Gabinete de Promoção dos Programa Quadro ID&I

# Oportunidades de Financiamento H2020
## Tecnologias da Informação e da Comunicação

**Eunice Ribeiro**

**Elisabete Pires| João Mil-Homens**

Ponta Delgada                                        15/12/2015

# H2020

## Excellent Science
### ~ EUR 24 400 M

- **European Research Council**
  - Frontier research by the best individual teams

- **Future and Emerging Technologies**
  - Collaborative research to open new fields of innovation

- **Marie Skłodowska Curie actions**
  - Opportunities for training and career development

- **Research infrastructures** (including e-infrastructure)
  - Ensuring access to world-class facilities

## Industrial Leadership
### ~ EUR 17 800 M

- **Leadership in enabling and industrial technologies**
  - ICT, nanotechnologies, materials, biotechnology, manufacturing, space

- **Access to risk finance**
  - Leveraging private finance and venture capital for research and innovation

- **Innovation in SMEs**
  - Fostering all forms of innovation in all types of SMEs

## Societal Challenges
### ~ EUR 29 700 M

1. Health, demographic change and wellbeing
2. Food security, sustainable agriculture, marine and maritime research & the bioeconomy
3. Secure, clean and efficient energy
4. Smart, green and integrated transport
5. Climate action, resource efficiency and raw materials
6. Inclusive, innovative and reflective societies
7. Security society
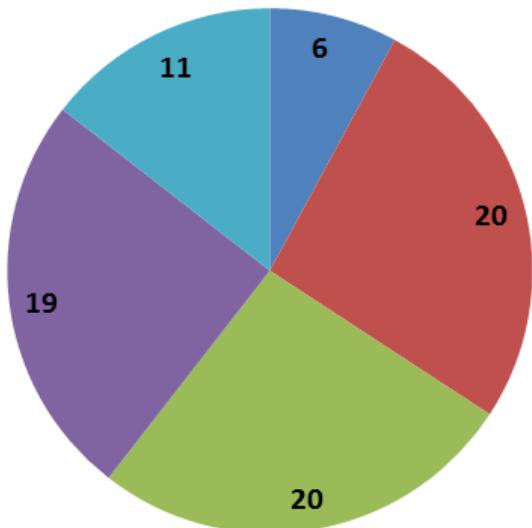
# Participação Nacional ICT 2014-2015

## Participação nacional (ICT):
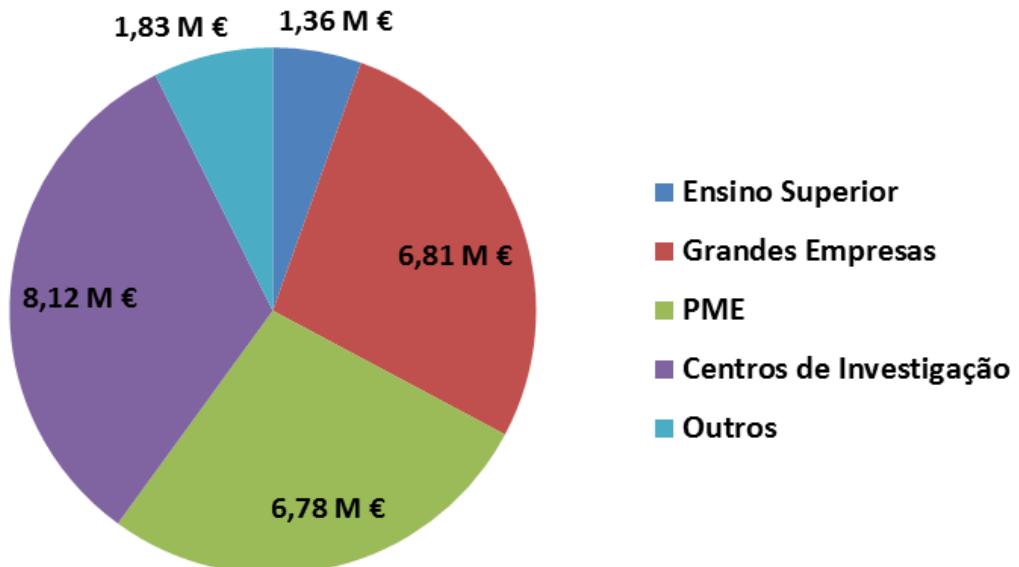
- **Propostas: 501**

- **Projetos aprovados: 53**

- **Financiamento para PT: 24,9M€**

# Projetos Aprovados ICT 2014-2015



**Participações nacionais**

**Financiamento**
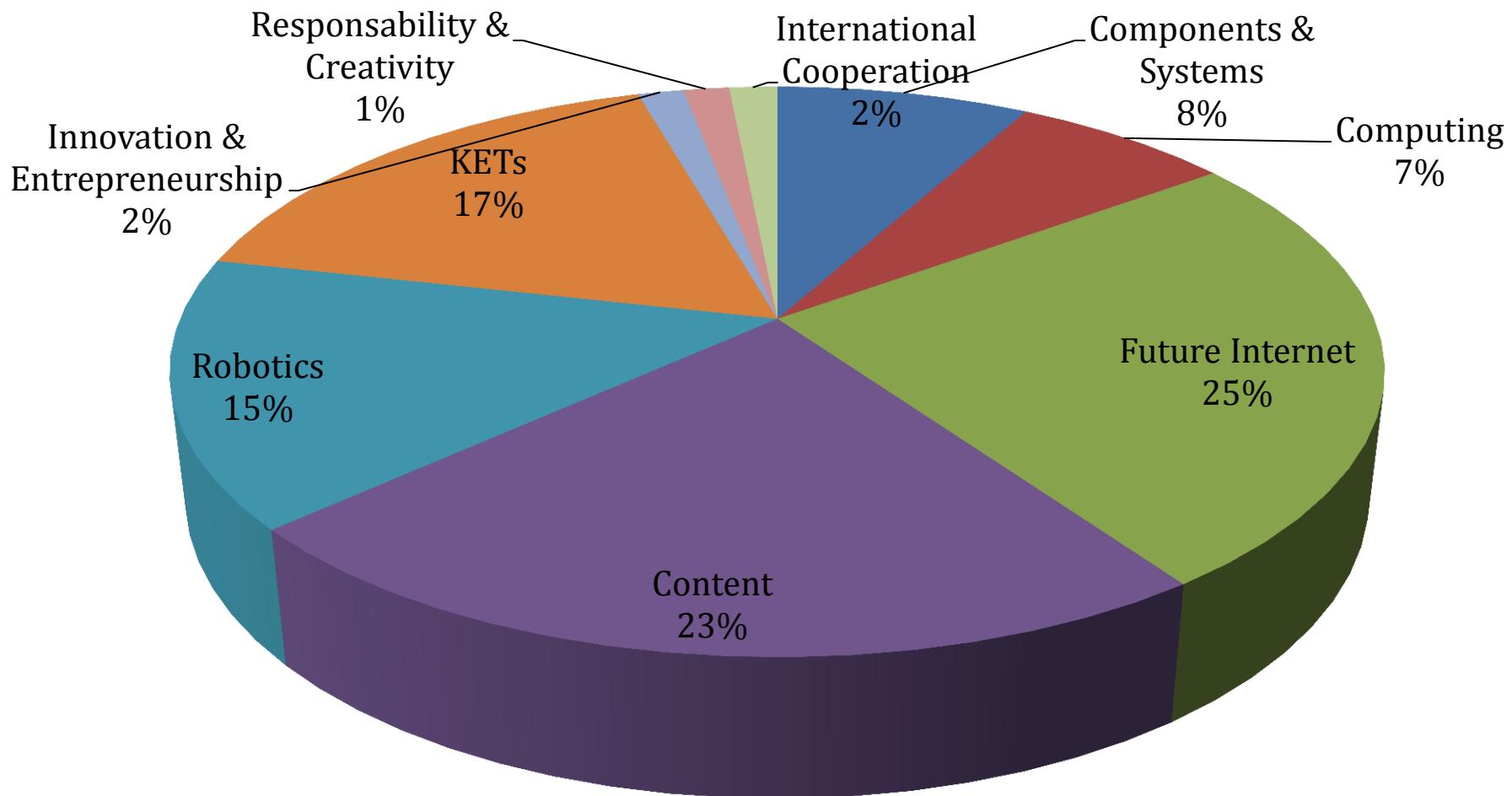
# Entidades com maior Participação/Financiamento
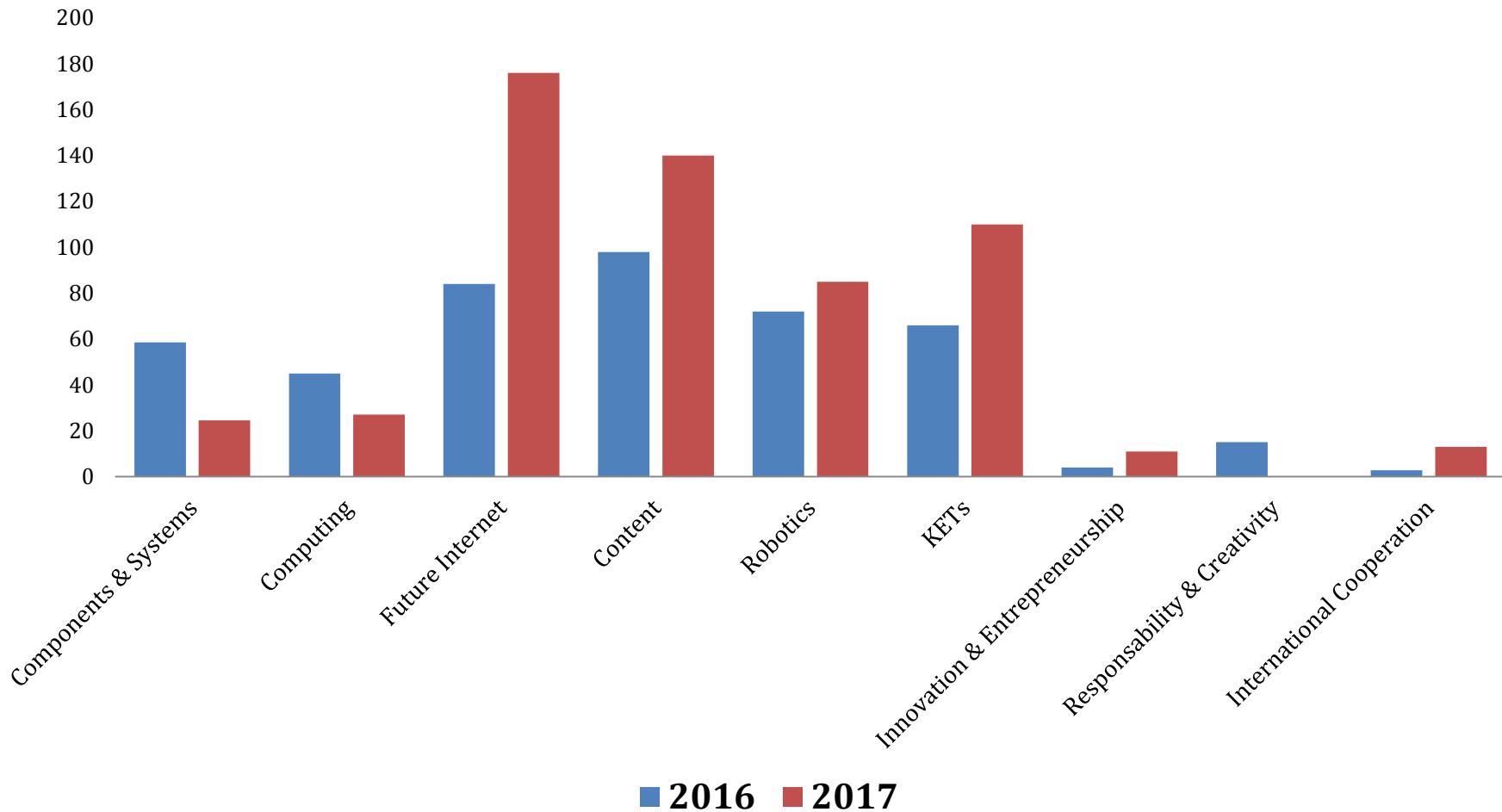
# LEIT ICT WORK PROGRAMME 2016 – 2017

- Components and Systems
- Advanced Computing and Cloud Computing
- **Future Internet**
- **Content**
- **Robotics**
- **KETs: Micro-nano-electronics and Photonics**
- Innovation & Entrepreneurship
- Responsibility & Creativity
- International Cooperation
- Open Disruptive Innovation

# CALL H2020-ICT-2016-2017

# CALL H2020-ICT-2016-2017

# Em direção ao Programa de Trabalho 2016-2017
## O início - orientação política

## Prioridades Europeias

- **Boost for jobs, growth and investment**
- **Digital Single Market**
- **Energy Union and Climate**
- **Internal Market**
- **Economic and Monetary Union**
- **Migration**
- **Justice and Fundamental Rights**
- **EU as a Global Actor**

**PPPs – Parcerias Público-Privadas**
Big Data, HPC, Robotics, Photonics, 5G PPP, Big Data, FoF, *Cybersecurity*

**Parcerias Europeias da Inovação (*EIP*)**
Smart Cities & Communities

**European Technology Platforms**
ARTEMIS, ENIAC, EPoSS, ETP4HPC, euRobotics, NEM, NESSI, Networld 2020, Photonics21

**ERA-NET**
FLAG-ERA, CHIST-ERA, SCC, Smart Grids Plus,

## Iniciativas Europeias

- **Joint Technology Initiatives** ECSEL
- **Ações COST**
- **Associações Europeias de I&DT**
- **Conferências, documentação de apoio** Roadmapps, Planos de Ação
- **Contributo espontâneo dos skateholders** (reuniões, consultas)
- **Experiência dos concursos anteriores e programas-quadro anteriores**
- **Joint Programming Initiatives** Urban Europe

**Estados-Membros (Comités dos Programas)**

*CAF – Connect Advisory Groups*

**Análise e Discussão pela Comissão Europeia**

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# DATAS IMPORTANTES

- **19/01/16 - EU-Japan e EU-South Korea**

- **19/01/16 - ICT-2016-1**

- **12/04/16 - ICT-2016-2**

- **14/03/17 - EU-Brazil**

- **08/11/16 - ICT-2017 -1**

- **25/04/17 – ICT-2017-2**

# COMPONENTS AND SYSTEMS

| Tópicos | | |
|---------|---|---|
| ICT-01 | Smart Cyber-Physical Systems (**RIA, CSA**) | 20M€ |
| ICT-02 | TOLAE - Thin, Organic and Large Area Electronics (**RIA, IA**) | 20M€ |
| ICT-03 | SSI – Smart System Integration (**RIA, CSA**) | 18,5M€ |
| ICT-04 | Smart Anything Everywhere Initiative (**IA, CSA**) | 25,5M€ |
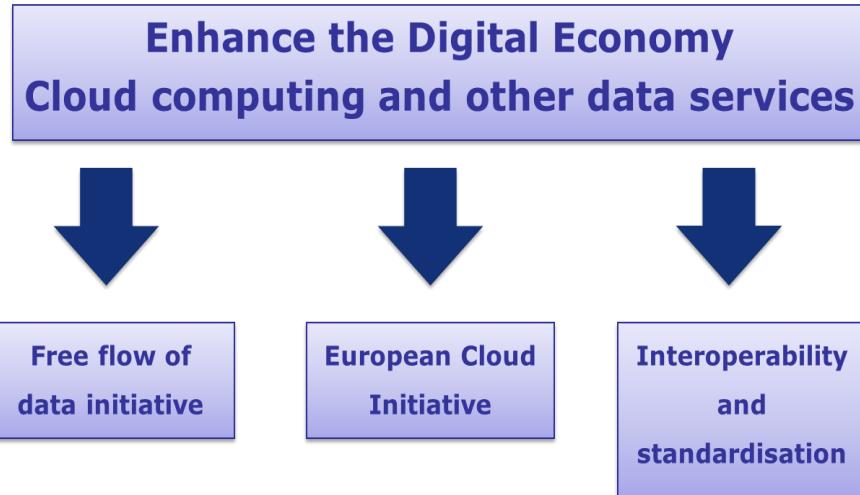
**Supporting product and service innovation through digital technologies**

**https://smartanythingeverywhere.eu/**

# ADVANCED COMPUTING & CLOUD COMPUTING
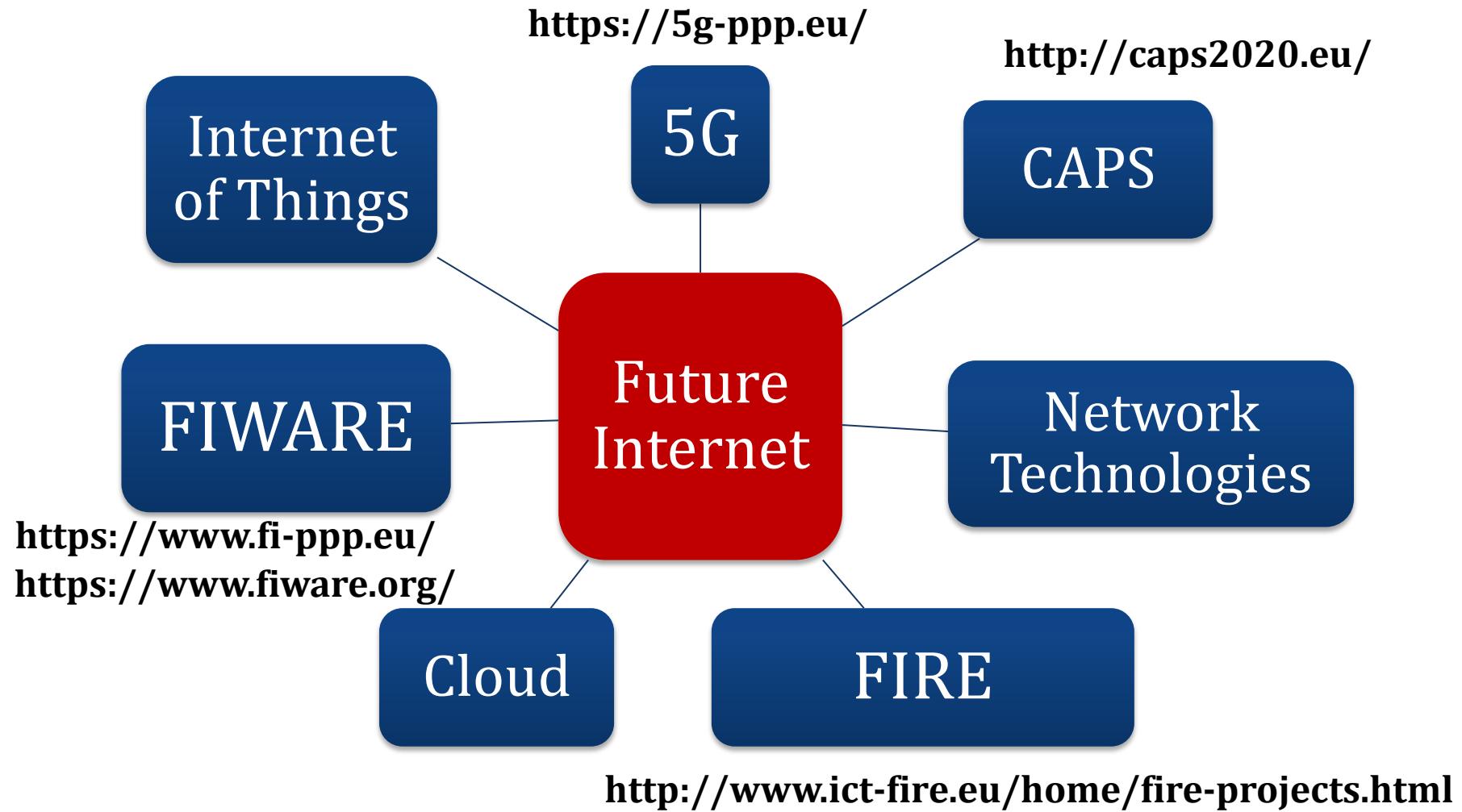
| Tópicos | | |
|---|---|---|
| ICT-05 | Customised and low energy computing (**RIA, CSA**) | 26M€ |
| ICT-06 | Cloud Computing (**RIA, IA**) | 45M€ |

**Enhance the Digital Economy**
**Cloud computing and other data services**

**Free flow of data initiative**

**European Cloud Initiative**

**Interoperability and standardisation**

**http://ec.europa.eu/digital-agenda/en/european-cloud-computing-strategy**
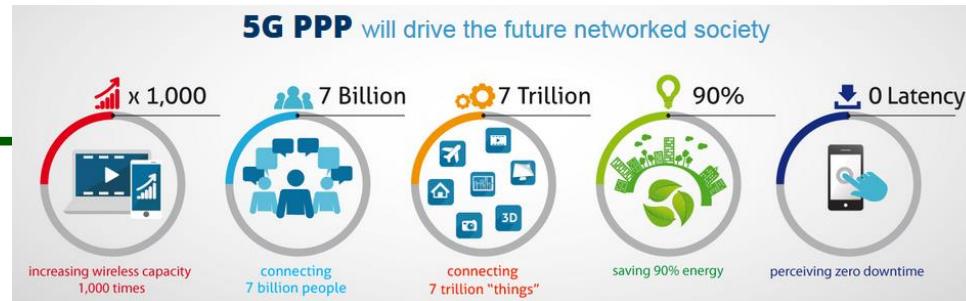
# FUTURE INTERNET

# FUTURE INTERNET



| Tópicos | | 253.2M€ |
|---|---|---|
| ICT-07 | 5G PPP Research and validation (**RIA, CSA**) | 103M € |
| ICT-08 | 5G PPP Convergent technologies (**IA, RIA**) | 45M€ |
| ICT-09 | Networking research beyond 5G (**RIA**) | 18M€ |
| ICT-10 | Software Technologies (**RIA**) | 31M€ |
| ICT-11 | Collective Awareness Platforms (**IA, CSA**) | 10M€ |
| ICT-12 | Net Innovation Factory (**RIA, CSA, CSA**) | 20.2M€ |
| ICT-13 | Experimentation – FIRE (**CSA, RIA**) | 26M€ |

**Big Data PPP** - http://www.bdva.eu/

| Tópicos | | |
|---|---|---|
| ICT-14 | Innovation hubs – integration (**IA**) | 27M€ |
| ICT-15 | Innovation hubs – experimentation (**IA**) | 25M€ |
| ICT-16 | Large Scale Pilots (**IA**) | 31M€ |
| ICT-17 | Research data economy (**RIA, CSA**) | 7M€ |
| ICT-18 | Support, Benchmarking and evaluation (**RIA, CSA**) | 9M€ |

# Content

| Tópicos | | |
|---|---|---|
| ICT-19 | Media and content convergence (**IA, CSA**) | 39M€ |
| ICT-20 | Tools for smart digital content (**RIA**) | 17M€ |
| ICT-21 | Support technology transfer to the creative industries (**IA**) | 14M€ |
| ICT-22 | Learning and skills (**IA, RIA**) | 31M€ |
| ICT-23 | Interfaces for accessibility (**RIA, IA**) | 12M€ |
| ICT-24 | Gaming and gamification (**IA**) | 12M€ |

# ROBOTICS



Industrial, professional and domestic service robotics

| | Topics | |
|---|---|---|
| ICT-25 | Advanced robot capabilities: research and take-up (**RIA, IA**) | 30M€ |
| ICT-26 | System abilities, development & pilot installations (**RIA, IA**) | 42M€ |
| ICT-27 | System abilities, SME & benchmarking actions, safety certification (**RIA, IA**) | 46M€ |
| ICT-28 | Robot competition, coordination and support (**CSA**) | 5M€ |
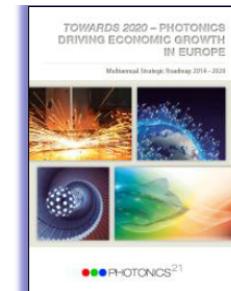
# KETs: Micro-nano-electronics and Photonics

| Topics | | |
|--------|--------|--------|
| ICT-29 | Photonics PPP Photonics KET 2016 (**RIA, IA, CSA**) | 66M€ |
| ICT-30 | Photonics PPP Photonics KET 2017 (**IA, CSA**) | 46M€ |
| ICT-31 | Generic Micro- and Nanoelectronicstechnologies (**RIA, IA, CSA**) | 23M€ |

> **Photonics21 and Photonics Public Private Partnership:**

PHOTONICS²¹    http://www.photonics21.org



TOWARDS 2020 – PHOTONICS
DRIVING ECONOMIC GROWTH
IN EUROPE

# INNOVATION & ENTREPRENEURSHIP

| Topics | | |
|--------|--------|--------|
| ICT-32 | Startup Europe / Innovation Radar (**IA, CSA**) | 12M€ |
| ICT-33 | Innovation procurement networks (**CSA**) | 4M€ |
| ICT-34 | Pre-commercial procurement (**PCP**) | 4M€ |

# RESPONSIBILITY AND CREATIVITY

SMEs represent 85% of all actors in the creative industry sectors in the EU. They co-exist with global players and often face difficulties in adopting state of the art ICT and in accessing finance.

| Topics | | |
|---|---|---|
| ICT-35 | Enabling responsible ICT-related research and innovation (**RIA**) | 7M€ |
| ICT-36 | Boost synergies between artists, creative people and technologists (**IA, CSA**) | 8M€ |



http://nem-initiative.org/

http://nem-portugal.org/

# INTERNATIONAL COOPERATION

| Topics | 35M€ |
|---|---|
| Mexico: ICT-38<br>→ FIWARE-based services | 1M€ |
| China: ICT-37<br>→ 5G & IoT | 1M€ |
| Africa/ASEAN: ICT-39 | 13M€ |
| Japan<br>→ 5G<br>→ IoT/Cloud/Big Data platforms | 7M€ |
| Brazil<br>→ Cloud Computing<br>→ IoT Pilots | 7M€ |
| South Korea<br>→ 5G<br>→ IoT<br>→ Cloud | 6M€ |

2017

2017

# Tecnologias da Informação e Comunicação

# H2020

| Excellent Science ~ EUR 24 400 M | Industrial Leadership ~ EUR 17 800 M | Societal Challenges ~ EUR 29 700 M |
|---|---|---|
| **European Research Council**<br>▪ Frontier research by the best individual teams | **Leadership in enabling and industrial technologies**<br>▪ ICT, nanotechnologies, materials, biotechnology, manufacturing, space | 1. Health, demographic change and wellbeing |
| **Future and Emerging Technologies**<br>▪ Collaborative research to open new fields of innovation | **Access to risk finance**<br>▪ Leveraging private finance and venture capital for research and innovation | 2. Food security, sustainable agriculture, marine and maritime research & the bioeconomy |
| **Marie Skłodowska Curie actions**<br>▪ Opportunities for training and career development | **Innovation in SMEs**<br>▪ Fostering all forms of innovation in all types of SMEs | 3. Secure, clean and efficient energy |
| **Research infrastructures** (including e-infrastructure)<br>▪ Ensuring access to world-class facilities | | 4. Smart, green and integrated transport |
| | | 5. Climate action, resource efficiency and raw materials |
| | | 6. Inclusive, innovative and reflective societies |
| | | 7. Security society |

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# Documentação…

LEIT ICT WORK PROGRAMME **2016 – 2017**

FET WORK PROGRAMME **2016 – 2017**

SC 1 - SC7 WORK PROGRAMMES **2016 – 2017**

CROSS-CUTTING ACTIVITIES WORK PROGRAMME **2016 – 2017**

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

# Tecnologias Futuras e Emergentes

# ICT nos Desafios Societais

- **Big Data**
  - ➢ **DS1 - Saúde: Big Data supporting Public Health policies** (topic: SC1-PM-18–2016)
  - ➢ **DS4 - Transportes: Innovative ICT solutions for future logistics operations** (topic: MG-5.2-2017)
  - ➢ **DS6 – Sociedades Inclusivas: Policy-development in the age of Big Data** (topic: CO-CREATION-06-2017)
  - ➢ **DS6 – Sociedades Inclusivas: European cultural heritage, access and analysis for a richer interpretation of the past** (topic: CULT-COOP-09-2017)

- **Robotics**
  - ➢ **DS1 – Saúde: Robotics-based solutions for active and healthy ageing** (topic: SC1-PM-14–2016)
  - ➢ **DS2 – Bio-economia: Robotics advances for precision farming** (topic: SFS-05-2017)

# Cross-cutting activities
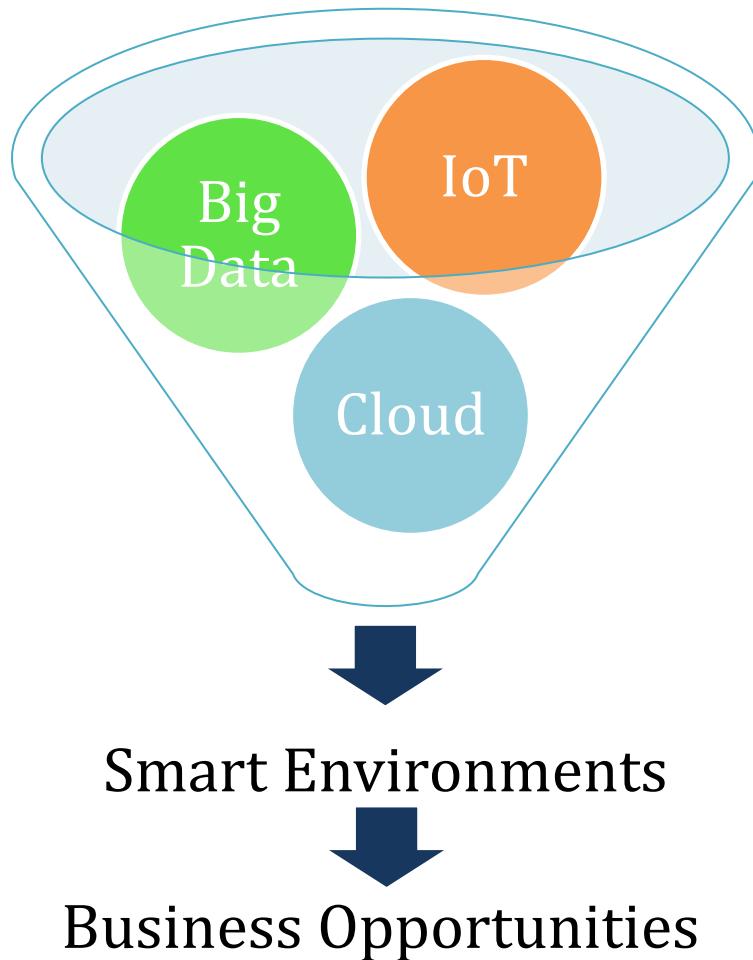
| ICT for the Factories of the Future | | |
|---|---|---|
| FOF-11 | Digital Automation | 53M€ |
| FOF-13 | Photonics Laser-based production | 30M€ |
| **Internet of Things** | | |
| IoT-01 | Large Scale Pilots | 100M€ |
| IoT-02 | IoT Horizontal Activities | 4M€ |
| **Smart and Sustainable Cities** | | |
| SCC-1 | Lighthouse projects | 60M€ |
| SCC-2 | Demonstrating nature-based solutions | 40M€ |
| SCC-3 | Urban re-naturing | 15M€ |

# Cross-cutting activities - IoT



**Thing**    **Sensor Actuator**    **Data**    **Network *Infrastructure***    **Service Platform**

**Alliance for the Internet of Things Innovation - http://www.aioti.eu/**

# Cross-cutting activities - IoT



Pilot 1: Smart living environments for ageing well

Pilot 2: Smart Farming and Food Security

Pilot 3: Wearables for Ecosystems

Pilot 4: Reference zones in EU cities

Pilot 5: Autonomous vehicles in a connected environment

# Horizonte 2020
## Dúvidas?...

# Contacte-nos...

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**ICT**
**Energia**

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Gabinete de Promoção dos
Programa Quadro ID&I

# Programa de Trabalho 2016-2017

**Eunice Ribeiro (eunice.ribeiro@gppq.pt)**
**Ana Raposo (ana.raposo@gppq.pt)**
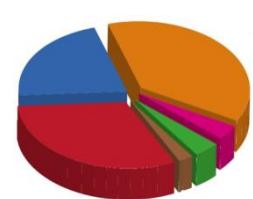
Ponta Delgada    15/12/2015

# Desafios Societais do Horizonte 2020
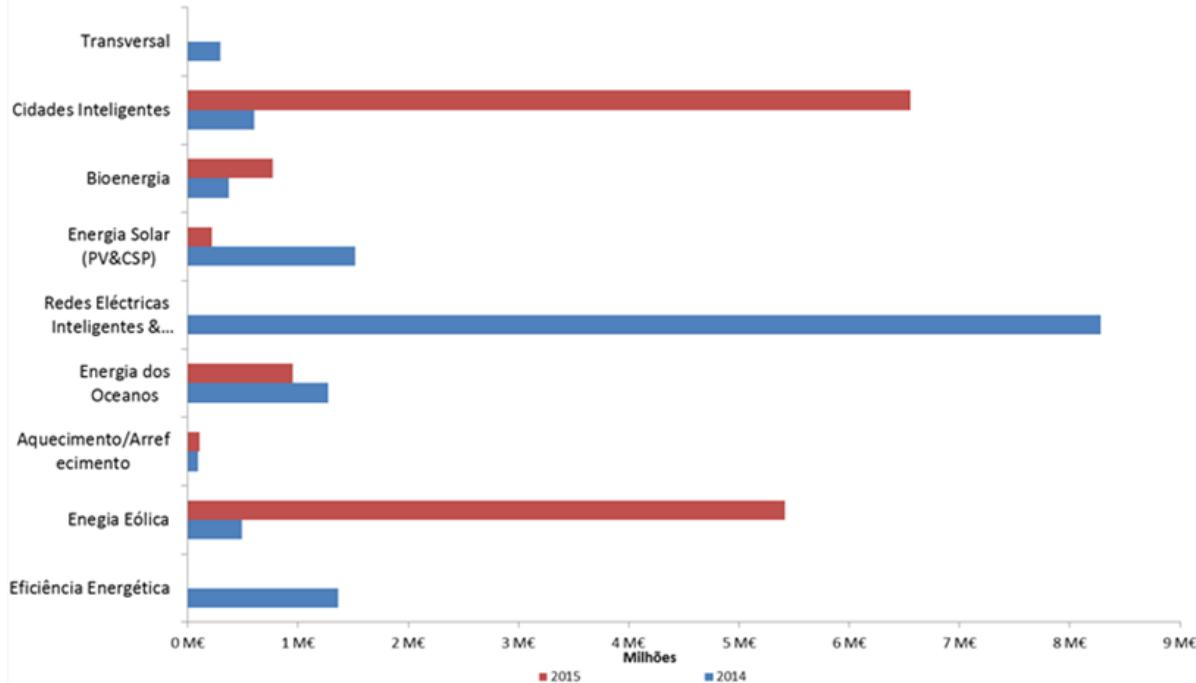
**Societal Challenges**
EUR 29.7 billion

| | Orçamento 2014-20 (mil M€) |
|---|---|
| 1. Health, demographic change and wellbeing | 7.5 |
| 2. Food security, sustainable agriculture and forestry, marine and maritime and inland water research and the Bioeconomy | 3.9 |
| **3. Secure, clean and efficient energy** | **5.9** |
| 4. Smart, green and integrated transport | 6.3 |
| 5. Climate action, environment, resource efficiency and raw materials | 3.1 |
| 6. Inclusive, innovative and reflective societies | 1.3 |
| 7. Secure societies | 1.7 |

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# Participação PT no DS3 nas calls 2014 & 2015



Transversal

Cidades Inteligentes

Bioenergia

Energia Solar (PV&CSP)

Redes Eléctricas Inteligentes &...

Energia dos Oceanos

Aquecimento/Arrefecimento

Enegia Eólica

Eficiência Energética

0 M€  1 M€  2 M€  3 M€  4 M€  5 M€  6 M€  7 M€  8 M€  9 M€

Milhões

■ 2015    ■ 2014
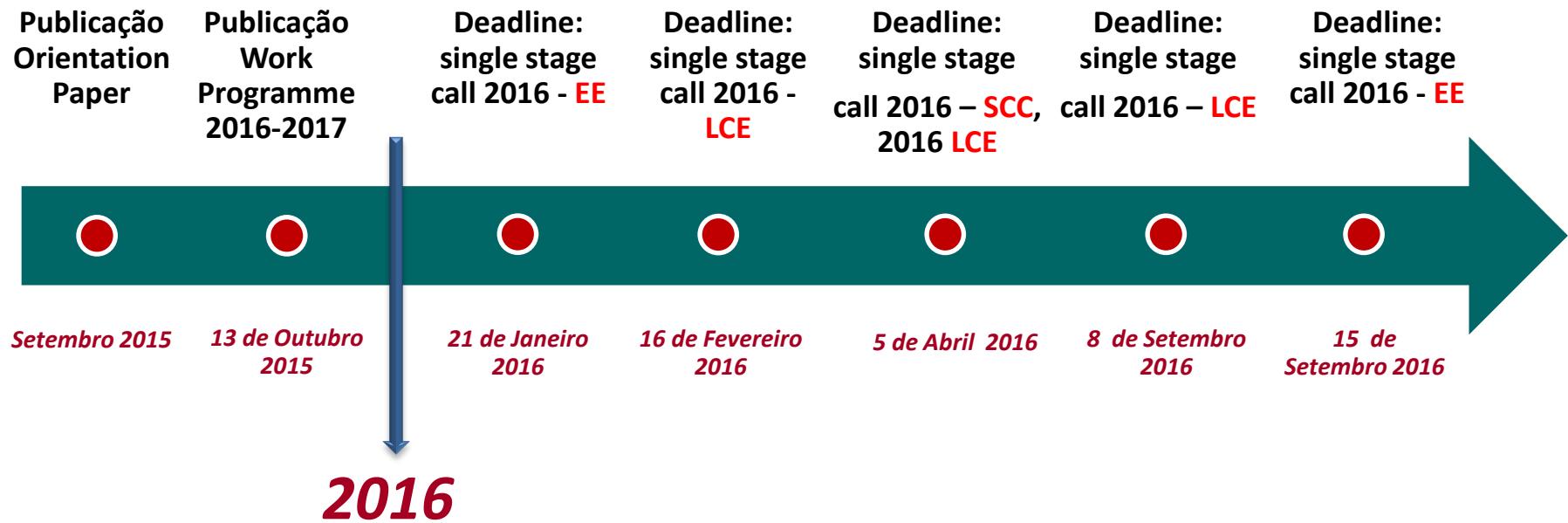
*Call* **2014 & 2015 do DS3**

- **35 projetos financiados + SME instrument**
- **2 coordenação nacional**
- **28 M€**
- **2,68% taxa de retorno**

Nota: dados de 2015 correspondem a cerca de 1/3 dos concursos apurados. Os restantes concursos irão ficando disponíveis até ao final do ano)

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# Calendário WP Energia 2016

| Publicação Orientation Paper | Publicação Work Programme 2016-2017 | Deadline: single stage call 2016 - EE | Deadline: single stage call 2016 - LCE | Deadline: single stage call 2016 – SCC, 2016 LCE | Deadline: single stage call 2016 – LCE | Deadline: single stage call 2016 - EE |
|---|---|---|---|---|---|---|
| Setembro 2015 | 13 de Outubro 2015 | 21 de Janeiro 2016 | 16 de Fevereiro 2016 | 5 de Abril 2016 | 8 de Setembro 2016 | 15 de Setembro 2016 |

**2016**

# Concursos do Programa de Trabalhos Energia 2016-2017

☞ **Secure, clean and efficient energy**

| Call | 2016 (M€) | 2017 (M€) |
|------|-----------|-----------|
| **Energy Efficiency** | 93 | 101 |
| Smart Cities and Communities | 60,5 | 71,5 |
| Competitive Low-Carbon Energy | 351,54 | 368,62 |
| SME Instrument | 46 | 50 |
| Fast Track to Innovation | 13,7 | |
| *Other actions (e.g. tenders; ELENA; Concerted Actions)* | *107,91* | *79,13* |
| *TOTAL* | *674,65* | *979,13* |

# Contexto Político – Estratégias e Iniciativas Europeias de apoio ao desafio Energia no Horizonte 2020

## 2030 Climate-Energy Package
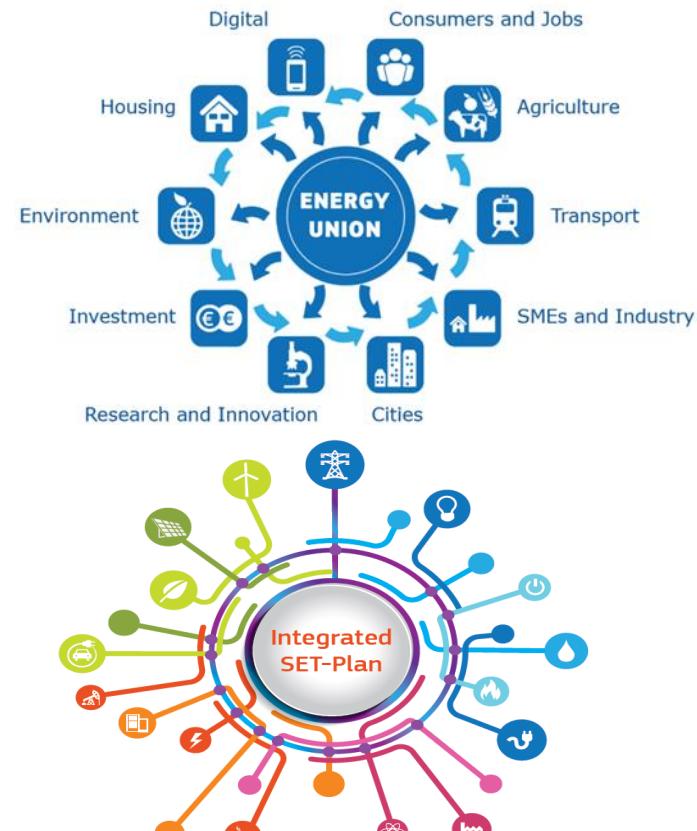
- 40% redução dos GEE
- 27% aumento de energias renováveis
- 27% eficiência energética

## União da Energia

- Segurança no abastecimento energético
- Mercado de energia integrado
- Eficiência Energética
- Descarbonização do Sistema Energético
- Investigação, Inovação e Competitividade

## SET-Plan

➢ Integrated Roadmap
➢ Communication on Integrated SET-Plan (COM[2015]6317)



**https://setis.ec.europa.eu/**

# Programa de Trabalhos de Energia 2016-2017

**ENERGY EFFICIENCY – 25 TÓPICOS**



**SMART CITIES AND COMMUNITIES – 1 TÓPICO**



*Programa de Trabalhos 2016-2017 – Energia Segura, Não Poluente e Eficiente*

**COMPETITIVE LOW CARBON ENERGY – 37 TÓPICOS**



**SMES FOR A LOW CARBON ENERGY AND EFFICIENT ENERGY SYSTEM 1 TÓPICO**
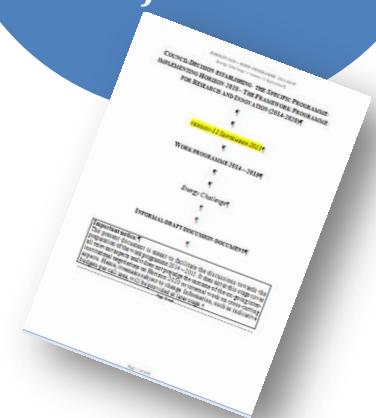


http://ec.europa.eu/research/participants/data/ref/h2020/wp/2016_2017/main/h2020-wp1617-energy_en.pdf

# Programa de Trabalhos de Energia 2016-2017

**ENERGY EFFICIENCY – 25 TÓPICOS**



*Programa de Trabalhos 2016-2017 – Energia Segura, Não Poluente e Eficiente*

# Desafio Societal Energia – Concursos 2016/2017 – Eficiência Energética

## Areas de financiamento



**Sistemas de Aquecimento e Arrefecimento**

**Edíficios e Consumidores**

**Indústria e Produtos**

**Investimento**

# Aquecimento e arrefecimento

| Heating and Coolings | TOPIC | Type of scheme | EC Contribution |
|---|---|---|---|
| EE 3 – 2016 | **Standardised installation packages integrating renewable and energy efficiency solutions for heating, cooling and/or hot water preparation** | IA (TRL 6-8) | 3-4M€ |

*Keywords: combine energy sources,energy storage, smart controls, integration in buildings*

| | | | |
|---|---|---|---|
| EE 4 – 2016/2017 | **New heating and cooling solutions using low grade sources of thermal energy** | RIA (TRL4-6) | 3-4M€ |

*Keywords: technologies to use low grade energy sources (residual and RES sources of thermal energy) and/or technologies that are able to take advantage of **very low and low** (moderate) temperature resources by upgrading them*

| | | | |
|---|---|---|---|
| EE 5 – 2016/2017 | **Models and tools for heating and cooling mapping and planning** | RIA  (TRL5-7) | 2,5-3M€ |

*Keywords: administrative practices of public authorities, planning tools to describe the energy system and development of all relavenat supply and demand elements  (energy resources, infrastructures, buildings*

# Consumidores

| Engaging consumers | TOPIC | Type of scheme | EC Contribution |
|---|---|---|---|
| **EE 6 – 2016/2017** | **Engaging private consumers towards sustainable energy** | CSA | 1-2M€ |

*Keywords: awareness of the collective consumer action,  actions to motivate changes, prosumers, vulnerable consumers, ict-solutions, understading energy bills*

| | | | |
|---|---|---|---|
| **EE 7 – 2016/2017** | **Behavioural change toward energy efficiency through ICT** | IA | 1-2M€ |

*Keywords: ICT-based solutions (smart meters, smart plugs, smart appliances), energy savings, factors influencing consumer choices and behaviour*

| | | | |
|---|---|---|---|
| **EE 8 – 2016** | **Socio-economic research on consumer's behaviour related to energy efficiency** | RIA | 1-1,5M€ |

*Keywords: consumer's decision making on energy efficient investments, impacts of energy efficiency policy*

| | | | |
|---|---|---|---|
| **EE 9 – 2016/2017** | **Engaging and activating public authorities** | CSA | 1-1,5M€ |

*Keywords:  a) develop, finance and implement sustainable energy plans and measures*
*        b) peer to peer learning for pub. Authorities – capacity to help deliver the energy transition*

# Edifícios

| Buildings | TOPIC | Type of scheme | EC Contribution |
|---|---|---|---|
| **EE 10 – 2016** | **Supporting accelerated and cost-effective deep renovation of buildings** | IA (TRL 6-8) | 3-4M€ |

*Keywords: more cost effective, higher quality, faster deep renovation, increase rate of renovation, pre-fabricated mass manufactured components*

| | | | |
|---|---|---|---|
| **EE 11 – 2016/2017** | **Overcoming market barriers and promoting deep renovation of buildings** | CSA | 1-2M€ |

*Keywords: remove regulatory barriers and non-regulatory barriers, at least 60% of energy savings, finantial mechanisms, instruments and business models*

| | | | |
|---|---|---|---|
| **EE 13 – 2016** | **Cost reduction of new Nearly Zero-Energy buildings** | CSA | 1-2M€ |

*Keywords: market ready cost reductions, integration of RES in NZEB, measurable nearly zero energy consumption and LCA in buildings*

| | | | |
|---|---|---|---|
| **EE 14 – 2016/2017** | **Construction skills** | CSA | 1-2M€ |

*Keywords: upgrading or setting upqualification and trainning schemes to increase the number of skilled building professionals/blue collar workers*

# Indústria, Serviços e Produtos

| Industry, Services, products | TOPIC | Type of scheme | EC Contribution |
|---|---|---|---|
| EE 16 – 2016/2017 | **Effective implementation of EU product efficiency legislation** | CSA | 1-2M€ |

*Keywords: Energy efficient products regulations: market "push" and market "pull"*

| Industry, Services, products | TOPIC | Type of scheme | EC Contribution |
|---|---|---|---|
| EE 17 – 2016/2017 | **Valorisation of waste heat in industrial systems** | RIA (TRL5-7) | 4-5M€ |

*Keywords: Energy Intensive Industries, design, build and test & demonstrate new processes/components or innovative adaptation of existing solutions for waste energy recovery in large industrial systems*

# Investimento

| Financing for Energy Efficiency | TOPIC | Type of scheme | EC Contribution |
|---|---|---|---|
| **EE 22– 2016/2017** | **Project Development Assistance** | CSA | 0,5-1,5M€ |

*Keywords: sustainable energy investments (7.5M€-50M€); financial engineering,*

| | | | |
|---|---|---|---|
| **EE 24 – 2016/2017** | **Making the energy efficiency market investible** | CSA | 1-1,5M€ |

*Keywords: standardization and benchmarking of EE investments, financial performance of EE investments, institutional investors*

| | | | |
|---|---|---|---|
| **EE 25 – 2016** | **Development and roll-out of innovative energy efficiency services** | CSA | 1-2M€ |

*Keywords: new types of energy efficiency services and business models for industrial and services companies*

# Prazos de submissão – Concurso Eficiência Energética 2016

| Concurso | Tópico | Prazo de Submissão |
|---|---|---|
| **H2020-EE-2016-RIA/IA** | EE-03, 04, 05, 07, 08, | Single stage<br>21/01/2016 |
| **H2020-EE-2016-PPP** | EE-10, 17 | Single stage<br>21/01/2016 |
| **H2020-EE-2016-CSA** | EE-06, 09, 11, 13, 14, 22, 24, 25 | Single stage<br>15/09/2016 |
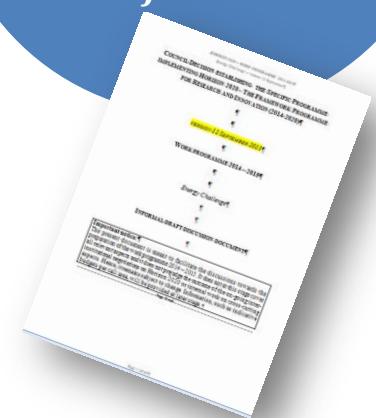
# Programa de Trabalhos de Energia 2016-2017



**COMPETITIVE LOW CARBON ENERGY – 37 TÓPICOS**

*Programa de Trabalhos 2016-2017 – Energia Segura, Não Poluente e Eficiente*

# COMPETITIVE LOW-CARBON ENERGY – Áreas

1. Towards an **integrated EU energy system**

2. **Renewable energy technologies**

3. Enabling the **decarbonisation of the use of fossil fuels** during the transition to a low-carbon economy

4. **Social, economic and human aspects** of the energy system

5. Supporting the development of a **European research** in the field of energy

# COMPETITIVE LOW-CARBON ENERGY
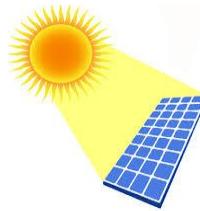
| Towards an Integrated Energy System | TOPIC | Type of scheme | TRL | EC Contribution |
|---|---|---|---|---|
| LCE 1 | Next generation innovative technologies enabling smart grids, storage and energy system integration with increasing share of renewables: distribution network | RIA | 3-6 | 2-4 M€ |

*Keywords: solutions beyond the state of the art; Areas for 2016: storage (EV) or synergies between energy networks*

| | | | | |
|---|---|---|---|---|
| LCE 2 | Demonstration of smart grid, storage and system integration technologies with increasing share of renewables: distribution system | IA | 5-8 | 12-15 M€ |

*Keywords: demand response, smartening the distribution grid, energy storage, connections between networks, smart integration of grid users from transport, large scale pilots, real life conditions validation*

| | | | | |
|---|---|---|---|---|
| LCE 3 | Support to R&I strategy for smart grid and storage | CSA | | 4 M€ |

*Keywords: new challenges -> novel approach to R&I strategy in the field smart grid and storage*

# Renewable Energies Technologies
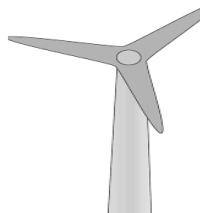
**Contexto**

- Energy Union
- Desafios das alterações climáticas
- SET-Plan
- Acelerar a transição energética
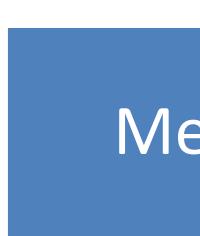


Investigação Básica

Investigação Avançada

Demonstração

Mercado

# COMPETITIVE LOW-CARBON ENERGY

| | Basic Research (TRL <4) | Advanced Research (TRL 3-5) | Demonstration (TRL 5-7) | Market uptake |
|---|---|---|---|---|
| PV | LCE-6 | LCE-7 | LCE-9, LCE-10 | LCE-21 |
| CSP | | | LCE-11 | |
| Solar Heating and Cooling | | | LCE-12 | |
| Wind Energy | | | LCE-13, LCE-14 | LCE-21 |
| Ocean Energy | | | LCE-15, LCE-16 | |
| Hydropower | | | | |
| Geothermal Energy | | | LCE-17, LCE-23, LCE-18 | |
| CHP | | | | |
| RES integration in the system | | | | |
| Bio- and Renewable Alternative Fuels | | LCE-8, LCE-22 | LCE-19, LCE-20 | |

# Energia Fotovoltaica (PV)

**Contexto**
- Alto potencial de geração;
- Reduzir os custos dos sistemas PV instalados e das dificuldades na integração na rede como prioridades para o setor;
- PV R&D para retomar uma posição inovadora e competitiva mundial com a tecnologia PV atualmente existente na Europa.

**Investigação fundamental**

- Upscaling technologies currently at lab-scale (!exceto atividades abordadas no tópico NMBP 19-2016!) - *LCE-6-2017*

**Investigação avançada**

- Next generation of c-Si (2016) and perovskite (2017) PV cells and modules – *LCE-7-2016-2017*

**Demonstração**

- Manufacturing innovations at pilot-line level for industrial production of cells and modules – *LCE-9-2016* *(25 M€)*

- Reducing cost of PV electricity – *LCE-10-2017* *(10 M€)*

**Market-uptake**

- Tackling the bottlenecks of high penetration levels of PV electricity into the electric power network – *LCE-21-2017*

# Solar Concentrado (CSP)

**Contexto**
- Presença forte da industria europeia nesta área, mas o domínio do mercado é de fora (forte competição)
- Necessidade de reduzir custos operacionais, bem como melhorar o desempenho do sistema e a sua pegada ambiental (relativamente ao consumo de água)

**Investigação fundamental**
- Upscaling technologies currently at lab-scale - *LCE-6-2017*

**Investigação avançada**
- Innovative components and configurations for reducing costs of CSP plants – *LCE-7-2016*
- New cycles and power blocks for reducing costs of CSP plants – *LCE-7-2017*

**Demonstração**
- Reducing water consumption of CSP plants – *LCE-11-2016* (12M€)

**Market-uptake**
- Facilitating the supply of electricity from CSP plants in Southern Europe to Central and Northern European countries  – **LCE-21-2017**

# Aquecimento e arrefecimento solar

**Contexto**
- Tecnologia madura, mas por explorar;
- Necessidade de tecnologia para aumento de escala no setor;
- Redução de custos e melhoria de desempenho;
- A competitividade e a aceitação dos sistemas solares tem de ser aumentada.

**Investigação fundamental**
- Upscaling technologies currently at lab-scale - *LCE-6-2017*

**Investigação avançada**
- Innovative components for solar compact hybrid systems  – *LCE-7-2016*
- Development of components for residential single-family solar-active houses – *LCE-7-2017*

**Demonstração**
- Solar heat in industrial processes – *LCE-12-2016* (8M€)

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# Energia Geotérmica

**Contexto**
- A energia geotérmica tem um potencial ainda não explorado para diversificar o mix de fontes de energias disponíveis
- "Shallow geothermal" apresenta avanços significativos;
- Enhanced geothermal systems (EGS): redução de custos e riscos e demonstração de tecnologias viáveis para a criação de novos reservatórios.

## Investigação fundamental
- Upscaling technologies currently at lab-scale - *LCE-6-2017*

## Investigação avançada
- Improving borehole heat exchanger (shallow geothermal) – *LCE-7-2016*
- Materials for geothermal installations (deep geothermal) – *LCE-7-2017*
- International cooperation with Mexico (deep geothermal) – **LCE-23-2016** (10M€)

## Demonstração
- Geothermal systems for retrofitting builldings – *LCE-17-2016 (8M€)*
- EGS in different geological conditions – *LCE-18-2017 (10M€)*

## Market-uptake
- Tackling bottlenecks for high penetration – *LCE-21-2017*
- Accelerating the penetration of heat pumps for heating and cooling – *LCE-21-2017*

# Energia Eólica

**Contexto**
- Apesar de as indústrias europeias ainda serem líderes mundias, a competição está a crescer fortemente;
- Redução de custos dos componentes, em especial para eólica offshore;
- Eólica offshore é considerada o mercado do futuro – demonstração de turbinas de elevadas potências
- Problemas no impacto social e ambiental

## Investigação fundamental

- Improved understanding of the physics of wind as primary energy source and wind energy technology le - *LCE-6-2017*

## Investigação avançada

- Iadvanced control of large-scale wind turbines and farms – *LCE-7-2016*
- Reduction of environmental impact – *LCE-7-2017*

## Demonstração

- Solutions for reduced maintenance, increased reliability and extended life-time of off-shore wind turbines/farms – *LCE-13-2016* (10M€)
- Large >10 MW wind turbines – *LCE-14-2017* (25M€)

## Market-uptake

- Increase market share of wind energy – *LCE-21-2017*

# Energia dos Oceanos

**Contexto**
- Indústria Europeia a liderar as tecnologias emergentes
- Muitos dispositivos desenvolvidos e protótipos testados, mas o potencial de mercado continua por explorar
- A demonstração de sistemas fiáveis e robustos é essencial.
- Impactos ambientais e sociais por avaliar

## Investigação fundamental
- Upscaling technologies currently at lab-scale - *LCE-6-2017*

## Investigação avançada
- Increased performace and reliability of ocean energy sub-systems – *LCE-7-2016*
- Innovative power take-off systems and control strategies – *LCE-7-2017*

## Demonstração
- Scaling up in the ocean energy sector to arrays – **LCE-15-2016** (5M€)
- Design tools for ocean energy devices and arrays development/deployment – **LCE-16-2017** (7M€)

## Market-uptake
- Multi-use of the oceans' marine space, offshore and near-shore: compatibility, regulations, environmental and legal issues (CSA), **BG-3-2016**, 2M€

# Integração de Sistemas de Energias Renováveis na rede

**Contexto**

• Aumento da contribuição das fontes de energias renováveis na rede obriga a repensar a gestão do sistema.

**Investigação avançada**

• **LCE-7-2016-2017**:

  • Developing system support functions enabling RES technologies to contribute - at transmission and distribution grid level - to a stable and safe energy system;

  • Define most suitable pathways for including integration considerations into the different RES development roadmaps

# Biocombustíveis

**Investigação fundamental**

- Diversification of renewable fuel production through novel conversion routes/fuels - **LCE-6-2017**

**Investigação avançada**

- **LCE-8-2016-2017**: Next generation of:
    - *Paraffinic biofuels from sugar through chemical and/or biochemical pathways (2016)*
    - *Biofuels from pyrolysis or hydrothermal liquefaction (2016)*
    - *Synthetic biufuels/hydrocarbons through biomass gasification (2016)*
    - *Biofuels from CO2 in industrial waste flue gases or other waste through different pathways (2017)*
    - *Biofuels from phototropic algae / bacteria (2017)*
- Cooperation with Brazil on advanced lignocellulosic biofuels - **LCE-22-2016** (5M€)

# Biocombustíveis

**Demonstração**

- *LCE-19-2016-2017* (15M€ para 2016 e 2017)
  - Biomass gasification (2016)
  - Biomass pyrolysis and torrefaction to intermediate bioenergy carriers (2016)
  - Biochecmical conversion to diesel and jet fuels (2016)
  - Biofuels from waste flue gases / other wastes and residues (2017)
  - Biomass from aquatic biomass (2017)
- Pre-commercial production of advanced aviation biofuels – **LCE-20-2016-2017** (15M€ 2016; 10M€ 2017)

**Market-uptake**

- Market roll-out of liquid advanced biofuels and liquid renewable alternative fuels – *LCE-21-2017*
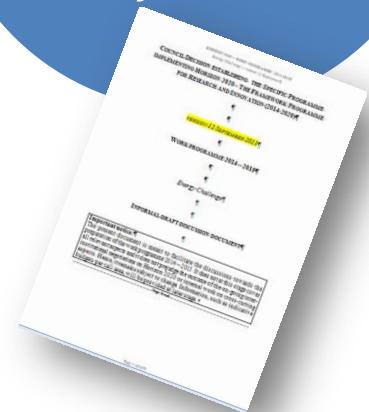
# Programa de Trabalhos de Energia 2016-2017

**SMART CITIES AND COMMUNITIES – 1 TÓPICO**



*Programa de Trabalhos 2016-2017 – Energia Segura, Não Poluente e Eficiente*

# Desafio Societal Energia – Concursos Cidades e Comunidades Inteligentes

**Contexto**

- Smart Cities 2012-2013: Energia e TIC
- Smart Cities 2014-2015: Energia, TIC e Transportes
- Smart Cities 2016-2017: Energia, TIC, Transportes and soluções baseadas na Natureza

**Objetivos**

- Criar massa crítica de projetos até 2020
- Captar verdadeiramente seguidores para replicar as soluções SCC
- Ser pioneiro em "coaching cities"
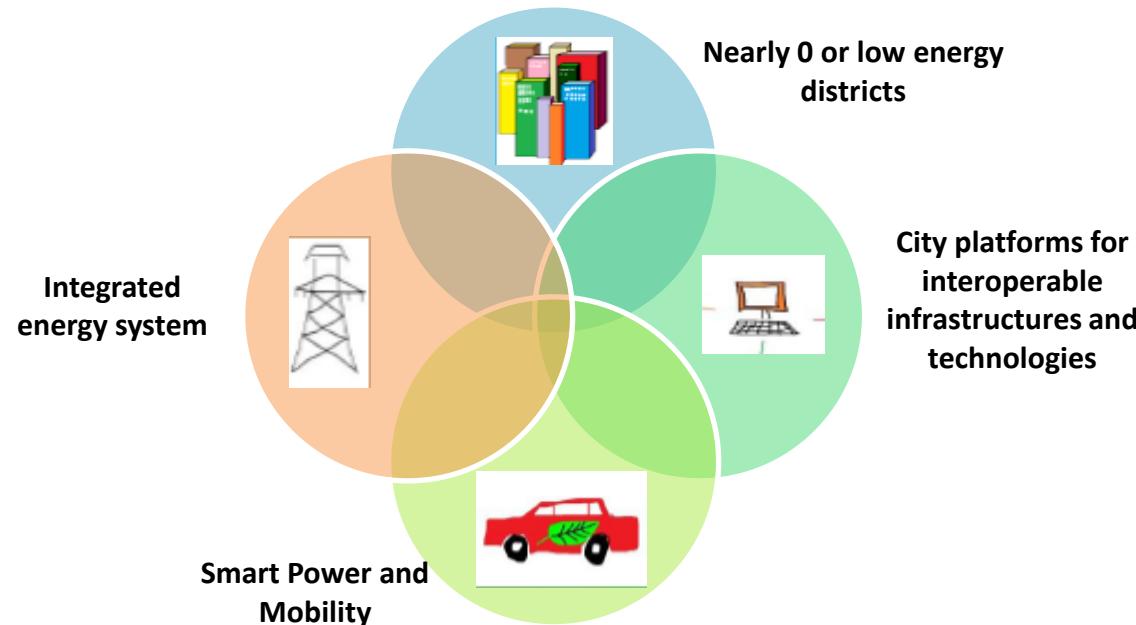
**Experiências dos concursos de 2014**

- Um número demasiado vasto de vertentes e uma separação pouco clara entre o que é obrigatório, recomendável ou apenas exemplo
- O tópico deverá ser melhorado e o ponto anterior clarificado

# Desafio Societal Energia – Concursos Cidades e Comunidades Inteligentes

| Smart Cities and Communities | TOPIC | Type of scheme | EC Contribution |
|---|---|---|---|
| SCC 1 – 2016/2017 | Smart Cities and Communities lighthouse projects | IA (> TRL 7) | 12-18 M€ |
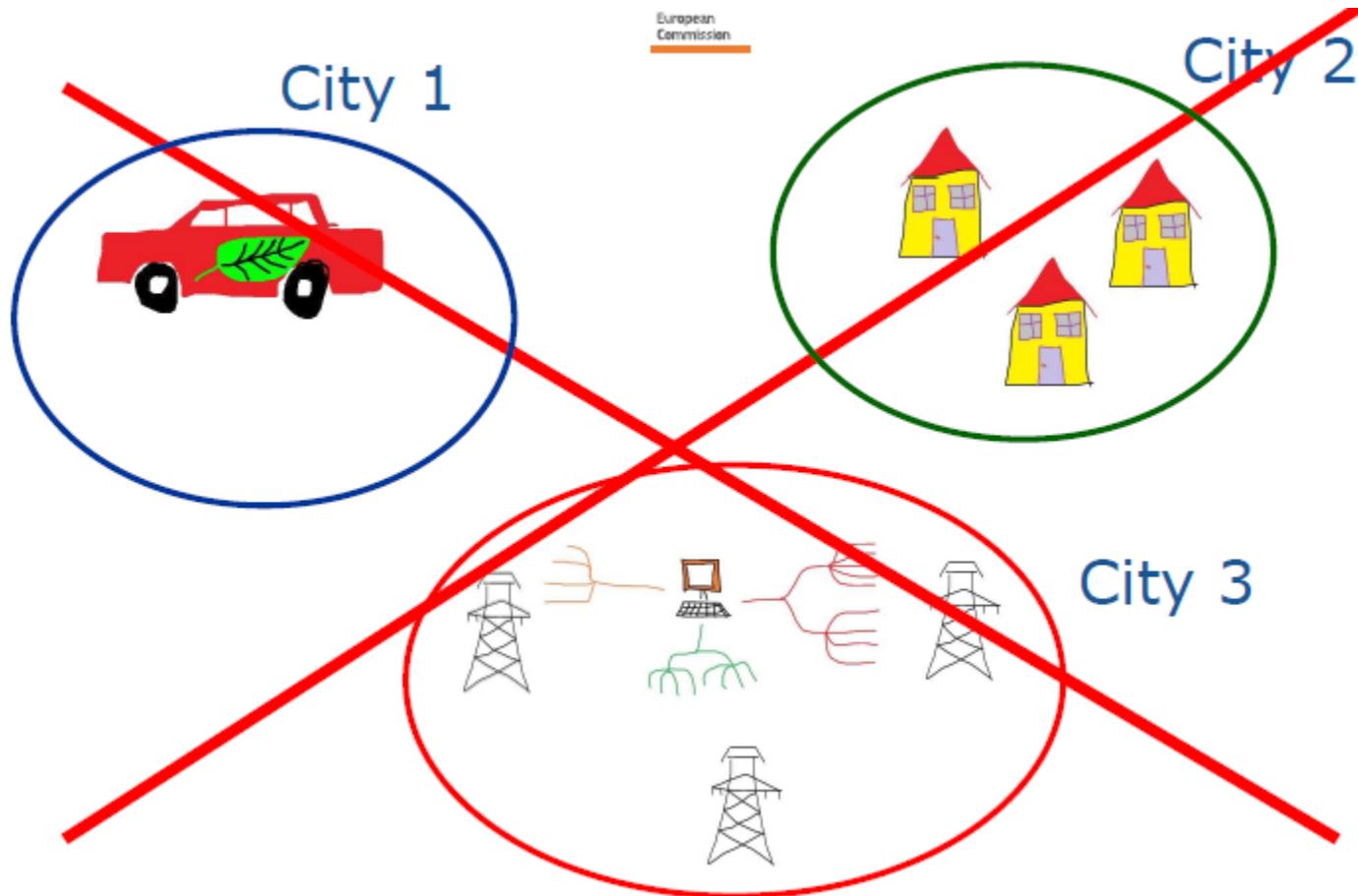
*Keywords: smart homes, smart energy, ICT systems and electric vehicles, integration, replication of solutions*



Nearly 0 or low energy districts

City platforms for interoperable infrastructures and technologies

Smart Power and Mobility

Integrated energy system
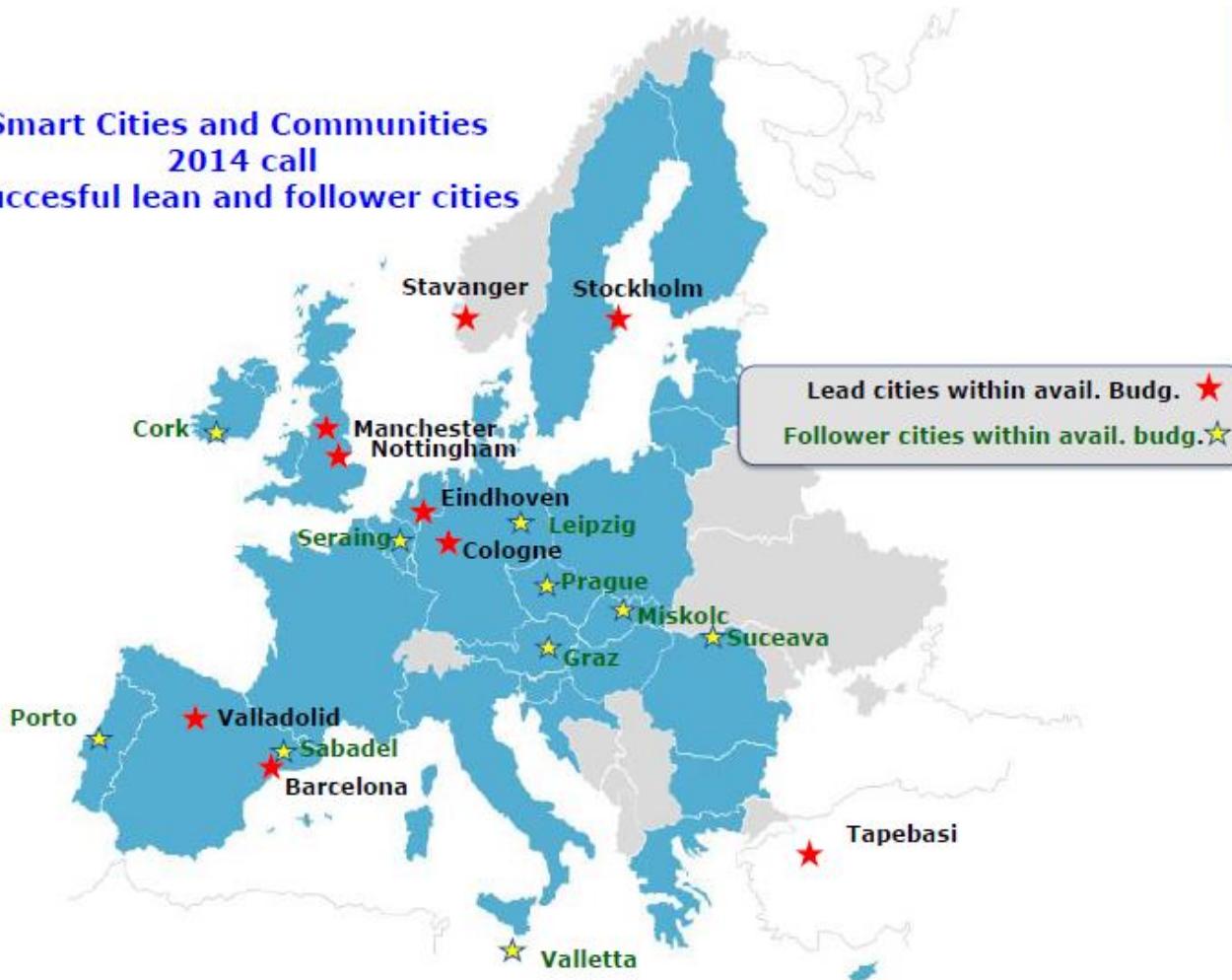
# Desafio Societal Energia – Concursos Cidades e Comunidades Inteligentes

# Desafio Societal Energia – Concursos Cidades e Comunidades Inteligentes



**Projetos SCC 2014**

✓ GrowSmarter

✓ Remourban

✓ Triangulum

# Prazos de submissão – Concurso Smart Cities 2016

| Concurso | Tópico | Prazo de Submissão |
|----------|--------|--------------------|
| **H2020-SCC-2016** | SCC1 | Single stage<br>5/04/2016 |

Gabinete de Promoção dos
Programa Quadro ID&I