ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ
ΥΠΟΥΡΓΕΙΟ ΠΑΙΔΕΙΑΣ
ΔΙΑ ΒΙΟΥ ΜΑΘΗΣΗΣ ΚΑΙ ΘΡΗΣΚΕΥΜΑΤΩΝ

7ο Πρόγραμμα Πλαίσιο
Ειδικό Πρόγραμμα ΣΥΝΕΡΓΑΣΙΑ
Τεχνολογίες Πληροφορίας και Επικοινωνιών/ Information & Communication Technologies(ICT)

Η 8η Πρόσκληση Υποβολής Προτάσεων του Προγράμματος

Τ. Σελλής, Καθ. ΕΜΠ
Δρ. Ν. Πρέκας

Εθνικοί Εκπρόσωποι Προγράμματος «ICT»

Αθήνα, ΕΙΕ, 27.06.2011

Η 8η Πρόσκληση του Προγράμματος ICT

- Τίτλος Πρόσκλησης: ICT Call 8
- Αναγνωριστικό Πρόσκλησης: FP7-ICT-2011-8
- Ημερομηνία Έναρξης: 26/7/2011
- Ημερομηνία Λήξης: 17/1/2011
- Ενδεικτικός Προϋπολογισμός: 785.5 M€

Η 8η Πρόσκληση του Προγράμματος "ICT"

Θεματικός Τομέας του Προγράμματος ICT	Προϋπολογισμός/Μ€
Future Networks	160
Cloud Computing, Internet of Services and Advanced Software Engineering	70
Trustworthy ICT/Information Communication Technologies	80
Future Internet Research and Experimentation (FIRE)	25
Very advanced nanoelectronic components: design, engineering, technology and manufacturability	60
Smart components and smart systems integration	39
Core and disruptive photonic technologies	92
Intelligent Information Management	50
Smart energy grids	30
ICT for efficient water resources management	15
Cooperative systems for energy efficient and sustainable mobility	40
Technology-Enhanced Learning	60
FET Proactive: Unconventional Computation (UCOMP)	15
FET Proactive: Dynamics of Multi-Level Complex Systems	23
FET Proactive: Minimising Energy Consumption of Computing to the Limit (MINCECC)	15
Coordinating Communities, Identifying new research topics for FET Proactive initiatives and Fostering Networking of National and Regional Research Programmes	3
Science of Global Systems	3,5
Pre-Commercial Procurement	8

Future Networks- Objectives 2011.1.1, 1.2, 1.4, 1.6

- **1.1: Future Networks supporting the convergence and interoperability of heterogeneous mobile, wired and wireless broadband network technologies**
  - **novel Internet architectures; network management and operation frameworks, wireless and mobile broadband systems and ultra-high capacity all-optical networks, satcoms**
  - **Budget 160 M€ (152 IP-STREP, 6 NoE, 2 CSA)**

- **1.2: Cloud computing, Internet of Services & advanced software engineering**
  - **technologies specific to the networked, distributed dimension of software and the access to services and data**
  - **Budget 70 M€ (68,5 IP-STREP, 1,5 CSA)**

- **1.4: Trustworthy ICT**
  - **security in networked service and computing environments; trust, privacy and claims management infrastructures; data policy, governance and socio-economic aspects of trustworthy ICT**
  - **Budget 80 M€ (70 IP-STREP, 10 NoE-CSA)**

- **1.6: Future Internet Research and Experimentation (FIRE)**
  - **FIRE Federation, FIRE Experimentation, Coordination and support**
  - **Budget 25 M€ (8 IP, 15 STREP, 2 CSA)**

Objective: Future Networks (ICT 2011.1.1)

a) Wireless and mobile broadband systems

b) High capacity end-to-end infrastructure technologies

c) Novel Internet architectures, management and operation frameworks

d) Flexible, resilient, broadband and integrated satellite communication

e) Coordination and Support Actions and Networks of Excellence

Objective: Cloud Computing, Internet of Services and Advanced Software Engineering (ICT 2011.1.2)

- **Cloud Computing** provides on-demand resources, e.g. servers, storage, networking, software and information; customers can scale up or down and pay for what they use. It is expected that the Cloud Computing trend will change the market and the structure of the IT and telecommunications industries. However, a report by a group of experts highlighted open research issues (http://cordis.europa.eu/fp7/ict/ssai/docs/cloud-report-final.pdf), for instance related to **scalability, interoperability, mobility, energy efficiency**, etc. These research issues should be addressed in Objective 1.2.
- The **Internet of Services** vision foresees many, many connected IT services, which are offered, bought, sold, used, and composed by service providers, consumers, aggregators, and brokers. Anyone can develop new services and make them available for others to use or build upon. The result is a new way of offering, using, and organising IT supported functionality. This research stream builds upon the work done in previous Work Programmes, and focuses on research issues arising from dealing with a **massive amount of services**.
- The **Advanced Software Engineering** goes to the core of the objective, namely software engineering. It targets **software engineering** techniques to cope with the challenges that are brought forward by the **Future Internet and Internet-scale applications**. In addition, research is welcomed in tools and methods for community-based software development.

Objective: Trustworthy ICT (ICT 2011.1.4)

a) **Heterogeneous networked, service and computing environments**

(Architectures and protocols, Future Internet, Virtualisation and other techniques for protection, assurance, Metrics and tools for quantitative security, Enabling technologies i.e. languages, biometry, crypto, ..)

b) **Trust, eIdentity and Privacy management infrastructures**

(Trust assurance, Privacy infrastructures, Management of ID claims i.e. usability, privacy, control)

c) **Data policy, governance and socio-economic ecosystems**

(Management and governance frameworks for trust and security policies, Technology supported socio-economics frameworks, Multi-polar security governance, Tools for trust measurement)

d) **Networking and Coordination activities**

(Stimulating and organising interplay technology-law-society-economy, Promoting standards, certification, best practices, Coordination national RTD activities)

Objective: Future Internet Research and Experimentation – FIRE (ICT 2011.1.6)

FIRE Federation: implementing a demand-driven high level federation framework for all FIRE prototype facilities making the facility self-sustainable towards 2015 (one IP will be accepted).

FIRE Experimentation: Experimentally-driven research in the broad field of the Future Internet using one or more of the existing FIRE facility prototypes (STREPs).

Coordination and Support Actions: EU-wide co-operation with related EU-level and Member States and associated countries activities such as the Public Private Partnership on the Future Internet, or national experimentation facilities, etc (CSAs).

Alternative Paths to Components and Systems - Objectives 2011.3.1, 3.2, 3.5

- **3.1: Very advanced nanoelectronic components: design, engineering, technology and manufacturability**
  - **New advanced nanoelectronic components; increased performance, increased systemability, integratability and manufacturability; joint equipment assessment and broker services**
  - **Budget 60 M€ (55 IP-STREP, 5 CSA)**

- **3.2: Smart components and smart systems integration**
  - **System miniaturization (wearability, implantability); high volume/low cost production; long-life autonomous systems; human-machine interfacing systems (tactile, gesture, motion); autonomous and smart implants**
  - **Budget 39 M€ (IP-STREP)**

- **3.5: Core and disruptive photonic technologies**
  - **Optical data communications; biophotonics for early, fast and reliable medical diagnosis of diseases; imaging & sensing for safety and security; lighting and displays; photonics integration platforms**
  - **Budget 92 M€ (79 IP-STREP, 19 ERANET, 3 CSA)**

Objective: Very advanced nanoelectronic components: design, engineering, technology and manufacturability (ICT 2011.3.1)

- **a) Beyond CMOS technology**
- **b) Circuit-technology solutions**
- **c) Nano-manufacturing and Joint Equipment Assessment**
- **d) Coordination and Support Actions**

Objective: Smart components and smart systems integration - Micro-Nano Bio Systems (MNBS) (ICT 2011.3.2)

Target outcomes

- Increased intelligence of devices (computation/decision power, sensing capabilities)
- Enhanced miniaturisation and integration of devices and systems
- Increased integration of bioactive components (molecular and cellular components, bio/nanochemistry) as well as processes.

For those actions addressing in particular the **health** area, emphasis is on:

- highly integrated, safe, active and autonomous "smart" implants which provide real-time performance feedback and are able to tolerate interfering body signals;
- integrated systems for rapid, sensitive, specific and multi-parametric in vitro molecular analysis/detection and cellular manipulation based on biodegradable materials. Cost, manufacturing and real scenarios validation should be considered;
- autonomous body sensor and actuator based systems for non- or minimally-invasive targeted early detection, diagnosis and therapy.

The focus of projects targeting **environment protection and food/beverage safety and quality control** should be on:

- integrated multisensing micro-nano systems able to analyse environment, food and beverage samples for the simultaneous and rapid identification of potentially dangerous species e.g. pathogens, allergens, chemicals, etc. Of paramount importance are selectivity, sensitivity, modularity and detection that is capable to identify several species;
- integrated sensor and actuator systems for safety and security that are able to support the individuals operating in harsh environments through contextual monitoring, feedback and networking capabilities.

Objective: Core and disruptive photonic technologies (ICT 2011.3.5)

a) **Core photonic technologies**

Application-specific photonic components and subsystems:

1. Optical data communications (IP, STREP)
2. Biophotonics for early, fast and reliable medical diagnosis of diseases (IP, STREP)
3. Imaging and sensing for safety and security (IP, STREP)
4. Lighting and displays (IP, STREP)

Cross-cutting technology:

5. Photonics integration platforms (IP)

c) **ERANET-Plus action**

d) **Development of innovative solutions through Pre-Commercial Procurement (PCP) action (CP-CSA)**

Technologies for Digital Content and Languages - Objective 2011.4.4

- **4.4: Intelligent Information Management**
  - **Reactive algorithms, infrastructures and methodologies** for scaling data intensive techniques up to extremely large data volumes and real time performance. /STREP/
  - **Intelligent integrated systems that directly support decision making and situation awareness** by dynamically integrating, correlating, fusing and analysing extremely large volumes of disparate data resources and streams. /IP, STREP/
  - **Framework and tools for benchmarking and exploring information management diversity** and comparing and optimising the performance of non mainstream data management architectures and computing paradigms, novel data structures and algorithms on extremely large volumes of data. /STREP/
  - Targeted competition framework speeding up progress towards large scale information management systems of global relevance. /SA/
  - **Budget 50 M€**

ICT for a Low Carbon Economy - Objective: Smart Energy Grids (ICT 2011.6.1)

a) **Strengthening the distribution grid** by providing control systems, management and decision support tools that enable the integration of renewable energy sources, both large scale production (e.g. wind and solar farms) and massively distributed production (e.g. residential and tertiary buildings).

b) Advancing **security and reliability**, as well as protection of equipment, fault detection and alert, and self-healing through development of the necessary high power electronics.

c) **Data management infrastructures** to allow electricity production and consumption to be measured, reported and controlled (and eventually credited or billed).

d) Home energy controlling hubs that will collect real-time or near real-time data on energy consumption data from smart household appliances and enable intelligent automation.

e) Building consensus on **industry-driven open standards** to ensure the interoperability of smart grids control and management systems. (CSA)

ICT for a Low Carbon Economy - Objective: ICT for efficient water resources management (ICT 2011.6.3)

- ICT-enabled solutions for **integrated water resources management (IWRM),** involving as key building blocks: innovative demand management systems, decision support systems and data management technologies. The proposed ICT solutions shall involve robust and proven technologies permitting a holistic approach towards IWRM, and possibly include new data management technologies with realtime predictive capability demand forecasting, advanced metering, real-time communication of consumption patterns, adaptive pricing, and/or combined energy and water management schemes.
- Projects should cover (i) **research and innovative integration** of solutions, (ii) substantial **validation** of these in at least two real-life operational environments in collaboration with responsible water authorities and utilities, and (iii) **evaluation** of their anticipated cost and benefits and market prospects.

ICT for a Low Carbon Economy - Objective: Cooperative systems for energy efficient and sustainable mobility (ICT 2011.6.7)

- Research proposals can be submitted in 2 areas, namely Cooperative Systems for low-carbon multi-modal mobility and the European Wide Service Platform (EWSP) for cooperative system enabled services. In addition, budget is reserved for Coordination and Support Actions.
- **Cooperative Systems for low-carbon multi-modal mobility** is covering cooperative applications and services for energy efficiency and eco-friendly mobility based on the harmonised European ITS Communications Architecture and bidirectional vehicle-to-vehicle (V2V), road-to-vehicle (R2V) and vehicle-to-infrastructure (V2I) communication technologies.
- **European Wide Service Platform (EWSP) for cooperative system enabled services** is aiming at providing to the drivers and other users a large variety of energy efficiency, mobility, comfort and safety related services.

ICT for Learning and Access to Cultural Resources - Objective: Technology-Enhanced Learning (ICT 2011.8.1)

a) **Technology-enhanced Learning systems** endowed with the capabilities of human tutors. Research should advance systems' capabilities to react to learners' abilities and difficulties, and provide systematic feedback based on innovative ways of interpreting the user's responses.

b) **Educational technologies for science, technology and maths**: (b1) Supporting students to understand and construct their personal conceptual knowledge and meaning of scientific, technological and/or mathematical subjects; activating curiosity and reasoning, and creative applications of the theory. (b2) Supporting European wide federation and use of remote laboratories and virtual experimentations for learning and teaching purposes.

c) Advanced solutions for **fast and flexible deployment of learning opportunities** at the workplace (targeting, in particular, SMEs): enable faster, situated, just-in-time up-/reskilling, and lower the costs/efforts of developing and maintaining quality instructional material in training processes.

d) Computational tools fostering **creativity in learning processes**: innovative tools encouraging nonlinear, non-standard thinking and problem-solving, as well as exploration and generation of new knowledge, ideas and concepts, or new associations between existing ideas or concepts.

e) Exploratory activities for fundamentally new forms of learning through ICT; establishment of a pan-European network of living schools for validations, demonstrations and showcases. (CSA)

Objective: FET Proactive: Unconventional Computation - UCOMP (ICT 2011.9.6)

- Nature (e.g. living cells), and our physical environment in general, show many unconventional ways of information processing, such as those based on (bio-)chemical, natural, wetware, DNA, molecular, amorphous, reversible, analogue computing, etc. These are generally very sophisticated, ingenious and highly effective for specific purposes, but sufficient knowledge (either from a theoretical or an engineering perspective) to properly exploit, mimic, or adapt these systems, is lacking.
- Proposals should develop alternative approaches for situations or problems that are challenging or impossible to solve with conventional methods and models of computation (i.e. von Neumann, Turing). Typical examples include computing in vivo, and performing massively parallel computation.

Objective: FET Proactive: Dynamics of Multi-Level Complex Systems(ICT 2011.9.7)

- Many artificial and natural systems are characterized by a high level of differentiation in structure and organization; they exist in areas as diverse as the Internet, energy management, climate, financial markets, infrastructures (including ICT), biology, transport, epidemics, meteorology, urban planning, social simulation and policy impact assessment. In order to describe and control these systems there is a need to observe and reconstruct their dynamics and make sense of large amounts of heterogeneous data gathered on various scales. Most of these areas would benefit from an international effort in collecting and sharing data, models and from looking for a general, common theoretical approach. The science of complex systems (CSS) offers a framework for this theoretical approach.
- Proposals are expected to make progress towards a general theory on complex systems through contributions in the area of dynamics of multi-level systems.

Objective: FET Proactive: Minimising Energy Consumption of Computing to the Limit - MINECC (ICT 2011.9.8)

- The energy consumption of computing technologies becomes more and more an obstacle to realizing new functionalities in, for instance, mobile or distributed applications, and limits performance. It also has an increasing impact on energy supply and the environment. Since energy efficiency of today's technologies is orders of magnitude above the theoretical limits, disruptive solutions and radically new approaches are needed to close this gap. These approaches could tackle topics such as computing paradigms, devices and inter-device communications or software models and programming methodologies.

- Foundations for radically new ICT technologies striving for the theoretical limits in energy consumption
  - New elementary devices and inter-device-communication mechanisms
  - Novel computing paradigms with radically improved energy efficiency (e.g. inspired by biology, post-Boolean logics, …)
  - Software models and programming methodologies supporting the strive for the energetic limit (e. g. energy cost awareness,..)
  - Proof of concept, indication of expected energy gain, appropriate energy metrics or benchmarks for verification

Objective: Coordinating Communities, Identifying new research topics for FET Proactive initiatives and Fostering Networking of National and Regional Research Programmes(ICT 2011.9.12)

Proposals should address one of the following areas:

1) Supporting the coordination and cooperation of targeted research communities, assessing the impact and proposing measures to increase the visibility of the domain to the scientific community, to targeted industries and to the public at large. Proposals should also foster the consolidation of research agendas.
2) Supporting and promoting cooperation with non-EU research teams in foundational research on FET topics, with a balanced participation from partners in the EU and from target countries.
3) Undertaking short duration projects (typically 6-12 Months) to organise consultations of multi-disciplinary communities to formulate novel FET research topics, focussing on new emerging research areas. The main objective should be to identify and motivate one or more new research avenues from a global perspective, the associated fundamental challenges, and to analyse the expected impact on science, technology and society.
4) Organising conferences and workshops which would foster dialogue between science, policy and society on the role and challenges of interdisciplinary ICT related long-term research, increasing Europe's creativity and innovation base and bridging diverse European research communities and disciplines.

Objective: Science of Global Systems (ICT 2011.9.14)

Global coordination requires new developments in science based on global system models that span the whole range from local regional to global multi-national decision making. A science of global systems must pay special attention to the interface with policy and society to better ground the scientific tools. IT will support the massive needs in computing and data handling and help establishing new links between science, policy and society.

- Improve use of data and knowledge from the past to choose between options for the future: Tools to represent uncertainty and to construct chains of causality (narratives) from models and data to outcomes for use in socio-political decision processes.
- ICT tools for better use- and user centred modelling techniques, data collection and usermodel interaction. Methods to address use of system models in a policy decision context.
- Understanding of distributed multilevel policy decision processes. Identify system patterns relevant for properties like resilience, vulnerability, and regime shift tendencies.
- Use and develop formal languages, constructive type theory and domain specific languages to make policy interfaces of models more adaptable to changing contexts.

Objective: Pre-Commercial Procurment Actions (ICT 2011.11.1)

- In addition to the possibility to submit proposals for networking on PCP, **consortia of public authorities from around Europe** can now also apply for EC funding for undertaking a pre-commercial procurement jointly.
- Scope for CSAs: networking and coordination activities for public bodies in Europe to cooperate in the innovation of public services through a strategy that includes PCP
- Scope for CP-CSAs: joint cross-border PCP addressing ICT solutions for improving the quality and/or efficiency of public sector challenges in any area of public interest such as e-gov, transport, energy, environment, health, ageing, security etc.
- With regards to PCP, the following Commission support is planned in Call 8 of the FP7 work programme 2011 for ICT.

(1) One targeted call for joint cross-border PCPs in the area of 'Photonic technologies'

Indicative Budget: 3 Mio EURO - More info on call: Objective 3.5(d) of the Work Programme

Scope: Innovative photonics solutions improving quality and / or efficiency of public sector challenges

(2) One open call for networking/experience sharing on PCP and joint cross-border PCPs:

Indicative Budget: 5 Mio EURO. - More info on call: Objective 11.1 of the Work Programme

Εθνικοί εκπρόσωποι & Εθνικά Σημεία Επαφής

Εθνικός Εκπρόσωπος

Τ. Σελλής, e-mail: timos@imis.athena-innovation.gr

Ερευνητικό Κέντρο «Αθηνά», Ινστιτούτο Πληροφ. Συστημάτων και Προσομοίωσης

Αναπληρωτής Εθνικός Εκπρόσωπος

Ν. Πρέκας, e-mail: n.prekas@gsrt.gr

Γενική Γραμματεία Έρευνας & Τεχνολογίας, Δ/νση Πληροφορικής & Οργάνωσης

Εθνικό Σημείο Επαφής

Μ. Κουτροκόη, e-mail: mkoutr@gsrt.gr

Γενική Γραμματεία Έρευνας & Τεχνολογίας, Διεύθυνση Διεθνούς Ε&Τ Συνεργασίας

Αναπληρωματικό Εθνικό Σημείο Επαφής

Γ. Μαζιώτη, e-mail: gmazio@ekt.gr

Εθνικό Ίδρυμα Ερευνών, Εθνικό Κέντρο Τεκμηρίωσης

Ευχαριστούμε για την προσοχή σας!