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.

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'**, **'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.

The following sections provide more details on the ICT-related activities in the different parts.

The detailed description of the topics can be found in the relevant sections of the work programme with the reference provided in this document.

Note that ICT is also addressed by the **European Research Council (ERC)** and the **Marie Skłodowska-Curie actions**, which are not covered in this document.

ICT in 'Excellent science'

1. Future and Emerging Technologies (FET)

FET Open: fostering novel ideas

FET Open, which will represent 40% of the overall FET budget in Horizon 2020, is entirely non-prescriptive with regards to the nature or purpose of the technologies that are envisaged. FET Open covers all technological areas and no budget is earmarked for ICT in FET Open.

FET Proactive: nurturing emerging themes and communities

ICT specifically concerns one of the three main FET proactive initiatives: **"Toward exascale high performance computing"**. This initiative implements part of the High Performance Computing research strategy by the HPC public-private partnership and comprises the three following topics:

- FETHPC 1 - 2014: HPC Core Technologies, Programming Environments and Algorithms for Extreme Parallelism and Extreme Data Applications
- FETHPC 2 - 2014: HPC Ecosystem Development

ICT is also covered in the two other proactive initiatives (addressed in one single call for proposals):

- FETPROACT 1 – 2014: Global Systems Science (GSS),
- FETPROACT 2 – 2014: Knowing, doing, being: cognition beyond problem solving,
- FETPROACT 3 – 2014: Quantum simulation.

FET Flagships: pursuing grand interdisciplinary science and technology challenges

Two flagship initiatives will be further developed and supported:

- the Graphene flagship,
- the Human Brain Project (HBP).

Both Flagships strengthens the interfaces between ICT and other disciplines, most notably material science and neuroscience.

2. Research infrastructures

Development, deployment and operation of ICT-based e-infrastructures

ICT e-infrastructures cover the following main priorities:

- development and integration of ICT infrastructure resources and services for research,
- access to and management of research data,
- implementation of the e-infrastructure part of the EU strategy on high-performance computing.

e-infrastructure is covered in a dedicated call (**'e-Infrastructures'** (EINFRA)) with the nine following topics:

- EINFRA 1-2014 – Managing, preserving and computing with big research data
- EINFRA 2-2014 – e-Infrastructure for Open Access
- EINFRA 3-2014 – Towards global data e-infrastructures – Research Data Alliance
- EINFRA 4-2014 – Pan-European High Performance Computing infrastructure and services
- EINFRA 5-2015 – Centres of Excellence for computing applications
- EINFRA 6-2014 – Network of HPC Competence Centres for SMEs
- EINFRA 7-2014 – Provision of core services across e-infrastructures
- EINFRA 8-2015 - Research and Education Networking – GÉANT
- EINFRA 9-2015 – e-Infrastructures for virtual research environments (VRE)

In addition to eInfrastructures, ICT is also covered in the following topic:

- INFRAIA 1-2014/2015: Integrating and opening existing national and regional research infrastructures of pan-European interest

ICT in 'Leadership in Enabling and Industrial Technologies'

This part covers the following ICT technological areas:

1. A new generation of components and system,
2. Advanced Computing,
3. Future Internet,
4. Content technologies and information management,
5. Robotics,
6. Micro- and nano-electronic technologies, Photonics.

The work programme also includes cross-cutting, horizontal and international activities.

Furthermore ICT topics are covered in the call for the factories of the future, which spans both the 'ICT' and the 'Nanotechnologies, Advanced Materials, Biotechnology and Advanced Manufacturing and Processing'.

The complete list of all ICT topics in LEIT WP 2014-15 is given below:

- A new generation of components and systems

- ICT 1 – 2014: Smart Cyber-Physical Systems
- ICT 2 – 2014: Smart System Integration
- ICT 3 – 2014: Advanced Thin, Organic and Large Area Electronics (TOLAE) technologies

- Advanced Computing

- ICT 4 – 2015: Customised and low power computing

- Future Internet

- ICT 5 – 2014: Smart Networks and novel Internet Architectures
- ICT 6 – 2014: Smart optical and wireless network technologies
- ICT 7 – 2014: Advanced Cloud Infrastructures and Services
- ICT 8 – 2015: Boosting public sector productivity and innovation through cloud computing services
- ICT 9 – 2014: Tools and Methods for Software Development
- ICT 10 – 2015: Collective Awareness Platforms for Sustainability and Social Innovation
- ICT 11 – 2014: FIRE+ (Future Internet Research & Experimentation)
- ICT 12 – 2015: More experimentation for the Future Internet
- ICT 13 – 2014: Web Entrepreneurship
- ICT 14 – 2014: Advanced 5G Network Infrastructure for the Future Internet

- Content technologies and information management

- ICT 15 – 2014: Big data Innovation and take-up
- ICT 16 – 2015: Big data - research
- ICT 17 – 2014: Cracking the language barrier
- ICT 18 – 2014: Support the growth of ICT innovative Creative Industries SMEs
- ICT 19 – 2015: Technologies for creative industries, social media and convergence
- ICT 20 – 2015: Technologies for better human learning and teaching
- ICT 21 – 2014: Advanced digital gaming/gamification technologies
- ICT 22 – 2014: Multimodal and Natural computer interaction

- Robotics

- ICT 23 – 2014: Robotics
- ICT 24 – 2015: Robotics

- Micro- and nano-electronic technologies, Photonics

- ICT 25 – 2015: Generic micro- and nano-electronic technologies
- ICT 26 – 2014: Photonics KET
- ICT 27 – 2015: Photonics KET
- ICT 28 – 2015: Cross-cutting ICT KETs
- ICT 29 – 2014: Development of novel materials and systems for OLED lighting

- ICT Cross-Cutting Activities

- ICT 30 – 2015: Internet of Things and Platforms for Connected Smart Objects
- ICT 31 – 2014: Human-centric Digital Age
- ICT 32 – 2014: Cybersecurity, Trustworthy ICT
- ICT 33 – 2014: Trans-national co-operation among National Contact Points

- Horizontal ICT Innovation actions

- ICT 34 – 2015: Support for access to finance
- ICT 35 – 2014: Innovation and Entrepreneurship Support
- ICT 36 – 2015Pre-commercial procurement open to all areas of public interest requiring new ICT solutions
- ICT 37 - 2014-15: Open Disruptive Innovation Scheme (implemented through the SME instrument)

- Fast track to Innovation – pilot

- Fast track to Innovation – ICT topic

- International Cooperation actions

- ICT 38 – 2015: International partnership building and support to dialogues with high income countries
- ICT 39 – 2015: International partnership building in low and middle income countries

- EU-Brazil Research and Development Cooperation in Advanced Cyber Infrastructure

- EUB 1 – 2015: Cloud Computing, including security aspects
- EUB 2 – 2015: High Performance Computing (HPC)
- EUB 3 – 2015: Experimental Platforms

- EU-Japan Research and Development Cooperation in Net Futures

- EUJ 1 – 2014: Technologies combining big data, internet of things in the cloud
- EUJ 2 – 2014: Optical communications
- EUJ 3 – 2014: Access networks for densely located users
- EUJ 4 – 2014: Experimentation and development on federated Japan – EU testbeds

- Factories of the Future

- FoF 1 – 2014: Process optimisation of manufacturing assets
- FoF 8 – 2015: ICT-enabled modelling, simulation, analytics and forecasting technologies
- FoF 9 – 2015: ICT Innovation for Manufacturing SMEs (I4MS)

ICT in 'Societal challenges'

Important ICT contributions are expected in six out of the seven societal challenges in Horizon 2020:

- SC1: Health, demographic change and wellbeing,
- SC3: Secure, clean and efficient energy,
- SC4: Smart, green and integrated transport,
- SC5: Climate action, environment, resource efficiency and raw materials,
- SC6: Europe in a changing world – Innovative, inclusive and reflective societies,
- SC7: Secure societies – Protecting freedom and security of Europe and its citizens.

ICT is in the societal challenges work programmes for 2014-15 addressed through either specific topics or calls or as part of a broader set of contributing technologies in the description of the targeted activities.

SC1 - Health, demographic change and wellbeing

ICT, which does have a prominent role in this societal challenge, is addressed in dedicated topics in the two calls in the challenge **"Personalising health and care" (PHC)** and the call on co-ordination activities (HCO).

ICT is contributing to the three following areas of the main call of SC1:

- **Advancing active and healthy ageing**, with three out of the four proposed topics:
  - PHC 19 – 2014: Advancing active and healthy ageing with ICT: Service robotics within assisted living environments
  - PHC 20 – 2014: Advancing active and healthy ageing with ICT: ICT solutions for independent living with cognitive impairment
  - PHC 21 – 2015: Advancing active and healthy ageing with ICT: Early risk detection and intervention
- **Integrated, sustainable, citizen-centred care**, with six out of eight topics:
  - PHC 25 – 2015: Advanced ICT systems and services for Integrated Care
  - PHC 26 – 2014: Self-management of health and disease: citizen engagement and mHealth
  - PHC 27 – 2015: Self-management of health and disease and patient empowerment supported by ICT
  - PHC 28 – 2015: Self-management of health and disease and decision support systems based on predictive computer modelling used by the patient him or herself
  - PHC 29 – 2015: Public procurement of innovative eHealth services
- **Improving health information, data exploitation and providing an evidence base for health policies and regulation**, with two out of six topics:
  - PHC 30 – 2015: Digital representation of health data to improve disease diagnosis and treatment
  - PHC 34 – 2014: eHealth interoperability

In addition to the above, coordination and support actions are foreseen with the two following topics:

- HCO 1 – 2014: Innovation Partnership: Support for the European Innovation Partnership on Active and Healthy Ageing
- HCO 2 – 2014: Joint Programming: Coordination Action for the Joint Programming Initiative (JPI) "More Years, Better Lives - the Challenges and Opportunities of Demographic Change"

SC3 - Secure, clean and efficient energy

ICT is present in the three calls, with a particularly prominent role in the third one (i.e. SCC).

- 'Energy Efficiency' (EE),
- 'Competitive Low-Carbon Energy' (LCE),
- 'Smart Cities and Communities' (SCC).

In the **'Energy Efficiency'** call, ICT appears in the activities focused on **buildings and consumers** in the following topics:

- EE 8 – 2014: Public procurement of innovative sustainable energy solutions, where the scope includes the support to public authorities in procuring fast-evolving information and communication technologies such as Green Data Centres
- EE 11 - New ICT-based solutions for energy efficiency.

In the **'Competitive Low-Carbon Energy'** call, ICT appears in one topic of the activities grouped under the title **'Modernising the European electricity grid'**:

- LCE 7 – 2015: Distribution grid and retail market, where the scope takes into account the contribution of ICT infrastructure to smart grids and smart metering.

The call on **'Smart Cities and Communities'** explicitly addresses solutions combining technologies from the energy, transport and ICT domains to address the issue of sustainable development in urban areas.

- SCC 1 – 2014/2015: Smart Cities and Communities solutions integrating energy, transport, ICT sectors through lighthouse (large scale demonstration - first of the kind) projects, which represents by far the main part of this call
- SCC 2 – 2014: Developing a framework for common, transparent data collection and performance measurement to allow comparability and replication between solutions and best-practice identification
- SCC 3 – 2015: Development of system standards for smart cities and communities solutions
- SCC 4 – 2014: Establishing networks of public procurers in local administrations on smart city solutions
- SCC 5 – 2014: Establishing a challenge prize competition: Smart solutions for creating better cities and communities

SC4 - Smart, green and integrated transport

Three calls are planned in 2014-15 for this challenge:

- 'Mobility for Growth' (MG), which actually constitutes the main call,
- 'Green vehicles' (GV),
- 'Small Business and Fast Track Innovation for Transport' (IT).

In the **'Mobility for Growth'** call, ICT is expected to contribute to four of the nine targeted areas:

- Road transport, with two dedicated topics:

- MG.3.5-2014 Cooperative ITS for safe, congestion-free and sustainable mobility
- MG.3.6-2015 Safe and connected automation in road transport

- Urban mobility, where ICT can play a role in the following topic:

- MG.5.3-2014 Tackling urban road congestion

- Logistics, with the following topic clearly requiring contribution from ICT:

- MG.6.3-2015 Common communication and navigation platforms for pan-European logistics applications

- Intelligent Transport Systems, with the two following topics also clearly requiring contribution from ICT:

- MG.7.1-2014 Connectivity and information sharing for intelligent mobility
- MG.7.2-2014 Towards seamless mobility addressing fragmentation in ITS deployment in Europe

In the **'Green Vehicles'** call, ICT is concerned by the following topic:

- GV.8-2015 Electric vehicles' enhanced performance and integration into the transport system and the grid, which notably addresses the integration of the overall cycle of electric vehicles' (EV) energy management into a comprehensive EV battery and ICT-based re-charging system management.

SC5 - Climate action, environment, resource efficiency and raw materials

ICT is expected to contribute to the activities foreseen in two calls:

- 'Waste: A Resource to Recycle, Reuse and Recover Raw Materials' (WASTE),
- 'Water Innovation: Boosting its value for Europe' (WATER),

The contribution in **waste management** is in four topics, for which ICT solutions are part of the scope:

- WASTE-1-2014: Moving towards a circular economy through industrial symbiosis
- WASTE-2-2014: A systems approach for the reduction, recycling and reuse of food waste
- WASTE-3-2014: Recycling of raw materials from products and buildings
- WASTE-4-2014/2015: Towards near-zero waste at European and global level

In the area of **water management**, the contribution of ICT is expected in the following topic:

- WATER-1-2014/2015: Bridging the gap: from innovative water solutions to market replication

SC6 - Europe in a changing world - Innovative, inclusive and reflective societies

ICT is contributing mostly with specific topics in four out of the five calls of this challenge:

- 'Reflective societies: cultural heritage and European identities' (REFLECTIVE),
- Overcoming the Crisis: New Ideas, Strategies and Governance Structures for Europe (EURO),
- The Young Generation in an Innovative, Inclusive and Sustainable Europe (YOUNG),
- 'New forms of innovation' (INSO),

In 'Reflective societies: cultural heritage and European identities', two topics deal with the use of ICT for the access to and the exploitation of cultural assets:

- REFLECTIVE 6 – 2015: Innovation ecosystems of digital cultural assets
- REFLECTIVE 7 – 2014: Advanced 3D modelling for accessing and understanding European cultural assets

In the three other calls, three topics address the role of ICT in modernising the public sector:

- EURO-6-2015: Meeting new societal needs by using emerging technologies in the public sector
- YOUNG-5–2014: Societal and political engagement of young people and their perspectives on Europe
- INSO-1–2014, 2015: ICT-enabled open government
- INSO-9–2014: Innovative mobile e-government applications by SMEs

It is also proposed to have a coordination and support action in the area of ICT for learning and inclusion:

- INSO-6-2014: Platform for ICT for Learning and Inclusion

SC7 - Secure societies – Protecting freedom and security of Europe and its citizens

In this challenge, one out of the four calls is dedicated to ICT: 'Digital Security: Cybersecurity, Privacy and Trust' (DS). This call comprises the six following topics:

- DS 1 – 2014: Privacy
- DS 2 – 2014: Access Control
- DS 3 – 2015: The role of ICT in Critical Infrastructure Protection
- DS 4 – 2015: Secure Information Sharing
- DS 5 – 2015: Trust eServices
- DS 6 – 2014: Risk management and assurance models