ICT in HORIZON 2020

The New EU Framework Programme for Research and Innovation 2014-2020

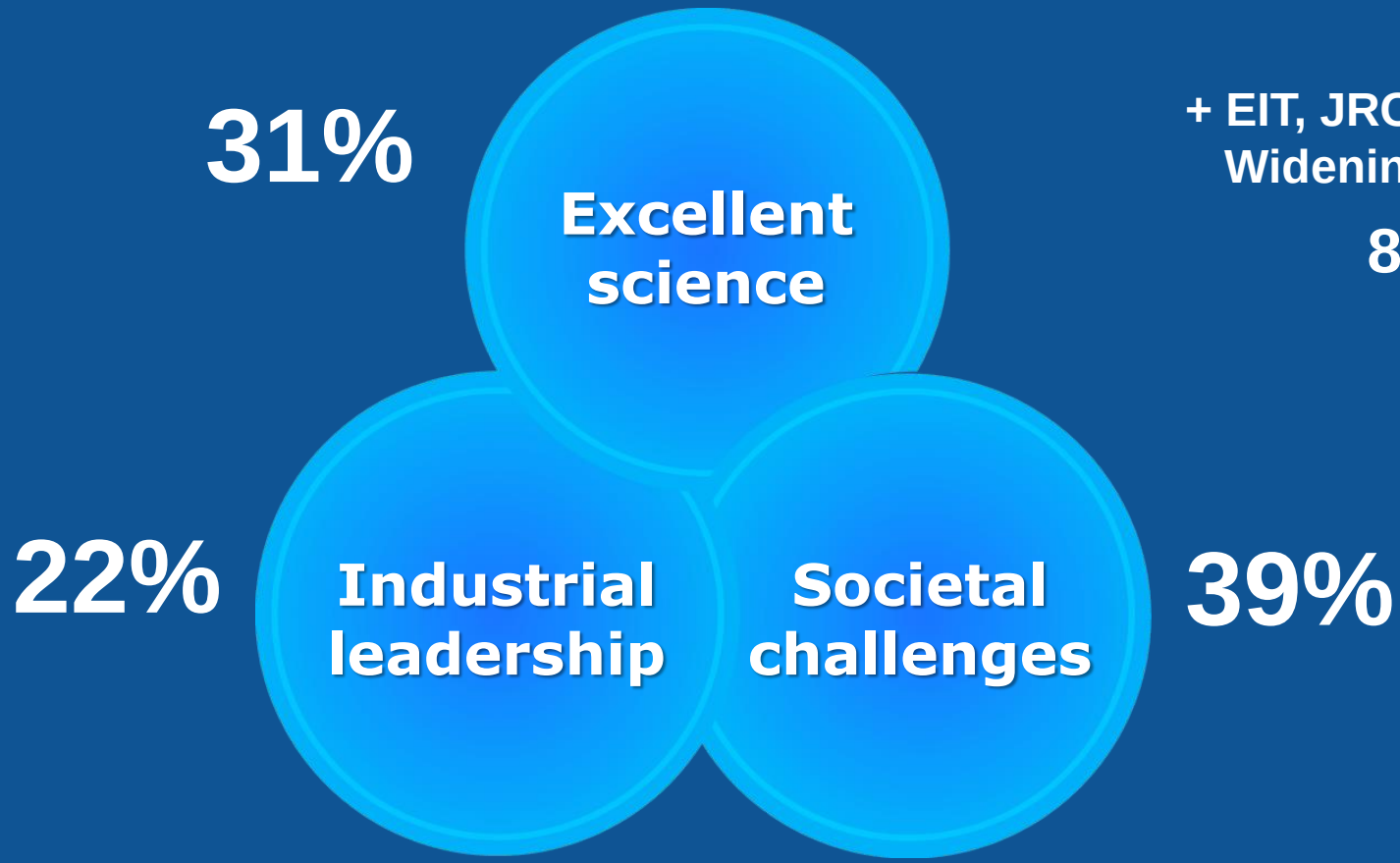
Regional EPC launch event

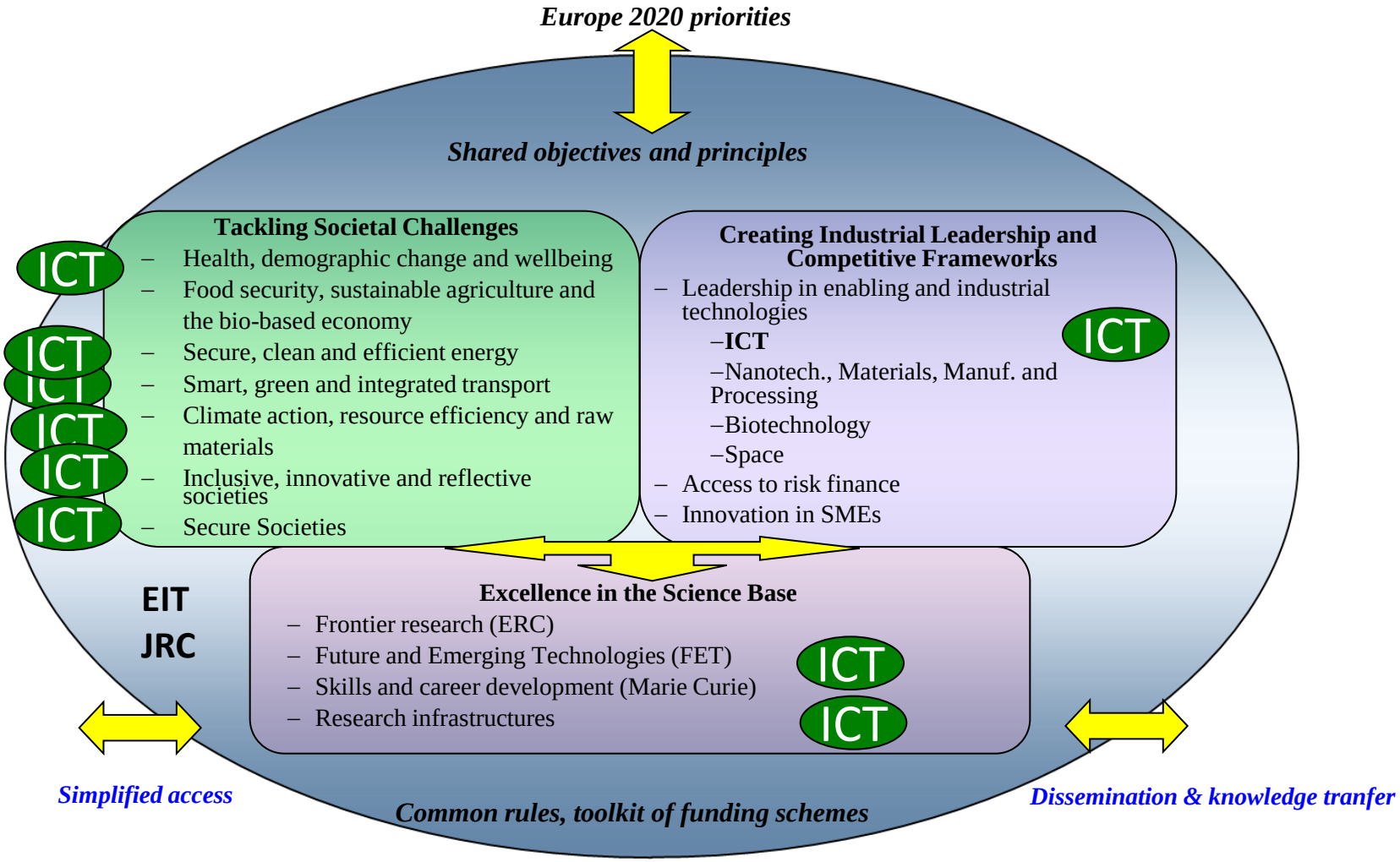
Chisinau, Moldova

17 March, 2014

Morten Møller, HoU,
DG CNET, Programe coordination

Three priorities




Europe 2020 priorities
Shared objectives and principles
Tackling Societal Challenges
– Health, demographic change and wellbeing
– Food security, sustainable agriculture and the bio-based economy
– Secure, clean and efficient energy
– Smart, green and integrated transport
– Climate action, resource efficiency and raw materials
– Inclusive, innovative and reflective societies
– Secure Societies
ICT
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ICT
Creating Industrial Leadership and Competitive Frameworks
– Leadership in enabling and industrial technologies
–ICT
–Nanotech., Materials, Manuf. and Processing
–Biotechnology
–Space
– Access to risk finance
– Innovation in SMEs
ICT
EIT
JRC
Excellence in the Science Base
– Frontier research (ERC)
– Future and Emerging Technologies (FET)
– Skills and career development (Marie Curie)
– Research infrastructures
ICT
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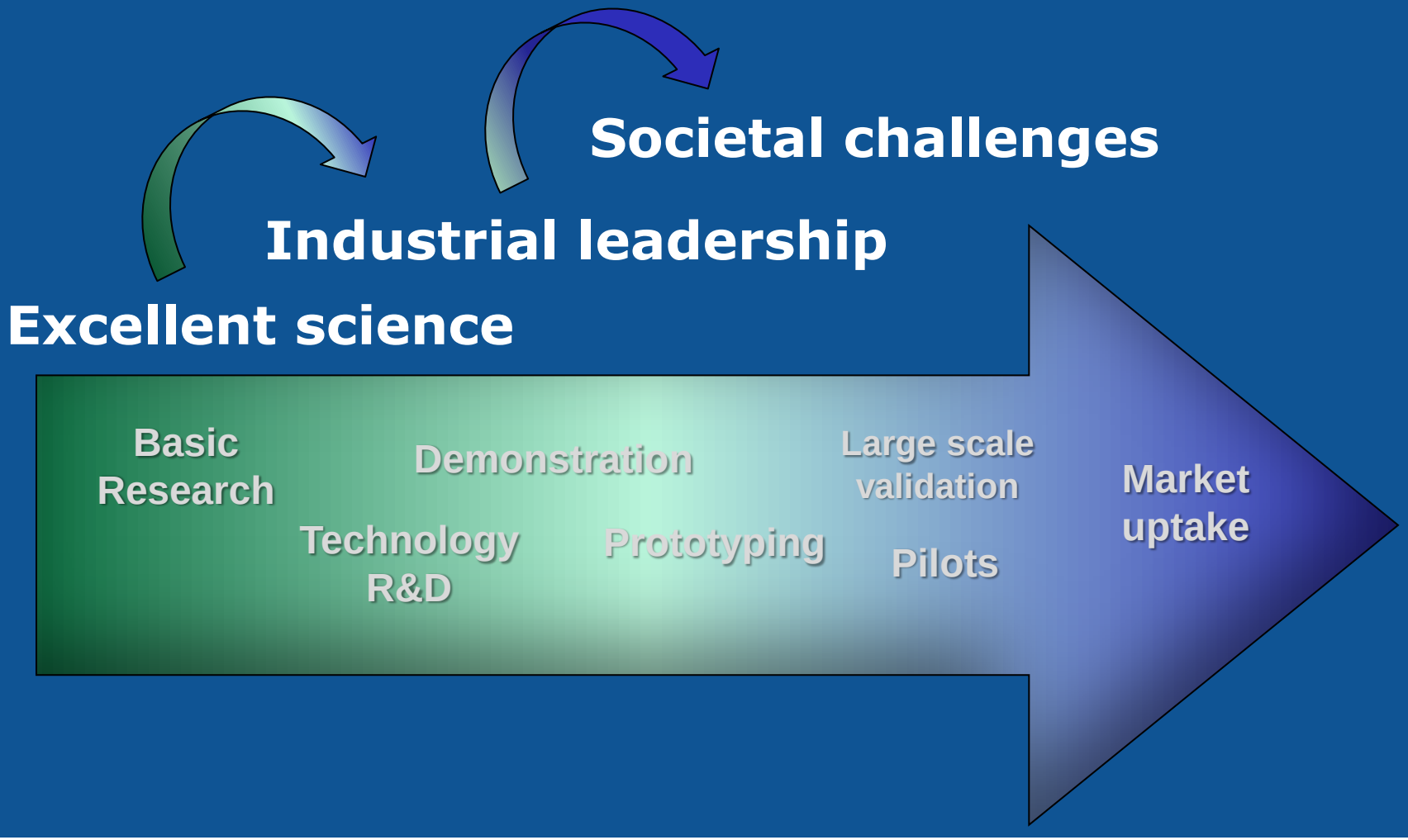
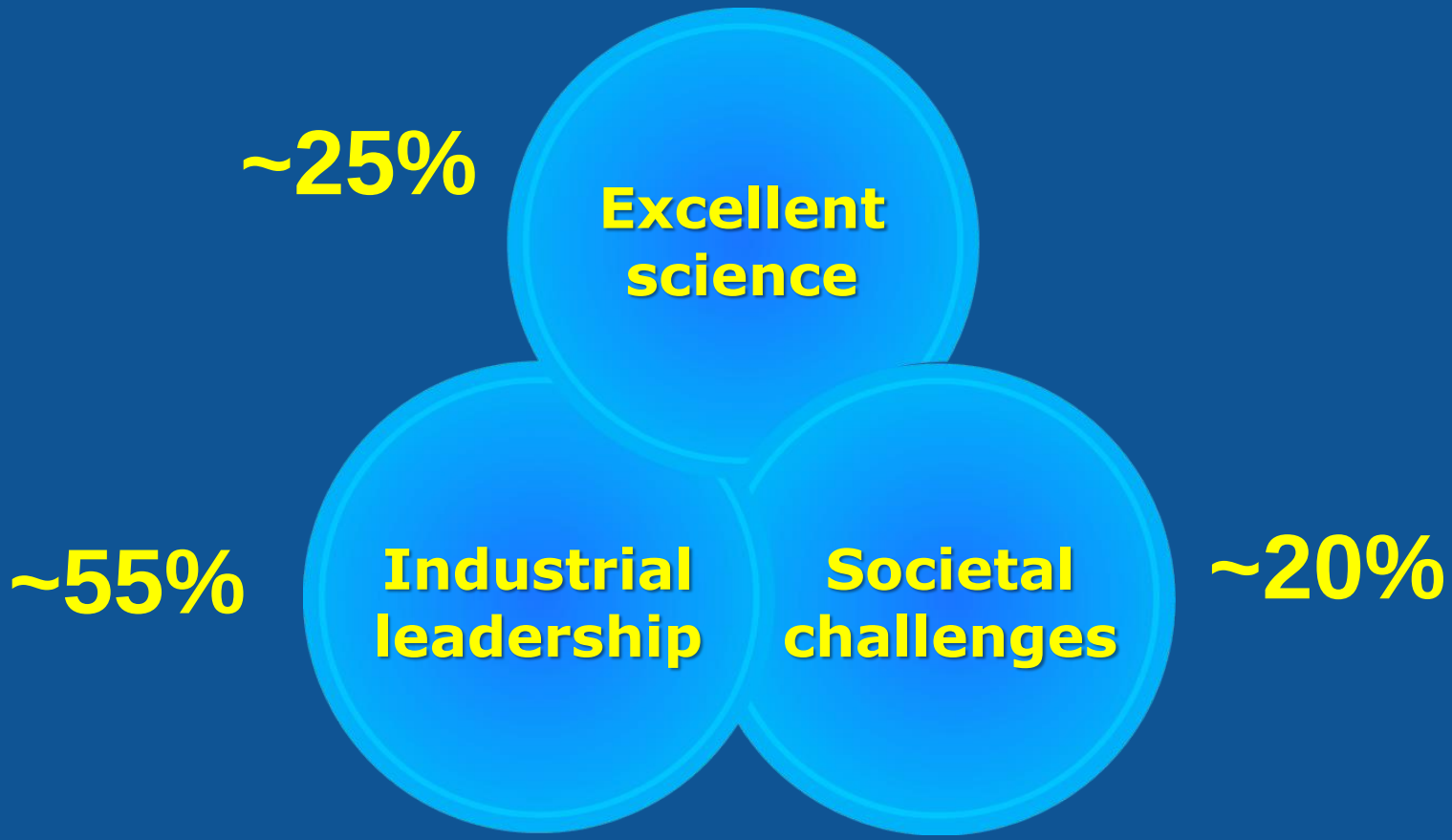
Simplified access
Common rules, toolkit of funding schemes
Dissemination & knowledge tranfer

Coverage of the full innovation chain



Three priorities for ICT



Coupling research to innovation

- Support to Research and Innovation **from lab to market**

  Use of 'research and innovation actions' and 'innovation actions' depending on the centre of gravity of the targeted activities

- Promotion of a closer relationship between **research and entrepreneurship**
- More support to **SMEs**
- More **evaluators from the business world** involved in the selection process
- About **half of the budget of ICT-related activities** allocated to instruments directly aiming at supporting innovation

ICT in Horizon 2020
Work Programmes 2014-15

European Commission

ICT in Excellent science 2014-15

Future and Emerging Technologies
2014-2015

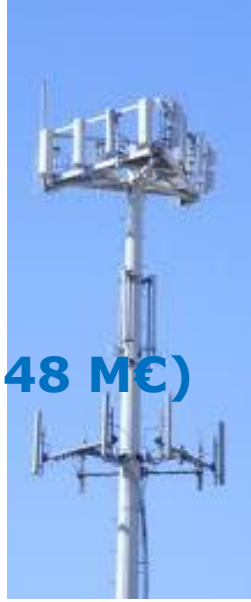
472 m€

- **FET Open** (160 m€)
  - **All technologies, no topical scope**
  - **Light and fast scheme**
    - Several cut-off dates per year, one-step submission of ~15 pages
    - One stage evaluation
- **FET Proactive** (132,4 m€)
  - **Global Systems Science (GSS)** (10 M€)
    - Improve the way in which scientific knowledge can stimulate, guide, and help evaluate policy and societal responses to global challenges
  - **Knowing, doing, being: cognition beyond problem solving** (15 M€)
    - New approaches to cognitive systems
  - **Quantum simulation** (10 M€)
    - Quantum technologies to ultimately address real world problems
  - **Towards exascale high performance computing** (97,4 M€)

    → **HPC PPP**: To be coordinated with complementary work in LEIT and RI
- **FET Flagships** (179,6 m€)
  - **Graphene**
  - **Human Brain Project**

eInfrastructures / 2014-2015

177 m€

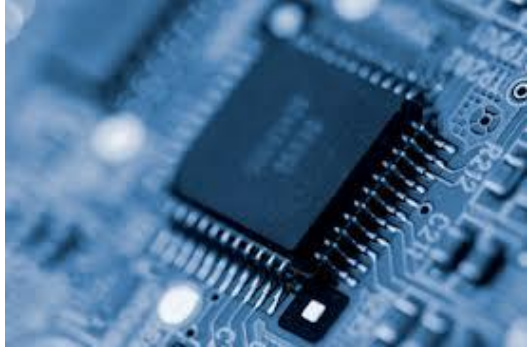


- **ICT infrastructure resources and services for Research (48 M€)**
  - Provision of core services across e-infrastructures
  - Research and Education Networking – GEANT
  - eInfrastructures for virtual research environments
- **Access to and management of scientific data (72 M€)**
  - Managing, preserving and computing with big research data
  - Towards global data e-infrastructures – Research Data Alliance
  - eInfrastructure for Open Access
- **High Performance Computing (57 M€)**
  - Pan-European High Performance Computing infrastructure and services
  - Centres of Excellence for computing applications
  - Network of HPC competence centres for SMEs

ICT in Industrial leadership 2014-15

Industrial Leadership - ICT

7,3 b€

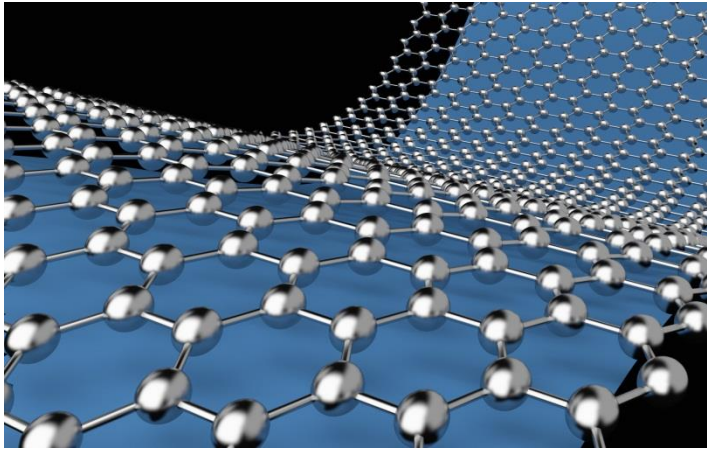


- **A new generation of components and systems:**
  - engineering of advanced embedded and resource efficient components and systems
- **Next generation computing:**
  - advanced and secure computing systems and technologies, including cloud computing
- **Future Internet:**
  - software, hardware, infrastructures, technologies and services
- **Content technologies and information management:**
  - ICT for digital content, cultural and creative industries
- **Advanced interfaces and robots:**
  - robotics and smart spaces
- **Micro- and nanoelectronics and photonics:**
  - key enabling technologies

European Commission

Components and systems
2014-2015

142 m€



- Covers **systemic integration from smart components to cyber-physical systems**
- **Complementary to the JTI Electronic Components and Systems (ECSEL)**
- **Organised in three related topics:**
  - Smart cyber-physical systems (56 M€)
    - Next generation embedded and connected systems
  - Smart system integration (48 M€)
    - Integration of heterogeneous micro- and nanotechnologies into smart systems
  - Advanced Thin, Organic and Large Area Electronics (38 M€)
- R&I in this area will also contribute to the implementation of the **SRA on Energy Efficient Buildings**

Advanced Computing
2014-2015

57 m€

- 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 (on Cloud Computing) and in Excellence Science pillar under Research Infrastructures and FET (on High Performance Computing)
- **Organised in one topic:**
    - Customised and low power computing

Future Internet / 2014-2015

395,5 m€

- Focused on **network and computing infrastructures** to accelerate innovation and address the most critical technical and use aspects of the Internet
- **Organised in ten topics:**
  - Smart networks and novel Internet **architectures** (24 M€)
  - Smart **optical** and **wireless network** technologies (30 M€)
  - Advanced **5G** Network Infrastructure for the Future Internet (125 M€) **→ 5G PPP**
  - Advanced **cloud** infrastructures and services (73 M€)
  - Boosting public sector productivity and innovation through cloud computing services (22 M€)
  - Tools and methods for **Software Development** (25 M€)
  - **FIRE+ (Future Internet Research & Experimentation)** (31,5M€)
  - More Experimentation for the Future Internet (18 M€)
  - **Collective Awareness Platforms** for sustainability and social innovation (37 M€)
  - **Web Entrepreneurship** (10 M€)

Content technologies and information management / 2014-2015

260 m€

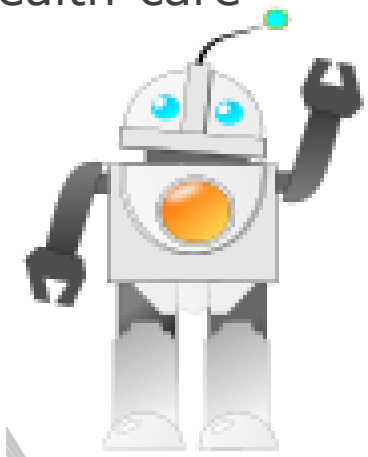
- **Addresses:**
  - **Big Data** with focus on both innovative data products and services and solving research problems
  - **Machine translation** in order to overcome barriers to multilingual online communication
  - **Tools for creative, media and learning industries** in order to mobilise the innovation potential of SMEs active in the area
  - **Multimodal and natural computer interaction**

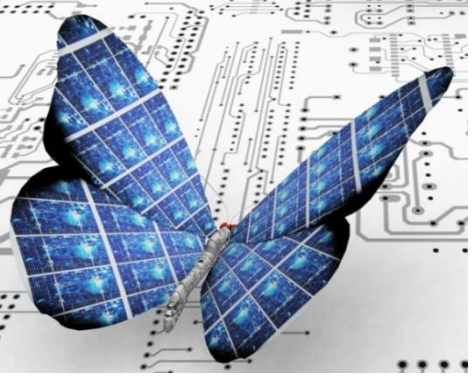
- **Organised in eight topics:**
  - Big data and Open Data innovation and take-up (50 M€)
  - Big data research (39 M€)
  - Cracking the language barrier (15 M€)
  - Support to the growth of ICT innovative creative industries SMEs (15 M€)
  - Technologies for creative industries, social media and convergence (41 M€)
  - Technologies for better human learning and teaching (52 M€)
  - Advanced digital gaming/gamification technologies (17 M€)
  - Multimodal and natural computer interaction (31 M€)

Robotics / 2014-2015

157 m€

- **Roadmap-based research driven by application needs**
  → Robotics PPP
- 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 robotic competitions
- **Organised in two annual calls**
  (of 74 M€ and 83M€ respectively)





Micro- and nano-electronics and photonics Key Enabling Technologies
2014-2015

215 m€

- Covers **generic technology developments on micro- and nano-electronics** focused on **advanced research** and lower Technology Readiness Levels (TRLs) (50 M€)
  - Complementary to the JTI Electronic Components and Systems

- 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.) (156 M€)
  →Photonics PPP
  - Includes calls for ERANETs as well as public procurement actions (roll-out and deployment of optical networking technologies)

Factory of the Future / 2014-2015

102 m€

- 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:**
  - Process optimisation of manufacturing assets (34 M€)
  - ICT-enabled modelling, simulation, analytics and forecasting technologies (32 M€)

- ICT Innovation for Manufacturing SMEs (36 M€)
- Part of **FoF PPP**

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ICT Cross-Cutting Activities / 2014-2015

- **Internet of Things and platforms for Connected Smart Objects (51 M€)**
  - Cutting across several LEIT-ICT areas (smart systems integration, smart networks, big data)
  - Bringing together different generic ICT technologies and their stakeholder constituencies

- **Human-centric Digital Age (7 M€)**
  - 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

- **Cyber-security, Trustworthy ICT (38 M€)**
  - Focuses on security-by-design for end to end security and a specific activity on cryptography
  - Complementary to Cyber-security in Societal Challenge 7

- **Trans-national co-operation among National Contact Points (4 M€)**
  - Mechanisms for effective cross border partnership searches, identifying, understanding and sharing good practices among ICT NCPs

ICT horizontal innovation actions / 2014-2015

- **Support for access to finance (15 M€)**
  - 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
- **Innovation and Entrepreneurship Support (11 M€)**
  - 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

- **Open Disruptive Innovation Scheme (90 M€)**
  - Support to a large set of **early stage high risk innovative SMEs in ICT**
  - Implementation through the **SME instrument**
    -> Continuously open calls with several (3) cut-off dates/year
    -> 5% of LEIT budget

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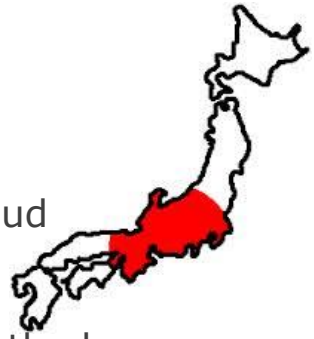
International cooperation actions / 2014-2015

27 m€



- **Coordinated calls**
  - **EU-Brazil (7 M€)**
    - Cloud computing, including security aspects
    - High performance computing
    - Experimental platforms
  - **EU-Japan (6 M€)**
    - Technologies combining big data, internet of things in the cloud
    - Optical communications
    - Acces networks for densely located users
    - Experimentation and development on federated Japan-EU testbeds

- **International partnership building and support to dialogues with high income countries (USA, Canada, East Asia and Oceania) (3 M€)**
- **International partnership building in low and middle income countries (11 M€)**

ICT in Societal challenges 2014-15

Societal Challenges - ICT
Proposed funding (€ million, 2014-2015)

Challenge	Total	ICT	%
Health, demographic change and wellbeing	**1 804**	**269**	**15%**
Food security, sustainable agriculture, marine and maritime research & the Bioeconomy	**687**		
Secure, clean and efficient energy	**1 447**	**72**	**5%**
Smart, green and integrated transport	**1 542**	**92**	**6%**
Climate action, environment, resource efficiency and raw materials	**745**	**26**	**3,5%**
Innovative, inclusive and reflective societies	**310**	**77**	**25%**
Secure societies	**393**	**100**	**25%**

Health, demographic change and wellbeing / 2014-2015

269 m€

- **Advancing active and healthy ageing with ICT**
  - **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)
  - **Self-management of health and disease**
  - Public-procurement of innovative eHealth services

- **Improving health information and data exploitation**
  - Digital representation of **health data** to improve diagnosis and treatment
  - **eHealth interoperability**

European Commission

Secure, clean and efficient energy / 2014-2015

72 m€

- **Energy efficiency / buildings and consumers**
  - Public procurement of **green data centres**
  - New ICT-based solutions for **energy efficiency through citizens' behavioural change**
- **Competitive low-carbon energy / modernising the single European electricity grid**
  - Distribution grid and retail market
    - Next generation ICT infrastructure for **smart metering and smart grids**
- **Smart cities and communities**
  - Integration of **energy, transport and ICT** through **lighthouse projects** (large scale demonstration)

Smart, green and integrated transport / 2014-2015

92 m€

- **Road**
  - **Cooperative Intelligent Transport Systems**
    - Connecting people, vehicles, infrastructures and businesses
  - Safe and connected **automation in road transport**
- **Green vehicles**
  - **Electric vehicles'** enhanced performance and **integration into the transport system and the electricity grid**

- **Smart cities and communities**
  - Integration of **energy, transport and ICT** through **lighthouse projects** (large scale demonstration)

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Climate action, environment, resource efficiency and raw materials / 2014-2015

26 m€

- **Waste management**
  - ICT solutions for waste traceability, waste material flow management
- **Water management**
  - Development and deployment of advanced ICT solutions for water resources management in agriculture and urban areas

Europe in a changing world – inclusive, innovative and reflective societies / 2014-2015

77 m€

- **Reflective societies – Cultural Heritage**
  - **Innovative ecosystems of digital cultural assets**
  - **Advanced 3D modelling for accessing and understanding European cultural assets**

- **New forms of innovation**
  - **Innovation in the public sector** by using emerging ICT technologies
  - ICT-enabled **open government**
  - Personalised public services
  - M-government
  - Open participation
  - Transparency
  - ICT for **learning and inclusion**

Secure societies – protecting freedom and security of Europe and its citizens / 2014-2015

100 m€

- **Digital security: cybersecurity, privacy and trust**
  - Protecting our society by providing sustained **trust in the usage of ICT** and in securing the ICT underlying our digital society
  - **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**
  - Demonstrating the viability and maturity of state-of-the-art security solutions in **large scale demonstrators**, involving end users

ICT in Horizon 2020: summary of novelties implementation

Description of topics

- **3 key features**
  - ***Specific Challenge*** - sets the context, the problem to be addressed, why intervention is necessary
  - ***Scope*** - delineates the problem, specifies the focus and the boundaries of the potential action BUT without overly describing specific approaches
  - ***Expected Impact*** - describes the key elements of what is expected to be achieved
- **Simplified types of action (instruments): research & innovation 100%; innovation 70%; Coordination and Support Action etc.**
- **Size of projects to be indicated**

Benefits of Partnerships - ICT

Joint Technology Initiatives

- **ECSEL** (Electronic Components and Systems for European Leadership)
  - ✓ **1,215 b€ from EU** (250m€ in 2014-15)
  - ✓ **3,6 b€** (out of which 1,2 b€ from Member States) **from industry partners and other sources**

Contractual PPPs

- **5G** –> **700m€** indicatively earmarked in H2020 (125m€ in WP2014-15)
- **Photonics** –> **700m€** (156m€)
- **Robotics** –> **700m€** (157m€)
- **High Performance Computing** –> **700m€** (157m€)
- **Factories of the Future** (ICT part) –> **450m€** (102m€)
- **Green Vehicles** (ICT part) –> **80m€** (20m€)

Coupling research to innovation

- Support to Research and Innovation from lab to market
  → Use of 'research and innovation actions' and 'innovation actions' depending on the centre of gravity of the targeted activities
- Incremental and disruptive innovation
- Promotion of a closer relationship between research and entrepreneurship
- More support to SMEs
- More evaluators from the business world involved in the selection process

European Commission

Innovation activities in LEIT-ICT WP2014-15

~46% of ICT LEIT funding to innovation-type activities

~650M€ to CP 70%

- Stimulating adoption, assessment and access services
- Technology transfer, rapid prototyping and testing of use cases
- Pilots (possibly large scale), experimentation and demonstration, large scale market validation (in real settings); pilot lines
- Consensus building, pre-normative activities, standardisation, reference implementations
- Online platforms and services for web entrepreneurs, SME incubators

90M€ on the Open Disruptive Innovation scheme (SME instrument)

~60M€ to PCP/PPI activities (cloud, lab-on-chip for in-vitro diagnosis, e-textile for healthcare, robotics, public sector innovation, network of procurers)

1M€ on Prizes (Optical transmission, Spectrum sharing) -> 2015

15M€ to access to finance (topped up with 15M from central scheme)

7 M€ Innovation and Entrepreneurship Support (business idea contests, summer academy, entrepreneurship labs, entrepreneurship culture..)

Innovation in Societal Challenges

~48% of Societal Challenges funding to innovation-type activities

- Pilot ICT Solutions for independent living
- Services and applications to stimulate consumers' engagement in energy-efficiency
- Demonstration and validation of electricity-system integration
- First application and market replication of near-market solutions in the area of water management
- Applications, tools and services fostering the exploitation of digital cultural assets
- Pilots on ICT-enabled open government
- Field trials on the use of ICT in critical infrastructure protection
- Pilots on secure information sharing, risk management and assurance models
- Demonstrators for the automated comparison and interoperability of electronic trust services

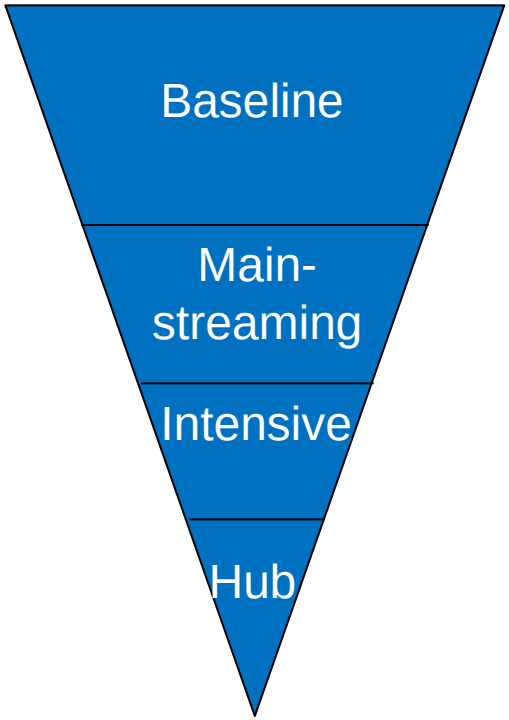
Responsible Research and Innovation (RRI) & Socio-Economic Sciences and Humanities (SSH):

An organic approach within the whole WP

- RRI actions & SSH expertise are called for as a baseline in Excellent Science, Industrial Leadership, and Societal Challenges
- RRI & SSH are explicitly called for in numerous topics

In particular, within the LEIT ICT part:

- 1 topic calls for intensive RRI & SSH input (ICT 10)
- Human-Centric Digital Age (ICT 31) serves as a hub for RRI/SSH

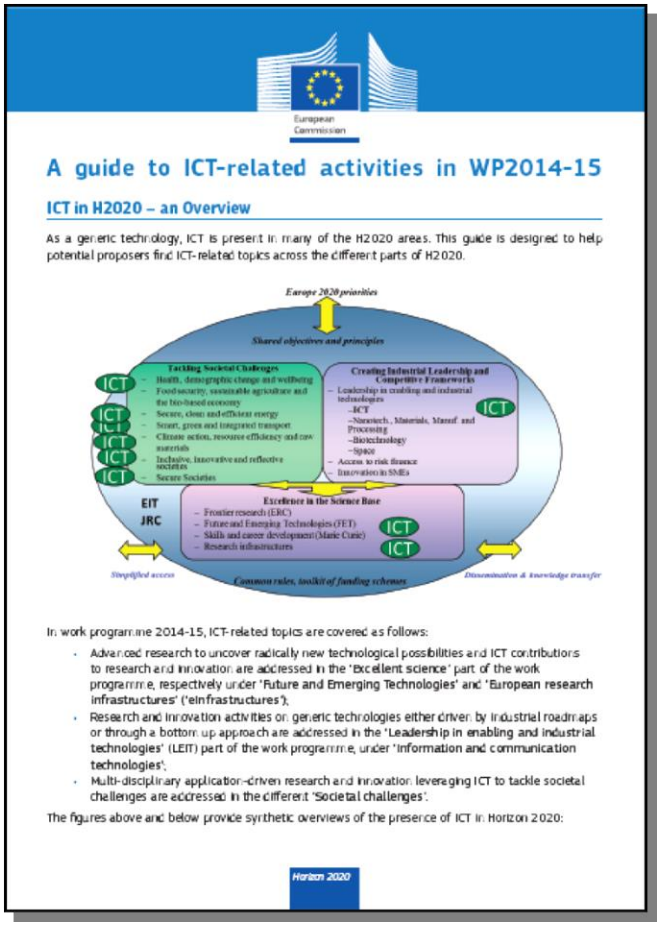


Guide to the presence of ICT in H2020

- **Comprehensive coverage of all three H2020 pillars**
- **Detailed list of calls and topics**
- **Available on H2020 website: http://ec.europa.eu/programmes /horizon2020/en/area /ict-research-innovation**

→ ***Publication of the WP: online since 11 December***

→ ***First deadlines: Spring 2014***



European Commission

A guide to ICT-related activities in WP2014-15

ICT in H2020 – an Overview

As a generic technology, ICT is present in many of the H2020 areas. This guide is designed to help potential proposers find ICT-related topics across the different parts of H2020.

Europe 2020 priorities

Shared objectives and principles

Tackling Societal Challenges
- Health, demographic change and wellbeing
- Food security, sustainable agriculture and the bio-based economy
- Secure, clean and efficient energy
- Smart, green and integrated transport
- Climate action, resource efficiency and raw materials
- Inclusive, innovative and reflective societies
- Secure Societies

Creating Industrial Leadership and Competitive Frameworks
- Leadership in enabling and industrial technologies
  - ICT
  - Nanotech., Materials, Manuf. and Processing
  - Biotechnology
  - Space
- Access to risk finance
- Innovation in SMEs

Excellence in the Science Base
- Frontier research (ERC)
- Future and Emerging Technologies (FET)
- Skills and career development (Marie Curie)
- Research infrastructures

EIT
JRC

Simplified access

Common rules, toolkit of funding schemes

Dissemination & knowledge transfer

In work programme 2014-15, ICT-related topics are covered as follows:

- Advanced research to uncover radically new technological possibilities and ICT contributions to research and innovation are addressed in the 'Excellent science' part of the work programme, respectively under 'Future and Emerging Technologies' and 'European research infrastructures' ('eInfrastructures');
- Research and innovation activities on generic technologies either driven by industrial roadmaps or through a bottom-up approach are addressed in the 'Leadership in enabling and industrial technologies' (LEIT) part of the work programme, under 'Information and communication technologies';
- Multi-disciplinary application-driven research and innovation leveraging ICT to tackle societal challenges are addressed in the different 'Societal challenges'.

The figures above and below provide synthetic overviews of the presence of ICT in Horizon 2020:

Horizon 2020

Call planning overview –
please check against publication on Participant Portal

- **LEIT**
  - **H2020-ICT-2014 (ICT Call 1)**
    - Publication date: 11 December 2013
    - Deadline: **23 April 2014** (all topics except 5G Future Internet)
    - Deadline for 5G Future Internet: **25 November 2014**
  - **H2020-FoF-2014/2015 (Factory of the Future)**
    - Publication date: 11 December 2013
    - Deadlines: **20 March 2014** and **9 December 2014**
  - **H2020-EUJ-2014 (EU-Japan Call)**
    - Publication date: 7 January 2014
    - Deadline: **10 April 2014**
  - **H2020-ICT-2015 (ICT Call 2)**
    - Publication date: 15 October 2014
    - Deadline: **14 April 2015**
  - **H2020-EUB-2015 (EU-Brazil Call)**
    - Publication date: 15 October 2014
    - Deadline: **21 April 2015**

EaP Participation in FP7 ICT (nr of projects)

- **Belarus - 9**
- **Ukraine - 8**
- **Armenia - 8**
- **Moldova - 6**
- **Georgia - 5**
- **Azerbaijan - 5**

Thank you for your attention!

Find out more:
www.ec.europa/research/horizon2020

HORIZON 2020