



# ICT in HORIZON 2020

## Workprogramme 2015

**Information and  
Communication Technologies  
in the EU Framework  
Programme for Research and  
Innovation**



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European Commission

# What is Horizon 2020



- **Initial Commission proposal for a €80 billion research and innovation funding programme (2014-2020); now just over €70 billion**
- **A core part of Europe 2020, Innovation Union & European Research Area:**
  - Responding to the economic crisis to invest in future jobs and growth
  - Addressing people's concerns about their livelihoods, safety and environment
  - Strengthening the EU's global position in research, innovation and technology

# What's new with respect to FP7

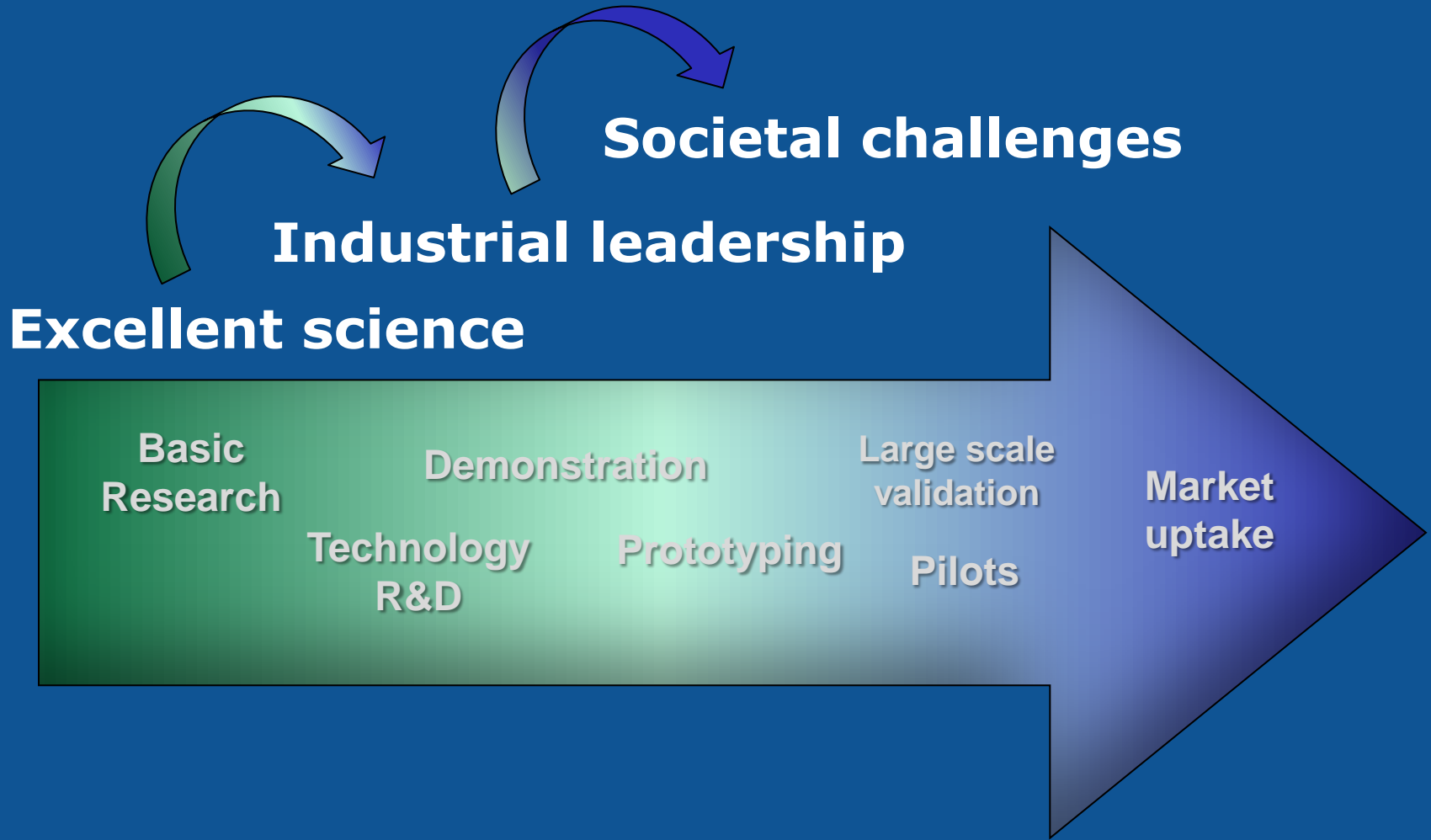
- **A single programme** bringing together three separate programmes/initiatives\*
- **Coupling research to innovation** – from research to retail, all forms of innovation
- **Focus on societal challenges** facing EU society, e.g. health, clean energy and transport
- **Simplified access**, for all companies, universities, institutes in all EU countries and beyond

\* The 7<sup>th</sup> Research Framework Programme (FP7), innovation aspects of Competitiveness and Innovation Framework Programme (CIP), EU contribution to the European Institute of Innovation and Technology (EIT)

# Three priorities



# Coverage of the full innovation chain



# Horizon 2020 structure

## Excellent Science

Frontier Research (ERC)

Future and Emerging Technologies (FET)

ICT

Skills and career development (Marie Skłodowska-Curie)

Research Infrastructures

ICT

## Industrial Leadership

Leadership in enabling  
and industrial technologies

ICT

ICT

ICT

Nanotech., Materials, Manuf. & Processing

Biotechnology

Space

Access to risk finance

Innovation in SMEs

## Societal Challenges

Health, demographic change and wellbeing

ICT

Food security, sustainable agriculture,  
and the bio-based economy

Secure, clean and efficient energy

ICT

Smart, green and integrated transport

ICT

Climate action, resource efficiency,  
and raw materials

ICT

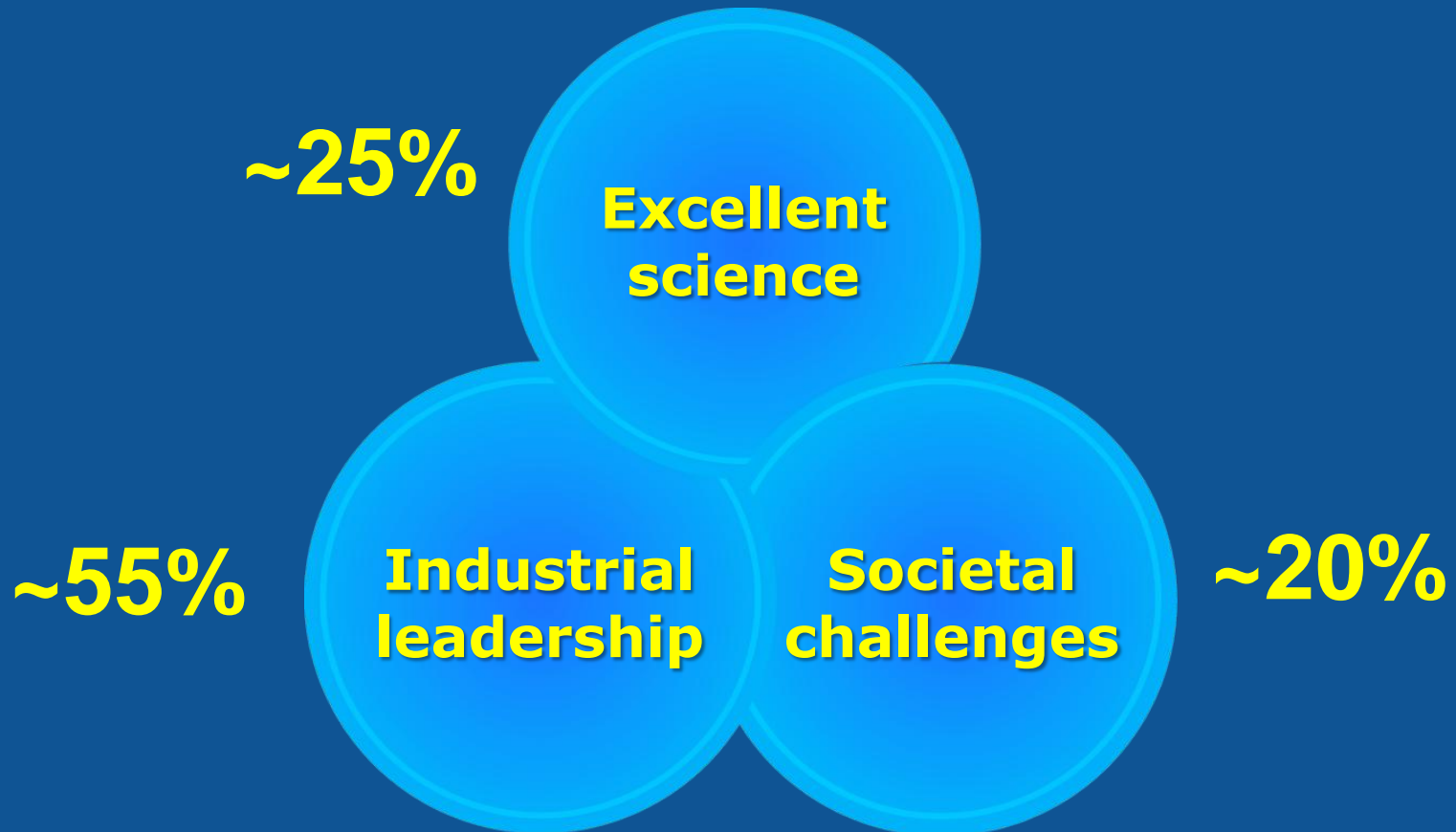
Inclusive, innovative and reflective societies

Secure societies

ICT

ICT

# 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



# 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€ in WP2014-15)
- **Robotics** → **700m€** (157m€ in WP2014-15)
- **High Performance Computing** → **700m€** (157m€ in WP2014-15)
- **Factories of the Future** (ICT part) → **450m€** (102m€ in WP2014-15)
- **Green Vehicles** (ICT part) → **80m€** (20m€ in WP2014-15)
- **NEW!!! Big Data** → 500m€ (not in WP2014-15 )

# **ICT** in Excellent science



# Excellent Science - ICT



2,5 b€\*

## • Future and Emerging Technologies (FET)

- **FET Open**: fostering novel ideas
- **FET Proactive**: nurturing emerging themes and communities
- **FET Flagships**: pursuing grand interdisciplinary science and technology challenges
  - **Graphene**
  - **Human Brain Project**

*\* Including budget for other areas than ICT covered in FET*

## • Research infrastructures

- Developing the European research infrastructure for 2020 and beyond
- **Development, deployment and operation of ICT-based e-infrastructures**
  - **ICT infrastructure resources and services for Research**
  - **Access to and management of scientific data**
  - **High Performance Computing**

862 m€

# Future and Emerging Technologies 2014-2015

177 M€

- **FET Open** (80M€)
  - **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** (97,4 m€)
  - **Global Systems Science (GSS)**
    - 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**
    - New approaches to cognitive systems
  - **Quantum simulation**
    - 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**
  - Graphene
  - Human Brain Project



# eInfrastructures / 2014-2015

80,5 M€

- **ICT infrastructure resources and services for Research (40,5 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**
  - Managing, preserving and computing with big research data
  - Towards global data e-infrastructures – Research Data Alliance
  - eInfrastructure for Open Access
- **High Performance Computing (40 M€)**



- Pan-European High Performance Computing infrastructure and services
- **Centres of Excellence for computing applications**
- Network of HPC competence centres for SMEs

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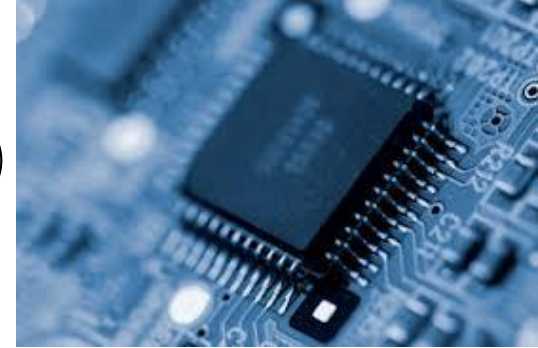


# ICT in Industrial leadership



# Industrial Leadership - ICT

7,3 b€

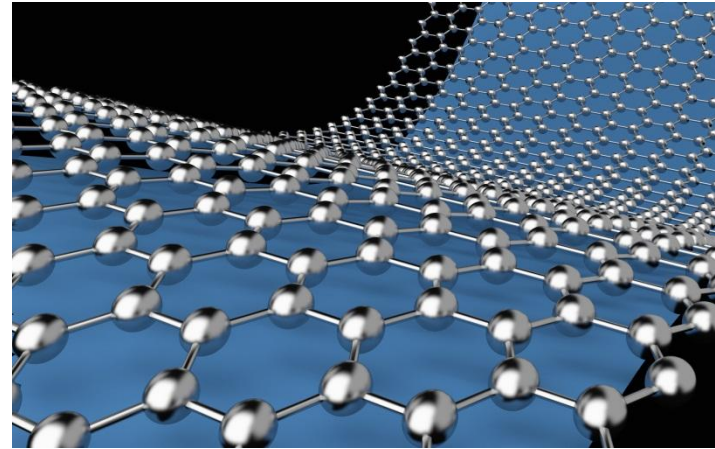


- **A new generation of components and systems:**
  - engineering of advanced embedded and resource efficient components and systems
- **Next generation computing:**
  - advanced and secure computing systems and technologies, including cloud computing
- **Future Internet:**
  - software, hardware, infrastructures, 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



# Components and systems

## 2014-2015



- 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

55 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

196 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**
  - Smart **optical** and **wireless network** technologies
  - Advanced **5G** Network Infrastructure for the Future Internet (122 M€)  
→ **5G PPP**
  - Advanced **cloud** infrastructures and services
  - Boosting public sector productivity and innovation through cloud computing services (21 M€)
  - Tools and methods for **Software Development**
  - **FIRE+ (Future Internet Research & Experimentation)**
  - More Experimentation for the Future Internet (17 M€)
  - **Collective Awareness Platforms** for sustainability and social innovation (36 M€)
  - **Web Entrepreneurship**

# Content technologies and information management / 2014-2015

127 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
- **Big data research (37 M€)**
- Cracking the language barrier
- Support to the growth of ICT innovative creative industries SMEs
- **Technologies for creative industries, social media and convergence (40 M€)**
- **Technologies for better human learning and teaching (50 M€)**
- Advanced digital gaming/gamification technologies
- Multimodal and natural computer interaction

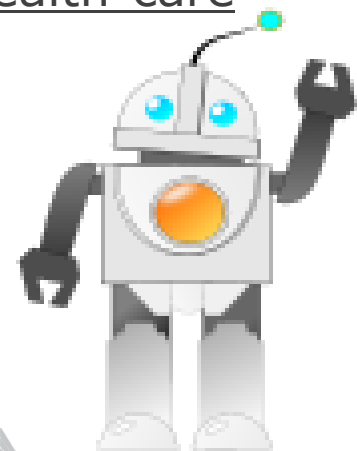


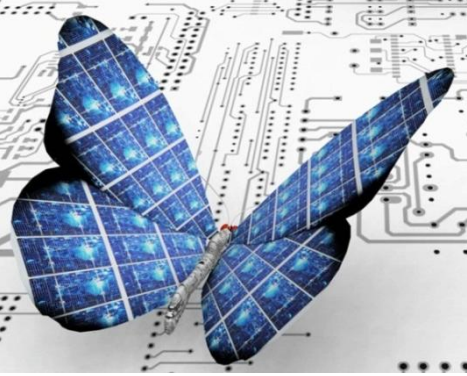


## Robotics / 2014-2015

80 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**  
(80 M€ in 2015)





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

143 M€

- Covers **generic technology developments on micro- and nano-electronics** focused on **advanced research** and lower Technology Readiness Levels (TRLs) (48 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.) (95 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

68 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**



# ICT Cross-Cutting Activities / 2014-2015

- **Internet of Things and platforms for Connected Smart Objects (49 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**

- 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**

- 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**

- 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

- Pre-commercial procurement (4 M€)

- Open Disruptive Innovation Scheme (88 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

- Fast Track to Innovation pilot (100 M€)

- Fully **bottom-up**
- **Reduced time-to-grant** (6 months)
- **Business-driven**





# International cooperation actions / 2014-2015

21 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
- Access 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



# Societal Challenges - ICT

636 M€  
(2014-15)



- **Health, demographic change and wellbeing**
- **Food security, sustainable agriculture, and forestry, marine, maritime and inland water research, and the bioeconomy**
- **Secure, clean and efficient energy**
- **Smart, green and integrated transport**
- **Climate action, environment, resource efficiency and raw materials**
- **Europe in a changing world – inclusive, innovative and reflective societies**
- **Secure societies – protecting freedom and security of Europe and its citizens**

# Key principles for ICT R&I in the Societal Challenges



- **Interoperability**
  - **Re-use and economies of scale**
  - **Breakthroughs leveraging the transformative power of ICT**
  - **Preparation for market deployment**
- +
- **Information for future digital policy**

# Societal Challenges - ICT

## Funding for ICT (€ million, 2014-2015)

Challenge	Total	ICT	%
<b>Health, demographic change and wellbeing</b>	<b>1 804</b>	<b>265</b>	<b>15%</b>
Food security, sustainable agriculture, marine and maritime research & the Bioeconomy	687		
<b>Secure, clean and efficient energy</b>	<b>1 447</b>	<b>72</b>	<b>5%</b>
<b>Smart, green and integrated transport</b>	<b>1 542</b>	<b>92</b>	<b>6%</b>
<b>Climate action, environment, resource efficiency and raw materials</b>	<b>745</b>	<b>26</b>	<b>3,5%</b>
<b>Innovative, inclusive and reflective societies</b>	<b>310</b>	<b>77</b>	<b>25%</b>
<b>Secure societies</b>	<b>393</b>	<b>100</b>	<b>25%</b>

# Health, demographic change and wellbeing / 2014-2015

104 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**



# Secure, clean and efficient energy / 2014-2015

24 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

52 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)



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

13 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

55 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

50 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

# WP2014-15 revision

- Published on 22 July 2014



- **Revision of several call deadlines**
- Description of main eligibility and award criteria of prizes
  - Collaborative Sharing of Spectrum (LEIT-ICT)
  - Breaking the optical transmission barriers (LEIT-ICT)
  - eHealth Inducement Prize: Food scanner (SC1)
- One additional topic in Digital Security call (SC7)
  - DS-7-2015: Value-sensitive technological innovation in Cybersecurity

# Call planning (1/2)

## FET

- **FET Open:** 30 Sept 2014, 31 March 2015, 29 Sept 2015
- **FET Proactive (HPC):** 25 Nov 2014

**Research Infrastructures :** 14 Jan 2015

## LEIT

- **5G PPP:** 25 Nov 2014
- **FoF:** ~~9 Dec 2014~~ **4 Feb 2015**
- **Main ICT call:** 14 April 2015
- **EU-Brazil:** 21 April 2015

**SC1 (Health)** 21 April 2015

## SC3 (Energy)

- **Energy-efficiency:** ~~10 June 2015~~ **4 June 2015**
- **Smart Cities:** ~~3 March 2015~~ **5 June 2015**



# Call planning (2/2)

## SC4 (Transport)

- **Mobility for growth:** ~~31 March 2015 + 27 August 2015~~ **23 April + 15 Oct 2015**
- **Green vehicle:** ~~27 August 2015~~ **15 Oct 2015**

## SC5 (Climate, Environment)

- **Water:** ~~16 Oct 2014 + 10 March 2015~~ **21 April + 8 Sept 2015**

## SC6 (Inclusive, Innovative and Reflective societies)

- Advanced 3D modelling (topic REFLECTIVE 7): 30 Sep 2014
- **EURO 6, REFLECTIVE 6, INSO 1:** ~~21 April 2015~~ **28 May 2015**

## SC7 (Security)

- **Digital Security:** ~~21 April 2015~~ **27 August 2015**

## SME instrument

- **Phase 1:** 18 June, 24 Sept, 17 Dec 2014, 18 March, 17 June, 17 Sept, 16 Dec 2015
- **Phase 2:** 9 Oct, 17 Dec 2014, 18 March, 17 June, 17 Sept, 16 Dec 2015

# Next steps: Timetable for WP2016-17

<b>30 September 2014</b>	<b>Presentation of ICT advisory group report to H2020 ICT Committee</b>
<b>16 October 2014</b>	<b>Discussion with PC strategic configuration on overarching strategic document</b>
<b>Nov – Jan 2014</b>	<b>Discussion with Programme Committees on scoping paper;</b>
<b>December 2014</b>	<b>Presentation of proposed strategic programming document to new Commissioner(s)</b>
<b>Jan – July 2015</b>	<b>Preparation of the detailed work programme 2016/17 content, prepared on the basis of the endorsed strategic programming document, including input from Advisory Groups and discussion with PC configurations</b>
<b>Summer 2015</b>	<b>Opinions of the Programme Committee configurations</b>
<b>Third quarter 2015</b>	<b>Adoption by the Commission of the Work Programme; publication of the calls for 2016</b>
<b>20-22 October 2015</b>	<b>ICT2015 Conference, Lisbon, Portugal: Presentation of ICT Work Programme 2016-17</b>

# ICT 2015

20-22 October 2015 in Lisbon, Portugal

## Features of the event :

- Conference
- Exhibition
- Networking

## Venue:

CCL – Lisboa Congress Centre

## Twitter:

@ICT2015eu

#ICT2015





# Find out more

- On the Horizon2020 web site
  - ✓ <http://ec.europa.eu/programmes/horizon2020>
- On the participants portal
  - ✓ <http://ec.europa.eu/research/participants/portal/desktop/en/home.html#helpdesk>
- H2020 Helpdesk, including FAQ
  - ✓ <http://ec.europa.eu/research/index.cfm?pg=enquiries>
- Contact your National Contact Points
  - ✓ [http://ec.europa.eu/research/participants/portal/desktop/en/support/national\\_contact\\_points.html](http://ec.europa.eu/research/participants/portal/desktop/en/support/national_contact_points.html)





# HORIZON 2020

**Thank you  
for your attention!**

**Find out more:**

<http://ec.europa.eu/programmes/horizon2020>