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 7th 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

- Excellent science
- Industrial leadership
- Societal challenges
Coverage of the full innovation chain

Societal challenges

Industrial leadership

Excellent science

Basic Research
Technology R&D
Demonstration
Prototyping
Large scale validation
Pilots
Market uptake

HORIZON 2020
Horizon 2020 structure

Excellent Science
- Frontier Research (ERC)
- Future and Emerging Technologies (FET)
- Skills and career development (Marie Skłodowska-Curie)
- Research Infrastructures

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

Industrial Leadership
- Leadership in enabling and industrial technologies
  - ICT
  - Nanotech., Materials, Manuf. & Processing
  - Biotechnology
  - Space
- Access to risk finance
- Innovation in SMEs
Three priorities for ICT

- Excellent science: ~25%
- Industrial leadership: ~55%
- Societal challenges: ~20%
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
- Industrial leadership
- Societal challenges
Excellent Science - ICT

- **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**

- **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**

* Including budget for other areas than ICT covered in FET

2,5 b€*

862 m€

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Future and Emerging Technologies
2014-2015

• 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

HORIZON 2020
eInfrastructures / 2014-2015

• 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
ICT in Industrial leadership

- Excellent science
- Industrial leadership
- Societal challenges
Industrial Leadership - ICT

• 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

- 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

55 M€
Future Internet / 2014-2015

- 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

- Total Funding: 196 M€
Content technologies and information management / 2014-2015

• **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

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• 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

• 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

• 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**

- Continuously open calls with several (3) cut-off dates/year
- 5% of LEIT budget
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

Excellent science

Industrial leadership

Societal challenges
Societal Challenges - ICT

- 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

636 M€ (2014-15)
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)**

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Total</th>
<th>ICT</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health, demographic change and wellbeing</td>
<td>1804</td>
<td>265</td>
<td>15%</td>
</tr>
<tr>
<td>Food security, sustainable agriculture, marine and maritime research &amp; the Bioeconomy</td>
<td>687</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secure, clean and efficient energy</td>
<td>1447</td>
<td>72</td>
<td>5%</td>
</tr>
<tr>
<td>Smart, green and integrated transport</td>
<td>1542</td>
<td>92</td>
<td>6%</td>
</tr>
<tr>
<td>Climate action, environment, resource efficiency and raw materials</td>
<td>745</td>
<td>26</td>
<td>3.5%</td>
</tr>
<tr>
<td>Innovative, inclusive and reflective societies</td>
<td>310</td>
<td>77</td>
<td>25%</td>
</tr>
<tr>
<td>Secure societies</td>
<td>393</td>
<td>100</td>
<td>25%</td>
</tr>
</tbody>
</table>
Health, demographic change and wellbeing / 2014-2015

- 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

• 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)

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24 M€
Smart, green and integrated transport / 2014-2015

• 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

- 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

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

• 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

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• 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

50 M€
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

HORIZON 2020
### Next steps: Timetable for WP2016-17

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 September 2014</td>
<td><strong>Presentation of ICT advisory group report to H2020 ICT Committee</strong></td>
</tr>
<tr>
<td>16 October 2014</td>
<td><strong>Discussion with PC strategic configuration</strong> on overarching strategic document</td>
</tr>
<tr>
<td>Nov – Jan 2014</td>
<td><strong>Discussion with Programme Committees</strong> on scoping paper;</td>
</tr>
<tr>
<td>December 2014</td>
<td><strong>Presentation of proposed strategic programming document to new Commissioner(s)</strong></td>
</tr>
<tr>
<td>Jan – July 2015</td>
<td><strong>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</strong></td>
</tr>
<tr>
<td>Summer 2015</td>
<td><strong>Opinions of the Programme Committee configurations</strong></td>
</tr>
<tr>
<td>Third quarter 2015</td>
<td><strong>Adoption by the Commission</strong> of the Work Programme; publication of the calls for 2016</td>
</tr>
<tr>
<td>20-22 October 2015</td>
<td><strong>ICT2015 Conference, Lisbon, Portugal:</strong> <strong>Presentation of ICT Work Programme 2016-17</strong></td>
</tr>
</tbody>
</table>
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
  ✓ 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
Thank you for your attention!

Find out more:

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