



H2020: ENERGÍA LIMPIA, SEGURA Y EFICIENTE WP 2016-2017

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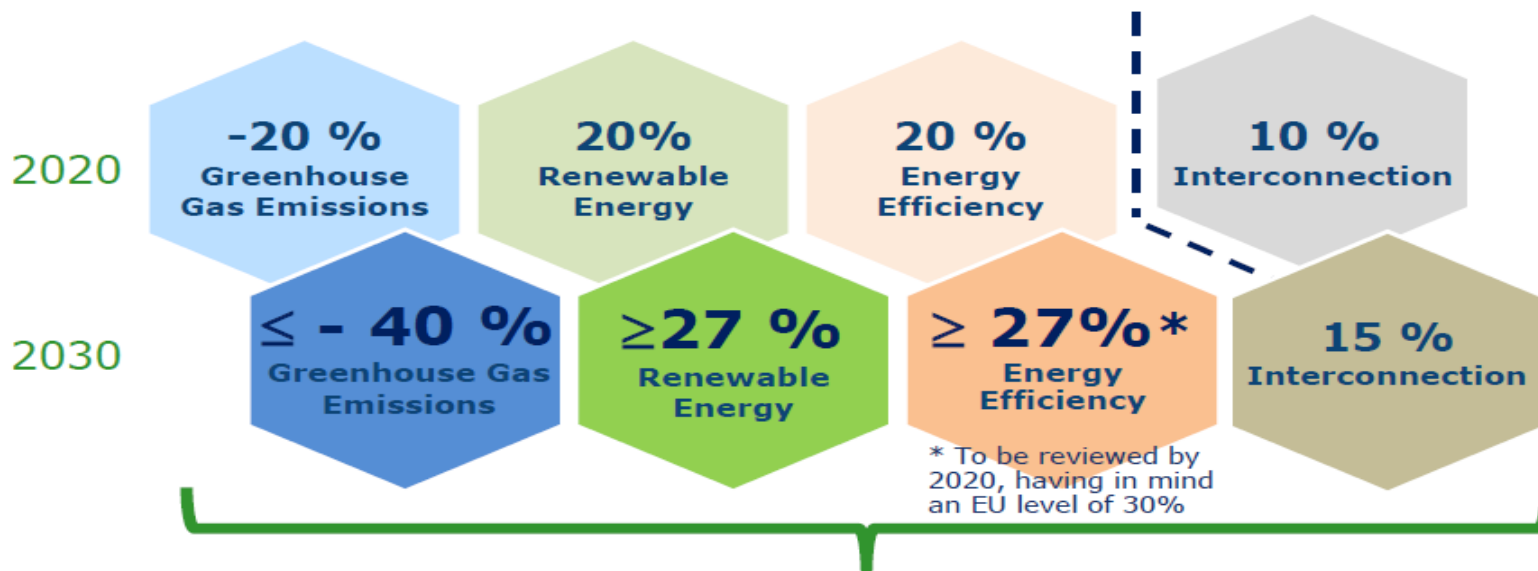
Punto Nacional de Contacto Reto Energía H2020
División Programas de la UE
Dirección de Programas Internacionales
CDTI

CENER, Pamplona, 26 de Noviembre de 2015

INDICE

- **Contexto Político**
- Aspectos generales del programa Energia-Novedades
- Convocatorias 2016 – 2017
 - Energy Efficiency
 - Competitive Low Carbon
 - Smart Cities and Communities
- Resultados convocatorias 2014

Agreed headline targets 2030 Framework for Climate and Energy



New governance system + indicators

<http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52014DC0015&from=EN>

2015 ENERGY UNION

http://ec.europa.eu/priorities/energy-union/index_en.htm

This communication aims to provide EU consumers (households and industries) with **SECURE, SUSTAINABLE, COMPETITIVE** and **AFFORDABLE** energy

NEW TECHNOLOGY FOR TOMORROW'S ENERGY

TODAY:
The EU has **LOST GROUND** on clean, **LOW-CARBON TECHNOLOGIES**.

WITH THE ENERGY UNION:
LOWER BILLS for EU citizens.

EUROPEAN COMPANIES to be world leading on renewable and low-carbon technologies.

#EnergyUnion

ENERGY UNION: 5 Pillars

1. **Energy security**, solidarity and trust

2. A fully **integrated** European **energy market**

3. **Energy efficiency** contributing to moderation of demand

4. **Decarbonisation** of the economy

5. **Research, Innovation and Competitiveness**

➤ Link to policy agenda

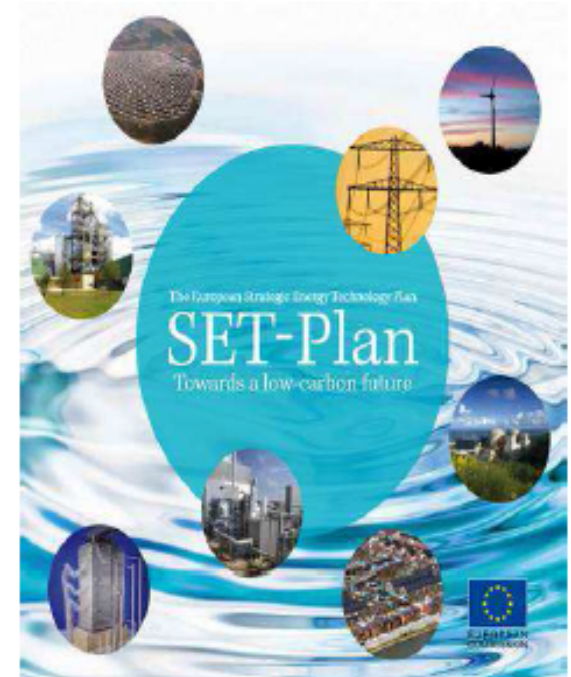
Objectives for 2020

- 20% reduction of CO2 emissions (ref. 1990)
- 20% share of renewable energy [of EU energy consumption]
- 20% improvement in Energy Efficiency

➤ Focus on technologies with market impact up to 2020

➤ 2 key implementing bodies:

- **European Industrial Initiatives (EII)**
(triggering MSs/industry investments)
- **European Energy Research Alliance (EERA)**
(coordination of research communities)



"Towards an Integrated Roadmap", December 2014

- Active consumer
 - Demand focus (energy efficiency)
 - System optimisation
 - Supply
-
- New integrated approach – going beyond technology silos
 - First time – a comprehensive European energy R&I agenda for solutions to cost-effectively accelerate the energy transition

Strategic Energy Technology (SET) Plan

Towards an Integrated Roadmap:
Research & Innovation Challenges and Needs
of the EU Energy System



<https://setis.ec.europa.eu/set-plan-process/integrated-roadmap-and-action-plan>

SET-Plan



- *Integrated Roadmap*
- *Communication on Integrated SET-Plan (COM[2015]6317)*
- *State of the Union 2015.* (Brussels, 18.11.2015
COM(2015) 572 final)

<https://ec.europa.eu/jrc/en/news/new-strategic-energy-technology-plan-set-plan-communication>

https://ec.europa.eu/energy/sites/ener/files/documents/1_EN_ACT_part1_v8_0.pdf

http://ec.europa.eu/priorities/energy-union/state-energy-union/docs/communication-state-energy-union_en.pdf

Energy Union Priorities

No1 in Renewables

Smart EU energy system,
with consumer at the
centre

Efficient energy systems

Sustainable transport

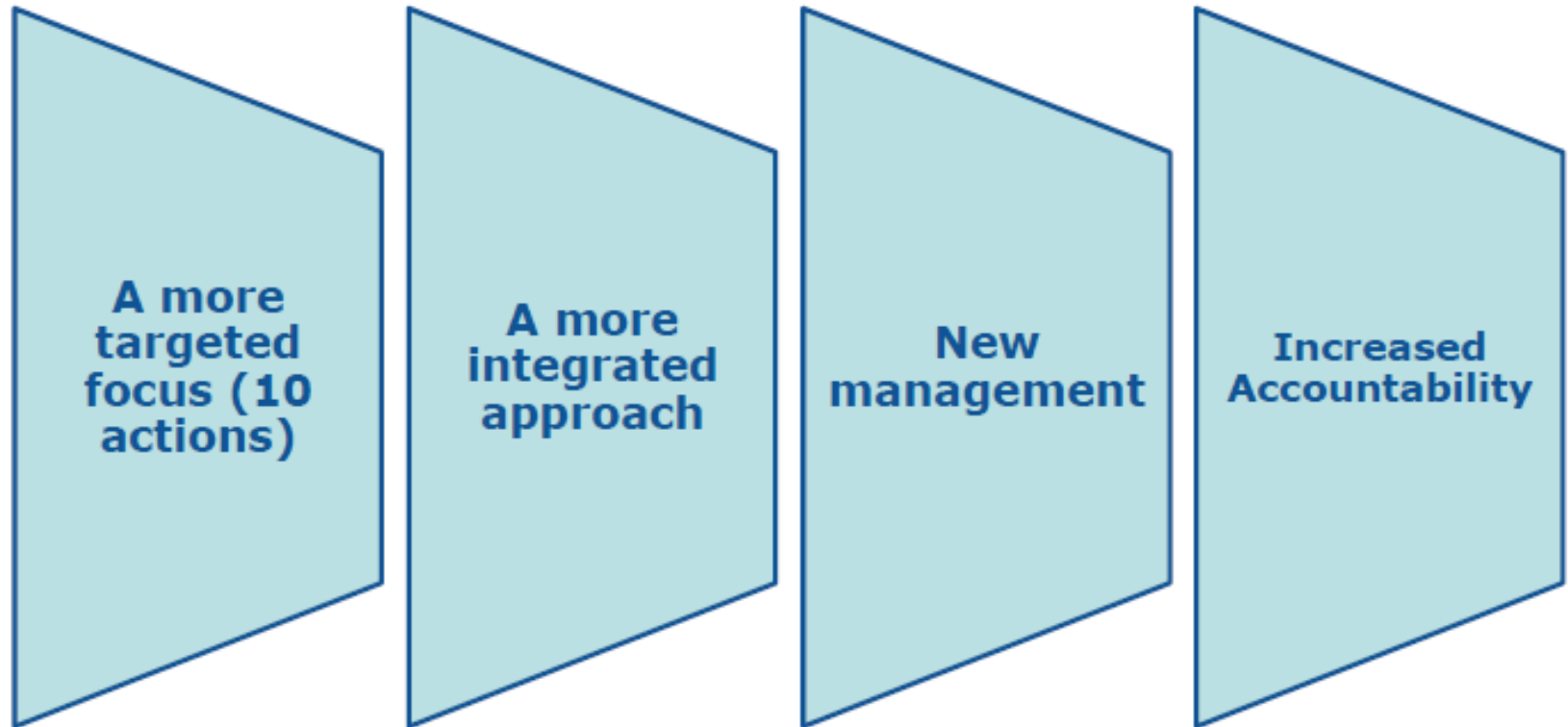
Nuclear Safety

CCS /CCU



September 2015 Communication: The Integrated SET Plan

What is new?

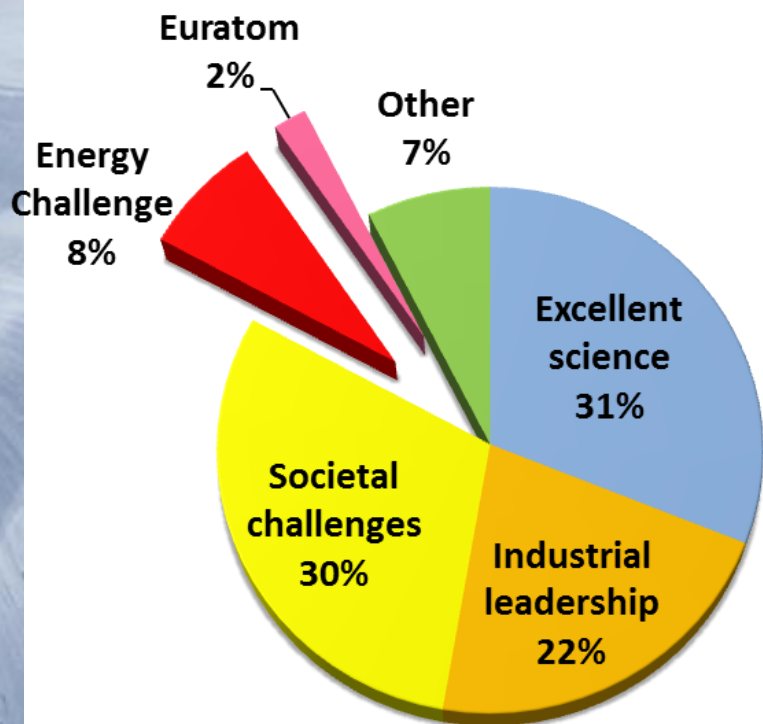


<https://ec.europa.eu/jrc/en/news/new-strategic-energy-technology-plan-set-plan-communication>

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HORIZONTE 2020 - PRESUPUESTOS

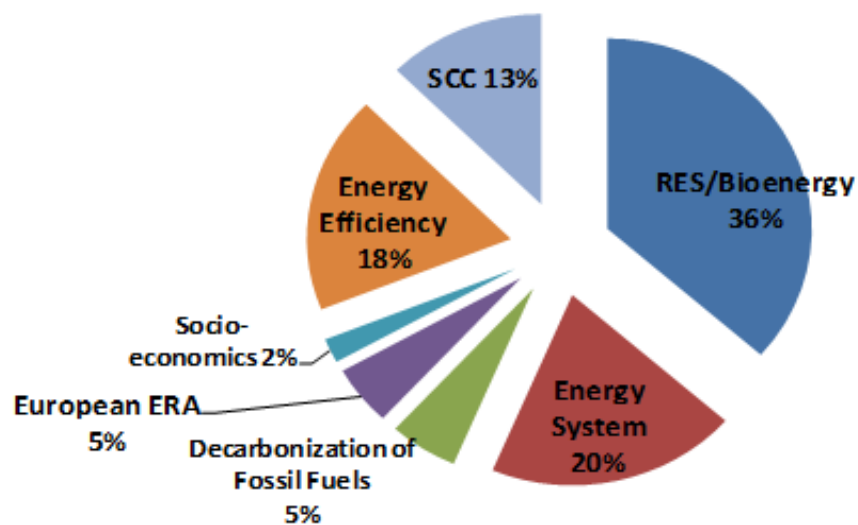


Total budget H2020:
EUR 74,83 billion

Budget of the Energy Challenge:
EUR 5,69 billion

	(*)Budget M.€		Total
WP 2014 & 2015	549,13	591,46	1.140,59
WP 2016 & 2017	508,66	540,12	1.048,78

Call M.€	2016	2017
EE	93	101
LCE	355,66	367,62
SCC	60	71,50



Estructura programa de ENERGIA Call 2014-2015

Secure Clean end
efficient Energy

→ **Energy
Challenge**

Energy Efficiency
21 topics

Low Carbon
Technologies
22 topics

Smart Cities and
Communities
4 topics

Estructura programa de ENERGIA Call 2016-2017

Societal Challenge 3 "Secure Clean end
efficient Energy

Cross-Cutting
activities

Energy Efficiency
25 topics

Low Carbon
Technologies
36 topics

Smart Cities and
Communities 1 topic

17. WP CROSS-CUTTING ACTIVITIES

(i) Industry 2020 in the Circular Economy

PILOT

FACTORIES OF THE FUTURE - (FoF)

SOSTEINABLE PROCESS INDUSTRIES - SPIRE

CIRCULAR ECONOMY

NCP
NMBP

NCP
RS 5

(ii) Internet of Things

NCP
ICT

(iii) Smart and Sustainable Cities

Smart Cities and Communities (SCC-01)

SCC-1-2016-2017: Smart Cities and Communities light house projects

NCP
RS 3

Sustainable cities though Nature-based solutions (SCC-02)

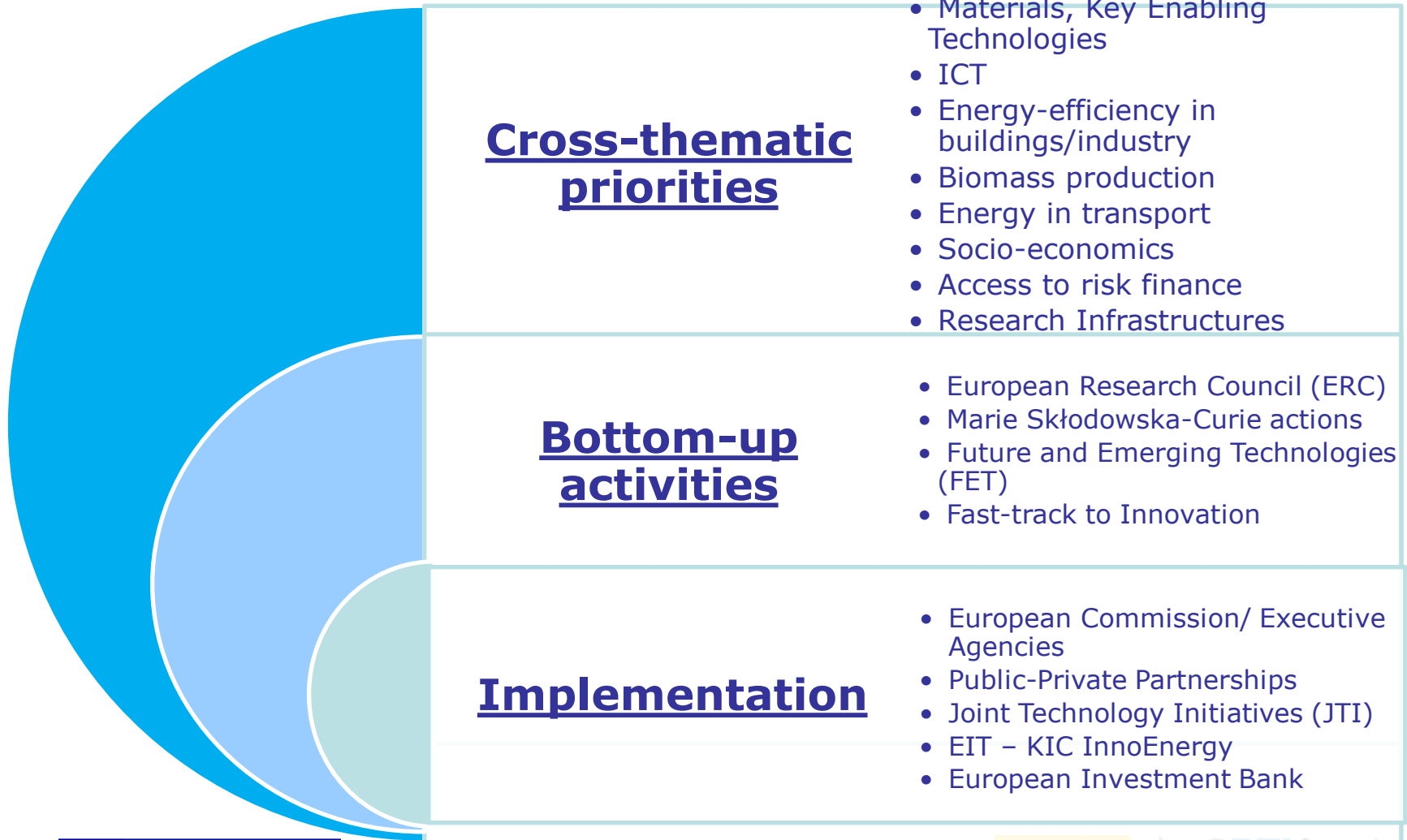
SCC-2-2016-2017: Demonstrating innovative nature-based solutions in cities

SCC-3-2016: New governance, business, financing models and economic impact assessment tools for sustainable cities with nature-based solutions (urban re-naturing)

NCP
RS 5

SCC-4-2016: Sustainable urbanisation

Energía fuera del RS3





Cross-Thematic Priorities

LEITs (Leadership in Enabling and Industrial Technologies)
Nanotechnologies, Advanced materials, Advanced manufacturing and processing, Biotechnology

Energy-efficient Buildings
(EEB-01 - EEB-8)

Sustainable Process Industry
(SPIRE-04, SPIRE-05, SPIRE-08)

Materials for Energy
(NMBP-2, NMBP-3, NMBP-17 - NMBP-20)

LEITs (Leadership in Enabling and Industrial Technologies)
Information and communication technologies

Low energy computing
(ICT-5)

Power electronics

Big Data
(ICT-15)

Photonics
(ICT-29)

Internet of Things
(EUB-2)



Cross- Thematic Priorities

Societal Challenge 2

Food security, sustainable agriculture and forestry, marine and maritime and inland water research and the bioeconomy

Biomass production
(BB-01, BG-03)

Marine energy
(RUR-07, RUR-08)

Societal Challenge 4

Smart, green and integrated transport

Energy-efficient transport
(MG-1.1, MG-2.1.)

Electric mobility
(MG-4.2)

Green Vehicles
(GV-1, GV-4, GV-5, GV-6, GV-8)

Use of alternative fuels
(MG-1.1, MG-2.1, GV-1)



Cross- Thematic Priorities

Societal Challenge 5

Climate action, environment, resource efficiency and raw materials

Nature-based solutions for Smart and Sustainable Cities

(SCC-2, SCC-3, SCC-4)

Societal Challenge 6 - Europe in a changing world; Science with and for Society

Social Innovation

(Horizon Prize - SwafS-10)

Responsible Research



Cross- Thematic Priorities

Societal Challenge 7

Secure societies

Critical Infrastructures

(CIP-1)

Access to Risk Finance

Support for first-of-a-kind demonstration projects

(InnovFin Energy Demonstration Projects - EDP)

European Research Infrastructures (including e-Infrastructures)

Research Infrastructures for energy (INFRAIA-01)

Energia en H2020 : JTI-FCH

Multi-annual Work-Plan 2014-2020

Continuation of EU support under Horizon 2020

- **EU budget: 665 mill. EUR**
- **Objectives:** reduce the (production) cost, increase the lifetime, increase the efficiency, reduce 'Critical raw materials'

Transport

- Road vehicles
- Non-road vehicles and machinery
- Refuelling infrastructure
- Maritime, rail and aviation applications

Energy

- Hydrogen production and distribution
- Hydrogen storage for renewable energy integration
- Fuel cells for power and combined heat & power generation

Cross-cutting Issues

(e.g. standards, consumer awareness, manufacturing methods, ...)



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TYPES of ACTIONS

Research and Innovation Action (RIA)

- establish new knowledge and/or to explore the feasibility of a new or improved technology, product, process, service or solution
- 100% funding rate
- At least 3 legal entities from 3 different MS/AC

Innovation Action (IA)

- producing plans/arrangements or designs for new, altered or improved products, processes or services (incl. prototyping, testing, demonstrating, piloting, large-scale product validation and market replication)
- 70% funding rate (but 100% for non-profit organisations)
- At least 3 legal entities from 3 different MS/AC

Coordination and Support Action (CSA)

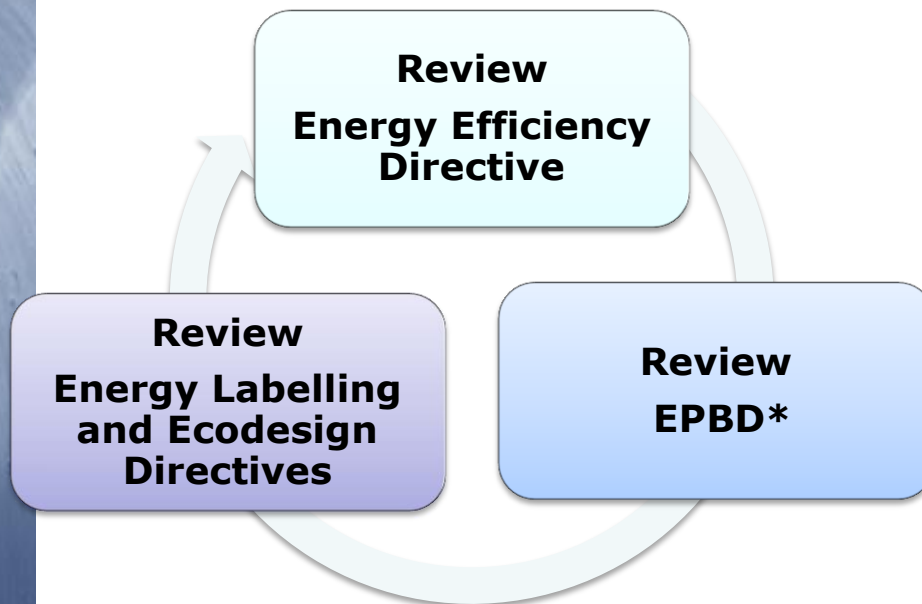
- accompanying measures such as standardisation, dissemination, awareness-raising and communication, networking, coordination or support services
- 100% funding rate
- At least 1 legal entity from MS/AC

ERA-NET Cofund

- support public-public partnerships in their preparation, networking, design, implementation and coordination of joint activities as well as EU topping-up of a trans-national call for proposals
- At least 3 legal entities from 3 different MS/AC
- participants must be 'research funders'

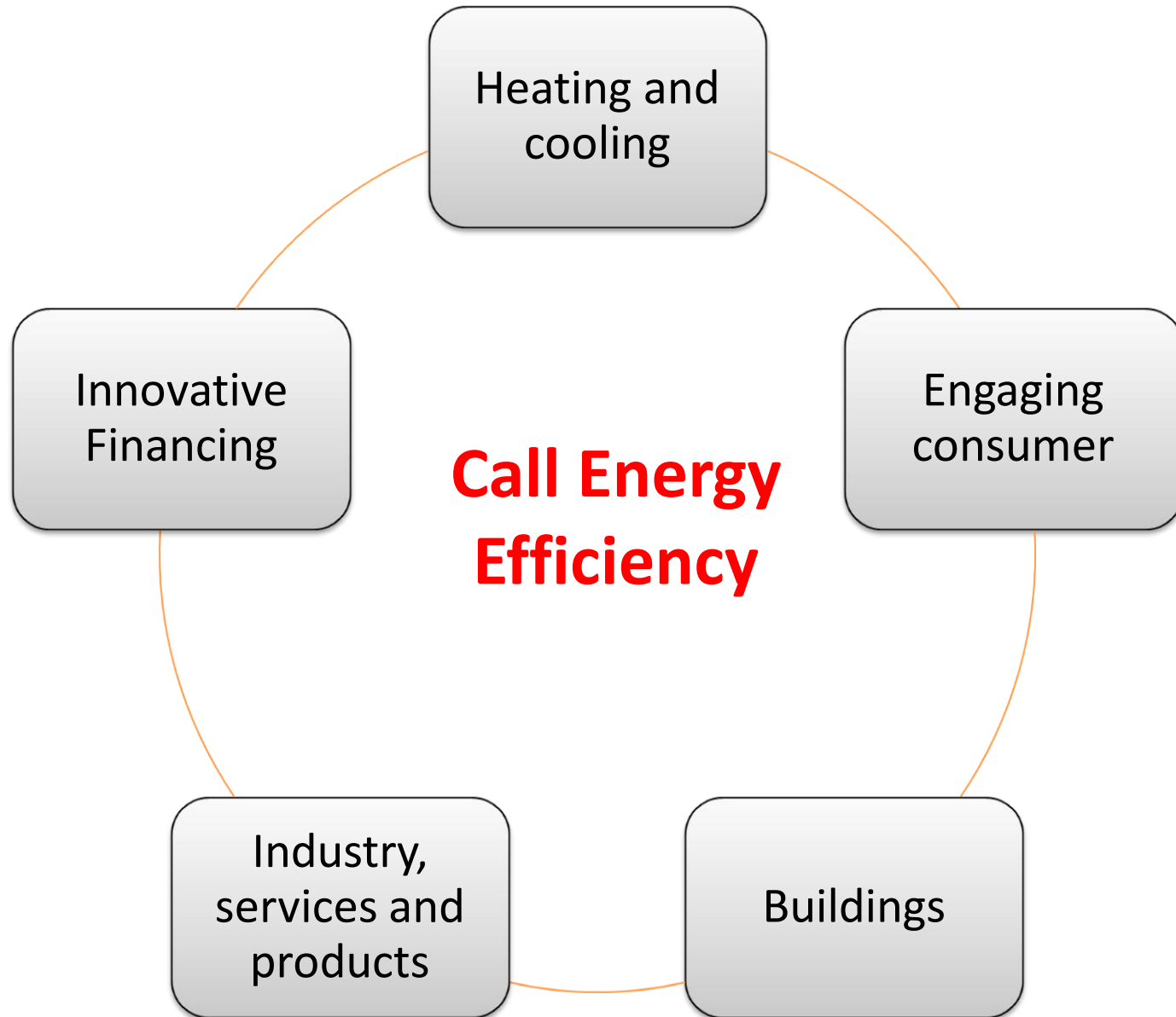
Energy Efficiency

- 2020 & 2030 Framework for Climate and Energy
- Energy Union and its third pillar – Energy Efficiency



WP 2016-2017:

- Focussing on consumer-related issues
- More topics on heating and cooling
- Multi-level approach to eliminate market barriers to finance for energy efficiency

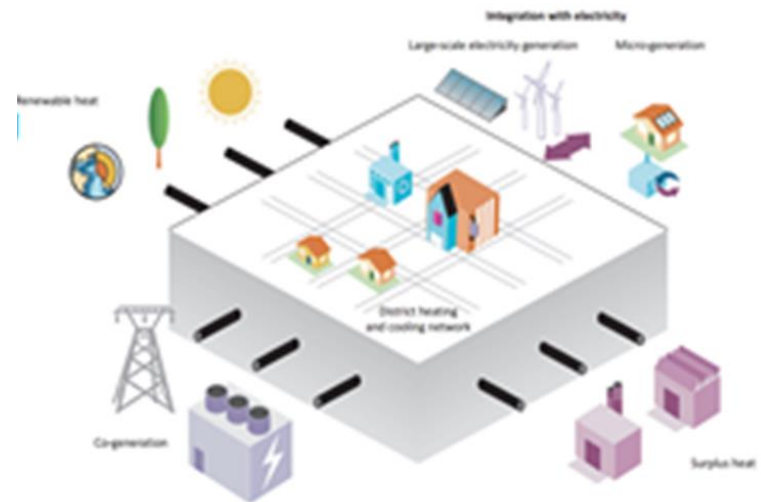


HEATING & COOLING

Communication on policy strategy foreseen beginning 2016, based on broad consultation of stakeholders

Objectives :

- Tackling H&C consumption – Moderating demand
- Increasing energy efficiency in supply
- Maximising use of local sustainable and renewable energy sources
- Recovering waste heat
- Linking with electricity system
- Achieving affordable costs



HEATING AND COOLING

HEATING & COOLING topics					
	EE1	EE2	EE3	EE4	EE5
2016			IA	RIA	RIA
2017	IA	CSA		RIA	

Topics H&C	Type of Action	TRLs	M.€ EU contribution	Call
EE1-2017: Waste heat recovery from urban facilities and re-use to increase energy efficiency of district or individual H&C systems	IA	6-8	3-4	2017
EE2-2017: Improving the performance of inefficient district heating networks	CSA		1-2	2017
EE3 -2016: Standardised installation packages integrating renewable and energy efficiency solutions for heating, cooling and/or hot water preparation	IA	6-8	3-4	2016
EE4 – 2016-1017 New heating and cooling solutions using low grade sources of thermal energy	RIA	4-6	3-4	2016-2017
EE5 – 2016 Models and tools for heating and cooling mapping and planning	RIA	5-7	2.5-3	2016

Consumer in the centre

New deal for energy consumers:

- ✓ Empowering consumer
- ✓ Deploying demand side response
- ✓ Using smart technologies
- ✓ Protecting vulnerable customers



Engaging private consumers towards sustainable energy

- *Topic EE-6-2016-2017*

Behavioural change toward energy-efficiency through ICT

- *Topic EE-7-2016-2017*

Socio-economic research on consumer's behaviour related to energy efficiency

- *Topic EE-8-2016*

Engaging and activating public authorities

- *Topic EE-9-2016-2017*

		ENGAGE CONSUMERS			
		EE6	EE7	EE8	EE9
2016	CSA		IA	RIA	CSA
2017					

ENGAGING CONSUMERS towards sustainable energy

Topics - Engaging Consumers	Type of Action	TRLs	M.€ EU contribution	Call
EE6 – 2016/2017 Engaging private consumers towards sustainable energy	CSA		1-2	2016 2017
EE7 – 2016/2017 Behavioural change toward energy efficiency through ICT	IA	TRL 6	1-2	2016 2017
EE8 – 2016 Socio-economic research on consumer's behavior related to energy efficiency	RIA		1-1.5	2016
EE9 – 2016-2017 Engaging and activating public authorities	CSA		1-2	2016 2017

- **Consumer empowerment** through smart homes system and demand response EE-12-2017
- **Consumer information** through EU product efficiency legislation EE-16-2016-2017



Buildings

Buildings account for 40% of the final energy consumption

Deep renovation of buildings

- *Topics EE-10-2016 (EeB-PPP), EE-11-2016-2017*

Demand response in energy management systems

- *Topic EE-12-2017 (EeB-PPP)*

Cost reduction of new Nearly Zero-Energy buildings

- *Topic EE-13-2016*

Construction skills

- *Topic EE-14-2016-2017*

BUILDINGS					
	EE10	EE11	EE12	EE13	EE14
2016	IA	CSA		CSA	CSA
2017			IA		

Buildings

Topics - Buildings	Type of Action	TRLs	M.€ EU contribution	Call
EE10 – 2016: Supporting accelerated and cost-effective deep renovation of buildings PPP-EeB	IA	6-8	3-4	2016
EE11 – 2016/2017: Overcoming market barriers and promoting deep renovation of buildings	CSA		1-2	2016 2017
EE12 – 2017: Integration of Demand Response in Energy Management Systems while ensuring interoperability PPP-EeB	IA	6-8	3-4	2017
EE13 - 2016: Cost reduction of new Nearly Zero-Energy Buildings (NZEB)	CSA		1-2	2016
EE-14 – 2016/2017: Construction skills	CSA		1-2	2016 2017



Industry, services and products – Topics 2016-2017

Industry and service sectors represent more than 39% of the EU's final energy consumption

Challenges

- Energy efficiency investments in industrial & service sectors are not implemented due to a combination of market factors & barriers;
- Waste heat recovery in large industrial systems is not fully exploited and waste energy from one industry could be a resource for another;
- European industry needs to develop a global technological leadership in energy efficiency solutions
- Demand for computing and data handling is driving increased energy consumption for data centres;
- Public sector spending means that it can act as a driver for procurement of innovative energy efficiency solutions

		Industry, services & products						
		EE15	EE16	EE17	EE18	EE19	EE20	EE21
2016			CSA	RIA				ERANET
2017	CSA				CSA	PPI	IA	

Industry, services and products

Topics - Industry, services & products	Type of Action	TRLs	M.€ EU contribution	Call
EE-15 -2017: Increasing capacities for actual implementation of energy efficiency measures in industry and services	CSA		1-2	2017
EE16 – 2016/17: Effective implementation of EU product efficiency legislation	CSA		1-2	2016 2017
EE17 – 2016/2017: Valorisation of waste heat in industrial systems PPP-Spire (Energy symbiosis in industrial systems)	RIA	5-7	4-5	2016 2017
EE18 – 2017: Energy efficiency of industrial parks through energy cooperation and mutualized energy services	CSA		1-2	2017
EE19 – 2017: Public Procurement of Innovative Solutions for energy efficiency	PPI		1-2	2017
EE20 – 2017: Bringing to market more energy efficient and integrated data centres	IA		2-3	2017
EE21 – 2016: ERA-NET Cofund actions supporting Joint Actions towards increasing energy efficiency in industry and services	ERANET Cofund		5	2016

Financing Energy Efficiency

100 bn € investments/year needed to achieve EE targets

Challenge:

- Improve supply of **large-scale finance** at a low cost for by:
 - Providing **Project Development Assistance** to public and private sectors to deliver innovative and bankable sustainable energy investments; **EE-22-2016-17**
 - Development of **innovative financing schemes** insuring flow of private finance for EE investments; **EE-23-2017**
 - Increase "readability" of market fundamentals for financiers and investors through **benchmarking and standardisation** of EE investments; **EE-24-2016-17**
 - Develop, demonstrate and standardise new types of **energy efficiency services and business models** ;**EE-25-2016**



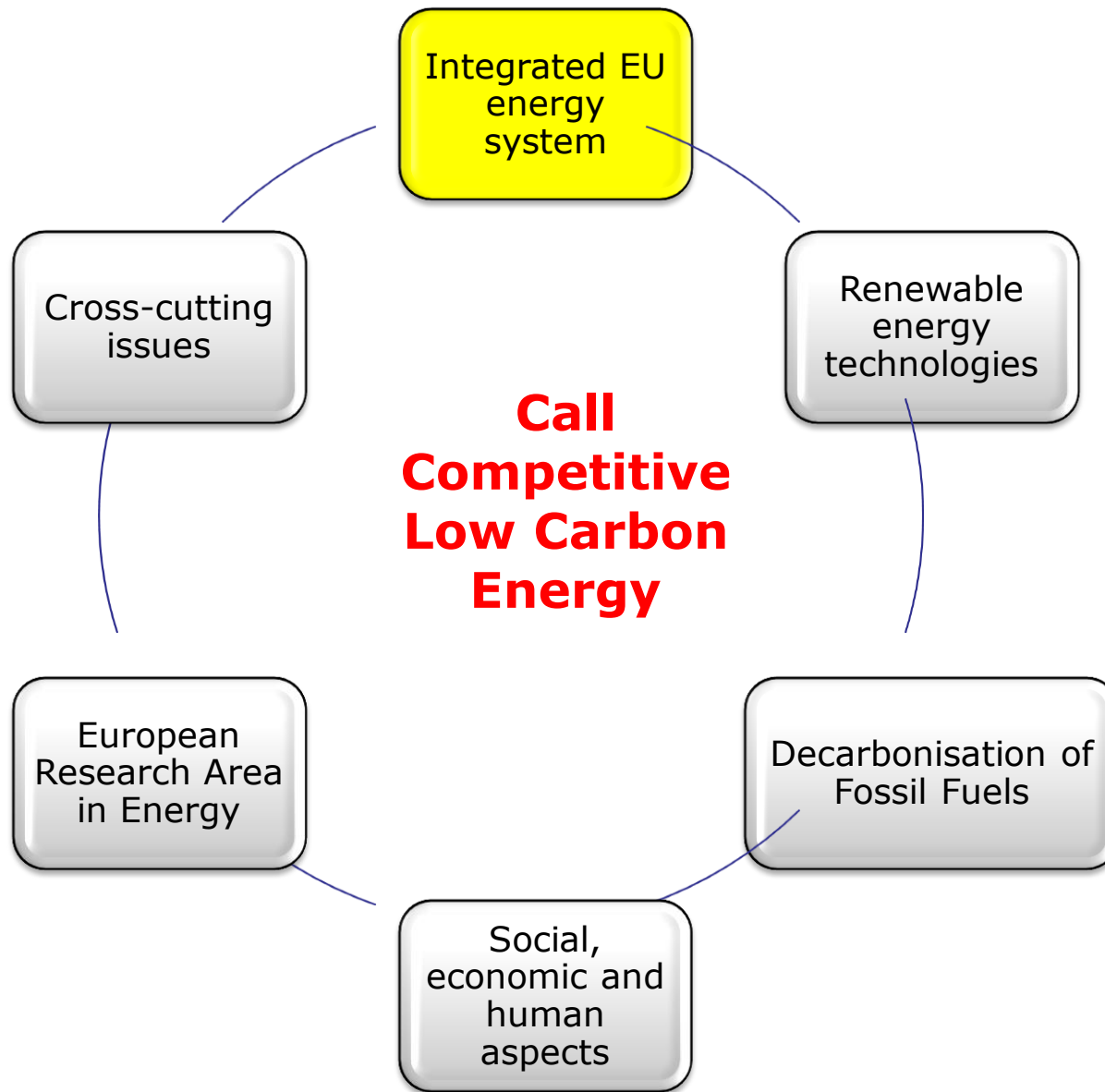
Call Energy Efficiency – H2020-EE-2016/2017

	Opening Date	Sub - Call	Topic	Call Budget M.€	Call Deadline
2016	15/10/2015	H2020-EE-2016-RIA/IA	EE-03, 04, 05, 07, 08	34	21/01/2016
		H2020-EE-2016-PPP (IA)	EE-10, 17	16	
	15/03/2016	H2020-EE-2016-CSA	EE-06, 09, 11, 13, 14, 16, 24, 25	30	15/09/2016
			EE-22-PDA	8	
		H2020-EE-2016-ERA-NET	EE-21	5	
	Total Budget 2016				93
2017	15/06/2016	H2020-EE-2017-IA/RIA	EE-01, 04, 07, 20	30	19/01/2017
		H2020-EE-2017-PPP (IA)	EE-12, 17	16	
	19/01/2017	H2020-EE-2017-CSA/PPI	EE-02, 06, 09, 11, 14, 15, 16, 18, 19, 23, 24	47	14/09/2017
			EE-22-PDA	8	
	Total Budget 2017				101

WP 2014/2015: 195,65 M.€

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Energy system – Context

Challenges for the European energy system

- Increasing electricity generation and consumption
- Increasing share of renewable energies in electricity generation
- Strong growth of variable RES (wind, solar)
- Huge differences between national energy systems

Energy system – topics 2016

LCE-1

Next generation Distribution Technologies

Research and
Innovation Action
(TRL 3-6)

2-4 M€/project
Budget: 20 M€

Address either

- Storage or
- Synergies between networks

LCE-2

Demonstration of Distribution Technologies

Innovation Action
(TRL 5-8),
12-15 M€/project
Budget: 73,46 M€

Address at least 3 :

- Demand response
- Smartening the distribution grid
- Energy storage and management
- Integration of transport needs

LCE-3

Support to R&I strategy for SG and Storage

Coordination and
Support Action (CSA)
1 proposal for up to 4
M€

- Develop R&I Roadmap
- Analyse R&I landscape/projects
- Organise workshops

Energy system – topics 2017

LCE-1

Next generation Distribution Technologies

Research and
Innovation Action
(TRL 3-6)
2-4 M€/project
Budget: 18 M€

Address either

- Demand response
or
- Smart grids

LCE-4

Demonstration of Transmission Technologies

Innovation Action
(TRL 5-8),
15-20 M€/project
Budget: 65,12 M€

Address at least 2 :

- Power transmission
- Large-scale storage
- ICT/tools for flexibility
- Wholesale market

LCE-5

Tools and Technologies for the Energy System

Research and
Innovation Action
2-4 M€/project
Budget: 28 M€

Address at least 1:

- energy system planning
- Tools for TSO/DSO coordination
- Data handling
- Synergies between gas and electricity
- socio-economics

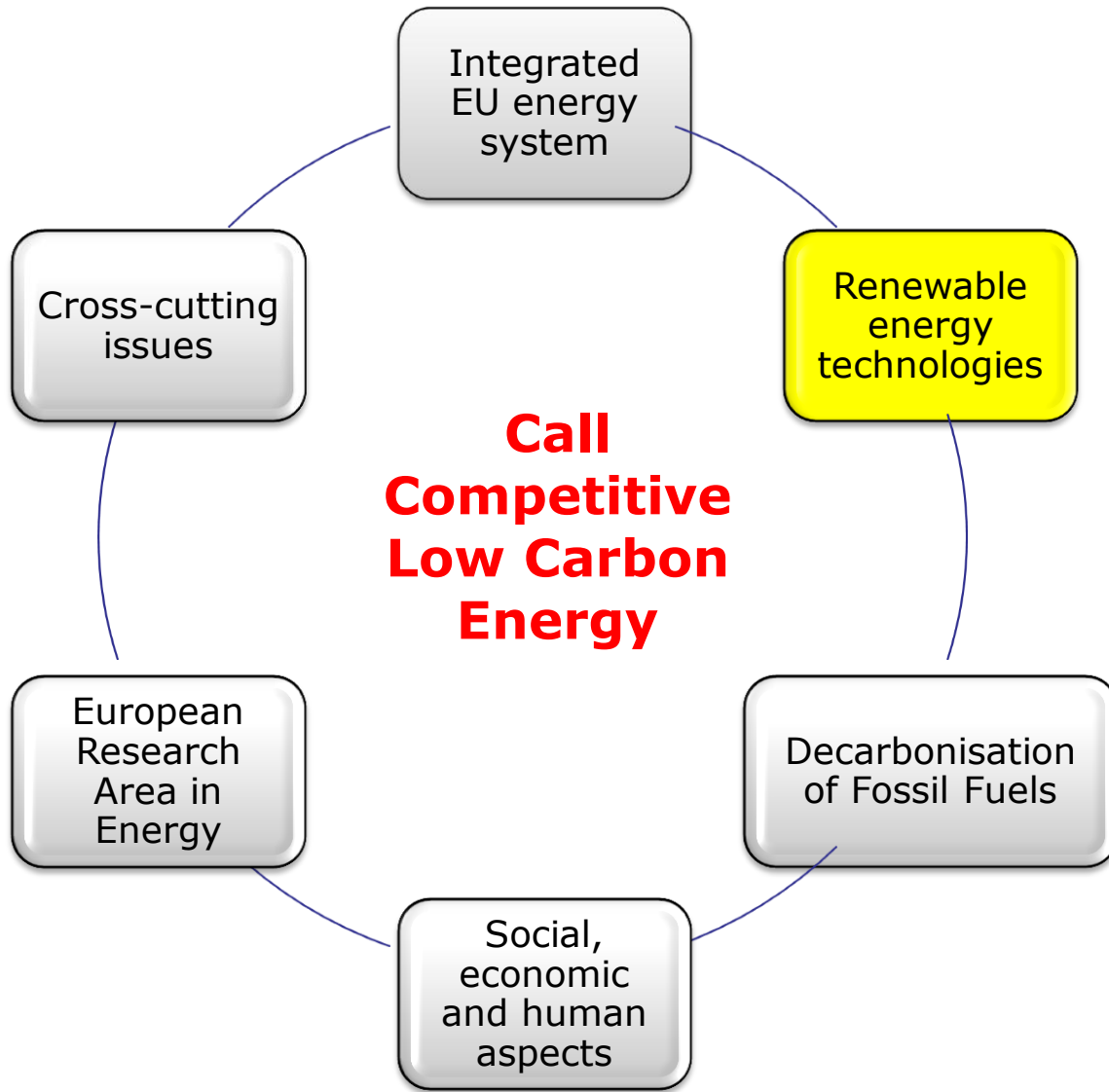
Towards an INTEGRATED EU Energy System. Topics.

Topics	Type of Instrument	TRLs	EU Grant Requested M.€	Budget M.€	Deadline
LCE1-2016/2017	RIA	3-6	2-4	20/18	05/04/2016
LCE2-2016	IA (*)	5-8	12-15	75,14	
LCE3-2016	CSA	-	4	4	
LCE4-2017	IA	5-8	15-20	65,12	14/02/2017
LCE5-2017	IA	-	2-4	28	

Topic LCE1, y LCE5: Ensure the coverage of each area – diferente ranking lists in each of the areas.

Contribute with the EU energy policy context - Internal Electricity Market , enhance interconnections between MS and/or between energy networks.

(*) Integrate several technologies



Renewable energies - Overview

	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

LCE7, 8, 23: Deadline 16 Feb 2016

Photovoltaics (PV)

Rationale:

- High power generation potential;
- Reducing the total cost of installed solar energy systems and grid-integration bottlenecks remains a priority for the sector;
- PV R&D is necessary to re-launch an innovative and worldwide competitive industry relying on the existing PV technology knowledge-base in Europe.

Basic research

- Upscaling technologies currently at lab-scale (!excluding activities funded under NMBP 19-2016!) - *LCE-6-2017*

Advanced research

- Next generation of c-Si (2016) and perovskite (2017) PV cells and modules – *LCE-7-2016-2017 (no ringfenced budget)*

Demonstration

- Manufacturing innovations at pilot-line level for industrial production of cells and modules – *LCE-9-2016 (EUR 25 million)*
- Reducing cost of PV electricity – *LCE-10-2017 (EUR 10 million)*

Market-uptake

- Tackling the bottlenecks of high penetration levels of PV electricity into the electric power network – *LCE-21-2017 (no ringfenced budget)*

Concentrated Solar Power (CSP)

Rationale:

- Strong European industrial presence but the larger share of the market is outside Europe. The competition is growing.
- Need to reduce further the capital and the operational costs as well as to improve system operations, performances and environmental footprint (water consumption).

Basic research

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

Advanced research

- 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*

Demonstration

- Reducing water consumption of CSP plants – *LCE-11-2016 (EUR 12 million)*

Market-uptake

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

Solar Heating and Cooling

Rationale:

- Mature technology exists but it still remains under-exploited;
- New technology is needed to enlarge the application sectors;
- Issues of cost, performance and operability still exist;
- Cost competitiveness and acceptability of solar heating systems need to be improved.

Basic research

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

Advanced research

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

Demonstration

- Solar heat in industrial processes – *LCE-12-2016 (EUR 8 million)*

Geothermal energy

Rationale:

- Geothermal energy has great untapped potential for diversifying the energy mix.
- "Shallow geothermal": retrofitting existing installations with improved technology;
- Enhanced geothermal systems (EGS): reduction of drilling costs and risks; demonstration of viable technologies to create new reservoirs.

Basic research

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

Advanced research

- 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 (EUR 10 million)*

Demonstration

- Geothermal systems for retrofitting buildings – *LCE-17-2016 (EUR 8 million)*
- EGS in different geological conditions – *LCE-18-2017 (EUR 10 million)*

Market-uptake

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

Wind energy

Rationale:

- European industries are still world leaders but the competition is growing;
- Cost reductions for all components essential, in particular for offshore;
- Offshore considered as the future market - large turbines to be demonstrated
- Issues remain on environmental and social impact, and on public acceptance

Basic research

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

Advanced research

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

Demonstration

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

Market-uptake

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

Ocean energy

Rationale:

- European industries are leading the emergence of the technologies.
- Many devices developed / prototypes tested, but market potential yet to be realised.
- Demonstration of reliable and survivable systems essential.
- Environmental, social and public impacts to be addressed

Basic research

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

Advanced research

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

Demonstration

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

Market uptake

- Multi-use of the oceans' marine space, offshore and near-shore: compatibility, regulations, environmental and legal issues (CSA), *BG-3-2016*, Budget: EUR 2 million

Combined Heat and Power (CHP)

Rationale:

- CHP installations already in use, commercial applications exist and have been supported under previous framework programmes
- Market potential for residential scale and for specific industrial applications to increase generation flexibility.

Basic research

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

Advanced research

- Highly efficient, low emission, medium- and large-scale biomass-based CHP systems – *LCE-7-2016*
- Transforming renewable energy into intermediates – *LCE-7-2017*

Integration of RES in the energy system

Rationale:

- Growing share of renewable energy sources requires rethink of system management;
- Complementing activities supported under the area '*Integrated EU energy system*', integration is also addressed from the perspective of the generation sources in order to share burden and costs.

Advanced research

- LCE-7-2016-2017:
 - Developing system support functions (or ancillary services) 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

Biofuels (1/2)

Rationale:

- European industries have leading technologies, but currently little deployment in EU;
- Biofuels are medium-term solution for road and maritime transports and the only solution for air transport;
- Both biological and thermo-chemical pathways are necessary to provide technology diversity, but the challenges in each pathway are different;
- Large scale demonstrations are needed to boost market access;
- Research needed to reduce cost, improve environmental impact and performance efficiency.

Basic research

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

Advanced research

- 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 biofuels/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)*

Biofuels (2/2)

Advanced research

- Cooperation with Brazil on advanced lignocellulosic biofuels - *LCE-22-2016 (EUR 5 million)*

Demonstration

- *LCE-19-2016-2017* (EUR 15 million for each 2016 and 2017)
 - Biomass gasification (2016)
 - Biomass pyrolysis and torrefaction to intermediate bioenergy carriers (2016)
 - Biochemical 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* (EUR 15 million in 2016; EUR 10 million in 2017)

Market-uptake

- Market roll-out of liquid advanced biofuels and liquid renewable alternative fuels – *LCE-21-2017*

Renewable energy – Topic overview

Deadline 16 February 2016

- LCE-7 – budget 61,3 M€
- LCE-8 – budget 10 M€
- LCE-23 – budget 10 M€

Deadline 5 January 2017

- LCE-6 – budget 20 M€
- LCE-7 – budget 66,5 M€
- LCE-8 – budget: 10 M€
- LCE-21 – budget 15 M€

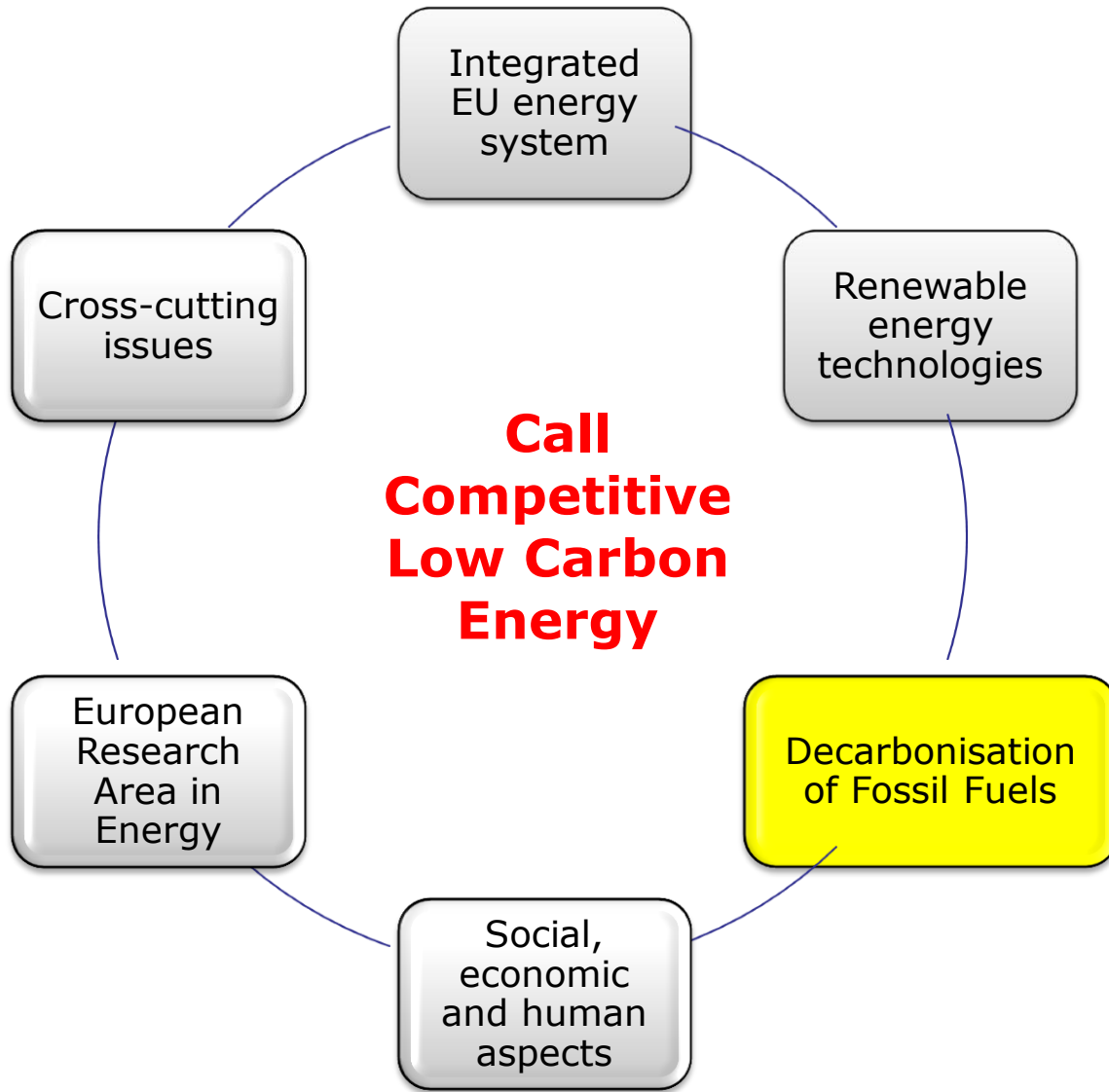
Deadline 8 September 2016

- LCE-9 – budget 25 M€
- LCE-13 – budget 10 M€
- LCE-15 – budget 15 M€
- LCE-19 – budget 15 M€
- LCE-20 – budget 15 M€
- LCE-22 – budget 5 M€

Deadline 7 September 2017

- LCE-10 – budget 10 M€
- LCE-11 – budget 12 M€
- LCE-12 – budget: 8 M
- LCE-14 – budget 25 M€
- LCE-16 – budget 7 M€
- LCE-17 – budget 8 M€
- LCE-18 – budget 10 M€
- LCE-19 – budget 15 M€
- LCE-20 – budget 10 M€

IA – green
RIA – blue
CSA – orange



Decarbonisation of Fossil Fuels - Context

- Fossil fuels will be used in Europe's power generation as well as in industrial processes for decades to come.
- A forward-looking approach to **Carbon Capture and Storage (CCS)** and **Carbon Capture and Use (CCU)** for the power and industrial sectors is crucial for reaching the 2050 climate objectives in a cost-effective way.
- **Shale gas** can contribute to our energy security, provided that issues of public acceptance and **environmental impact** are adequately addressed.
- The integration of (fluctuating) renewable electricity generation in our energy system requires new solutions for fossil fuel power plants to provide **highly flexible yet efficient back-up power** to stabilise the grid.

Decarbonisation of Fossil Fuels – Topics 2016

Deadline:

16 February 2016

Activities
supported
in **2016**

LCE-24: New generation high-efficiency capture processes RIA

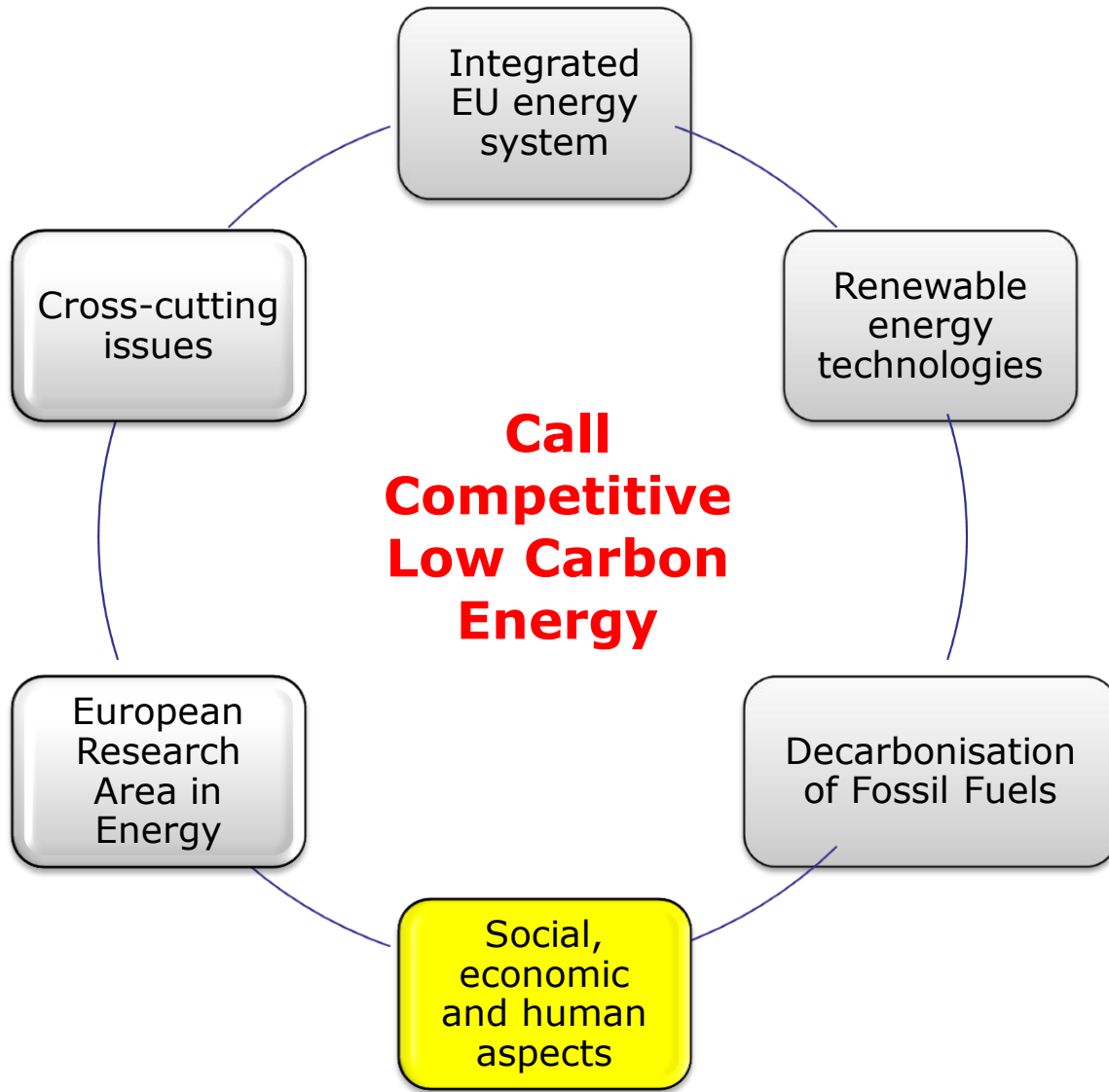
- TRL 2/3 -> 5; Budget: EUR 17 million (~ 2-5 M€/project)
- Twinning with South Korean projects

LCE-25: Utilisation of captures CO2 as feedstock for the process industry RIA

- TRL 5/6 -> 6/7; Budget EUR 10 million (~ 6-10 M€/project)

LCE-26: ERA-NET on Applied Geosciences

- Covering ground water, raw materials and geo-energy
- Produce reliable scientific information on resources and potential consequences of their exploitation
- Budget: EUR 10 million; ERA-NET Cofund



Social Sciences and Humanities (SSH)

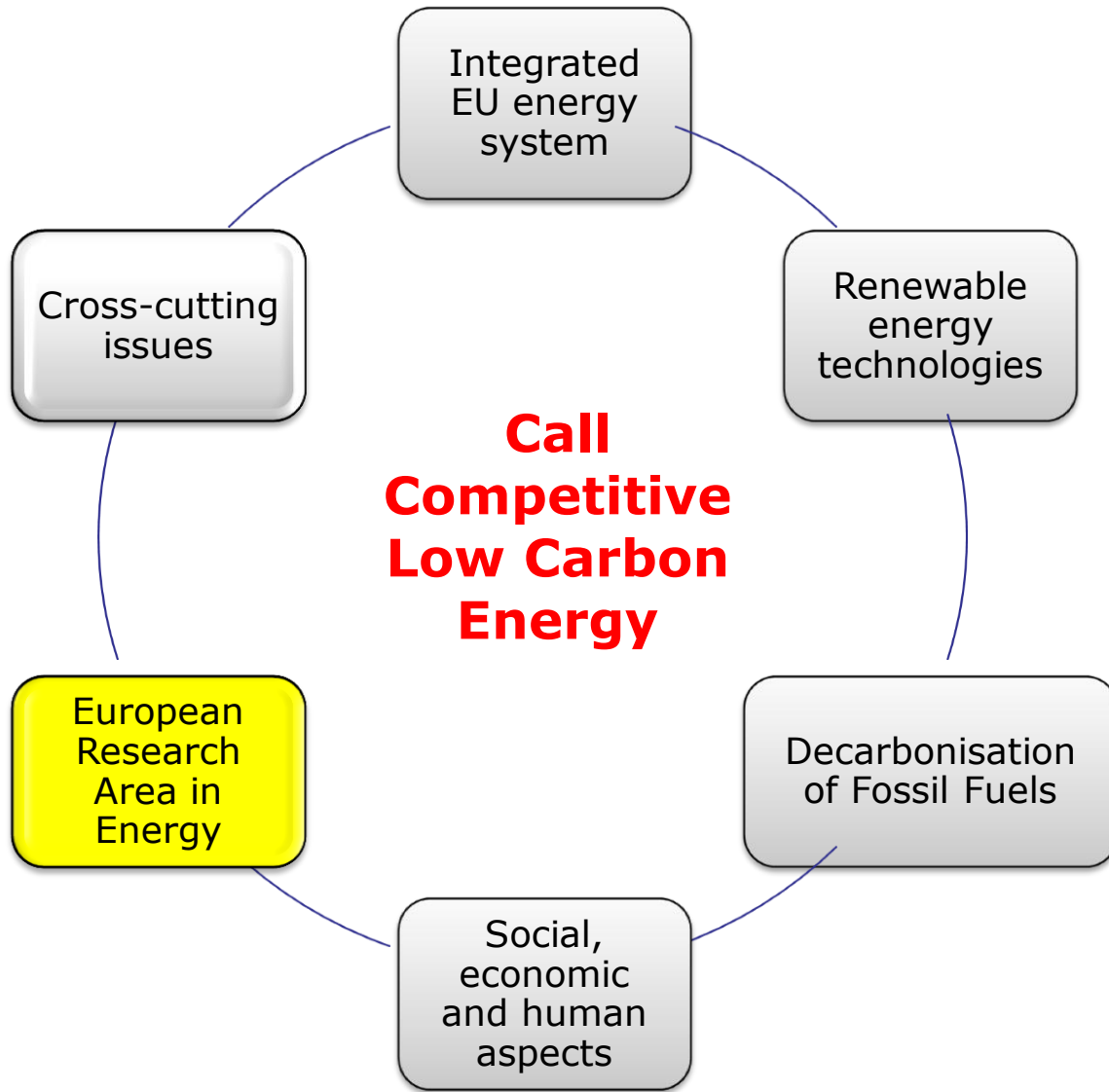
Transition to a low-carbon energy system is a **complex societal problem** because it changes the interrelations between all relevant actors in the system (-> policy, economic, governance challenges)

Social Sciences in support of the Energy Union (LCE-31-2016-2017) RIA

European Platform for energy-related SSH research (LCE-32-2016) CSA

Main-streaming of SSH

- For example topics EE-8, LCE-6, LCE-7, LCE-11, LCE-15, LCE-17, LCE-18, LCE-19, LCE-20, LCE-22, LCE-28



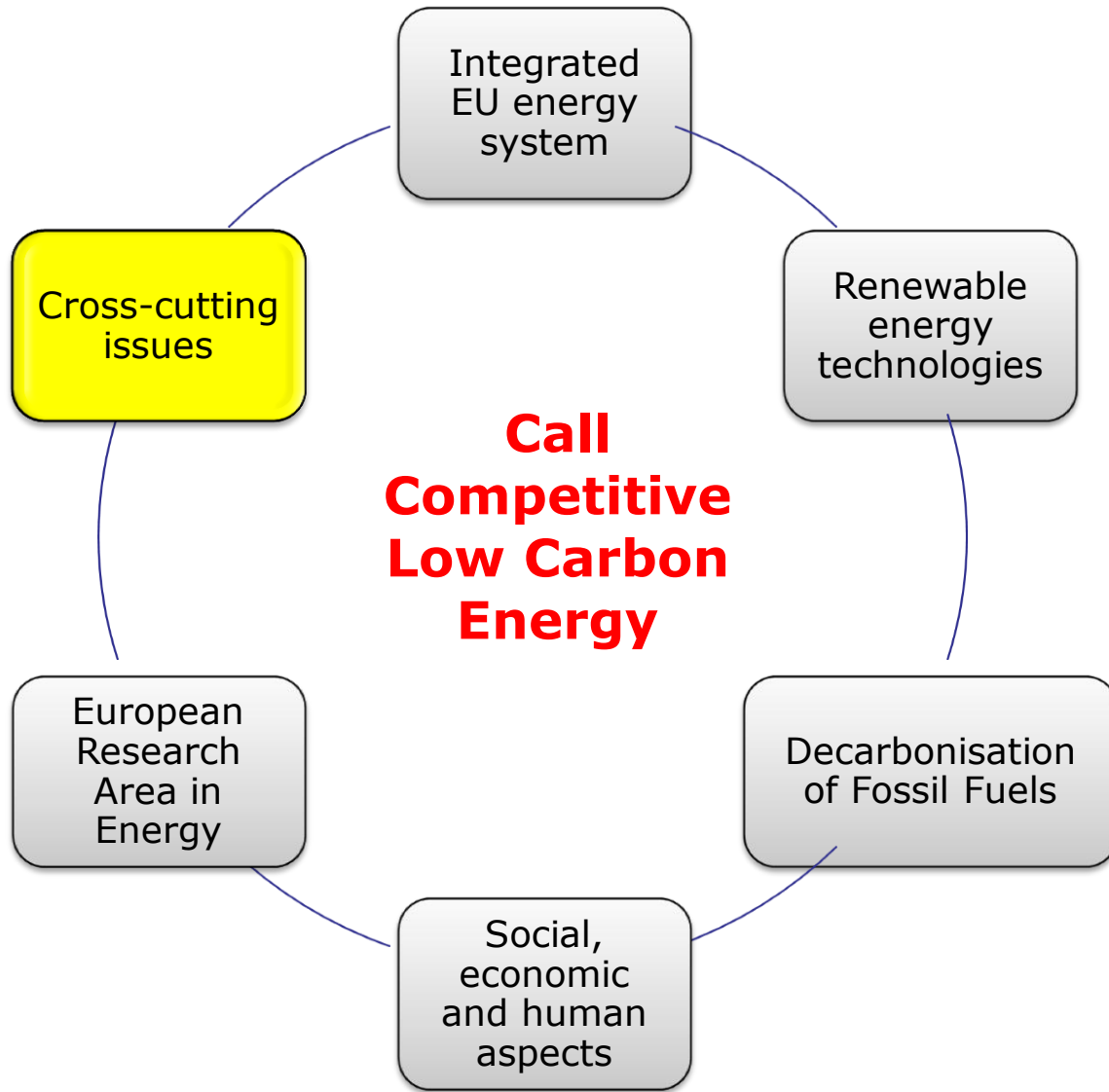
European Research Area in Energy

ERA-NETs (LCE-34, LCE-35, LCE-26, EE-21)

- Focus on demonstration projects and encouraging industrial participation
- Eligible participants: only programme owner and programme managers
- Combination of national and European funding.
- Budget LCE-34-2016: 30.8 M€
- Approach for 2017 to be reviewed in 2016

European Common Research and Innovation Agendas (ECRIA, LCE-33)

- Creating a transnational critical mass of research capacity in a certain area.
- Combination of national and European funding.
- Addressing integration aspect of the energy system.
- TRLs 2 -> 5; clear deliverables
- Deadline: 5 April 2016; Budget: 10 M€



Cross-cutting issues

Support to the energy stakeholders to contribute to the SET-Plan (LCE-36-2016-2017) CSA

- Areas supported:
 - **Photovoltaics**
 - **Ocean energy**
 - **Zero emission fossil fuel power plants and energy intensive industry**
 - **Biofuels**
- Coordination and support action (up to one project per area)
- Budget: 2.4 M€ (~ 0.6 M€ / project)
- Recommended grant duration: 2 years
- Deadline: 16 February 2016

INDICE

- Contexto Político
- Aspectos generales del programa Energia-Novedades
- **Convocatorias 2016 – 2017**
 - Energy Efficiency
 - Competitive Low Carbon
 - **Smart Cities and Communities**
- Resultados convocatorias 2014

SCC1 call 2016

- 'Lighthouse project' approach continued
- Sustainable, cost-effective and replicable district-scale solutions at the intersection of energy and transport enabled by ICT
- Intelligent, user-driven and demand-oriented city infrastructures and services.



SCC1 call 2016 . SCOPE

- Develop and test **integrated innovative solutions** at large scale
- Become the most advanced cities in Europe and act as **exemplars** for their region by **paving the way for replication** of these solutions
- **Long term political commitment :**
 - Sustainable Energy Actions Plans (SEAP) approved by the Covenant of Mayors initiative are obligatory
 - Links with the broader Sustainable and Integrated Urban Development Strategies in the framework of the European Structural and Investment Funds

SCC1 call 2016 - SCOPE

INTEGRATION

BALANCED COMBINATION

REPLICATION

- smart **buildings** (existing/new)
- smart **grids** (electricity, DH, telecom, water, etc...)
- **energy storage**,
- **electric vehicles** and smart charging infrastructures,
- latest generation **ICT platforms** based on open specifications

Capitalizing on synergies between components to increase efficiency and reduce costs.

CALL CONDITIONS:

Each project must:

- Be realised in **3 new lighthouse cities** situated in different EU Member States or Associated countries.
- Involve **at least 3 follower cities** from different EU Member states or associated countries.

Type of action: Innovation Action (IA)

Foreseen contribution from the EU: between EUR 12 to 18 million / selected project

Call 2016:

Deadline: 05 April 2016

Budget: 60 M.€

Call 2017:

Deadline: 14 February 2017

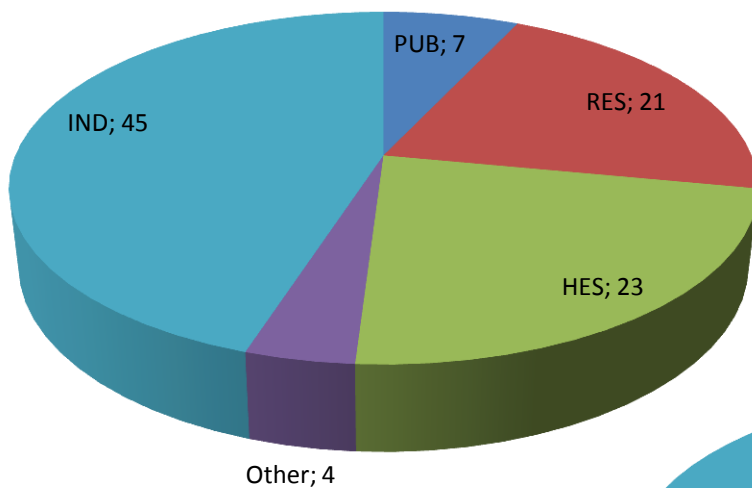
Budget: 71,5 M.€

INDICE

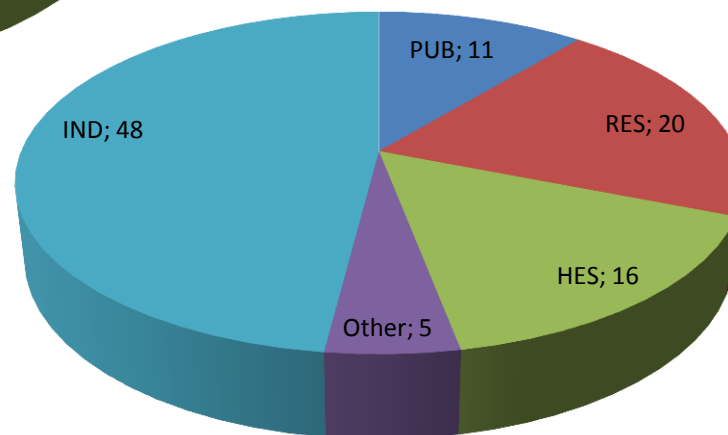
- Contexto Político
- Aspectos generales del programa Energia-Novedades
- Convocatorias 2016 – 2017
 - Energy Efficiency
 - Competitive Low Carbon
 - Smart Cities and Communities
- **Resultados convocatorias 2014**

Tipo de entidad: % en propuestas y proyectos (EU Contrib)

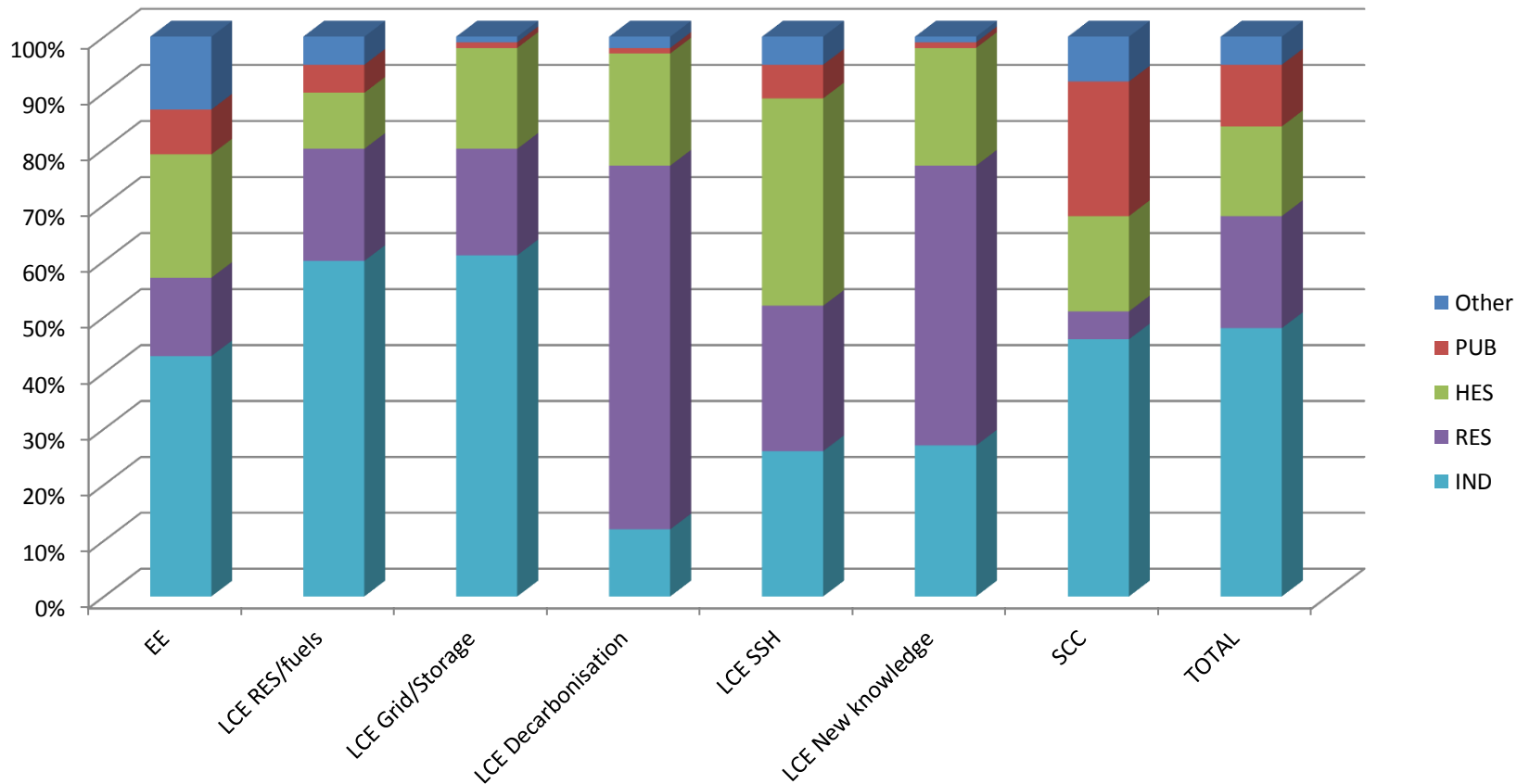
PROPOSALS



Projects



Tipo de Entidad por Área (Proyectos)

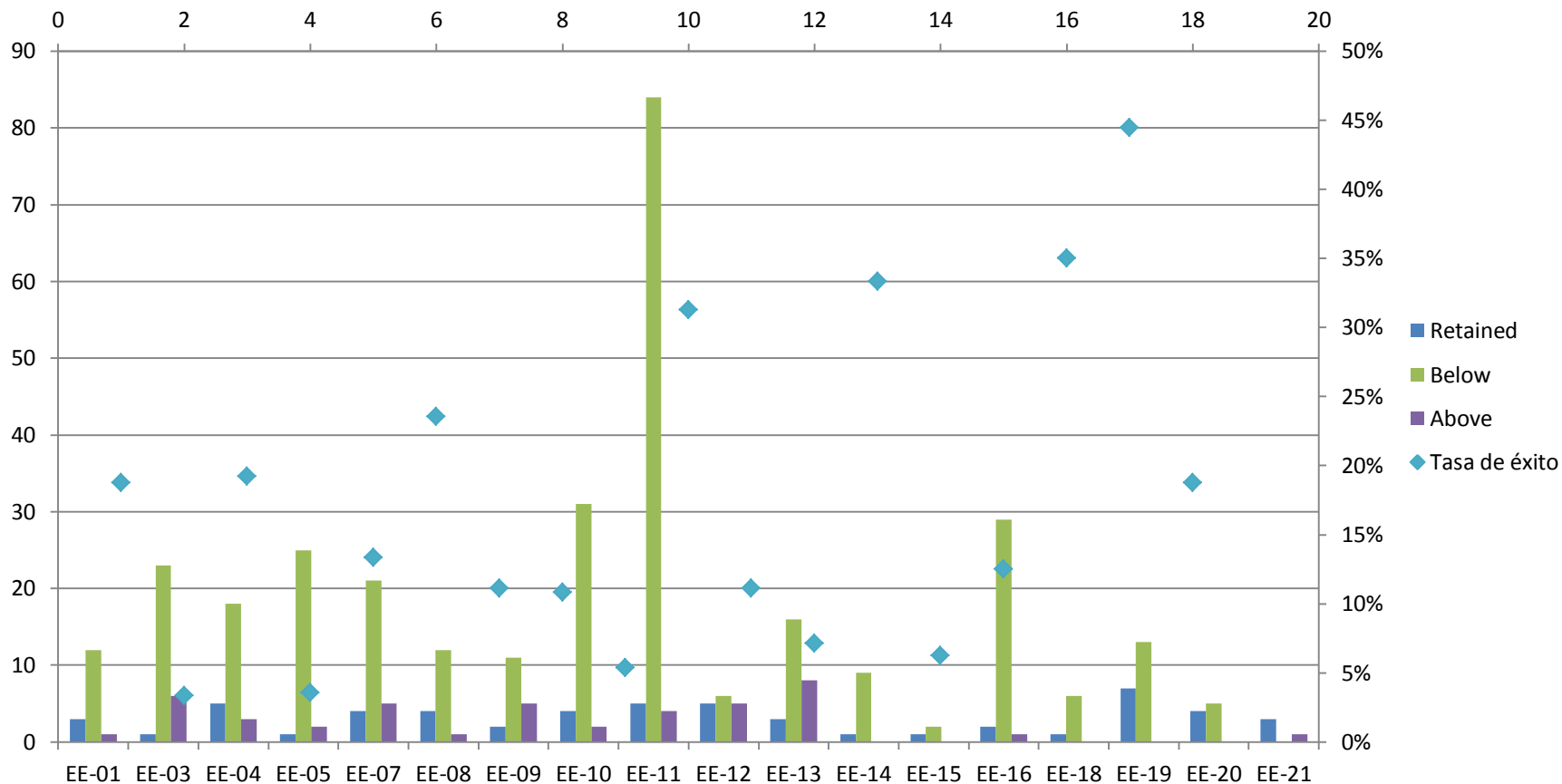


Tasas de éxito globales

	Propuestas	Proyectos	Tasa de Éxito
EE*	661	56	8%
LCE	922	115	12%
SCC	81	9	11%
Total	1664	180	11%

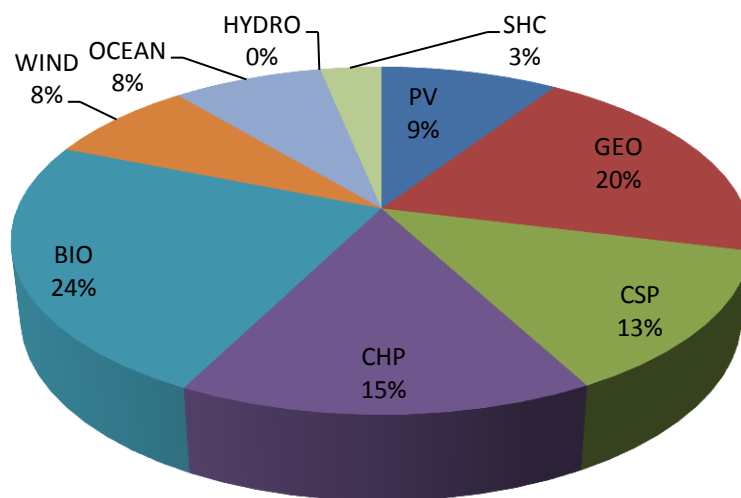
* Sólo 2014

Tasas de éxito: EE (2014)



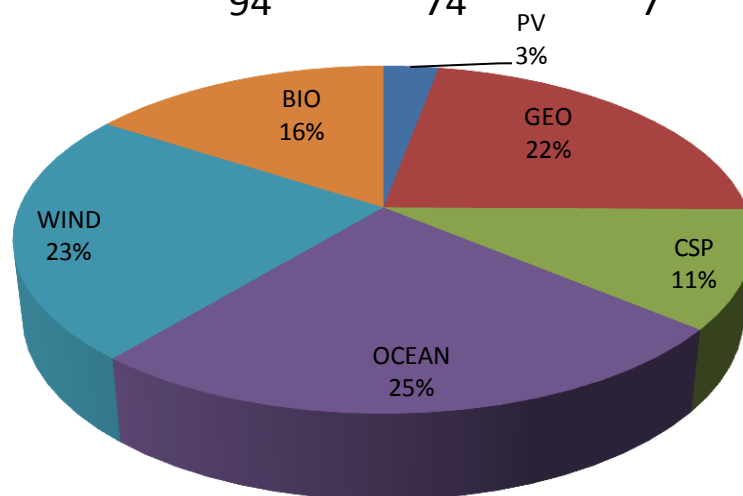
Tecnologías topics LCE-2 y LCE-11

	2014			2015			TOTAL	
	Proposals	Funded	Subv (M€)	Proposals	Funded	Subv (M€)	Funded	Subv (M€)
PV	36	2	9,5	47	1	3,3	3	12,8
GEO	11	2	12,1	18	3	14,9	5	27
CSP	25	1	6,5	13	2	11,8	3	18,3
CHP	31	2	12,1	19	2	9	4	21,1
BIO	81	2	10,6	88	4	22	6	32,6
WIND	25	1	7,3	10	1	3,5	2	10,8
OCEAN	25	0	0	20	2	10,8	2	10,8
HYDRO	9	0	0	4	0	0	0	0
SHC	18	0	0	6	1	4,4	1	4,4
Total	261	10	58,1	225	16	79,8	26	137,9

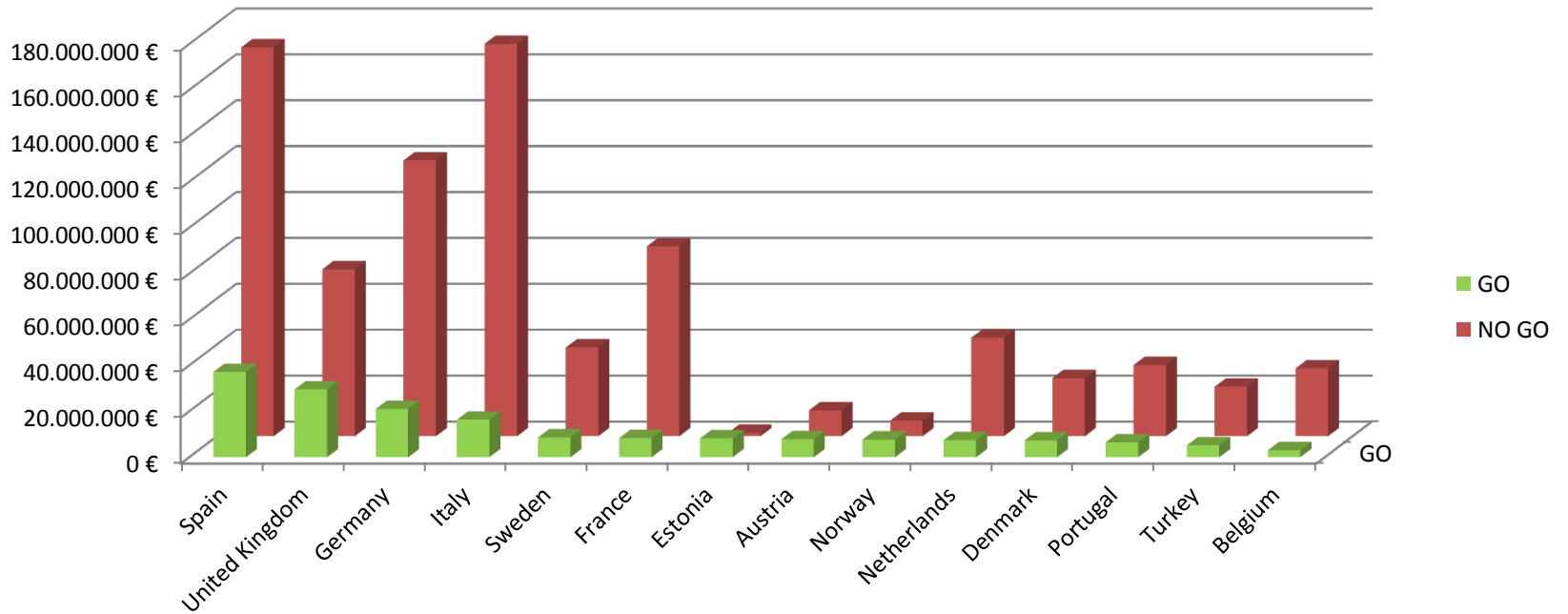


Tecnologías topics LCE-3 y LCE-12

	2014			2015			TOTAL	
	Proposals	Funded	Subv (M€)	Proposals	Funded	Subv (M€)	Funded	Subv (M€)
PV	3	0	0	57	1	5,5	1	5,5
GEO	6	2	11,9		2	30,7	4	42,6
CSP	8	2	20,9		0	0	2	20,9
OCEAN	8	1	17		2	30,6	3	47,6
WIND	6	2	14		2	30,4	4	44,4
BIO	5	2	30,2	17	0	0	2	30,2
Total	36	9	94	74	7	97,3	16	191,3



SCC: Light House Projects, CSA



SCC 2014: SCC-1

- 90 M€
- 19 Propuestas, 3 Proyectos Main List
 - Growsmarter (12): Barcelona, Estocolmo, Colonia
 - Graz, Oporto, Cork, Suceava, Valetta
 - REMOURBAN (12); Valladolid, Nottingham, Tepabasi
 - Seraing, Miskolc
 - Triangulum (11,5); Manchester, Eindhoven, Stavanger
 - Praga, Sabadell, Leipzig

SCC: 2014 CSAs

- **SCC2:** Developing a framework for common, transparent data collection and performance measurement to allow comparability and replication between solutions and bestpractice identification
 - Citykeys
 - VTT, AIT, TNO, Tampere, Rotterdam, Zaragoza, Zagreb, Viena y Eurocities
- **SCC4:** Establishing networks of public procurers in local administrations on smart city solutions
 - Desierto

SCC 2015: SCC-1

- 106 M€
- 48 Propuestas 3 Proyectos Main List
 - SmartENcity (12,5): Vitoria, Tartu, Sonderborg
 - Lecce, Asenovgrad,
 - Replicate (12,5); San Sebastián, Florencia, Bristol
 - Essen, Nilufer, Lausanne
 - SMAR TER TOGETHER(12,5); Lyon, Munich, Viena
 - Santiago, Sofía, Venecia, Kiev, Yokohama
 - SHARMLLM (11); Lisboa, Milán
 - Burdeos, Varsovia, Burgas

SCC: 2015 CSAs

- SCC3: Development of system standards for smart cities and communities solutions
 - ESPRESSO 16 socios

ENLACES DE INTERES

- Enlace a presentación de la Comisión europea durante un infoday de presentación en Bruselas, de los topics LCE1- A LCE5

<http://ec.europa.eu/research/index.cfm?pg=events&eventcode=18AF0024-A41E-6CC7-DD146B5B8A0D53EC>

- Enlace proyectos financiados en H2020 y VIIPM:

http://cordis.europa.eu/projects/home_en.html

- Enlace al infoday sobre las PPPs del 16 de octubre del 2015 en Bruselas

http://ec.europa.eu/research/industrial_technologies/information-day-for-ppp-2015_en.html

- Enlace al infoday del WP-2016-17 que tuvo lugar en Bruselas el 14-15 de septiembre

<http://ec.europa.eu/research/index.cfm?pg=events&eventcode=0B56FA95-AFE0-D63B-DD0527FE301EC26C>

- Enlace al infoday de SCC en Bruselas el 6 noviembre 2015

<http://ec.europa.eu/research/index.cfm?pg=events&eventcode=8BDC94AA-B603-4E55-36835522D7C0CD08>

ES **HORIZONTE** 2020

Portal español del Programa Marco de Investigación e Innovación de la Unión Europea

EVALUADORES!!

MUCHAS GRACIAS

M^a Luisa Revilla

Punto Nacional de Contacto - Reto Energía – Horizonte 2020

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