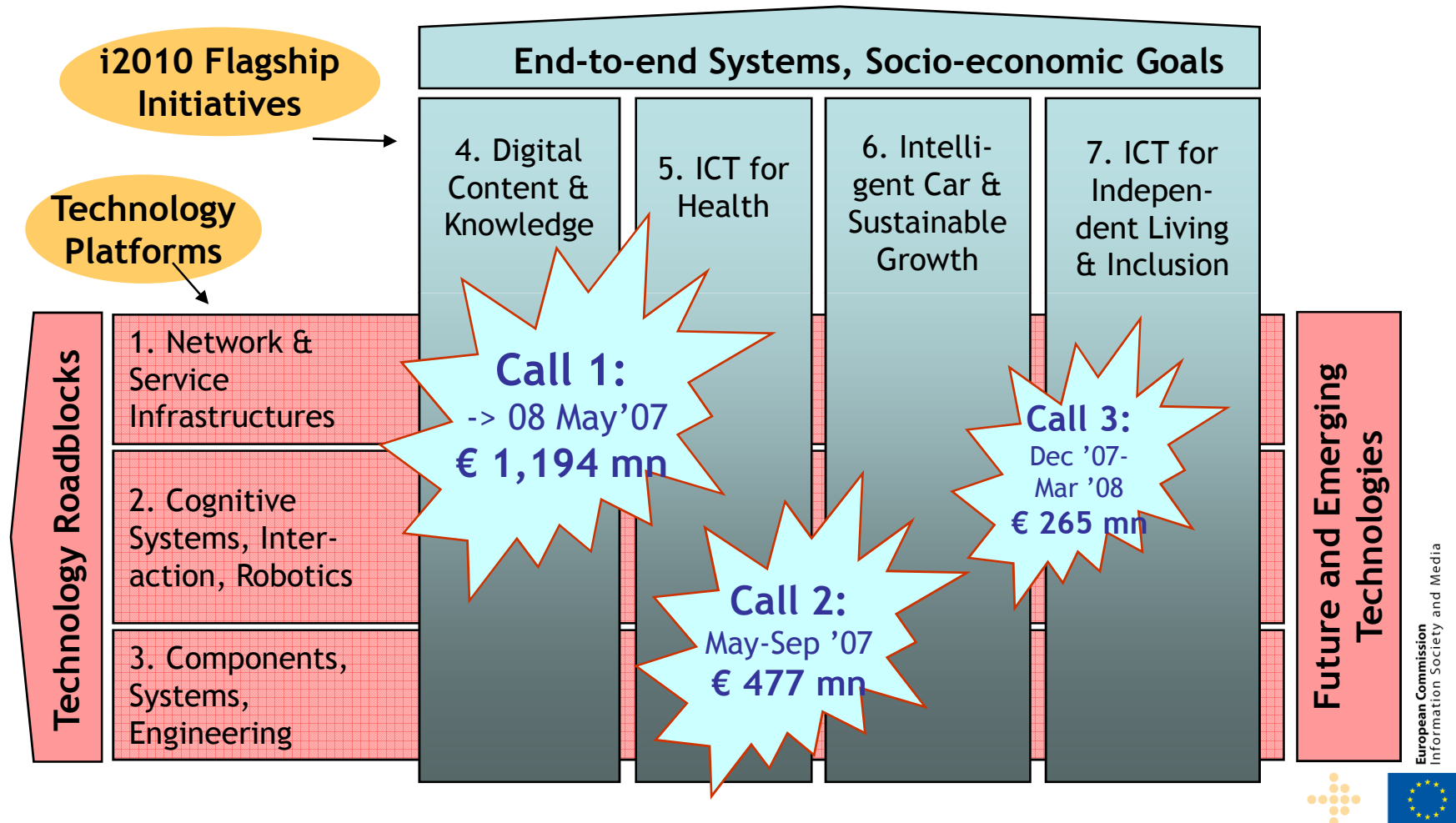
- ICT technology pillars
 - Pushing further performance & functionality
- ICT technology integration
 - Integrating multi-technology sets that underlie new services
- ICT applied research
 - Providing the knowledge & the means to develop a wide range of innovative ICT applications
- Future and Emerging Technologies
 - Supporting collaborative research at the frontier of knowledge



ICT Work Programme: Approach & structure

- Addresses a limited set of “Challenges”
 - In response to well-identified industry & technology needs
 - Targeting specific socio-economic objectives
- A “Challenge” is characterised by a limited set of R&D “Objectives” that form the basis of Calls for Proposals
- An “Objective” is described through:
 - Target outcomes (characteristics)
 - Expected impact (in terms of industrial competitiveness, societal goals, technological progress)
- A total of 24 “Objectives” in 7 “Challenges”

ICT Work Programme 2007-08



Challenge 1: Pervasive & trusted network & service infrastructures

- Network & service infrastructures support economic & societal progress
 - 2 bn mobile terminals in commercial operation, 1 bn Internet users, 400 mn Internet-enabled devices
- Growing & changing demand
 - increasing user control of content/services
 - convergence: networks/devices/services - video/audio/ data/voice
- Current technology needs significant improvement
 - scalability & flexibility
 - security, dependability, robustness
 - higher performance, more functionality
- Europe is well-positioned: industry, technology, users
 - networks equipment & services, business software, middleware, security, home systems, etc.

Challenge 1: Targets

Today

- “Convergence” is emerging but:
 - user handles separate networks
 - a multiplicity of devices
- Billions of connected devices
- Security & trust an “add 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
- Trillions of connected devices
- Built-in security & trust
- Highly dependable software and systems
- Full support to distributed value chains



Objectives addressing Challenge 1

Call 1

- The network of the future (€ 200 mn)
 - Mobile, broadband ... spectrum-efficient, high-speed
- Service & software architectures, infrastructures & engineering (€ 120 mn)
 - Tools for service development, software design, virtualisation
- ICT in support of the networked enterprise (€ 30 mn)
 - Enterprise interoperability, RFID applications
- Secure, dependable and trusted infrastructures (€ 90 mn)
 - Resilience in networks, trust in services, identity, privacy
- Networked media (€ 85 mn)
 - Multimedia networks, platforms, services

Call 2

- New paradigms & experimental facilities (€ 40 mn)
 - Advanced networking architectures, interconnected testbeds
- Critical infrastructure protection (€ 20 + 20 mn from Security)
 - Secure, resilient, always available information infrastructures ...

Budget:
€ 585 mn
(+ € 20 mn
Security)



Challenge 2: Cognitive systems, interaction, robotics

- Today's ICT systems cannot learn from experience & reason, cannot contextualise & adapt, cannot (inter)act based on observation & learning
 - Many ICT applications cannot be developed further if there are no new breakthroughs in machine intelligence & systems engineering
- Overcoming such technology roadblocks opens up new application fields
 - Vision/sensing systems, service robots, health robots, industrial robots, multimodal & multilingual interaction
- Europe has key assets to build on
 - World leadership in industrial robotics & systems engineering
 - Multi-disciplinary research: neuroscience/microsystems integration, etc.
 - Excellent academic research in these fields



Challenge 2: Targets

Today

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

5 - 10 years

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

Objective addressing Challenge 2

Call 1

+

Call 3

- Cognitive systems, interaction, robotics
 - engineering principles for intelligent, integrated systems
 - robots/agents that operate autonomously
 - human-machine interaction based on sensor data & human language

Budget:
€ 193 mn

Challenge 3: Components, Systems, Engineering

To enable Europe's industry to stay at the forefront of electronics developments & applications through chip making, integration & embedded systems capabilities



www.eniac.eu



www.artemis-office.org



www.smart-systems-integration.org



www.photonics21.de

R&D objectives are in line with Strategic Research Agendas of European Technology Platforms & support international co-operation under the Intelligent Manufacturing Systems initiative



cordis.europa.eu/ims



Challenge 3: Targets

Today

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

5 - 10 years

- Below the 32 nanometer node
 - 450 mm wafers
- CMOS & alternative technologies
 - heterogeneous integration (SoC, SiP)
 - Organic electronics
- Wide use of advanced photonics
- Higher productivity in the design of embedded systems/software
- Higher control capacity of large-scale real-time embedded systems

Objectives addressing Challenge 3

Call 1

- Next-generation nanoelectronics components & electronics integration (€ 86 mn)
 - More Moore, More than Moore: SoC/SiP, beyond CMOS, ...
- Organic & large-area electronics, visualisation & display systems (€ 63 mn)
 - For logic, memory & light-emitting functions, visualisation systems
- Embedded systems design (€ 40 mn)
 - Design methods, integrated tool chains
- Computing systems (€ 25 mn)
 - Architectures for multi-core computing system, for embedded platforms

Call 2

- Photonic components & subsystems (€ 90 mn)
 - Core & application-specific components/subsystems
- Micro/nanosystems (€ 83 mn)
 - Smart systems, nano/bio/ICT, smart fabrics, memory systems
- Networked embedded and control systems (€ 47 mn)
 - Middleware platforms, cooperating objects, advanced control

Budget:
€ 434 mn

Challenge 4: Digital libraries & content

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



Challenge 4: Targets

Today

- Limited access & usability
 - content not efficiently exploited
- Content capturing & editing in its infancy
- Content is not personalised
- Learning tools primarily focus on the delivery of content

5 - 10 years

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

Objectives addressing Challenge 4

Call 1

+

Call 3

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

Budget:
€ 203 mn



Challenge 5: Towards sustainable & personalised healthcare

- Rising demands on healthcare
 - by 2050 close to 40% of EU population will be over 65 years
 - growing expectations of citizens for better care
 - increasing mobility of patients & 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 & securely manage large amounts of health information
- ICT is also supporting progress in medical research & 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

- Citizens, healthy or under treatment, cannot monitor their health
 - no access to comprehensive & secure Electronic Health Records
 -
- Health professionals do not have fast & easy access to patient-specific data @ point-of-need
 - to support diagnosis or plan clinical interventions
- ICT-based prediction, detection & monitoring of adverse effects
 - e.g. data mining

5 - 10 years

- Innovative systems & services for personalised health monitoring.
 - e.g. wearable/portable ICT
- Efficient systems for point-of-care diagnostics
 - e.g. alert & management support
- Patient-specific computational modelling & simulation (e.g. of organs)



Objectives addressing Challenge 5

- Personal health systems for monitoring & point-of-care diagnostics (€ 72 mn)

Call 1

- Personalised monitoring/diagnostics, chronic disease management, preventive monitoring for people at risk
- Advanced ICT for risk assessment & patient safety (€ 30 mn)
 - Computerised adverse event systems, risk prediction for large-scale events

Budget:
€ 174 mn

- Virtual physiological human (€ 72 mn)

Call 2

- Patient-specific computational modelling & simulation, data integration, knowledge extraction, clinical applications/demos

Challenge 6: ICT for mobility, environmental sustainability & energy efficiency

- Growing demand for transport services
 - More congestion, higher energy consumption, pollutant emissions
- Accidents causing fatalities and injuries
 - Over 40,000 fatalities on EU roads every year
- Natural & industrial disasters have doubled in one decade
 - Killing 500,000 people & causing € 700 bn of damage
- Increasing demand for natural resources
 - 1 - 2% per year for energy & growing water consumption
- Europe's industry is one of the most competitive
 - Automotive, transportation, energy efficient products & processes



Challenge 6: Targets

Today

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

5 - 10 years

- Intelligent Vehicle Systems
 - secure & reliable vehicle-to-vehicle & vehicle-to-infrastructure communication
 - optimised traffic management at large scale & mobility services
- Fully integrated management systems to warn & react to environmental & other risks
- Intelligent monitoring of energy production, distribution, trading & use

Objectives addressing Challenge 6

Call 1

- ICT for the intelligent vehicles & mobility services (€ 57 mn)
 - Accident prevention,
 - Mobility services for people & goods

Budget:
€ 159 mn

Call 2

- ICT for cooperative systems (€ 48 mn)
 - Vehicle-to-vehicle, vehicle-to-infrastructure, field operational tests
- ICT for environmental management & energy efficiency (€ 54 mn)
 - Collaborative systems for environmental management, ICT for energy efficiency & energy neutral environments



Challenge 7: ICT for independent living & inclusion

- In the EU, between 1998 & 2025 the proportion of the population classified as “elderly” will increase from 20% to 28%
 - Increasing disability rates
 - Shrinking workforce
- Need for a paradigm shift in health & social care; new requirements for inclusion, accessibility & usability
- Complexity & lack of accessibility & usability of many ICT-based products & services is a major barrier for many people
- A major economic opportunity for Europe’s industry



Challenge 7: Targets

Today

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

5 - 10 years

- ICT-based solutions extending independence & 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 & reliable integration of devices & services

Objectives addressing Challenge 7

Call 1

- ICT and ageing (€ 30 mn)
 - Systemic solutions for independent living & active ageing; personal autonomy, participation in society

Budget:
€ 73 mn

Call 2

- Accessible & inclusive ICT (€ 43 mn)
 - Embedded generalised accessibility support, user interaction, assistive systems

Future and Emerging Technologies (FET)

- **Objective**
 - To lay the foundations of tomorrow's ICT innovations
 - To foster trans-disciplinary research excellence in emerging ICT-related research domains
 - To help emerging research communities to organise & structure their research agenda
- **Impact**
 - FET pathfinder role: prepare for future ICT directions
 - Create new long-term competitive options for ICT
 - Avoid 'tunnel vision' in FP7, by exploring unconventional 'minority' options & opportunities off the beaten track



FET structure & content

- FET Open scheme (65 M€)
 - Open to any foundational ICT-related research
 - High-risk/high-potential impact
 - To shape emerging research communities & agendae
 - Coordination & international cooperation
 - Continuous submission, CP (STREP only), CSA (CA only)
- FET Pro-active initiatives (120M€)
 - Fundamental cross-cutting long-term challenges in ICT:
 1. Nano-scale ICT devices & systems (20 M€, call 1)
 2. Pervasive adaptation (20 M€, call 1)
 3. Bio-ICT convergence (20 M€, call 1)
 4. Science of complex systems for socially intelligent ICT (20 M€, call 3)
 5. Embodied intelligence (20 M€, call 3)
 6. ICT forever yours (20 M€, call 3)



Horizontal support actions

- International cooperation (12 M€)
 - To pave the way for strategic partnerships & to strengthen EU competitiveness towards global standards & interoperable solutions
 - To widen the diffusion of the Information Society, especially in developing countries & to strengthen EU development policy
- Trans-national co-operation among National Contact Points (3 M€)
 - One proposal including officially appointed NCPs
 - 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

Funding schemes

- Collaborative Projects (CP)
 - To generate new knowledge, to develop new technologies, to demonstrate the feasibility of approaches
 - Two types:
 - Small or medium-scale focused research actions (STREP)
 - Large-scale integrating projects (IP)
- Networks of Excellence (NoE)
 - To strengthen S&T excellence & to increase efficiency in the use of resources by restructuring/integration of capacities
- Coordination and Support Actions (CSA)
 - Aimed at coordinating or supporting research activities & policies (networking, exchanges, coordination of funded projects, studies, conferences, etc.)
 - Two types:
 - Coordination Actions (CA)
 - Specific Support Actions (SSA)



Overview of Calls: ICT Call 1

Call 1:
-> 08 May '07
€ 1,194 mn
+ FET Open

<i>Challenge 1</i>	Budget [mn €]	<i>Challenge 4</i>	Budget [mn €]
The network of the future	200	Digital libraries & technology-enhanced learning	52
Service & software architectures, infrastructures & engineering	120	Intelligent content & semantics	51
ICT in support of the networked enterprise	30	<i>Challenge 5</i>	
Secure, dependable & trusted infrastructures	90	Personal health systems for monitoring & point-of-care diagnostics	72
Networked media	85	Advanced ICT for risk assessment & patient safety	30
<i>Challenge 2</i>		<i>Challenge 6</i>	
Cognitive systems, interaction, robotics	96	ICT for intelligent vehicles & mobility services	57
<i>Challenge 3</i>		<i>Challenge 7</i>	
Next generation nanoelectronics components & electronics integr.	86	ICT & ageing	30
Organic & large-area electronics & display systems	63	FET Pro-active (nano-scale ICT devices & systems; pervasive adaptation; bio-ICT convergence)	60
Embedded systems design	40	Horizontal support actions	7
Computing systems	25	FET-Open	65



Overview of Calls: ICT Calls 2 + 3

Challenge 1	Budget [mn €]
New paradigms & experimental facilities	40
Challenge 3	
Photonic components & subsystems	90
Micro/nanosystems	83
Networked embedded & control systems	47
Challenge 5	
Virtual physiological human	72
Challenge 6	
ICT for cooperative systems	48
ICT for environmental management & energy efficiency	54
Challenge 7	
Accessible & inclusive ICT	43

Call 2:
May-Sep '07
€ 477 mn

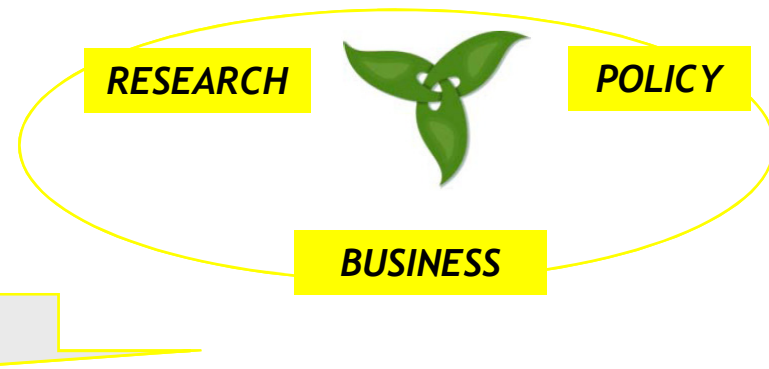
Challenge 2	Budget [mn €]
Cognitive systems, interaction, robotics	97
Challenge 4	
Digital libraries & technology-enhanced learning	50
Intelligent content & semantics	50
FET Pro-active (Science of complex systems for socially intelligent ICT; embodied intelligence; ICT forever yours)	60
Horizontal support actions	8

Call 3:
Dec '07-
Mar '08
€ 265 mn



European Technology Platforms

A spiral model of innovation capitalising on the multiple reciprocal relationships between public & private stakeholders at various knowledge stages



30+ European Technology Platforms launched so far:

- Addressing major technological challenges in specific domains
- Aiming to leverage public & private investment for R&D & innovation
- Involving key R&D stakeholders
 - eg industry, the research community & public authorities
- Bundling fragmented R&D efforts towards agreed goals
 - Vision 2020 document & Strategic Research Agenda

cordis.europa.eu/technology-platforms

For more information

European research on the web:

<http://cordis.europa.eu>

<http://cordis.europa.eu/fp7>

<http://ec.europa.eu/comm/research/future/>

<http://ec.europa.eu/ims>

Information Society and Media:

http://ec.europa.eu/information_society/

<http://cordis.europa.eu/fp7/ict>

Calls:

<http://cordis.europa.eu/fp7/dc>

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