Horizon 2020: Three priorities

Excellent science

Industrial leadership

Societal challenges

European Commission

Coverage of the full innovation chain

Societal challenges

Industrial leadership

Excellent science

Basic Research

Demonstration

Technology R&D

Prototyping

Large scale validation

Pilots

Market uptake

European Commission
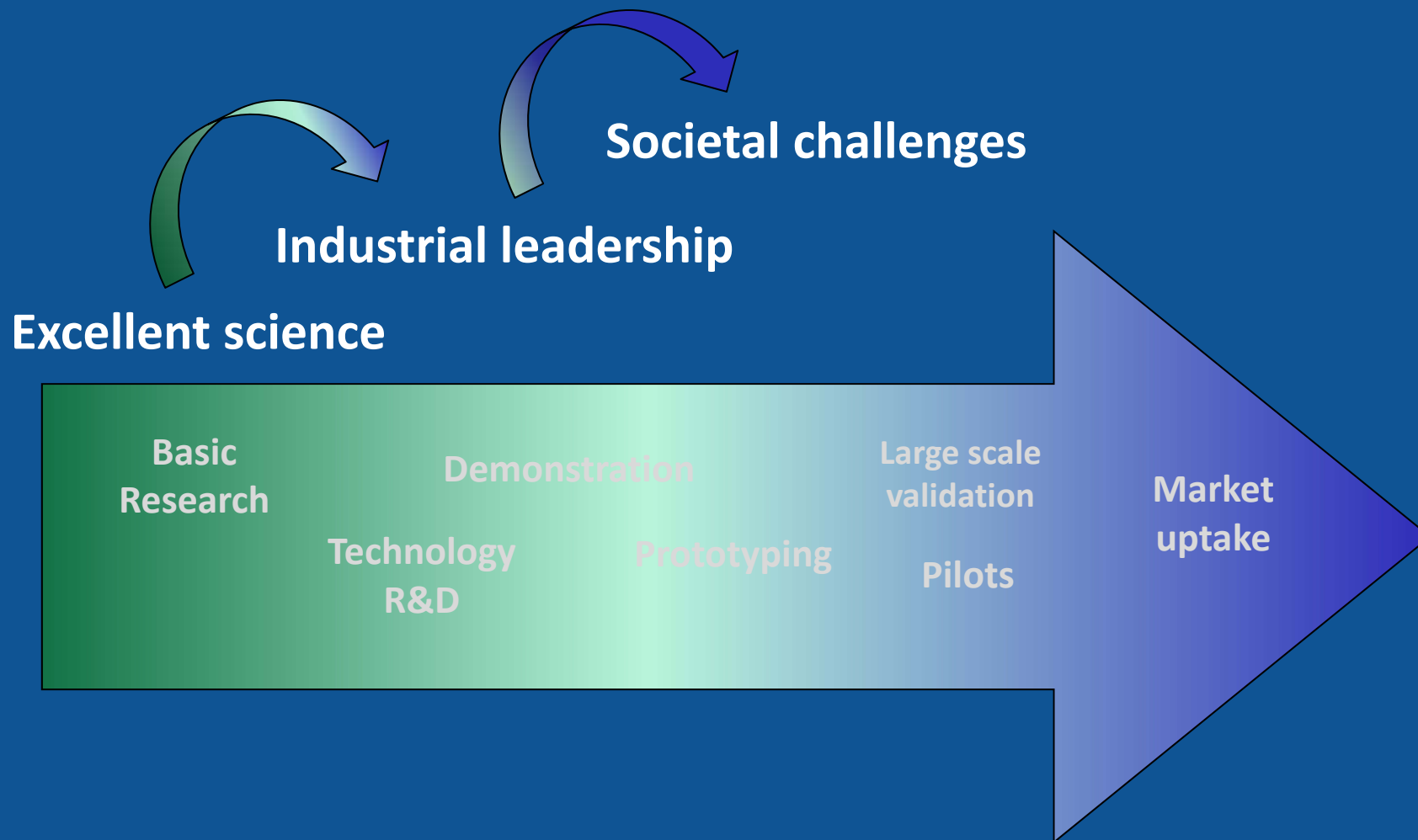
Lessons learned from 2014-15 calls…
…Changes for 2016-17

What's new?

- Increased support to **cross-cutting activities**
  - **Focus areas**

- Consolidation and strengthening of the **SME instrument**
  - **Single call** grouping all topics across the WP

- Fewer and broader topics, with higher budget per topic and overall

- Change of **innovative procurement** instruments (PCP/PPI)
  - Move from co-fund to **standard grants**
  - **Increase of funding rates** (90%/35%)

- Reinforcement of **international cooperation**

- Increased use of **inducement prizes**

- More **precision**, **focus** and **clarity** in the topic descriptions (notably the **expected impacts**)…while keeping up an open and non-prescriptive approach

European Commission

ICT in Horizon 2020

Reminder: ICT in H2020

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**

Nanotech., Materials, Manuf. & Processing **ICT**

Biotechnology

Space

Access to risk finance

Innovation in SMEs **ICT**

Societal Challenges

Health, demographic change and wellbeing **ICT**

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

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 **ICT**

Secure societies **ICT**

European Commission

Public Private Partnerships in ICT

Joint Technology Initiatives

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

Contractual PPPs

- **5G** → **700 M€** indicatively earmarked in H2020

- **Photonics** → **700 M€**

- **Robotics** → **700 M€**

- **High Performance Computing** → **700 M€**

- **Factories of the Future** (ICT part) → **450 M€**

- **Green Vehicles** (ICT part) → **80 M€**

- **Big Data** → **500 M€ (NEW!)**

European Commission

Industrial Leadership – ICT
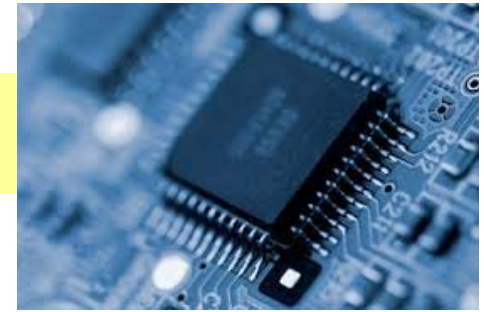
- **A new generation of components and systems:** **ECSEL JTI**
  - engineering of advanced embedded and resource efficient components and systems

- **Next generation computing:** **HPC PPP**
  - advanced and secure computing systems and technologies, including cloud computing

- **Future Internet:** **5G PPP**
  - software, hardware, infrastructures, technologies and services

- **Content technologies and information management:** **Big Data PPP**
  - ICT for digital content, cultural and creative industries

  - **Advanced interfaces and robots:** **Robotics PPP**
    - robotics and smart spaces

  - **Micro- and nanoelectronics and photonics:** **ECSEL JTI** **Photonics PPP**
    - key enabling technologies

European Commission

Components and systems / 2016-2017   84 M€

- Covers **systemic integration from smart integrated components to cyber-physical systems**

- **Complementary to the JTI Electronic Components and Systems (ECSEL)**

- **Organised in four topics:**

  - **ICT 01 – 2016: Smart cyber-physical systems → 20 M€**
    - Next generation embedded and connected systems
  - **ICT 02 – 2016: Thin, Organic and Large Area Electronics → 20 M€**
  - **ICT 03 – 2016: SSI - Smart system integration → 18.5 M€**
    - Integration of heterogeneous micro- and nanotechnologies into smart systems
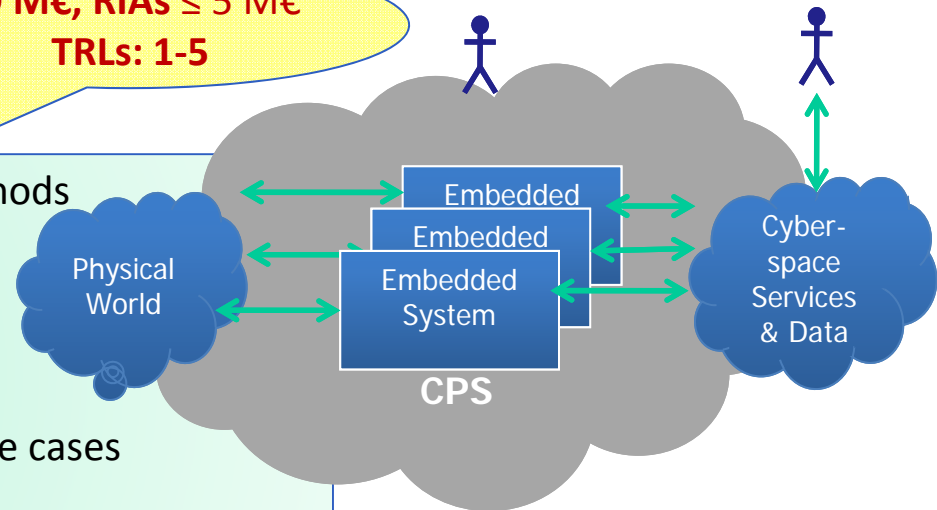 - ICT 04 – 2017: Smart Anything Everywhere initiative → 25.5 M€

European Commission
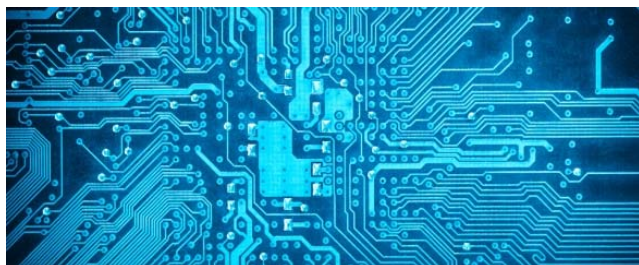
Components and systems / 2016-20157
ICT 01 – 2016: Smart cyber-physical systems (CPS)

ICT 01: 20 M€

a. Research and Innovation actions

**19 M€, RIAs $\leq$ 5 M€
TRLs: 1-5**

- New model-centric and predictive engineering methods and tools for CPS and systems of systems with a high degree of autonomy
- Adaptability, scalability, complexity management, security and safety, trust to humans in the loop
- Driven by industrial needs and validated in $\geq$ two use cases
- Integration into development environments
- Maturity: TRLs 1-4, demos up to level 5

Physical World

Embedded
Embedded
Embedded System

Cyber-space Services & Data

CPS

Stakeholders
Suppliers of CPS,
Academia, RIs,
tool providers,
system integrators,
auditors/certification bodies
users of CPS

b. Coordination and Support Actions

1 M€ for 1 CSA

- Structure CPS constituency; Update and validate CPS roadmaps ; Cooperate with European programmes (ECSEL, ITEA); Promote pre-normative activities; Build consensus on societal and legal issues related to the deployment of CPS

Opens: 20 OCT 2015
Deadline: 12 APR 2016

Cyber-Physical Systems:
http://ec.europa.eu/digital-agenda/en/cyber-physical-systems

Components and systems / 2016-20157
ICT 02 – 2016: Thin, Organic and Large Area Electronics

ICT 02: 20 M€

> 12 M€, RIAs: 2-4 M€
> 100% funding

> 8 M€, actions 2-8 M€
> 70% funding

a. Research and Innovation actions

Advancing the readiness of TOLAE technologies and/or Hybrid integration for use in applications

Focus is on:

- Advanced materials, technologies and scalable manufacturing processes
- Hybrid integration of electronics and photonics components
- Conformable / flexible or stretchable substrates

➔ *Demonstrate strong industrial and user commitment and include validation*

b. Innovation actions

- Set-up and validation of (an open access) pilot line for manufacturing hybrid systems: provide design and development services in particular for SMEs

- Demonstration of TOLAE-enabled product prototypes: prototype development and demonstration in automotive, healthcare, smart packaging and buildings

➔ *Describe business cases and exploitation strategies for the industrialisation of the pilot line or for the targeted products*

Opens: 20 OCT 2015
Deadline: 12 APR 2016

European Commission

Components and systems / 2016-20157
ICT 03 – 2016: SSI – Smart System Integration

ICT 03: 18.5 M€

17 M€, RIAs: 2-4M€
TRLs: 2-4

a. Research and Innovation actions

Challenge: To develop and manufacture smart objects and systems
→ Functional integration: Sensors, Actuators, MEMS, Processing power, Embedded memory, Communication capabilities
→ Optimise the use of supply power
Scope: Technology breakthroughs in next generation miniaturised smart integrated systems: integration of Micro- Nanoelectronics; Microfluidics; Micro- Nano- Electro Mechanics; Magnetic; Photonics; Bio-electronics, MNBS; Microwave in miniaturised, reliable, smart integrated systems

1.5 M€, CSAs: 0.5-1 M€

b. Coordination and Support actions

■ Structure industrial cooperation

■ Facilitate end-user adoption

■ Strengthen SSI ecosystems

Activities: end-user needs; Strategic R&I Agendas; measures for standardisation; networking & cooperation; project clustering; …

Opens: 20 OCT 2015
Deadline: 12 APR 2016

European Commission

Advanced Computing / 2016-2017

71 M€

- **Reinforce and expand Europe's industrial and technology strengths in low-power ICT**

- **Foster the evolution of Cloud technology to increase its uptake**

- **Complementary to the work in the Excellent Science pillar under Research Infrastructures and FET (on High Performance Computing)**

- **Organised in two topics:**
  - ICT-05-2017: Customised and low energy computing → 26 M€
  - **ICT-06-2016: Cloud Computing → 45 M€**
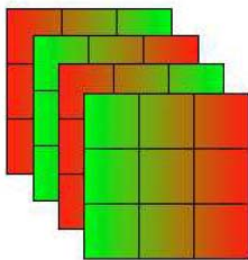
Multi core and
parallel architectures

Energy efficiency

Mixed criticality systems
and applications

Advanced Computing / 2016-2017
ICT-06-2016: Cloud Computing

ICT 06: 45 M€

Specific Challenge

- Address the evolution in cloud architectures & Increase the uptake of cloud technology by providing robust, trustworthy, and performant solutions

- Foster the provision /adoption of competitive, innovative, secure and reliable cloud computing services by SMEs and public sector organisations across Europe

35 M€, RIAs, 3-5 M€ 100% funding

10 M€, IAs, 2-4 M€ 70% funding

Scope a. New Paradigms

- Infrastructures, including the extension of the fog computing paradigm to the extreme edge of the network

- Cloud networking in the context of software-defined data centres

- Addressing trust, security and privacy in decentralised cloud infrastructures and across multiple cloud providers

- Evolution of cloud architectures to improve the management of physical resources and the efficiency of cloud systems

Scope b. Experimentation SMEs and Public Sector Innovation

- Experimentation in large-scale federated environments → solutions for interoperability and standardisation

- Cloud Computing for SMEs and Public Sector Innovation: piloting and demonstration in near-operational settings

Opens: 20 OCT 2015
Deadline: 12 APR 2016

European Commission

Future Internet / 2016-2017

- Integrated response to technology challenges and innovation needs of the future Internet

- Organised in seven topics:
  - ICT-07-2017: 5G PPP Research and Validation of critical technologies and systems → 103 M€
  - ICT-08-2017: 5G PPP Convergent Technologies → 45 M€
  - ICT-09-2017: Networking research beyond 5G → 18 M€
  - **ICT-10-2016: Software Technologies → 31 M€**
  - ICT-11-2017: Collective Awareness Platforms for Sustainability and Social Innovation → 10 M€
  - **ICT-12-2016: Net Innovation Initiative → 20 M€**
  - **ICT-13-2016: Future Internet Experimentation - Building a European experimental Infrastructure → 26 M€**

5G PPP

(148 M€)

European Commission

Future Internet / 2016-2017
ICT-10-2016: Software Technologies

ICT 10: 31 M€

Specific Challenge

- Need for programming and modelling methods, platforms and software reuse

- Convergence and interrelationship of technologies via a holistic approach in SW development that goes beyond SW production within specific application domains

**RIAs, 3-5 M€
100% funding**

Scope a. Advanced software development approaches and methodologies and / or Scope b. Seamless software architectures

- a. Novel development approaches to drastically increase development productivity and SW quality → security, reliability, performance, scalability and adaptability

- b. Innovative architectures, frameworks and platforms for evolvable, secure, context-aware and self-adaptive SW in highly connected and interoperable systems.
  Support for the development and testing of SW for distributed systems in heterogeneous environments → focus on data consistency, reliability, scalability and efficient use of resources

Opens: 20 OCT 2015
Deadline: 12 APR 2016

European Commission

Future Internet / 2016-2017
ICT-12-2016: Net Innovation Initiative

ICT 12: 20 M€

Specific Challenge

- Unlock rapid innovation via open platforms, such as FIWARE, for new services and applications

- Promote distributed architectures for big and social data management

- Transfer faster R&I outcomes to key players and ecosystems, start-ups and SMEs

Scope a. Open Service Platforms - FIWARE

15 M€, IAs, 2-6 M€ - 70% funding

- i. Take-up of FIWARE in cities and the evolution of the FIWARE platform

- ii. Ecosystem creation = building and supporting an open community of FIWARE innovators and users

- iii. FIWARE sustainability and evolution

- iv. Acceleration activities: support SMEs and startups via financial support to third parties

Scope b. Distributed Architectures

5 M€, RIAs, 2-5 M€ - 100% funding

- Design, develop and demonstrate an architecture for a decentralised, open hardware and software platform (fully distributed)

- Proposals must involve relevant technological actors as well as civil society organisations (citizens' organisations, artists, social scientists) and interested developers (creative industries, SMEs, etc.)

Scope c. Coordination and Support Actions

CSA 200 K€

- Support for collaboration and networking including the organisation of the Net Futures conference

Opens: 20 OCT 2015
Deadline: 12 APR 2016

European Commission

Future Internet / 2016-2017
ICT-13-2016: Future Internet Experimentation

ICT 13: 26 M€

a. Research and Innovation actions

i.   Federation and Brokering

One project i) building upon the federation efforts; ii)developing a sustainability and evaluation framework for selecting testbeds for federation; iii) continuing federating the experimental testbeds under FIRE+; iv) brokering between facilities and experimenters, including in particular SMEs; v) pursuing the efforts of federation in a global context

ii.   Experimental Infrastructures:

➔ Cognitive radio, dynamic spectrum sharing in licensed and unlicensed bands

➔ Service delivery networks, integrated through SDN/NFV techniques in demanding high mobility environments, e.g. connected vehicles

➔ Future Multimedia Internet (FMI) services fully integrated with broadcasting, and its impact on communication and storage infrastructures

Opens: 20 OCT 2015
Deadline: 12 APR 2016

Specific Challenge

■ A Federated Experimental Infrastructure for Future Internet Research & Experimentation (FIRE+) offering controlled and replicable conditions

■ Real-world prototyping and experimenting environments for innovation creation

25 M€, RIAs TRL: 3-7: i. 10 M€; ii. 5 M€
100% funding – cascading grants

b. Coordination and Support Actions

■ Identification, evaluation and roadmap of future needs

■ Communication, community building, impact and effectiveness stimulation and dissemination of results

CSA 1 M€

European Commission

Focus Area: Internet of Things (IoT) / 2016-17

139 M€

- Cross-cutting focus area with contributions from SC1 and SC2

- Increased support with the ambition
  to **foster the take-up of IoT in Europe and
  to enable the emergence of IoT ecosystems**
  supported by open technologies and platforms

Organised in 3 topics:

- Large scale pilots (100 M€)

  - **Smart living environment for ageing well – 20 M€**
  - **Smart farming and food security – 30 M€**
  - **Wearables for smart ecosystems – 15 M€**
  - **Reference zones in EU cities – 15 M€**
  - **Autonomous vehicles in a connected environment – 20 M€**

- IoT Horizontal activities (4 M€)

- R&I on IoT integration and platforms (35 M€)

European Commission

Internet of Things/ 2016-2017
IoT-01-2016: Large Scale Pilots

IoT 01-02: 104 M€

Specific Challenge

- Foster the deployment of IoT solutions in Europe while overcoming the following roadblocks:

- i) integration and further R & D of the most advanced technologies across the value chain;

- ii) validation of user acceptability by addressing issues of trust, attention, security and privacy;

- iii) validation of the related business models.

Scope – Large-scale pilots

100 M€, IAs 70% funding

- Targeted, goal driven initiatives that will propose IoT approaches to specific real-life industrial/societal challenges. Pilots involve supply and demand sides, and contain all the technological and innovation elements, the tasks related to the use, application and deployment as well as the development, testing and integration activities

- Use of experimental testbeds, such as FIRE, and real-world demonstrations may support IoT technologies validation before they are deployed in field trials.

IoT2 – Horizontal Activities (CSAs)

4 M€, CSAs

- a. Co-ordination of and support to the IoT Focus Area – **3 M€**

- b. RRI-SSH support to IoT – **1 M€**

Opens 20 OCT 2015
Deadline: 12 APR 2016

European Commission

Content Technologies / 2016-2017

278 M€

- Improve **access, creation, management** and **use o**f **data** and **content** through advances along the **data, content and knowledge value chains**

- Organised in eleven topics (+ one prize):
  - **Big data PPP → 153 M€**   **Big Data PPP**
    - ICT-14-2016-2017: Cross-sectorial and cross-lingual data integration and experimentation → 54 M€
    - ICT-15-2016-2017: Large scale pilots in sectors best benefitting from data-driven innovation → 50 M€
    - ICT-16-2017: Research addressing main technology challenges of the data economy → 31 M€
    - ICT-17-2016-2017: Support, industrial skills, benchmarking and evaluation → 7 M€
    - ICT-18-2016: Privacy-preserving big data technologies → 9 M€
    - *Big Data inducement prize (2 M€)*
  - **ICT-19-2017: Media and content convergence → 39 M€**
  - **ICT-20-2017: Tools for smart digital content in the creative industries → 17 M€**
  - **ICT-21-2016: Support technology transfer to the creative industries → 14 M€**
  - **ICT-22-2016:Technologies for Learning and Skills → 31 M€**
  - **ICT-23-2017: Interfaces for accessibility → 12 M€**
  - **ICT-24-2016: Gaming and gamification → 12 M€**

Big Data PPP: The Challenge

Big Data PPP

- The main objective is to roll out an **industrial strategy** to develop Europe's data driven economy as outlined in the EC Communication 'Towards a thriving data-driven economy' COM(2014)442

- The Work Programme 2016-17 implements the Big Data PPP's **Strategic Research and Innovation Agenda** (http://www.bdva.eu)

European Commission

Content technologies / 2016-2017
ICT-14-2016-2017: Cross-sectorial and cross-lingual data integration and experimentation

ICT 14: 27+27 M€

Big Data PPP

Specific Challenge

- Foster the exchange, linking and reuse of data assets

- Integrate data assets from multiple sectors across languages and formats in a safe environment for experimentations of innovative services and product ideas

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**IAs, 1-3 M€
70% funding**

**IAs, ~7 M€
70% funding**

Scope a. Data Integration

- Cross domain data integration challenges of EU industries arranged along data value chains.

- Wide range of technical issues to be tackled (i.e. data models, entity identifiers, standards, multi-lingual support, brokerage schemes, data quality, privacy, etc...)

Scope b. Data experimentation incubators

- Address big data industrial challenges in a cross-sectorial, cross-lingual and/or cross-border set-up

- Experimenters: SMEs and start-ups ≥50% of experiments defined by data providers

- The incubator will offer access to cross-sectorial, cross language data pools, computing infrastructure & open SW tools in addition to organizational, legal, IPR support

- **Min 70%: Financial Support to Third Parties (50-100 K€ each)**

2016 Call: Opens 20 OCT 2015 <u>Deadline</u>: 12 APR 2016
2017 Call: Opens 08 DEC 2016 <u>Deadline</u>: 25 APR 2017

Commission

Content technologies / 2016-2017
ICT-15-2016-2017: Large scale pilots in sectors best benefitting from data-driven innovation

ICT 15: 25+25M€

Big Data PPP

Specific Challenge → Lighthouse projects of the PPP

- Large Scale Pilot Actions in data intensive sectors involving key European industrial actors

- Aim: demonstrate how industrial sectors will be transformed by putting big data technologies at their core

- The Large Scale Pilot actions are meant to serve as best practice examples to be transferred to other sectors

**IAs, 10-15 M€
70% funding**

Scope

- Address domains of strategic importance for EU industry and carry out large scale sectorial demos

- Examples of industrial sectors : health, energy, environment, earth observation, geospatial, transport, manufacturing, finance and media, …

- Pilots should exhibit substantial visibility, mobilisation, and commercial and technological impact. Proposals must demonstrate that they have access to appropriately large, complex and realistic data sets

2016 Call: Opens 20 OCT 2015 Deadline: 12 APR 2016
2017 Call: Opens 08 DEC 2016 Deadline: 25 APR 2017

European Commission

Content technologies / 2016-2017
ICT-19-2017: Media and content convergence

ICT 19: 39 M€

Specific Challenge

■ Make the best use of technology for reaching out to new audiences, adapting to the digital era and thriving in the connected Digital Single Market

38 M€, IAs: 2-4M€, 70% funding

Scope a. Innovation actions

■ Develop immersive environments to enhance users' experience in content consumption
→ New solutions, services, technologies

■ Validated via large scale demonstrations, pilots or close-to-market prototypes

■ On

   i. Social media

   ii. Personalised user experience

   iii. Content interaction in a multiplatform scenario

   iv. Content accessibility

1 CSA, 1 M€

Scope b. Coordination and Support Actions

• Increase awareness and cooperation between policy and research on Convergence and Social Media

• Support on Convergence and Social Media activities (dissemination, research roadmap, pre-standardisation initiatives, …)

<u>Opens</u>: 10 MAY 2016
<u>Deadline</u>: 08 NOV 2016

European Commission

Content technologies / 2016-2017
ICT-22-2016: Technologies for Learning and Skills

ICT 22: 31M€

Specific Challenge

- Build an innovation ecosystem for open, more effective and efficient co-design, co-creation, and use of digital content, tools and services for personalised learning and teaching

- Allow co-creation and co-evolution of knowledge and partnerships to develop technologies empowering teachers and learners and facilitating innovation in education and training

Scope a. Innovation actions

20 M€, IAs of ~5 M€ 70% funding

- Open, interoperable components for a flexible, scalable and cost effective **cloud-based digital learning infrastructure** for K12
- Personalised, collaborative or experimental learning and skills validation
- Actions to cover:
  - Easy creation, mix and re-use of content/data/services for interactive learning
  - New learning experiences & experimentation
  - Educational support services
- Test of large pilots in several European countries

Scope b. RIA

11 M€, RIAs: ~2.5 M€, 2 years, 100% funding

- Technologies for deeper learning STEM combined with Arts
- Foundational research and/or component and system level design with pilot testing

Opens: 20 OCT 2015
Deadline: 12 APR 2016

European Commission

Content technologies / 2016-2017
ICT-17, ICT 18, ICT 21, ICT 24

ICT-17-2016-2017: Support, industrial skills, benchmarking and evaluation → 5+2 M€

2016: 1 CSA for 5 M€ → support the PPP, centres of excellence, curricula, etc.

Big Data PPP

ICT-18-2016: Privacy-preserving big data technologies → 8 M€ RIAs + 1 M€ CSA

▪ RIAs (2-4M€) on supporting protection of personal data for harvesting, sharing and querying data assets. Cross-disciplinary (legal and technical) Consortia are required

Big Data PPP

▪ 1 CSA for validating ethical and societal requirements in privacy

ICT-21-2016: Support technology transfer to the creative industries →14 M€ IAs

Very open call → IAs (0.5-1M€, 12-18 months): Stimulate ICT innovation in *creative industries SMEs* → they have a driving role. Work should respond to market demand + impact + draft business plan

ICT-24-2016: Gaming and gamification → 12 M€ IAs

Application of gaming technologies, design and aesthetics to non-leisure contexts

▪ IAs (~1 M€): Technology transfer through small scale experiments applied to non-leisure situations and scenarios for training and motivational purposes

Opens: 20 OCT 2015
Deadline: 12 APR 2016

European Commission

Robotics & Autonomous Systems (RAS) / 2016-2017 `164 M€`

- **Technology-driven** actions to keep EU at the cutting edge of research
  + market-driven actions to accelerate take-up and deployment of robot

- **Roadmap-based approach** `Robotics PPP`

- **Organised in four topics in LEIT-ICT + one topic in SC2**
  - **ICT-25-2016-2017: Advanced robot capabilities research and take-up → 64 M€**
  - **ICT-26-2016: System abilities, development and pilot installations → 42 M€**
  - ICT-27-2017: System abilities, SME & benchmarking actions, safety certification → 46 M€
  - ICT-28-2017: Robotics competition, coordination and support → 5 M€
  - SFS-05-2017: Robotics Advances for Precision Farming → 7 M€

European Commission

The Robotics PPP

EuRobotics AISBL (Private)

SPARC

EC (Public)

Industry

Academia

End-Users

Work Programme

Call implementation

http://sparc-robotics.eu/about/

SPARC
The Partnership for Robotics in Europe

Strategic Research Agenda

Strategic Research Agenda For Robotics in Europe 2014-2020

SPARC
The Partnership for Robotics in Europe

VISION GOALS

GUIDANCE HOW TO

Multi-annual Roadmap

2014-2020
Robotics2020
Multi-Annual Roadmap

Essential reading for proposers → gives definitions and examples of the selected priorities
ALL PROPOSALS TO DEMONSTRATE THEIR CONTRIBUTION TO THIS ROADMAP

Robotics and Autonomous Systems (RAS) / 2016-2017
ICT-25-2016-2017: Advanced robot capabilities research and take-up

Robotics PPP

ICT 25: 30+34 M€

15 M€, RIAs 2-4 M€ 100% funding

15 M€, IAs 2-4 M€ 70% funding

Research and Innovation actions

a. **Generic research for technical advances in robotics** open to all topics and disciplines Cross-cutting domains

b. Step changes in capabilities of high priority RAS technologies: **systems development, HRI, mechatronics, perception, navigation and cognition**

Innovation actions

c. **Improve deployment via end user-driven application development** → Areas with high market potential > TRL5 target not-only tech outputs: operating parameters & reducing commercial risks

d. End user-driven innovation actions v. market entry barriers → Address technical capability / system ability gap

2016 Call: Opens 20 OCT 2015 <u>Deadline</u>: 12 APR 2016
2017 Call: Opens 08 DEC 2016 <u>Deadline</u>: 25 APR 2017

European Commission

Robotics and Autonomous Systems / 2016-2017
ICT-26-2016: System abilities, development and pilot installations

ICT 26: 42 M€

Robotics PPP

Specific Challenge

- **Increase RAS ability levels** (configurability, adaptability, motion, manipulation, decision autonomy, perception, interaction, etc.)
- **Develop complete multiple actor robotic systems**
- Develop & disseminate **common development tools & realistic testing environments for end-users**

24 M€, RIAs
a. 2-4 M€; b. 2-7 M€
100% funding

18 M€, IAs
c. 5-8 M€; d. 7-10 M€
70% funding

Research and Innovation actions

a. **Advance SoA in smart robotic systems abilities**
Prioritised Abilities: Dependability, Social interaction, Cognitive abilities

b. **Develop user-driven multiple-actor systems**
Show robustness, different environments, autonomy, service level gains

Opens: 20 OCT 2015
Deadline: 12 APR 2016

Innovation actions

c. **System development technology**
Tool chains and system building blocks for different applications
Min 50%: Financial Support to Third Parties (50-250k€ each)

d. **Pilot installations for robot testing**
End-user driven / real world conditions / shared facility + support
Min 60%: Financial Support to Third Parties (50-150k€ each)

ICT Key Enabling Technologies / 2016-2017
ICT-29-2016: Photonics KET 2016

ICT 29: 66 M€

Photonics PPP

**40 M€, RIAs: 2-4M€
100% funding**

a. Research and Innovation actions

Major S&T and R&I progress to sustain competitiveness & leadership in market sectors where Europe is strong. Focus is on:

– **Biophotonics**: advancing imaging for in-depth disease diagnosis (after a positive screening, allowing for more effective treatment)

– Breakthrough in miniaturisation of **SSL light engines and systems** (new form factor expanding application fields)

– Pervasive high-specificity and high sensitivity **sensing for a safer environment** (e.g. monitoring of water or air quality at large scale)

Opens: 20 OCT 2015
Deadline: 12 APR 2016

**23 M€, IAs
i. 2-4 M€; ii. 6-14 M€
70% funding**

b. Innovation actions

i. Photonic devices integrated in systems: *Microdisplay-based immersive, augmented and virtual reality* **visualisation systems**

ii. **Pilot Line for Assembly and Packaging of PICs** (synergies and co-financing from other sources possible)

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3 M€, CSAs ≤ 1.5M€

c. Coordination and Support actions

i. Coordination of regional photonics strategies

ii. Photonics enhanced MakerLabs (skills enhancement via access to photonics equipment)

European Commission

Innovation and Entrepreneurship Support / 2016-2017

- Reinforce the **involvement of users** in R&D&I

- Support **digital entrepreneurship**

- Strengthen the **support to start-ups and SMEs**

- Facilitate the meeting between **investors and start-ups**

- Increase the **entrepreneurial skills**

- Organised in five topics + inducement prizes:
  - ICT-32-2017: Startup Europe for growth and Innovation Radar (12 M€)
  - ICT-33-2017: Innovation procurement networks (4 M€)
  - **ICT-34-2016: Pre-commercial procurement open (4 M€)**

  - **Open Disruptive Innovation scheme – SME instrument (126 M€)**
  - **Fast Track to Innovation (100 M€ - for all fields of LEIT and SCs)**
  - **ICT Horizon prizes (10 M€)**

256+ M€

European Commission

Innovation and Entrepreneurship / 2016-2017
Open Disruptive Innovation – SME Instrument

ODI-SME: 60+66 M€

Specific Challenge

- Provide support to a large set of high-risk innovative Start-ups and SMEs in the ICT sector.

- Focus is on companies proposing disruptive ICT concepts, products and services applying new sets of rules, values and models which ultimately create new markets (e.g. by tackling non consumption) or disrupt existing markets

Scope

- Proposed projects should have a potential for disruptive innovation and fast market up-take. The action is particularly well suited for start-up and young innovative SMEs that are looking for swift support to their innovative ideas.

- **Phase 1**: Concept and feasibility assessment
  lump sum of 50 K€ per project for ~6 months project durations

- **Phase 2**: R&D, demonstration, market replication (70% funding)
  0.5 to 2.5 M€ per project for 1 to 2 years; **Must include a first commercialisation plan**

- **Phase 3**: via the Debt Facility (EIB/EIF)

Continuous Open Call with cut-off dates:
SME-Phase 1: 24 Feb, 03 May, 07 Sep, 09 Nov 2016
SME-Phase 2: 03 Feb, 14 Apr, 15 Jun, 13 Oct 2016

European Commission

Open Disruptive Innovation – SME Instrument Statistics and lessons learnt from the 2014-15 calls

- 2,029 proposals under Phase 1 by the second cut-off date of 2015 on 17 June

- 342 received an evaluation score above the application threshold

- 128 or 37,4 % of those with above threshold score have been selected for funding (6,3% of total)

- 142 SMEs from 23 countries have been selected

- Italy with 35 beneficiaries accepted for funding, followed by firms from Spain (29) and the UK (22)

- Since the launch of the programme on 1/1/2014, 958 SMEs have been selected under Phase 1

What NOT to do: most of the non-selected proposals were

1. Too much focused on the project and not enough on the business opportunity

2. Not convincing when describing the company
   (you have to explain why your company will succeed and not your competitor)

3. Not providing enough information on competing solutions

4. Having a too low level of innovation, planning to develop a product that already exists on the market

5. Proposing just an idea without any concept for its commercialisation

6. Just trying their luck (the SME Instrument is not a lottery!)

European Commission

Responsibility and Creativity / 2016-2017

- **For innovation to happen skills are needed such as creativity, and the capacity to involve all of society in the process.**

- **Cross-cutting activities aiming at supporting the nexus between technology, social sciences, humanities and arts.**

- **Engage with social scientists and humanists on the development of responsible research and innovation agendas that meet citizens' civil society's concerns and expectations.**

- **Engage with artists, in order to include them in innovation processes to foster creativity and help enhance user acceptance.**

- **Organised in two topics:**
  - **ICT-35-2016: Enabling responsible ICT-related research and innovation RIAs from 300K€ – 2M€ (for a total 7 M€)**
  - **ICT-36-2016: Boosting synergies between artists, creative people and technologists – IAs 3M€ and CSA 4M€ (for a total 8 M€)**

15 M€

European Commission

International cooperation

40.8 M€

- **International partnership building in low and middle income countries (13,8 M€) / Target: sub-Saharan Africa and ASEAN**

- **Coordinated calls**
  - **EU-Brazil (7 M€) 2 topics: Cloud Computing – IoT Pilots**
  - **EU-Japan (7 M€) 3 topics: 5G – IoT/Cloud/Big Data platforms – FIRE / ICN**
  - **EU-South Korea (6 M€) 3 topics: 5G – IoT – Federated cloud**
  - **Cooperation with Taiwan in 5G PPP topic on Convergent Technologies (5 M€)**

- **Other international cooperation activities**
  - **China: Collaboration on Future Internet (1 M€)**
  - **Mexico: Collaboration on ICT (with a focus on FIWARE) (1 M€)**

European Commission

ICT for the Factories of the Future / 2016-2017 116 M€

- Part of the **'Industry 2020 in the Circular Economy'** cross-cutting focus area

- Focus on **ICT components of innovative production systems in all sectors** (for a more personalised, diversified and mass-produced product portfolio and for rapid and flexible reaction to market changes)

- Implementation of the **FoF PPP**   FoF PPP

- Organised in three topics:

  - **FOF-11-2016: Digital automation → 53 M€**

  - **FOF-12-ICT Innovation for Manufacturing SMEs (I4MS) → 33 M€**

  - **FOF-13-2016: Photonics laser-based production → 30 M€**

European Commission

ICT for the Factories of the Future / 2016-2017
FOF-11-2016: Digital automation

FoF 11: 53 M€

FoF PPP

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a. Research and Innovation actions

51 M€, RIAs, TRL: 3-5
1. ≤ 8 M€; 2. ≤ 4 M€
100% funding

1. **Collaborative manufacturing and logistics**

   → develop the "operating system" of the connected factory of the future: real-time architectures for interoperability; management of big data; ICT security, knowledge protection, and trust in collaborative infrastructures.

   → pilots on business and system level

2. **Novel architectures for factory automation (based on CPS and IoT):**

   → novel decentralised, modular, scalable responsive automation architectures for discrete factories
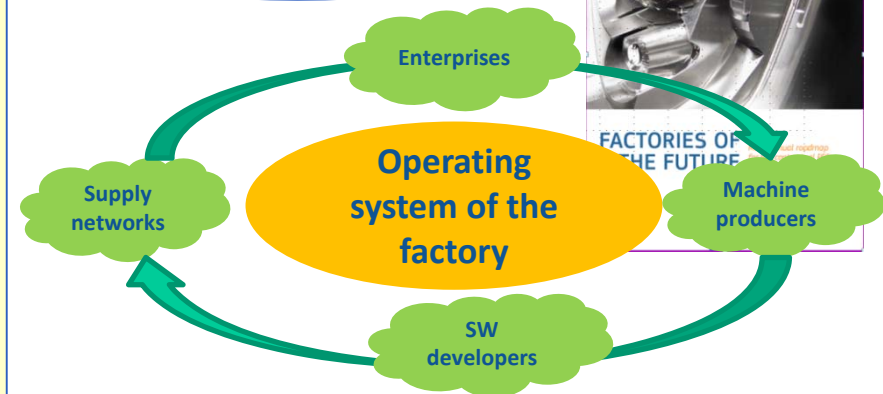
   → develop reference implementations of platforms in a multi-sided market ecosystem; User-driven proof-of-concept demonstrations and validation in several different scenarios: e.g. through testbeds

   → provide an outline business case and industrial exploitation strategy

Opens: 15 OCT 2015
Deadline: 21 JAN 2016

Enterprises

Supply networks

Operating system of the factory

Machine producers

SW developers

FACTORIES OF THE FUTURE

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2 M€, CSAs
100% funding

c. Coordination and Support Actions

support industrial consensus building both with suppliers and users across Europe, addressing future factory automation systems built on CPS and the IoT

European Commission

ICT for the Factories of the Future / 2016-2017
FOF-13-2016: Photonics laser-based production

FoF 13: 30 M€

Photonics PPP

TOWARDS 2020 – PHOTONICS DRIVING ECONOMIC GROWTH IN EUROPE

Multiannual Strategic Roadmap 2014 - 2020

PHOTONICS21

15 M€, RIAs 2-4 M€
100% funding

a. Research and Innovation actions

■ "From design to piece" – **Excellence in laser-based industrial additive manufacturing (AM)**

➔ (3D printing) of <u>metallic materials</u>: all process chain steps may be addressed

➔ significantly improve the overall performance in terms of speed and costs whilst producing high quality work pieces: address at least two important steps and the links between them

Other dimensions to consider: standardisation; be driven by concrete business cases; include outline of business case and industrial exploitation strategy; cover the value chain

15 M€, IAs 2-4 M€
70% funding

b. Innovation Actions

■ **Rapid individualised laser-based production**
Development and set-up of highly flexible high throughput pilot facilities on the basis of existing laser-based production processes
➔ Validation in real settings
➔ Advances needed in a number of aspects
➔ Must be Industry driven and include the key stakeholders running the pilot facility
➔ Provide outline business case and industrial exploitation strategy
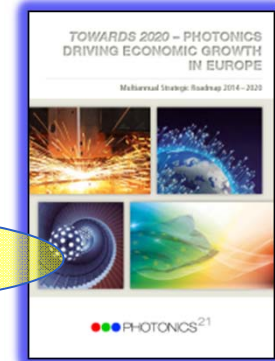
<u>Opens</u>: 15 OCT 2015
<u>Deadline</u>: 21 JAN 2016

European Commission

Reminder: ICT in H2020

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**

  Nanotech., Materials, Manuf. & Processi **ICT**

  Biotechnology

  Space

Access to risk finance

Innovation in SMEs **ICT**

Societal Challenges

1. Health, demographic change and wellbeing **ICT**

2. Food security, sustainable agriculture, and the bio-based economy **ICT**

3. Secure, clean and efficient energy **ICT**

4. Smart, green and integrated transport **ICT**

5. Climate action, resource efficiency, and raw materials **ICT**

6. Inclusive, innovative and reflective societies **ICT**

7. Secure societies **ICT**

HORIZON 2020

European Commission

Societal Challenges

1. **Health, demographic change and wellbeing**

2. **Food security, sustainable agriculture, and forestry, marine, maritime and inland water research, and the bio-economy**

3. **Secure, clean and efficient energy**

4. **Smart, green and integrated transport**

5. **Climate action, environment, resource efficiency and raw materials**

6. **Europe in a changing world – inclusive, innovative and reflective societies**

7. **Secure societies – protecting freedom and security of Europe and its citizens**

Key principles:

- **Interoperability**
- **Breakthroughs**
- **Re-use and economies of scale**
- **Market deployment**

European Commission

Links to policy initiatives

- **eHealth**
  - eHealth action plan 2012-2020
- **Silver Economy**

- **Digital Single Market**
  - Privacy & Cybersecurity
  - New eGovernment action plan
- **Smart Cities and Communities EIP**

- **Strategic Energy Technology (SET) Plan**

- **ICT contribution to EU2020 20/20/20 objectives**

European Commission

Approach to WP2016-17

- **Stronger integration of ICT with other disciplines within SC calls**
  - **Joint calls**
  - **Multidisciplinarity**

- **Increased support to activities cutting across SCs and LEIT-ICT**
  - **Focus areas**
    - **Internet of Things**
    - **Digital Security**
  - **Other cross-cutting topics**
    - **Big Data supporting Public Health policies (SC1)**
    - **Policy-making in the age of Big Data (SC6)**

- **Consolidation and strengthening of the SME instrument**

What's new?

European Commission

Health, demographic change and wellbeing / 2016-2017

- **Continuity with WP2014-15, FP7 and CIP**
  - **Active and healthy ageing**
  - **Personalization of healthcare and patient empowerment**

- **Contribution to other major WP initiatives in ICT**
  - **Digital Security / IoT / Big Data**

- **Introduction of specific SME-instrument topic**

- **Innovative public procurement actions**

- **International cooperation with US and Japan**

- **Contribution to the AAL programme**

European Commission

Health, demographic change and wellbeing / 2016-2017

One single call: Personalized Medicine (114,5 M€)

■ **Active ageing and self-management of health (58,5 M€)**

– **PCP - eHealth innovation in empowering the hospitalised patient (18 M€)**
– **PPI for deployment and scaling up of ICT solutions for active and healthy ageing (10,5 M€)**
– **EU-Japan cooperation on novel ICT Robotics based solutions for active and healthy ageing at home or in care facilities (5 M€)**
– Personalised coaching for well-being of older persons (25 M€) - 2017

■ **Methods and data (56 M€)**

– In-silico trials for developing and assessing biomedical products (19 M€) - 2017
– Personalised computer models and in-silico systems for well-being (19 M€) - 2017
– **Big Data supporting Public Health policies (10 M€)**
– PPI for uptake of standards for the exchange of digitalised healthcare records (8 M€) - 2017

■ **Coordination activities (9,5 M€)**

<u>Opens</u>: 20 OCT 2015
<u>Deadline</u>: 16 FEB 2016 except EU-Japan: 19 JAN 2016

European Commission

Food security and sustainable use of natural resources 2016-2017

- **Contribution from LEIT-ICT to the focus area 'Sustainable Food Security – Resilient and resource-efficient value chains'**
  - Robot-based precision farming (7 M€) - 2017

- **Contribution from SC2 to the IoT focus area**
  - Large-scale pilot on 'Smart farming and food security' (30 M€)

Opens: 20 OCT 2015
Deadline: 12 APR 2016

European Commission

Energy / 2016-2017

■ **Continuity with WP2014-15**
...with a stronger emphasis on

    –   security and affordability of energy from supply to demand
    –   integration and optimisation of the energy system

■ **Contribution of ICT**

    –   **Energy-efficiency**
    –   **Smart distribution grids**
    –   **Smart cities and communities**

European Commission

Energy / 2016-2017

Three calls (all focus areas)

1. **Energy-efficiency (194 M€ overall)**

   – **Behavioural change toward energy efficiency through ICT**

   Opens: 15 OCT 2015 Deadline: 21 JAN 2016

   – Bringing to market more energy efficient and integrated data centres

2. **Competitive low-carbon energy (725 M€ overall)**

   – **Smart grids, storage and energy system integration technologies
   (4 topics – 182 M€)** Opens: 8 DEC 2015 Deadline: 05 APR 2016

   – Tools and technologies for coordination and integration of the European energy system (28 M€)

3. **Smart cities and communities (231 M€ overall)**

   – **part of smart and sustainable cities cross-cutting focus area
   Smart Cities and Communities lighthouse projects (131,5 M€)**

European Commission

Smart and Sustainable Cities / 2016
SCC-1-2016: Lighthouse Projects

SCC-1-2016: 60 M€

Specific Challenge

Demonstrate solutions at district scale integrating smart homes, smart grids (electricity, district heating, telecom, water, etc.), energy storage, electric vehicles and smart charging infrastructures.

Scope – Lighthouse Projects

IAs, 70% funding

- A city can be funded as a lighthouse city only once under Horizon2020
- Technologies should exist already or be very near-to-market (TRL >7)
- Follower cities have not yet acquired the full technical competence to become a lighthouse city
- Address a well-balanced combination of smart homes, smart energy and ICT, and electric vehicles
- Each project must:
    - Be realised in 3 new lighthouse cities that are situated in different countries (MS or AC)
    - Involve at least 3 follower cities from at least 3 different countries (that are different from the countries of the lighthouse cities of the project).
- Each lighthouse city must have Sustainable Energy Action Plan (SEAP), positively evaluated by the Covenant of Mayors

Opens 08 DEC 2015
Deadline: 05 APR 2016

European Commission

Transport / 2016-2017

- **Automation of road transport as a priority**

- **Contribution of ICT**
  - **Automated road transport**
  - **Intelligent Transport Systems**
  - **Logistics**
  - **Green vehicle**

European Commission
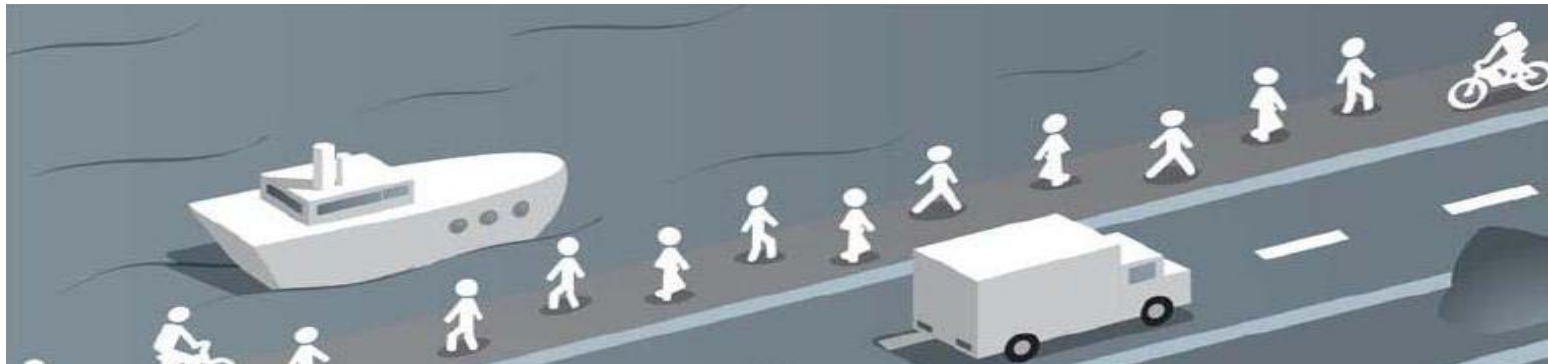
Transport / 2016-2017

Three calls

1. **Mobility for growth (436 M€ overall)**
   - Innovative ICT solutions for future logistics operations - 2017
   - **Intelligent Transport Systems (3 topics)**
   - Increasing the take up and scale-up of innovative solutions to achieve sustainable mobility in urban areas - 2017

2. **Automated road transport (114 M€ overall)**
   - ICT infrastructure to enable the transition towards road transport automation - 2017

3. **European green vehicle initiative (206 M€ overall)**
   - Demonstration (pilots) for integration of electrified L-category vehicles in the urban transport system - 2017

Opens: 15 OCT 2015
Deadline: Stage 1: 20 JAN 2016 – Stage 2: 29 SEP 2016

European Commission

Climate and environment / 2016-2017

- **Priority to R&I activities taking a systemic approach**
  - Circular economy / Climate services / Nature-based solutions / Raw materials
- **+ Other priorities in 2016-17:**

  Earth observation / Water / Cultural heritage / The Arctic
- **One generic SC5 call + contributions to three focus areas**
  1. **Industry 2020 in the circular economy**
  2. **Blue growth**
  3. **Smart and sustainable cities**
- **Opportunities for ICT contributions**
  - Water management
  - Climate and water resilience in cities
  - Business models for the circular economy
  - European data hub for the GEOSS information system

European Commission

Inclusive, innovative and reflective societies / 2016-2017

- **Three priorities:**

  1. **Co-creation for growth and inclusion**
  2. **Reversing inequalities and promoting fairness**
  3. **Understanding Europe**

- **Four calls:**

1. **Co-creation for growth and inclusion (ICT: 30,5 M€)**

2. **Reversing inequalities and promoting fairness (ICT: 4 M€)**

3. **Understanding Europe (ICT: 35,5 M€)**

   - **Virtual museums and social platforms, … (11 M€)**
   - **European cultural heritage (9 M€)**
   - **Understanding the transformation of European public administrations (15,5 M€)**

4. **Engaging together globally**

European Commission

Security / 2016-2017

- Integration of physical and cyber-security activities in a joint call on critical infrastructure protection

- Focus area on Digital Security with contributions from LEIT-ICT and SC1

- Joint SME topic

Five calls

1. Digital Security focus area

2. Critical infrastructure protection

3. Disaster resilience

4. Fight against crime and terrorism

5. Border security and external security

European Commission

Security / 2016-2017

- **Digital Security focus area (118 M€)**
  - **Assurance and Certification for Trustworthy and Secure ICT systems, services and components (LEIT-ICT) (23,5 M€)**
  - **Cyber Security for SMEs, local public administration and Individuals (22 M€)**
  - **Increasing digital security of health related data on a systemic level (11 M€)**
  - **Economics of Cybersecurity (4 M€)**
  - **EU Cooperation and International Dialogues in Cybersecurity and Privacy Research and Innovation (3 M€)**
  - Cryptography (LEIT-ICT) (18,5 M€) - 2017
  - Addressing Advanced Cyber Security Threats and Threat Actors (18 M€) – 2017
  - Privacy and Data Protection (18 M€) - 2017

- **Critical infrastructure protection (40 M€)**   Opens: 15 MAR 16 – Deadline: 25 AUG 16
  - **Prevention, detection, response and mitigation of the combination of physical and cyber threats to the critical infrastructure of Europe (40 M€)**

European Commission

Guide to ICT-related activities in WP2016-17

- **Comprehensive coverage of the three H2020 pillars**

- **Detailed list of calls and topics**

- **Available on H2020 website**

**All WP texts available online
(H2020 Participant Portal):**

http://ec.europa.eu/research/participants/portal/desktop/en/funding/reference_docs.html#h2020-work-programmes-2016-17
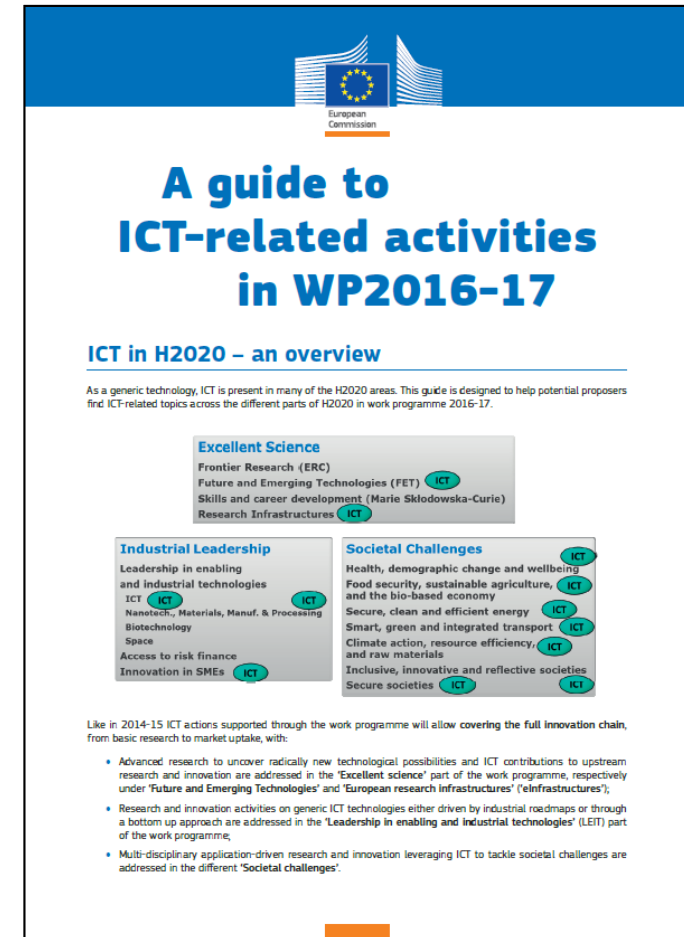
Find out more

■ **Horizon2020 web site**

  ✓ http://ec.europa.eu/programmes/horizon2020

■ **Participants portal**

  ✓ http://ec.europa.eu/research/participants/portal

■ **H2020 Helpdesk**, including FAQ

  ✓ http://ec.europa.eu/research/index.cfm?pg=enquiries

■ **National Contact Points**

  ✓ http://ec.europa.eu/research/participants/portal/desktop/en/support/national_contact_points.html

European Commission