ICT Research and Innovation in Horizon 2020

Morten Møller Head of Programme Coordination Unit DG CONNECT European Commission

HORI





Armenian participation in FP7 ICT Calls for Proposals

- Armenia has so far been the second most successful country among the EaP nations in terms of participations in the FP7
 ICT theme
- A total number of <u>six</u> projects with Armenian partners have so far been selected in FP7 ICT (<u>four</u> distinct organisations involved in these projects)
- To date, European funding to Armenian organisations totals €263,937 in FP7 ICT





EaP participation in FP7 ICT (nr of projects, ICT Calls 1-9)



HOF



Areas of Collaboration with AR in FP7 ICT

- International Cooperation/Partnership
 Building, Support to Dialogues (4
 participations by AR partners)
- Design of miniaturised systems
- Next generation Nano-electronic components



Armenia and ICT Work Programme 2013

- General opening, AM remains eligible for EC funding
- A targeted opening in Objective ICT-2013.10.3 International partnership building and support to dialogues – Horizontal International Cooperation Actions, part (c) focussing on Eastern Europe and Central Asia
- The aim is to support dialogues between the European Commission/the EU and strategic partner countries and regions, and to foster cooperation with strategic third country organisations in collaborative ICT R&D both within the EU's Framework Programmes (FP7, Horizon 2020) and under relevant third country programmes
- CSA, Call 10, total budget: €8M (€800,000 per proposal)
- Evaluations completed, possibly two projects covering AM (among other countries) will emerge; negotiations will begin shortly



Draft LEIT ICT WP2014-15

Morten Møller

DG CONNECT September 5, 2013

HORLZ





Content of presentation

- H2020 overview
- ICT in Excellent Science
- ICT in Societal Challenges

ΗО

ICT LEIT Work-programme 2014-15

2020

Next steps



H2020 overview

HORIZ N 2020





Horizon 2020

- A European Research & Innovation funding programme (2014-20) (~77 billion Euro)
- Part of proposals for next EU budget, complementing Structural Funds, education, etc.
- A core part of Europe 2020, Innovation Union & European Research Area:
 - Responding to the economic crisis to invest in future jobs and growth
 - Addressing peoples' concerns about their livelihoods, safety and environment
 - Strengthening the EU's global position in research, innovation and technology



A stronger, clearer focus

HOF









HORI





ICT in Excellent Science

HORIZ







Excellent science

- World class science is the foundation of tomorrow's technologies, jobs and well-being
- Europe needs to develop, attract and retain **research talent**
- Researchers need access to the best *infrastructures*

	13 268
European Research Council	
Frontier research by the best individual teams	
	3 100
Future and Emerging Technologies	
Collaborative research to open new fields of innovation	
	5 752
Marie Curie actions*	
Opportunities for training and career development	
Deserve infective (including a infective) Ensuring	2 478
Research intrastructures (including e-intrastructure) Ensuring	
access to world-class facilities	

ICT in Excellent Science





FET Open: fostering novel ideas

- <u>'Open is open'</u>: all technologies, no topical scope
- <u>40% of the FET budget</u> in H2020 (>1B€)
- An end-to-end light and fast scheme:
 - Deadline free, 1 step submission, ~15 page
 - 1-stage evaluation (FET specific evaluation criteria)
- Coordination and Support actions





FET Proactive in WP2014-15

Three topics are selected for funding in WP2014-15:

- Knowing, doing and being: cognition beyond problem solving
- **Global Systems Science (GSS** improve the way in which scientific knowledge can stimulate, guide, and help evaluate policy and societal responses to global challenges)
- Towards exascale high-performance computing, as part of the High Performance Computing Public-Private Partnership.



High Performance Computing PPP

The EC Communication "**High-Performance Computing: Europe's place in a global race**", adopted 15 Feb 2012, describes an ambitious strategy for HPC, combining three elements:

- (a) Computer Science: towards exascale High Performance Computing;
- (b) providing access to the best supercomputing facilities and services for both industry and academia;
- FET +RI
- (c) achieving excellence in HPC applications;

Complemented with training, education and skills development in HPC



FET Flagships Graphene & Human Brain Project selected



Call for **Preparatory Actions** $21 \rightarrow 6$ **July 2010**

mmission

Stimulating ideas & structuring the scientific community 2009 - 2010

Flagship selection $6 \rightarrow 2$ end 2012

Operational ramp-up phase mid 2013- end 2015

SCIENCE WORLD REPORT

Space & The Future Nature & Environment Health & Medicine Tech Physics Human V

in Share

Brain Simulation and Graphene Research Receive Billion Euro Each



E-mail Print

First Posted: Jan 28, 2013 09:57 AM EST

The result of the highly anticipated decision of which two research projects will receive a one billion Euro research grant, the largest single research award ever, from the European Commission were announced by the European Commission's Vice-President Neelie Kroes today.



The first project is the Human Brain Project, led by neuroscientist Henry Markram at the Swiss Federal Institute of Technology (EPFL) in Lausanne, which aims to simulate the human brain in a supercomputer, in order to aid medical advancement in brain disorders

Like Us on Facebook

The second, called Graphene Project, is led by theoretical physicist Jari Kinaret at Chalmers University of Technology in Gothenburg. Sweden, It's goal is to develop the awesome



RESEARCH INFRASTRUCTURE Work Programme 2014-2015



ICT in Societal Challenges

HORIZ





Societal challenges

- EU policy objectives (health, ageing, climate, environment, energy, transport...) cannot be achieved without innovation
- Breakthrough solutions come from multidisciplinary collaborations, including social sciences & humanities
- Promising solutions need to be tested, demonstrated and scaled up



SC1 Health and wellbeing

Advancing active and healthy ageing

Service robotics within assisted living environments ICT solutions for independent living with cognitive impairments ICT solutions enabling early risk detection and intervention

Integrated, sustainable, citizen-centred care

ICT-based approaches for integrated care (beyond current state-of-art in tele-health and tele-care)

Mobile Health

Public-procurement of innovative eHealth services

Improving health information and data exploitation

Decisional support systems eHealth interoperability





SC3 Energy

Energy efficiency

New ICT-based solutions for consumer engagement Public procurement of green data centres

Competitive low-carbon energy
 Smart Grids

Smart Cities and Communities

Smart Cities and Communities solutions integrating energy, transport, ICT sectors

Enhancing the roll-out of Smart Cities and Communities solutions by stimulating the market demand





SC4 Smart, green and integrated transport

ICT offer the tools to address sustainability of transport systems, congestion and road fatalities effectively.

- ICT pilots addressing smart, energy-efficient and safe mobility
- Connected mobility linking vehicles and people on the move
- (Semi-)Automated driving for increased efficiency and safety
- Cooperative Intelligent Transportation Systems (C-ITS)
- 20% higher energy efficiency
- 10% less traffic congestion
- 10% fully electric vehicles in Europe
- 30% less road fatalities
- 30% less injured persons and an increase
- ✓ 50% in reliability of transport schedules by 2020





SC5 Climate and resource efficiency Water and Waste Management

• Water

Modular, fully interoperable and real-time components, able also to interoperate with management and control systems of other infrastructures (e.g. energy infrastructures)

Waste

More effective processes and technologies for recycling and improved dismantling capacity of ICT

2020

More efficient handling of waste in general through ICT



SC6 Inclusive, innovative and reflective society (1)

ICT-driven Public Sector Innovation

Make the services closer to the citizens and be adapted to their new modes of communication

Innovation through achieving European cross-border interoperability of public services

Cultural heritage and European identity

Innovative solutions for researchers and citizens to access European cultural heritage

Preservation of our digital memory for the future





SC6 Inclusive, innovative and reflective society (2)

Stimulating the use of ICT tools and services for learning and teaching

Digital skills and e-learning platforms

Implementation of large scale projects piloting of educational technologies & services for take up of ICT in Education and Training

Stimulating the use of ICT tools to facilitate the social & economic integration of excluded citizens

Piloting of innovative ICT solutions for disadvantaged groups Connecting people to skills needs/ Targeted Serious games





SC7 Securing the Digital Society

- Protecting our society by providing sustained trust in the usage of ICT and in securing the ICT underlying our digital society.
- Demonstrating the viability and maturity of state-of-the-art security solutions in large scale demonstrators, involving end users
- **Preventing cyber-attacks** on any component of the digital society
- Ensuring freedom and privacy in the digital society, protecting the fundamental values of our society and democratic rights of our citizens in cyberspace
- Protect the weak in our society from abuses over the internet and giving the user control over his private data and the uses that are made thereof



Draft ICT LEIT Work-programme 2014-15

HORIZ





Industrial leadership

- Strategic investments in key technologies (e.g. advanced manufacturing, micro-electronics) underpin innovation across existing and emerging sectors
- Europe needs to attract more private investment in research and innovation
- Europe needs more innovative SMEs to create growth and jobs



ICT in Industrial Leadership

- 1. Components and systems
- 2. Advanced Computing
- 3. Future Internet
- 4. Content technologies and information management
- 5. Robotics
- 6. Key Enabling Technologies: Micronano-electronics and photonics
- + Factory of the Future cPPP

+ International Cooperation actions (EU-Brazil, EU-Japan)

ICT Cross cutting activities:

- Internet of Things
- Human-centric Digital Age
- Cybersecurity
- Support to NCPs

ICT Innovation actions

- Access to finance
- Innovation policy support
- Open disruptive innovation scheme (SME instrument)



Components and systems

- Covers systemic integration from smart integrated components to cyber-physical systems
- Work is complementary to the JTI Electronic Components and Systems
- Organised in three related topics
 - ICT 1: Smart Cyber-Physical Systems (2014-15 budget: ~56M)
 - ICT 2: Smart System Integration (2014-15 budget: ~48M)
 - ICT 3: Advanced Thin, Organic and Large Area Electronics (2014-15 budget: ~38M)
- R&I in this area will also contribute to the implementation of the SRA on Energy Efficient Buildings

[Additional budget for ECSEL JTI (embedded systems): ~71M]





Advanced Computing

- Reinforce and expand Europe's industrial and technology strengths in low-power ICT
- Focus is on integration of advanced components on all levels in computing systems
- Complementary to and coordinated with work in the Future Internet area and in Excellence Science pillar under Research Infrastructures and FET
- Organised in one topic:
 - ICT 4: Customised and low power computing (~57M)



Future Internet (1)

- Focus is on network and computing infrastructures to accelerate innovation and address the most critical technical and use aspects of the Internet
- Addresses:
 - limitations of the Internet not designed to support the very large set of requirements
 - more efficient computational and data management models
 - availability of testbeds for experiments and research validation
 - Leveraging of Internet to foster innovative usages of social and economic value and to promote entrepreneurship
- Links to a cross-cutting action on IoT with Components and Systems



Future Internet (2)

- Organised in 10 topics
 - ICT 5: Smart Networks and novel Internet Architectures (~23M)
 - ICT 6: Smart optical and wireless network technologies (~32M)
 - ICT 7: Advanced cloud Infrastructures and Services (~73M)
 - ICT 8: Boosting public sector productivity and innovation through cloud computing services (~22M)
 - ICT 9: Tools and methods for Software Development (~21M)
 - ICT 10: Collective Awareness Platforms for Sustainability and Social Innovation (~37M)
 - ICT 11: FIRE+ (Future Internet Research & Experimentation) (~31M)
 - ICT 12: More Experimentation for the Future Internet (~18M)
 - ICT 13: Web Entrepreneurship (~10M)
 - ICT 14: Advanced 5G Network Infrastructure for the Future Internet (~125M)



Content technologies and information management (1)

- Addresses:
 - Big Data with focus on
 - Innovative data products and services
 - Solving fundamental research problems
 - Machine translation
 - Overcoming barriers to multilingual online communication
 - Tools for creative, media and learning industries
 - Mobilising the innovation potential of SMEs active in the area
 - Multimodal and natural computer interaction



Content technologies and information management (2)

- Organised in eight topics
 - ICT 15: Big data Innovation and take-up (~50M)
 - ICT 16: Big data research (~39M)
 - ICT 17: Cracking the language barrier (~15M)
 - ICT 18: Support the growth of ICT innovative Creative Industries SMEs (~15M)
 - ICT 19: Technologies for creative industries, social media and convergence (~41M)
 - ICT 20: Technologies for better human learning and teaching (~52M)
 - ICT 21: Advanced digital gaming/gamification technologies (~17M)
 - ICT 22: Multimodal and Natural computer interaction (~31M)



Robotics

- Roadmap-based research driven by application needs (established by the planned Public-Private Partnership in Robotics)
- Effort to close the innovation gap to allow large scale deployment of robots and foster market take-up: use-cases, pre-commercial procurement, industry-academia cross-fertilisation
- Includes two pre-commercial procurement actions (health-care sector, public safety and environmental monitoring)
- Additional activities: shared resources, performance evaluation & benchmarking, community building and competitions
- Organised in two annual calls
 - ICT 23: 2014 Robotics (~74M)
 - ICT 24: 2015 Robotics (~83M)



ICT KET 1: Micro- and nano-electronics

- Addresses R&I in ICT Key Enabling Technology (KET) micro- and nanoelectronics
- Covers generic technology developments on micro- and nano-electronics focused on advanced research and lower Technology Readiness Levels (TRLs) Organised in one topic:
- Includes a coordination and support action with international cooperation with USA and Asia in the areas of standardisation including manufacturing (450 mm wafers)

- Includes also an awareness actions targeted at young students
 - ICT 25: generic micro- and nano-electronic technologies (~50M)
- Complementary to the JTI Electronic Components and Systems [Additional budget for ECSEL JTI: ~179M]

ICT KET 2: Photonics

- Addresses R&I in the ICT Key Enabling Technology (KET) photonics
- Covers R&I activities under the photonics public private partnership (PPP)
- Addresses the full *innovation and value chain* in markets sectors where the European photonics industry is particularly strong (optical communications, lighting, medical photonics, laser technologies, etc.) Organised in three topics and a joint ICT/NMP topic
 - ICT 26: 2014 Photonics KET (~47M)
 - ICT 27: 2015 Photonics KET (~44M)
 - ICT 28: Cross-cutting ICT KETs (56M) (micro-nano [8M] + photonics [~48])
 - A specific challenge on novel materials and systems for OLED lighting or displays (under the FoF PPP specific call) (~9M)
- Includes calls for ERANETs as well as public procurement actions (roll-out and deployment of optical networking technologies)



Factory of the Future (FoF cPPP)

- Supports the 2013 Multi-Annual roadmap for the Public Private Partnership FoF (developed by the European factories of the Future Research Association - EFFRA)
- Focuses on ICT components of innovative production systems in all sectors (for more personalised, diversified and mass-produced product portfolio and for rapid adaptations to market changes)
- Organised in three topics
 - FoF 1: Process optimisation of manufacturing assets (~34M)
 - FoF 2: ICT-enabled modelling, simulation, analytics and forecasting technologies (~32M)
 - FoF 3: ICT Innovation for Manufacturing SMEs (~36M)
- Work will also contribute to implementation of the SRA of the PPP Sustainable Process Industry through Resource and Energy Efficiency (SPIRE)



ICT Cross-Cutting Activities

Organised in four topics

- ICT 29: Internet of Things and platforms for Connected Smart Objects (~51M)
 - Cutting across several LEIT-ICT areas (smart systems integration, smart networks, big data)
 - Brings together different generic ICT technologies and their stakeholder constituencies
- ICT 30: Human-centric Digital Age (~7M)
 - Understanding technologies, networks and new digital and social media and how these are changing the way people behave, think, interact and socialise as persons, citizens, workers and consumers
- ICT 31: Cyber-security, Trustworthy ICT (~38M)
 - Focuses on security-by-design for end to end security and a specific activity on cryptography
 - Complementary to Cyber-security in Societal Challenge 7
- ICT 32: Trans-national co-operation among National Contact Points (~4M)
 - Mechanisms for effective cross border partnership searches, identifying, understanding and sharing good practices among ICT NCPs



ICT Innovation actions

- Organised in three topics
 - ICT 33: Support for access to finance (~15M)
 - Pilot action for business angels to co-invest in ICT innovative companies
 - Implemented by EIF and closely coordinated with "Access to risk finance" part of H2020

- ICT 34: Innovation and Entrepreneurship Support (~11M)
 - ICT business idea contests in Universities and High Schools
 - ICT entrepreneurship summer Academy
 - ICT entrepreneurship Labs
 - Campaign on Entrepreneurship culture in innovative ICT sectors
 - Support for definition and implementation of Inducement prizes
 - European networks of procurers
 - Pre-commercial procurement



ICT35: Open Disruptive Innovation Scheme (~90м)

- Agile space to combine new technologies, devices, applications, interfaces, business models for new product and services concepts
- Open, fast and light
- Small-scale bottom-up initiatives
- Continuously open calls with cut-off dates/year
- SME instrument
- 5% of LEIT budget



International Cooperation actions

- Two coordinated calls
 - EUB: Brazil (advanced cyber infrastructure) (~7M)
 - EUJ: Japan (Network Futures) (~6M)
- ICT36: International partnership building and support to dialogues with high income countries (USA, Canada and East Asia) (~3M)
- ICT37: International partnership building in low and middle income countries (~11M)
- Targeted opening on Future Internet Research and Experimentation Micro- and nano electronics with US, Japan, Brazil and South Korea



ICT in H2020



HORL





Next steps

- October: Discussion with Member States on WP 2014-15
- November 6-8: ICT 2013 Conference in Vilnius (4th ICT NEG)

- December 10: WP adoption by Commission
- December 11: Publication of first calls
- Spring 2014: closing of first call





ICT 2013: Create, Connect, Grow 6-8 November 2013, Vilnius



Aim of the event:

ICT in Horizon 2020 - the EU's Framework Programme for Research and Innovation for 2014-2020.

Structure of the event :

- > conference,
- > exhibition,
- networking.

Registration: Open from the end of April 2013



Thank you for your attention!

Find out more:

www.ec.europa.eu/research/horizon2020

Research and Innovation