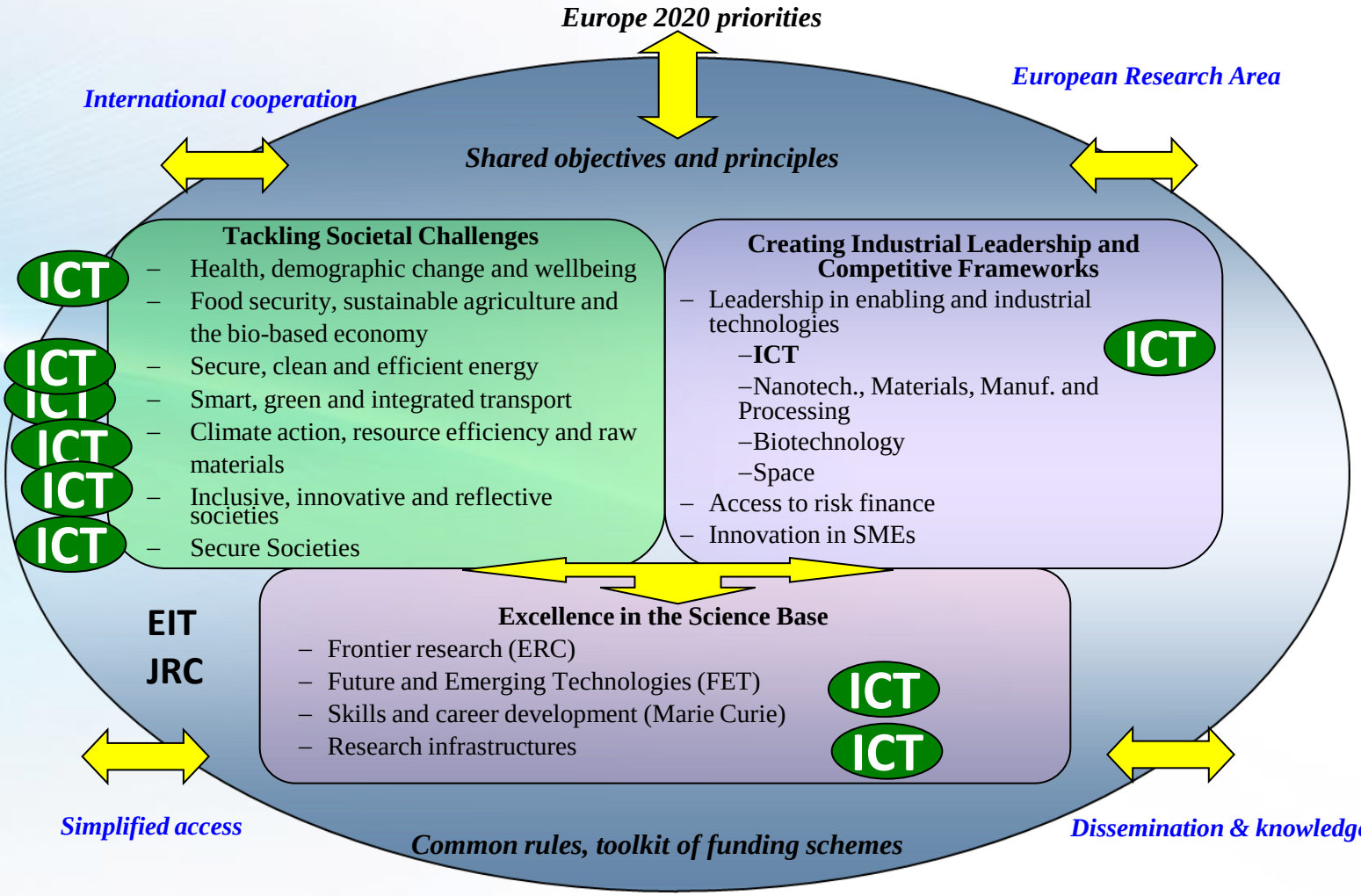
Draft LEIT ICT WP2014-15 *

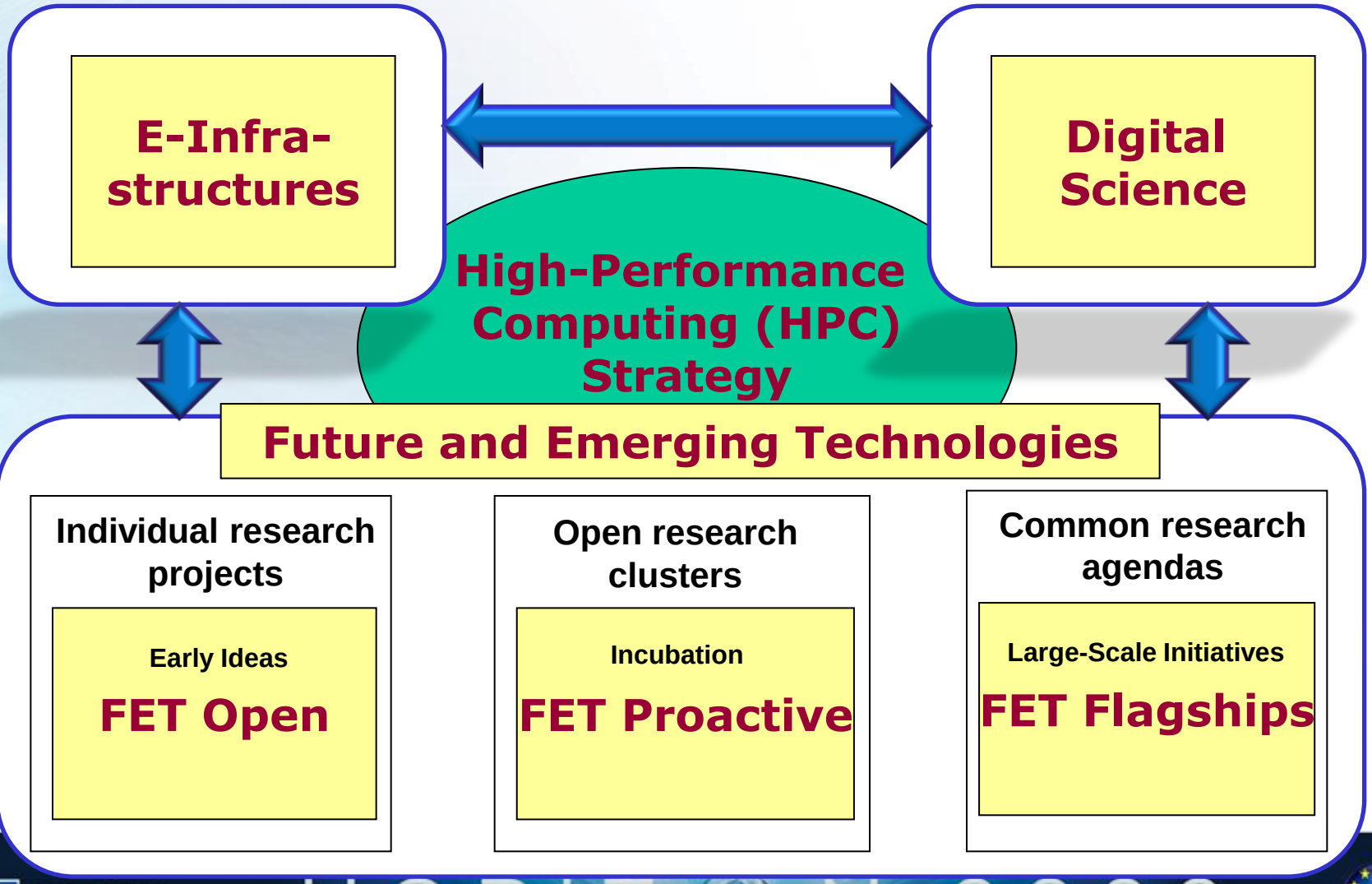
*** Slide Commissione Europea - Dg Connect**

H2020 overview


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

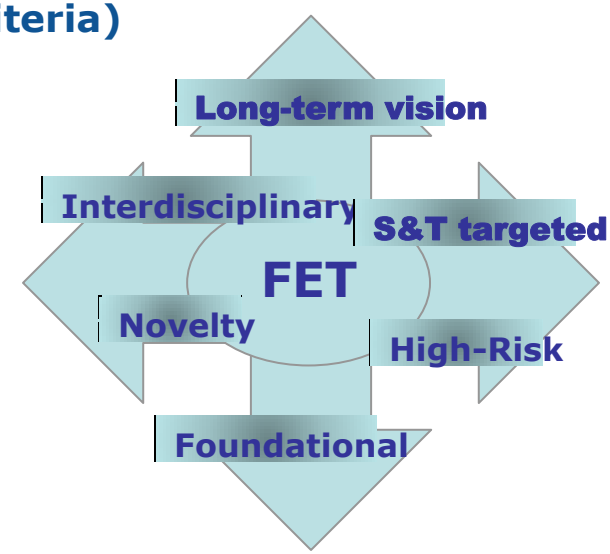
Overview of ICT in Excellent Science

ICT in Excellent Science



FET Open: fostering novel ideas

- *'Open is open': all technologies, no topical scope*
- *40% of the FET budget in H2020 (>1B€)*
- *An end-to-end light and fast scheme:*
  - **Deadline free, 1 step submission, ~15 page**
  - **1-stage evaluation (FET specific evaluation criteria)**
- *Coordination and Support actions*



FET Proactive in WP2014-15

Three topics are selected for funding in WP2014-15:

- **Knowing, doing and being: cognition beyond problem solving**
- **Global Systems Science (GSS** - improve the way in which scientific knowledge can stimulate, guide, and help evaluate policy and societal responses to global challenges)
- **Towards exascale high-performance computing,** as part of the High Performance Computing Public-Private Partnership.

High Performance Computing PPP

*The EC Communication "**High-Performance Computing: Europe's place in a global race**", adopted 15 Feb 2012, describes an ambitious strategy for HPC, combining three elements:*

FET

(a) Computer Science: towards exascale High Performance Computing;

RI

(b) providing access to the best supercomputing facilities and services for both industry and academia;

FET +RI

(c) achieving excellence in HPC applications;

Complemented with training, education and skills development in HPC

FET Flagships
Graphene & Human Brain Project selected

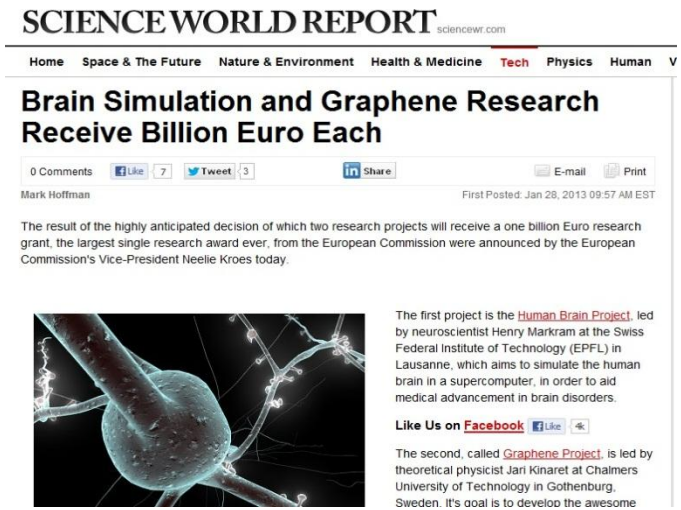
Stimulating ideas & structuring the scientific community
2009 - 2010

Call for Preparatory Actions
21 → 6
July 2010

Preparatory Phase Pilots
05/11 - 04/12

Flagship selection
6 → 2
end 2012

Operational ramp-up phase
mid 2013- end 2015



SCIENCE WORLD REPORT sciencewr.com

Home | Space & The Future | Nature & Environment | Health & Medicine | Tech | Physics | Human | V

Brain Simulation and Graphene Research Receive Billion Euro Each

0 Comments | Like 7 | Tweet 3 | Share | E-mail | Print

Mark Hoffman — First Posted: Jan 28, 2013 09:57 AM EST

The result of the highly anticipated decision of which two research projects will receive a one billion Euro research grant, the largest single research award ever, from the European Commission were announced by the European Commission's Vice-President Neelie Kroes today.

The first project is the Human Brain Project, led by neuroscientist Henry Markram at the Swiss Federal Institute of Technology (EPFL) in Lausanne, which aims to simulate the human brain in a supercomputer, in order to aid medical advancement in brain disorders.

Like Us on Facebook Like 4k

The second, called Graphene Project, is led by theoretical physicist Jari Kinaret at Chalmers University of Technology in Gothenburg, Sweden. It's goal is to develop the awesome

FET Flagships implementation

- **Ramp-up phase (FP7) started 1 Oct 2013 for 30 months (54M€ funding for each Flagship)**
- **Establishing transparency and long-term commitment under Horizon 2020 through Framework Partnership Agreements**
- **Ensuring openness and allowing others to take ownership**

  (a) call for new partners organised by Flagships during ramp-up phase (autumn 2013; 8-9M€ per flagship)*

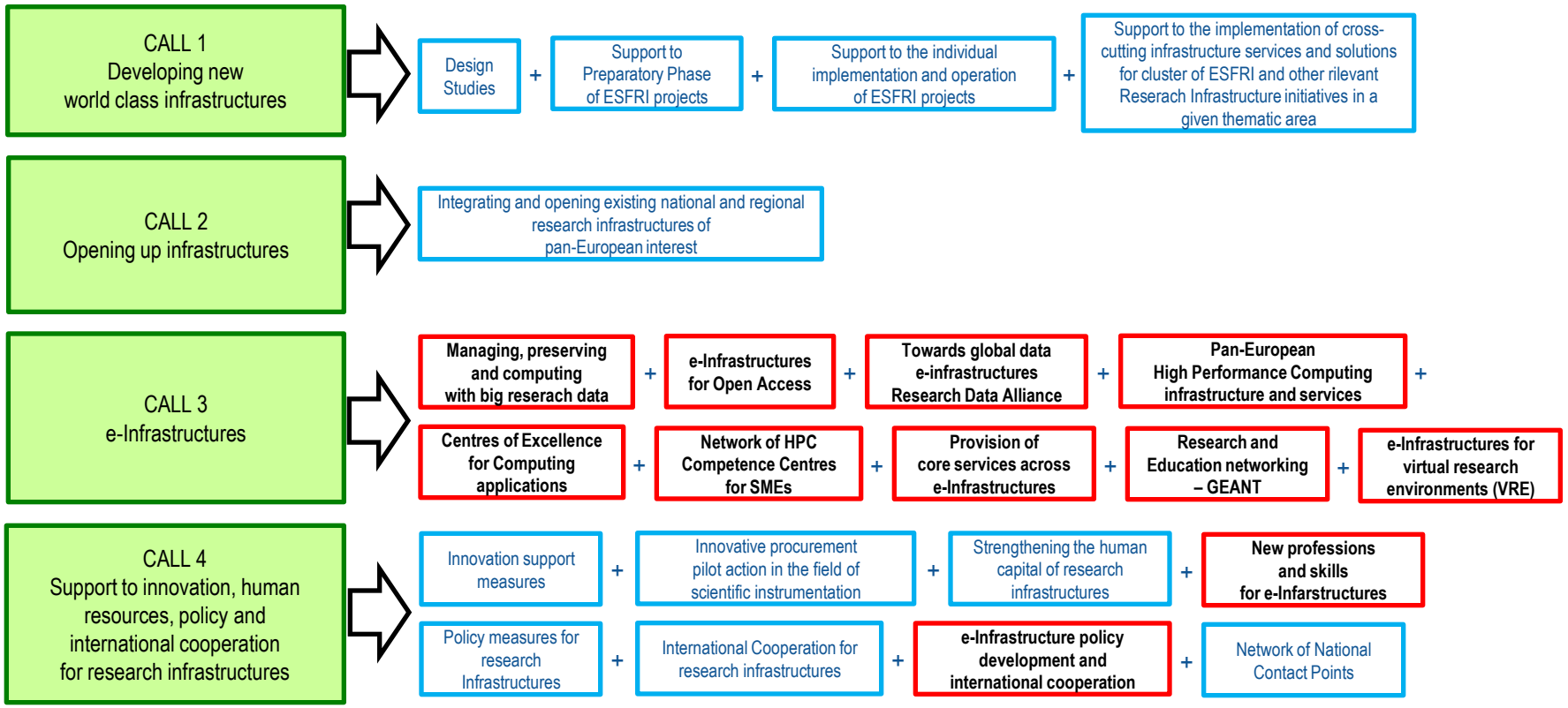
  (b) association of other projects/initiatives (funded at EU/national/transnational level)

  (c) after ramp-up phase: specific call by FET for complementary projects

*) Only for new beneficiaries, i.e. organisations which are not part of the existing consortium

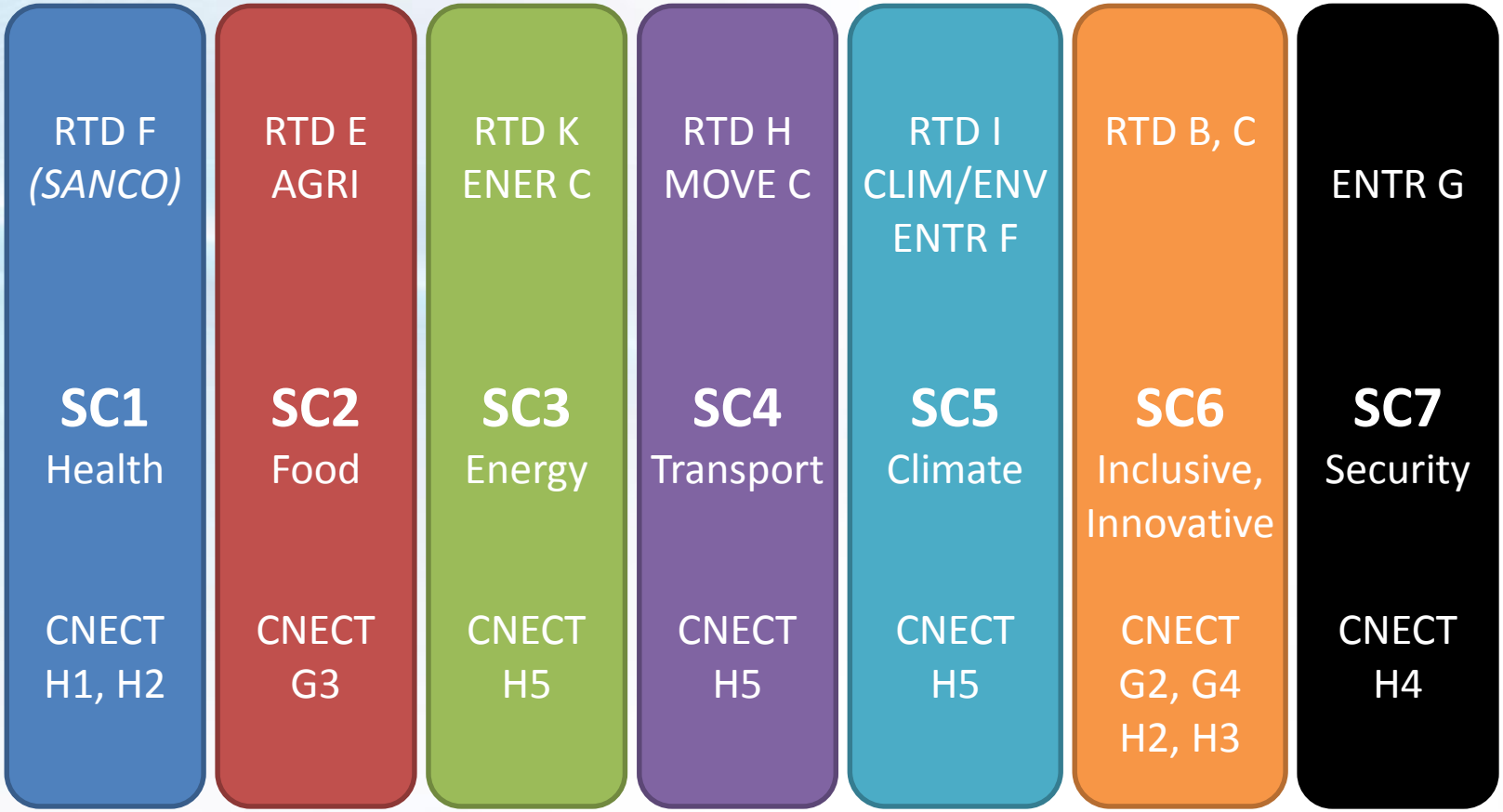
European Commission

RESEARCH INFRASTRUCTURE
Work Programme 2014-2015



Overview of ICT in Societal Challenges

H2020 Societal Challenges
Organisational Configuration



SC1 Health and wellbeing

- **Advancing active and healthy ageing**

  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)

  Mobile Health

  Public-procurement of innovative eHealth services

- **Improving health information and data exploitation**

  Decisional support systems

  eHealth interoperability

SC3 Energy

- **Energy efficiency**

  New ICT-based solutions for consumer engagement

  Public procurement of green data centres

- **Competitive low-carbon energy**

  Smart Grids

- **Smart Cities and Communities**

  Smart Cities and Communities solutions integrating energy, transport, ICT sectors

  Enhancing the roll-out of Smart Cities and Communities solutions by stimulating the market demand

SC4 Smart, green and integrated transport

ICT offer the tools to address sustainability of transport systems, congestion and road fatalities effectively.

- **ICT pilots** addressing smart, energy-efficient and safe mobility
- **Connected mobility** - linking vehicles and people on the move
- **(Semi-)Automated driving** for increased efficiency and safety
- Cooperative **Intelligent Transportation** Systems (C-ITS)

- ✓ 20% higher energy efficiency
- ✓ 10% less traffic congestion
- ✓ 10% fully electric vehicles in Europe
- ✓ 30% less road fatalities
- ✓ 30% less injured persons and an increase
- ✓ 50% in reliability of transport schedules by 2020

SC5 Climate and resource efficiency
Water and Waste Management

- **Water**

  Modular, fully interoperable and real-time components, able also to interoperate with management and control systems of other infrastructures (e.g. energy infrastructures)

- **Waste**

  More effective processes and technologies for recycling and improved dismantling capacity of ICT

  More efficient handling of waste in general through ICT

SC6 Inclusive, innovative and reflective society (1)

- **ICT-driven Public Sector Innovation**

  Make the services closer to the citizens and be adapted to their new modes of communication

  Innovation through achieving European cross-border interoperability of public services

- **Cultural heritage and European identity**

  Innovative solutions for researchers and citizens to access European cultural heritage

  Preservation of our digital memory for the future

SC6 Inclusive, innovative and reflective society (2)

- **Stimulating the use of ICT tools and services for learning and teaching**

  Digital skills and e-learning platforms

  Implementation of large scale projects piloting of educational technologies & services for take up of ICT in Education and Training

- **Stimulating the use of ICT tools to facilitate the social & economic integration of excluded citizens**

  Piloting of innovative ICT solutions for disadvantaged groups

  Connecting people to skills needs/ Targeted Serious games

SC7 Securing the Digital Society

- Protecting our society by providing sustained **trust in the usage of ICT** and in securing the ICT underlying our digital society.
- Demonstrating the viability and maturity of state-of-the-art security solutions in **large scale demonstrators**, involving end users
- **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** and the uses that are made thereof

Draft ICT LEIT
Work-programme 2014-15

https://ec.europa.eu/digital-agenda/en/ict-2013-conference?goback=%2Egde_2454211_member_5804651460834643972#%21

ICT in Industrial Leadership

1. Components and systems
2. Advanced Computing
3. Future Internet
4. Content technologies and information management
5. Robotics
6. Key Enabling Technologies: Micro-nano-electronics and photonics

+ Factory of the Future cPPP

+ International Cooperation actions (EU-Brazil, EU-Japan)

ICT Cross cutting activities:

- Internet of Things
- Human-centric Digital Age
- Cybersecurity
- Support to NCPs

ICT Innovation actions

- Access to finance
- Innovation policy support
- Open disruptive innovation scheme (SME instrument)

A balanced approach

For growth and jobs and for adressing societal challenges Europe needs:

1. to maintain expertise in key technology value chains
2. to move quicker from research excellence to the market

This requires…

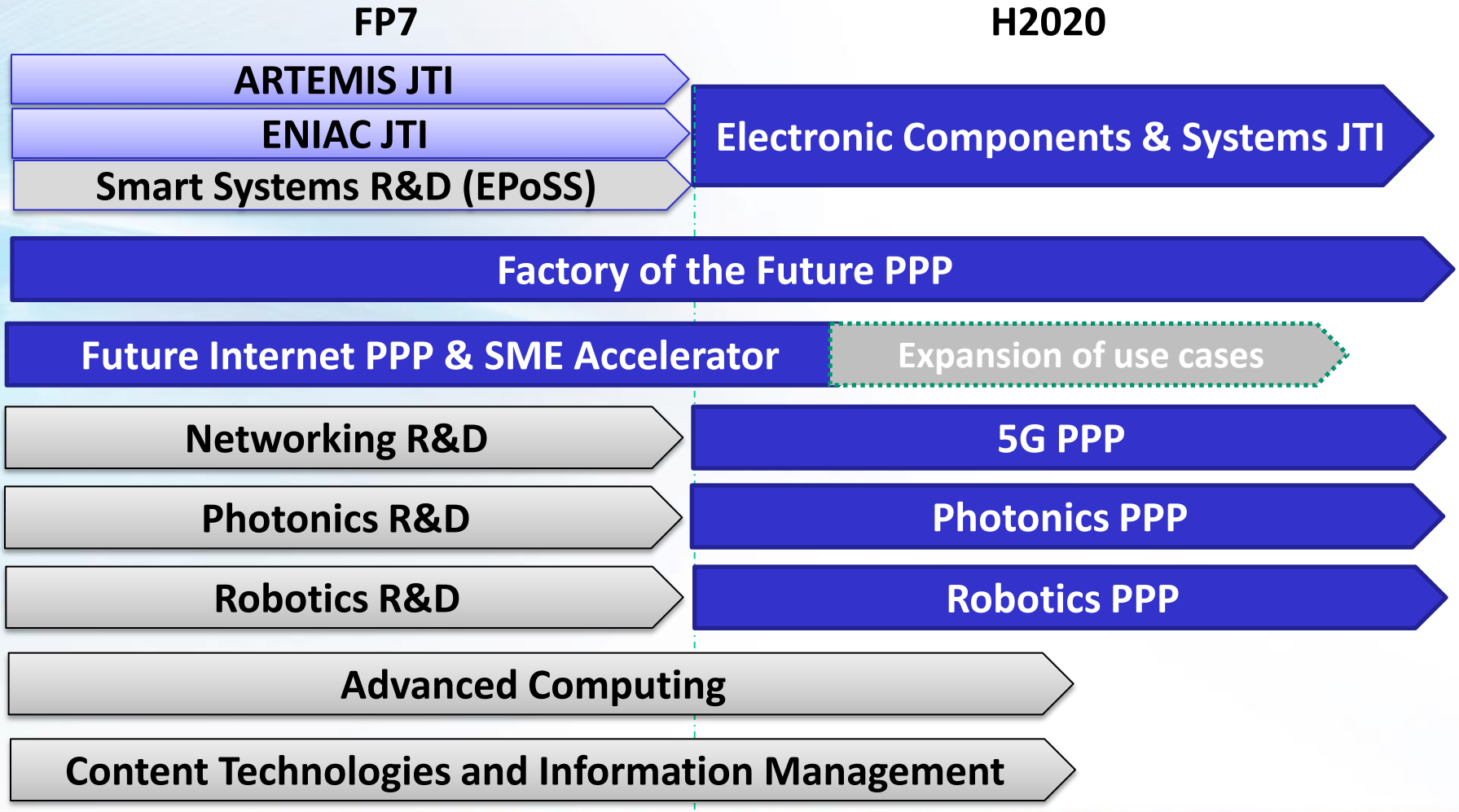
1. <u>Strong industrial roadmaps:</u>

- long term commitment
- continuity and stability
- new actors to exploit and leverage new technologies

2. <u>Disruptive innovation:</u>

- flexibility and openess
- dynamic eco-systems
- new actors to initiate and drive change

ICT Roadmap-based research: Continuity and consolidation



Innovation dimension

~46% of funding to innovation-led activities

Large number of Innovation Actions (70%):

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

5% on the Open Disruptive Innovation scheme (SME instrument)

PCP/PPI activities (cloud/PSI, lab-on-chip for in-vitro diagnosis, e-textile for healthcare, robotics, photonics, network of procurers)

Two Prizes (Optical transmission, Spectrum sharing)

Special activity on access to finance (topped up with funding from central scheme)

Components and systems (2014-15 budget: 142M)

- Covers systemic integration from smart integrated components to cyber-physical systems
- Work is complementary to the JTI Electronic Components and Systems
- Organised in three related topics
  - ICT 1: Smart Cyber-Physical Systems (2014-15 budget: 56M)
  - ICT 2: Smart System Integration (2014-15 budget: 48M)
  - ICT 3: Advanced Thin, Organic and Large Area Electronics (2014-15 budget: 38M)
- R&I in this area will also contribute to the implementation of the SRA on Energy Efficient Buildings

[Additional budget for ECSEL JTI (embedded systems): 71M]

Advanced Computing (57M)

- 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 and in Excellence Science pillar under Research Infrastructures and FET
- Organised in one topic:
  - ICT 4: Customised and low power computing (57M)

Future Internet (1) (392M)

- Focus is on network and computing infrastructures to accelerate innovation and address the most critical technical and use aspects of the Internet
- Addresses:
  - limitations of the Internet not designed to support the very large set of requirements
  - more efficient computational and data management models
  - availability of testbeds for experiments and research validation
  - Leveraging of Internet to foster innovative usages of social and economic value and to promote entrepreneurship
- Links to a cross-cutting action on IoT with Components and Systems

Future Internet (2)

- Organised in 10 topics
  - ICT 5: Smart Networks and novel Internet Architectures (23M)
  - ICT 6: Smart optical and wireless network technologies (32M)
  - ICT 7: Advanced cloud Infrastructures and Services (73M)
  - ICT 8: Boosting public sector productivity and innovation through cloud computing services (22M)
  - ICT 9: Tools and methods for Software Development (21M)
  - ICT 10: Collective Awareness Platforms for Sustainability and Social Innovation (37M)
  - ICT 11: FIRE+ (Future Internet Research & Experimentation) (31M)
  - ICT 12: More Experimentation for the Future Internet (18M)
  - ICT 13: Web Entrepreneurship (10M)
  - ICT 14: Advanced 5G Network Infrastructure for the Future Internet (125M)

Content technologies and information management (1) (260M)

- Addresses:
  - Big Data with focus on
    - Innovative data products and services
    - Solving fundamental research problems
  - Machine translation
    - Overcoming barriers to multilingual online communication
  - Tools for creative, media and learning industries
    - Mobilising the innovation potential of SMEs active in the area
  - Multimodal and natural computer interaction

Content technologies and information management (2)

- Organised in eight topics
  - ICT 15: Big data Innovation and take-up (50M)
  - ICT 16: Big data – research (39M)
  - ICT 17: Cracking the language barrier (15M)
  - ICT 18: Support the growth of ICT innovative Creative Industries SMEs (15M)
  - ICT 19: Technologies for creative industries, social media and convergence (41M)
  - ICT 20: Technologies for better human learning and teaching (52M)
  - ICT 21: Advanced digital gaming/gamification technologies (17M)
  - ICT 22: Multimodal and Natural computer interaction (31M)

Robotics (157M)

- Roadmap-based research driven by application needs (established by the planned Public-Private Partnership in Robotics)
- 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 competitions
- Organised in two annual calls
  - ICT 23: 2014 Robotics (74M)
  - ICT 24: 2015 Robotics (83M)

ICT KET 1: Micro- and nano-electronics
(50M + 8M to ICT CC KETs)

- Addresses R&I in ICT Key Enabling Technology (KET) micro- and nano-electronics
- Covers generic technology developments on micro- and nano-electronics focused on advanced research and lower Technology Readiness Levels (TRLs) Organised in one topic:
- Includes a coordination and support action with international cooperation with USA and Asia in the areas of standardisation including manufacturing (450 mm wafers)
- Includes also an awareness actions targeted at young students
    - ICT 25: generic micro- and nano-electronic technologies (50M)
- Complementary to the JTI Electronic Components and Systems

[Additional budget for ECSEL JTI: 179M]

ICT KET 2: Photonics (148M)

- Addresses R&I in the ICT Key Enabling Technology (KET) photonics
- Covers R&I activities under the photonics public private partnership (PPP)
- 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.) Organised in three topics and a joint ICT/NMP topic
  - ICT 26: 2014 Photonics KET (47M)
  - ICT 27: 2015 Photonics KET (44M)
  - ICT 28: Cross-cutting ICT KETs (56M) (micro-nano [8M] + photonics [48])
  - A specific challenge on novel materials and systems for OLED lighting or displays (under the FoF PPP specific call) (9M)
- Includes calls for ERANETs as well as public procurement actions (roll-out and deployment of optical networking technologies)

Factory of the Future (FoF cPPP) (102M)

- Supports the 2013 Multi-Annual roadmap for the Public Private Partnership FoF (developed by the European factories of the Future Research Association - EFFRA)
- 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
  - FoF 1: Process optimisation of manufacturing assets (34M)
  - FoF 2: ICT-enabled modelling, simulation, analytics and forecasting technologies (32M)
  - FoF 3: ICT Innovation for Manufacturing SMEs (36M)
- Work will also contribute to implementation of the SRA of the PPP Sustainable Process Industry through Resource and Energy Efficiency (SPIRE)

Cross cutting KETs

1/ Within ICT - Nano-electronics and photonics

- Cross sectorial pilot lines (3 Pilot Lines)
  - High performance production of OLEDS, Mid infrared micro-sensors, Integrated micro-nanoelectronics and photonics components

2/ Within the ECSEL JTI:

- Multi-disciplinary Pilot lines
  - Advanced manufacturing, material, electronics and photonics e.g.
  - Silicon photonics, Solid State lighting, ..

3/ Jointly with NMP Theme (FoF PPP, specific call)

- Development of novel materials and systems for OLED lighting or displays

ICT Cross-Cutting Activities

Organised in four topics

- ICT 29: Internet of Things and platforms for Connected Smart Objects (51M)
  - Cutting across several LEIT-ICT areas (smart systems integration, smart networks, big data)
  - Brings together different generic ICT technologies and their stakeholder constituencies
- ICT 30: Human-centric Digital Age (7M)
  - 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
- ICT 31: Cyber-security, Trustworthy ICT (38M)
  - Focuses on security-by-design for end to end security and a specific activity on cryptography
  - Complementary to Cyber-security in Societal Challenge 7
- ICT 32: Trans-national co-operation among National Contact Points (4M)
  - Mechanisms for effective cross border partnership searches, identifying, understanding and sharing good practices among ICT NCPs

ICT Innovation actions

- Organised in three topics
  - ICT 33: Support for access to finance (15M)
    - 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
  - ICT 34: Innovation and Entrepreneurship Support (11M)
    - ICT business idea contests in Universities and High Schools
    - ICT entrepreneurship summer Academy
    - ICT entrepreneurship Labs
    - Campaign on Entrepreneurship culture in innovative ICT sectors
    - Support for definition and implementation of Inducement prizes
    - European networks of procurers
    - Pre-commercial procurement

ICT35: Open Disruptive Innovation Scheme (90M)

- Agile space to combine new technologies, devices, applications, interfaces, business models for new product and services concepts
- Open, fast and light
- Small-scale bottom-up initiatives
- Continuously open calls with cut-off dates/year
- SME instrument
- 5% of LEIT budget

Prizes (2M)

Inducement prizes for LEIT-ICT:

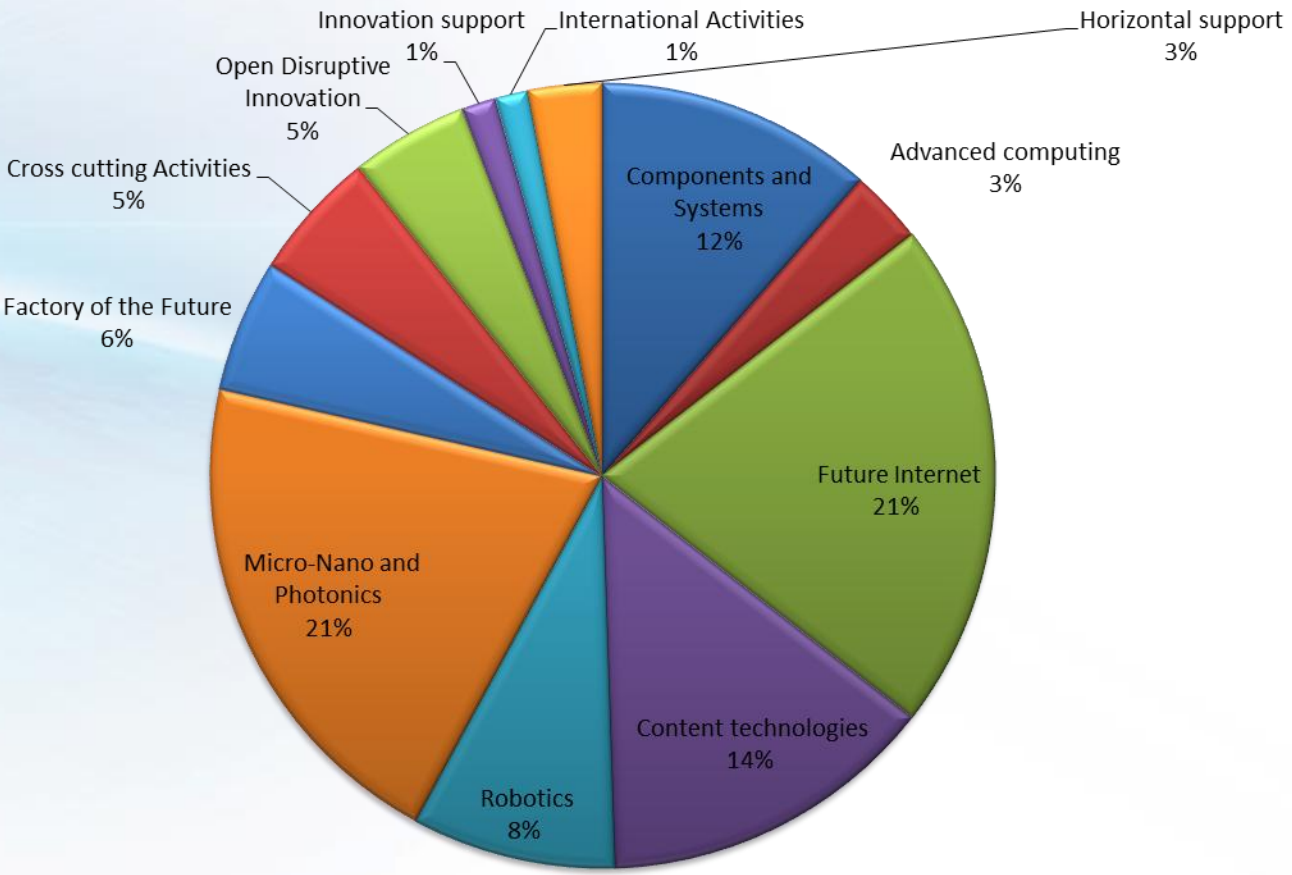
1) Breaking the optical transmission barriers in the core network
2) Collaborative sharing of spectrum with focus on wireless networks
(implementation details for these prizes are still under preparation)

In addition a CSA activity is proposed under innovation support for definition and implementation of inducement prizes

International Cooperation actions

- Two coordinated calls
  - EUB: Brazil (advanced cyber infrastructure) (7M)
  - EUJ: Japan (Network Futures) (6M)
- ICT36: International partnership building and support to dialogues with high income countries (USA, Canada and East Asia) (3M)
- ICT37: International partnership building in low and middle income countries (11M)
- Targeted opening on Future Internet Research and Experimentation Micro- and nano electronics with US, Japan, Brazil and South Korea

ICT LEIT Budget Overview



Social Science and Humanities dimension

Dedicated cross-cutting objective (Human-Centric Digital Age)

- Understand better the way technologies, networks and new digital and social media are changing the way people behave, think, interact and socialize as persons, citizens, workers and consumers
- Explore identity, privacy, reputation, motivations, responsibility, attention, and fairness, in the hyper-connected age

+ Embedding of SSH dimension where relevant

- eg. Collective Awareness Platforms, Multimodal Interfaces, interaction between humans and robots..

Responsible Research and Innovation (RRI) Dimension

- RRI was addressed at an early stage in the WP design process by DG CONNECT
- Systematically open up and call for the engagement of a broad set of stakeholders
- RRI including ethical principles will be taken into account throughout ICT WP (e.g. privacy, protection of personal data, exposure to electro-magnetic radiations, energy-efficiency..)
- Support social innovation (eg. Collective Awareness Platforms for Sustainability and Social innovation)
- Strongly committed to and driving Open Access (mandate for scientific publications)

Gender dimension

- Examples of ICT LEIT challenges that may need to take the gender dimension into account:
  - Human-centric Digital Age (gender-dependant behaviours and relation to digital products & services)
  - Collective Awareness Platforms (increasing awareness and help reduce gender inequality through networking)
  - Web Entrepreneurship & Creative Industries SMEs (foster/encourage women innovators)

PCP/PPI

- **Pre-Commercial Procurement / Public Procurement of Innovative solutions**:
  - Procurements carried out by procurers in Member States and or Associated countries or
  - Procurements carried out by the EC on its own behalf or in cooperation with MS/AC (not in WP2014-15 yet)
  - PCP/PPI create demand for new solutions and innovations of public interest

Overview of calls for ICT LEIT WP2014-15

- H2020-ICT-2014 (ICT Call 1):
  - Publication date: 11 December 2013
  - Deadline: 23 April 2014 (all topics except 5G Future Internet)
  - Deadline for 5G Future Internet: 23 September 2014
- H2020-FoF-2014/2015 (Factory of the Future):
  - Publication date: 11 December 2013
  - Deadlines: May 2014 and December 2014
- H2020-EUJ-2014 (EU-Japan Call):
  - Publication date: 11 December 2013
  - Deadline: May 2014
- H2020-ICT-2015 (ICT Call 2)
  - Publication date: July 2014
  - Deadline: 20 January 2015
- H2020-EUB-2015 (EU-Brazil Call):
  - Publication date: December 2014
  - Deadline: April 2015