

PROGRAMME “ENVIRONMENTAL AND CLIMATE CHANGE- RELATED RESEARCH AND TECHNOLOGY”

RESULTS AND ACHIEVEMENTS

18TH OCTOBER, 2016



Cofounded through the European Economic Area Financial Mechanism, whose objective is to reduce economic and social disparities and to strengthening bilateral relations between the beneficiaries states (Spain, among them) and Iceland, Liechtenstein and Norway.

Programme's Objective: to increase the development and application of technology that benefits the environment.

Budget: 18,472,132 Euros, with a grant from the EEA 18,215,000 Euros.

Donor programme partner: Innovation Norway

ACTIVITIES CARRIED OUT:

- Two Calls for proposals to develop R&D projects within the environment, climate change, energy efficiency and renewable energies areas.
- Activities to strengthen bilateral relations between Spain and Norway, Iceland and Liechtenstein.

RESULTS OF THE CALLS. Projects funded*

	FIRST CALL	SECOND CALL	Total
Projects signed	83	91	174
Number of contracts signed	89	100	189
Thematic area			
Environment	33	34	67
Energy Efficiency	23	40	63
Renewable Energy	30	24	54
Climate change	3	2	5
Contracts signed with cooperation donor countries	36	17	53 (49 Norwegian and 4 Icelandic)
Budget	€ 66,798,142	€ 47,254,238	€ 114,052,380
Average budget per project	€ 804,797	€ 519, 277	€ 655,473
Aid granted	€ 52,307,799	€ 36,687,041	€ 88,994,840
TNR (EEA Grants) granted	€ 9,567,764	€ 6,732,044	€ 16,299,808

* *Projects signed*

Some project examples:

- **Environment:**
 - Remediation of soils with radiological isotopes and decommissioning materials from radiological facilities
 - Development of a prototype of CO2 supercritical for tanning
- **Energy Efficiency:**
 - High efficient electric distribution system for marine applications
 - Recovery and energy use from railways vibrations

- **Renewable Energy:**
 - Grid integration of large photovoltaic plants supported with energy storage units
 - Innovative and efficient foundations addressed to thermo solar and photovoltaic plants
- **Climate change:**
 - Research and technological development of an intelligent CO2 capture system for small industries and residential areas
 - Wine-making adaptation to climate change by an efficient and sustainable way

BILATERAL RELATIONS ACTIVITIES:

- **Workshops and seminars:** 40 infodays, with about 2300 participants
- **Events:** 6 public events to promote the calls, explain results and present new funded opportunities in the same areas as the programme.
- **Study Trips:** 3 study trips between Innovation Norway, CDTI and Spanish companies.
- **Investment Forum in Green Technologies**

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Thank you for your attention

Susana Rodríguez
susana.rodriguez@cdti.es

**ES02 -Environmental and Climate Change-related Research
and Technology Programme
EEA Grants 2009-2014 - Spain
Promoting bilateral cooperation**

Rodrigo Ballesteros Cruz

Senior Adviser – Representative of the DPP in Spain

Innovation Norway - Donor Programme Partner (DPP)

Time to change!!



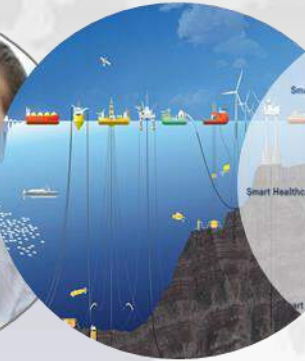
Clean energy



Bio economy



Health/welfare



Ocean space



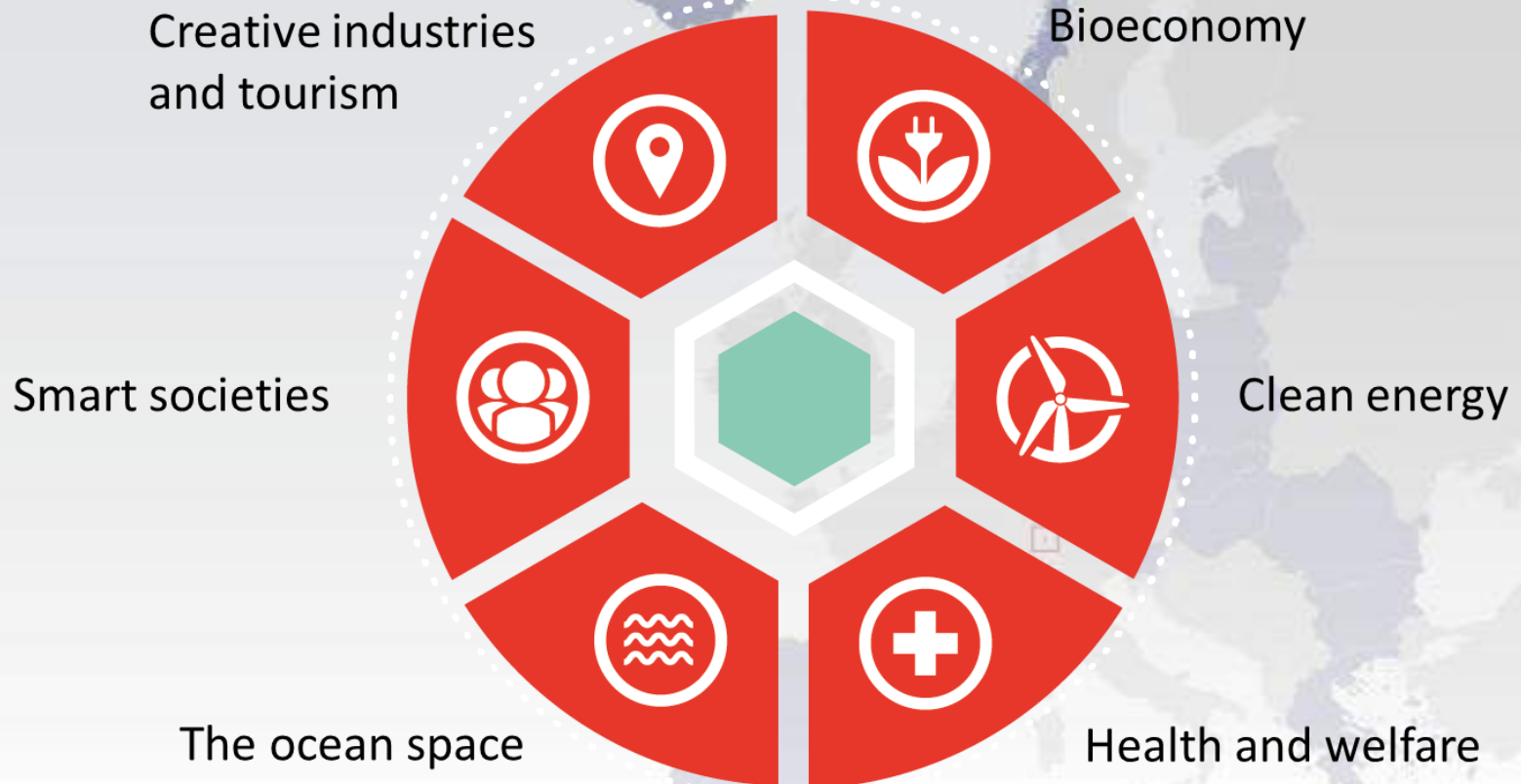
Smart society



Tourism/Creative

Norway is ready to answer the world's demands

Areas of opportunities – growth and value creation



EEA Grants: building up international R&D partnership

EEA Grants Program

Environmental and Climate Change-related Research and Technology

- Target: Spanish tech companies if possible in collaboration with firms from the Donor States
- 18,4 million € (EEA Grants) + 88 million € (CDTI)
- 174 projects financed
- **53 in in coop with donor partners (49 Norwegian + 4 Icelandic)**



Bilateral cooperation

- Over 40 promotion events
- 11 B2B seminars
- Participation of over 100 Norwegian and 2,300 Spanish firms/institutions
- 3 study trips for Knowledge exchange

Building up the future

Promotion of joint projects under:

- EU Programs: H2020, Eureka, Eurostars
- National programs: IFU
- Investment Forum: reaching funding for the creation of new technologies

The other results:

- High profile of Spain and the Donor States as an R&D international partner
- Norwegian firms installed in Spain as a consequence of their participation in the B2B events





Thank you!!

Rodrigo Ballesteros Cruz (rodrigo.ballesteros@innovationnorway.no)

Innovation Norway-Madrid



The Research Council
of Norway



CDTI Centro para el
Desarrollo
Tecnológico
Industrial

EUREKA

innovation across borders

Antonio Gómez, CDTI antonio.gomez@cdti.es

Madrid, 18th October 2016

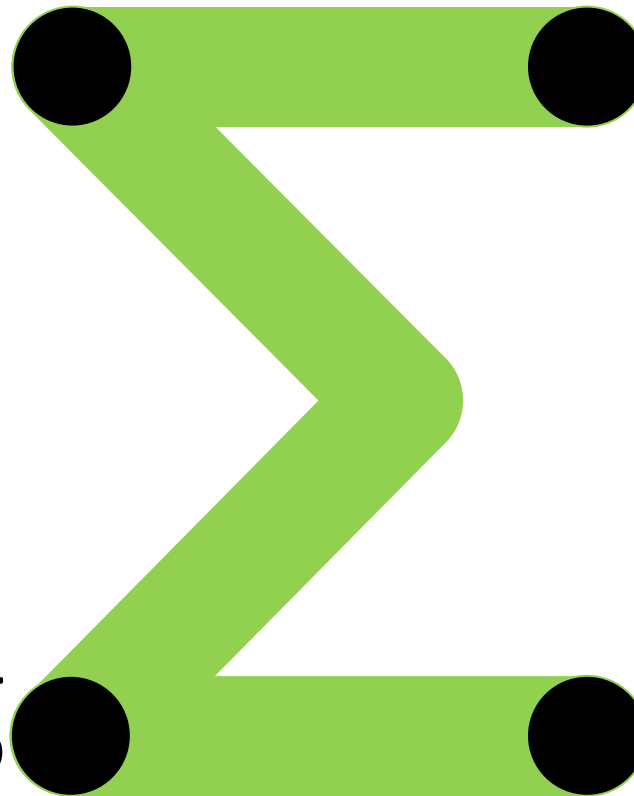
EUREKA is...

Leading **platform**
for international
cooperation

Intergovernmental
network

Supporting **market-
oriented R&D**
projects

Facilitating
access to finance



More than 40 Eureka countries

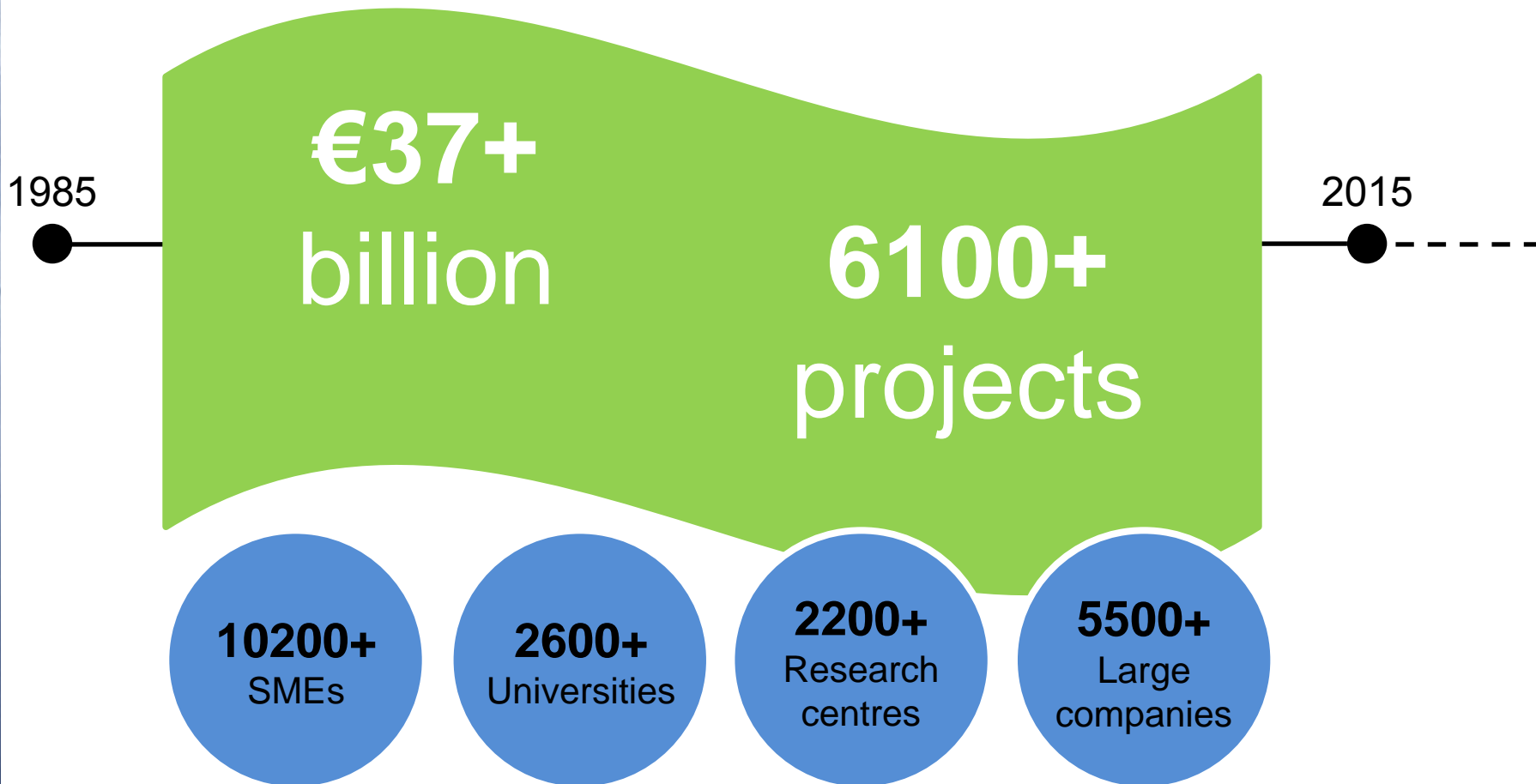
● Full members & NIPs

● Associated countries



Results

30 **EUREKA** 
years of innovation across borders



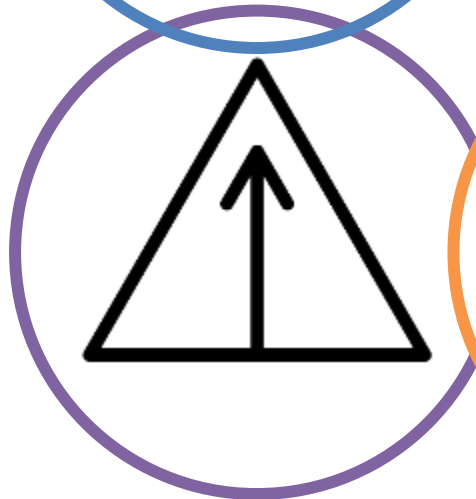
EUREKA Characteristics

Market-oriented
nature

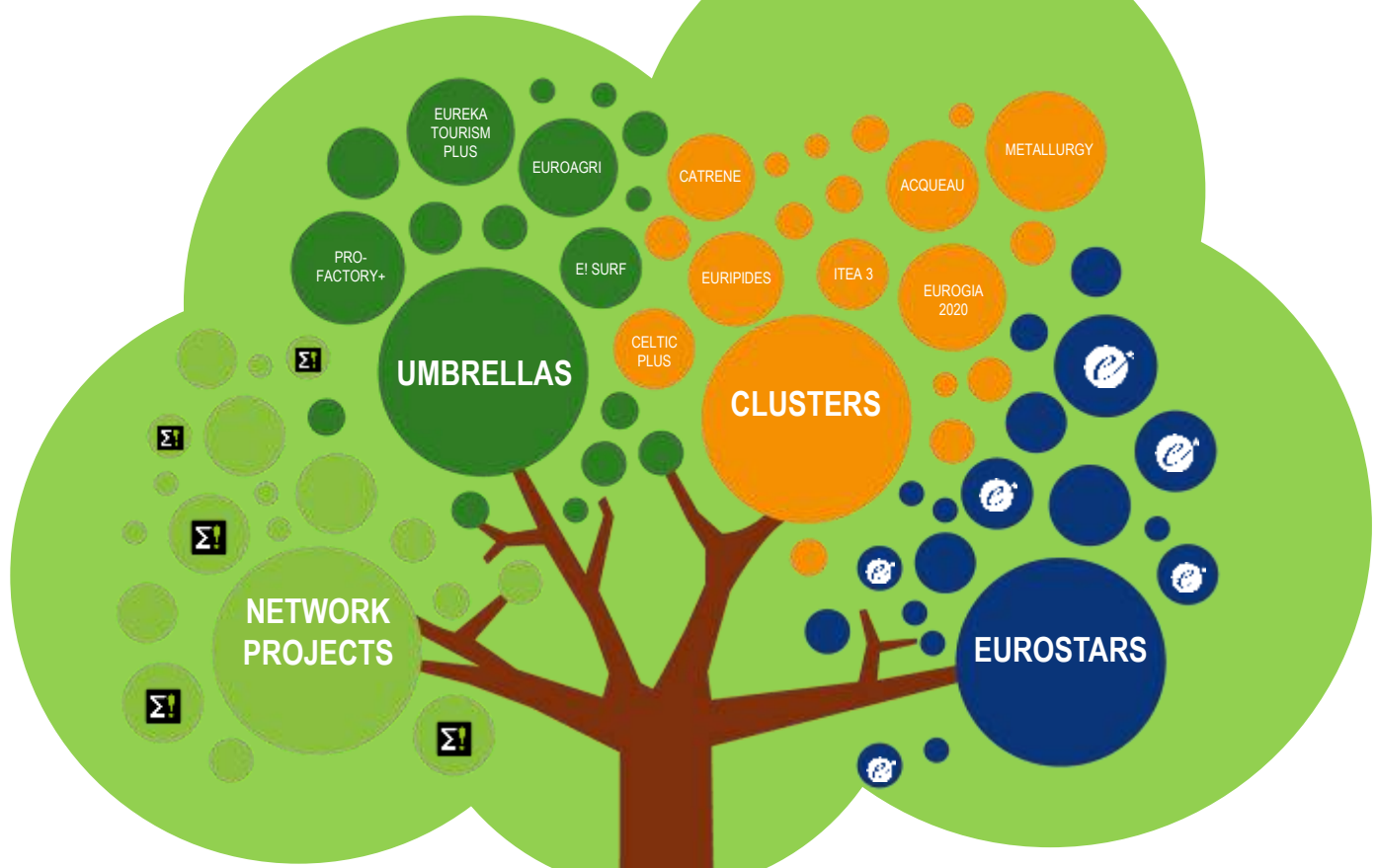


Innovative
product,
process or
service

Bottom-up
approach



International
cooperation



EUREKA instruments

Over
40 countries

EUREKA Network Projects:



Innovative
product, process
or service with a
civilian purpose



Participants
from at least
two EUREKA
countries



No thematic
restrictions but
projects need to
reflect **market**
demand



National
evaluation
procedures &
funding

Simple & flexible
Requires coordination in the countries involved

Average data for Network Projects



3–4 participants



2–3 countries



average duration

31 months



average project cost

€1.74 million

Data for
2008–2014

AIM HIGHER



eurostars™



Eurostars.

Eurostars is a joint programme between more than 30
EUREKA member countries and the European Union



Eurostars is...

Joint programme between EUREKA and EU



Dedicated to R&D-performing SMEs

Market-oriented



Bottom-up

International cooperation



Eurostars countries

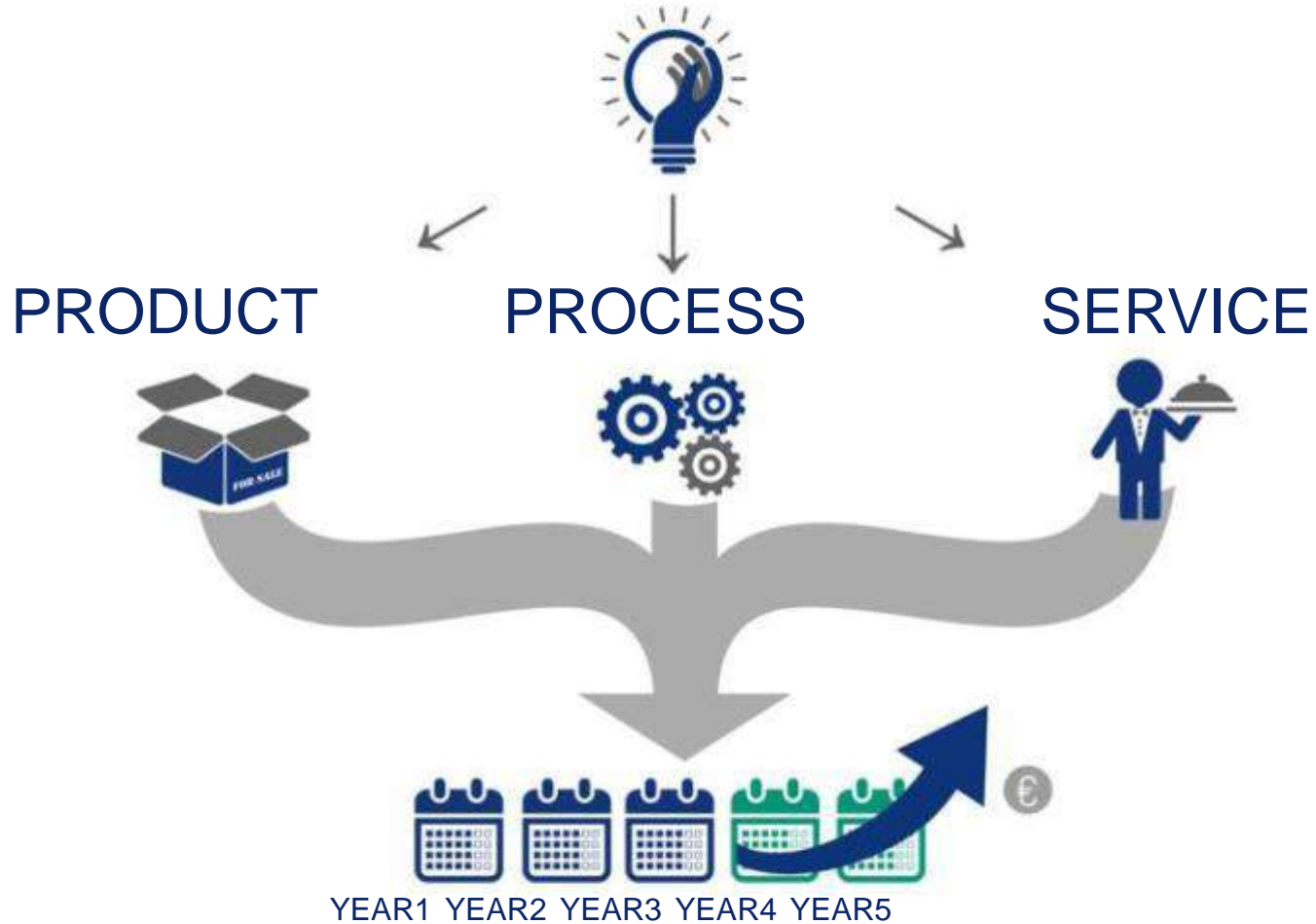
Austria	Lithuania
Bulgaria	Luxembourg
Belgium	Malta
Croatia	The Netherlands
Cyprus	Norway
Czech Republic	Poland
Denmark	Portugal
Estonia	Romania
Finland	Slovak Republic
France	Slovenia
Germany	South Korea
Greece	Spain
Hungary	Sweden
Iceland	Switzerland
Ireland	Turkey
Israel	United Kingdom
Italy	
Latvia	



34 COUNTRIES

Market-oriented

INNOVATIVE



Market introduction is foreseen within 2 years after project completion

Eligibility



Project leader is an **R&D-performing SME** from a Eurostars country



At least 2 participants

- Autonomous entities
- Legal entities

from at least 2 Eurostars countries



SMEs are in the driving seat





International balance



Project duration is max. 3 years

Market introduction within 2 years

Eureka funding in Norway & Spain

		
	<p>Grant 30-50% of the budget attending to the company size 50-70% for University and RTO depending on Norwegian SME participation</p>	<p>Grant 40-60% of the budget attending to the company size <i>(the smaller, the higher)</i></p>
 Eureka Network	<p>Grant Will differ according to different national funding programs.</p>	<p>Loan 75% of the budget, <i>(EURIBOR, 10 years, 30% non reimbursable)</i></p>
Participants	<p>Mainly Companies but Universities and Research Institutes can be partners</p>	<p>Companies only Universities, RTOs... as subcontractors</p>

Conclusions about EUREKA

Simple, fast and convenient framework for funding R&D projects developed in cooperation by two or more international partners.

Bottom-Up Market-oriented National funding

Different instruments:

- Eureka Network Projects: flexible – simple – coordinated
- Eurostars: R&D performing SMEs – 2 competitive calls/year

Norway & Spain play a **relevant role in EUREKA** since 1985 according to number of projects and involvement in the management of the network



NORWAY
2013/14



*Norway took the EUREKA
Chairmanship in 2013-14...*

... and Spain is just now in 2016

Thank you very much for your attention!



Antonio Gómez, CDTI / Oscar González, CDTI oscar.gonzalez@cdti.es

CDTI FINANCING OPPORTUNITIES FOR INTERNATIONAL TECHNOLOGY COOPERATION

EUROPEAN FINANCING OPPORTUNITIES FOR R&D WITHIN THE ENERGY AND
ENVIRONMENT SECTOR AND EEA GRANTS EXPERIENCES

Raúl García Esparza
Department of Energy, Transport, Manufacturing & Digital Society
DIRECTORATE, PROMOTION & COOPERATION
MADRID, 18 October 2016
raul.garcia@cdti.es

What is CDTI?

Center for Industrial Technological Development

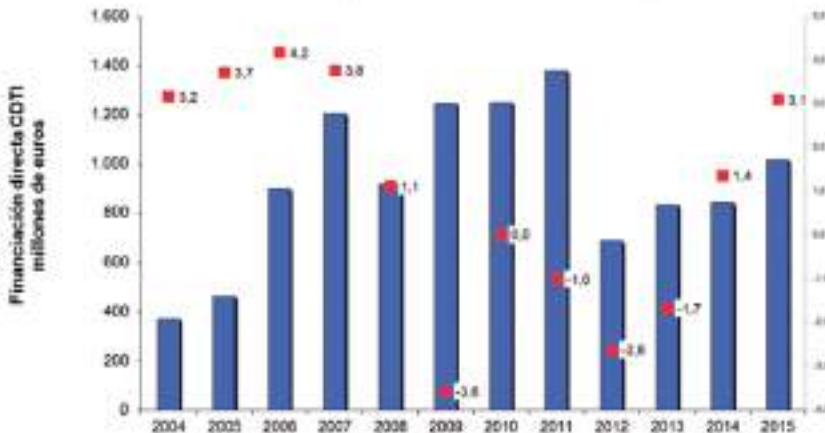
- ✓ Created in 1977
- ✓ Public Entity (Ministry of Economy and Competitiveness, State Secretariat for Research, Development and Innovation)
- ✓ CDTI employs over 300 people. External network of offices or representatives present in 28 countries
- ✓ Business innovation financing agency (LCTI)
- ✓ High national and international prestige

Enhance Spanish companies' competitiveness and internationalization through innovation

DATA AND FACTS: 2015

Compromised funding (en M€)

Evolución de la financiación directa comprometida por el CDTI (euros corrientes) y la tasa de variación del producto interior bruto (PIB) en término reales. Año 2004 - 2015 (Gráfico 1 – crecimiento FD CDTI)



Fuente: CDTI, Banco Mundial y FUNCAS (estimación PIB real 2015 18/12/2015)

2015

RTDI INVESTMENT BUDGET

1,020 M€

**9-10 % Sub.
Universities &
Research Centers**

RTDI PROJECTS

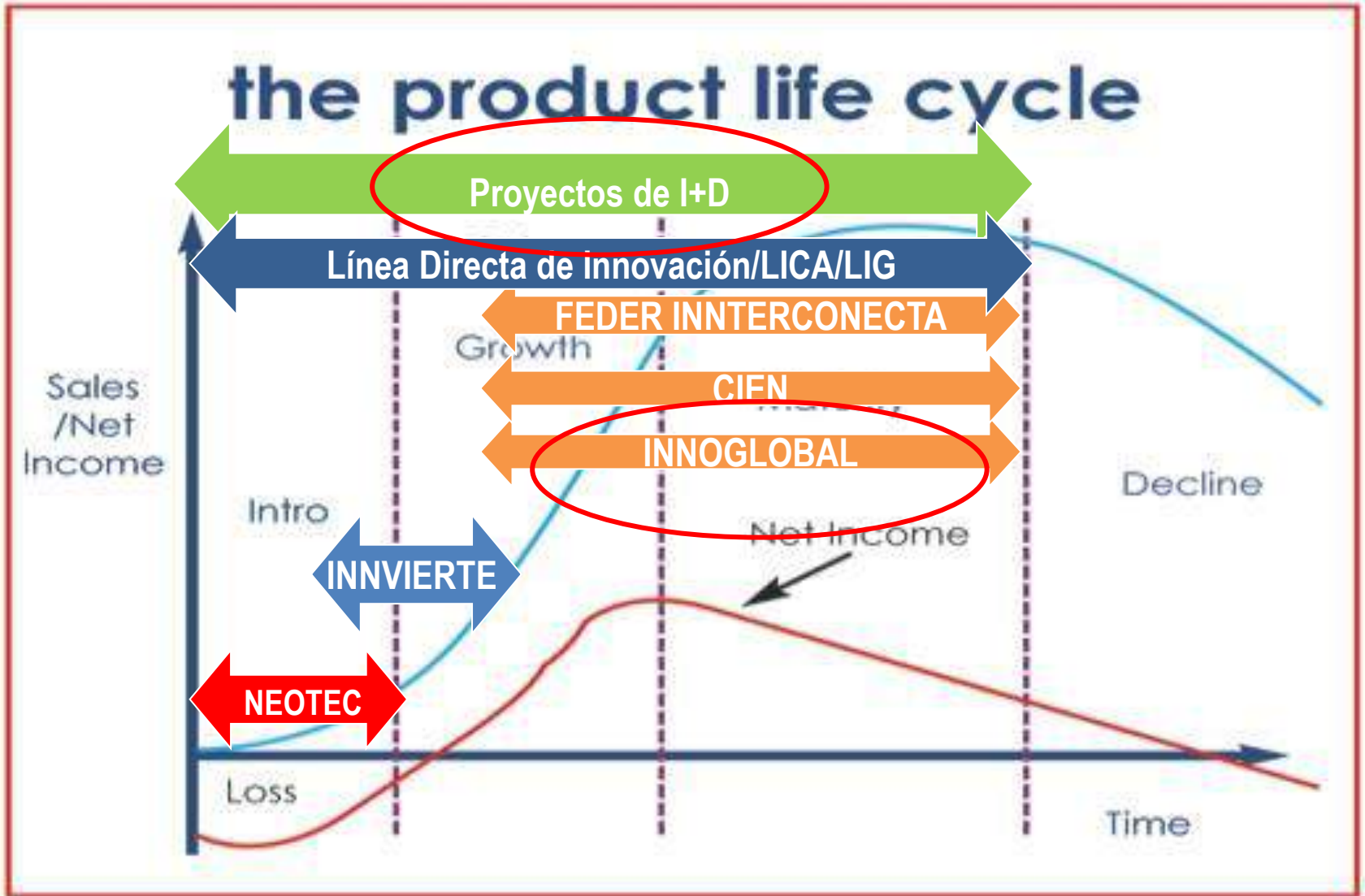
67% SMEs

33%
Large companies

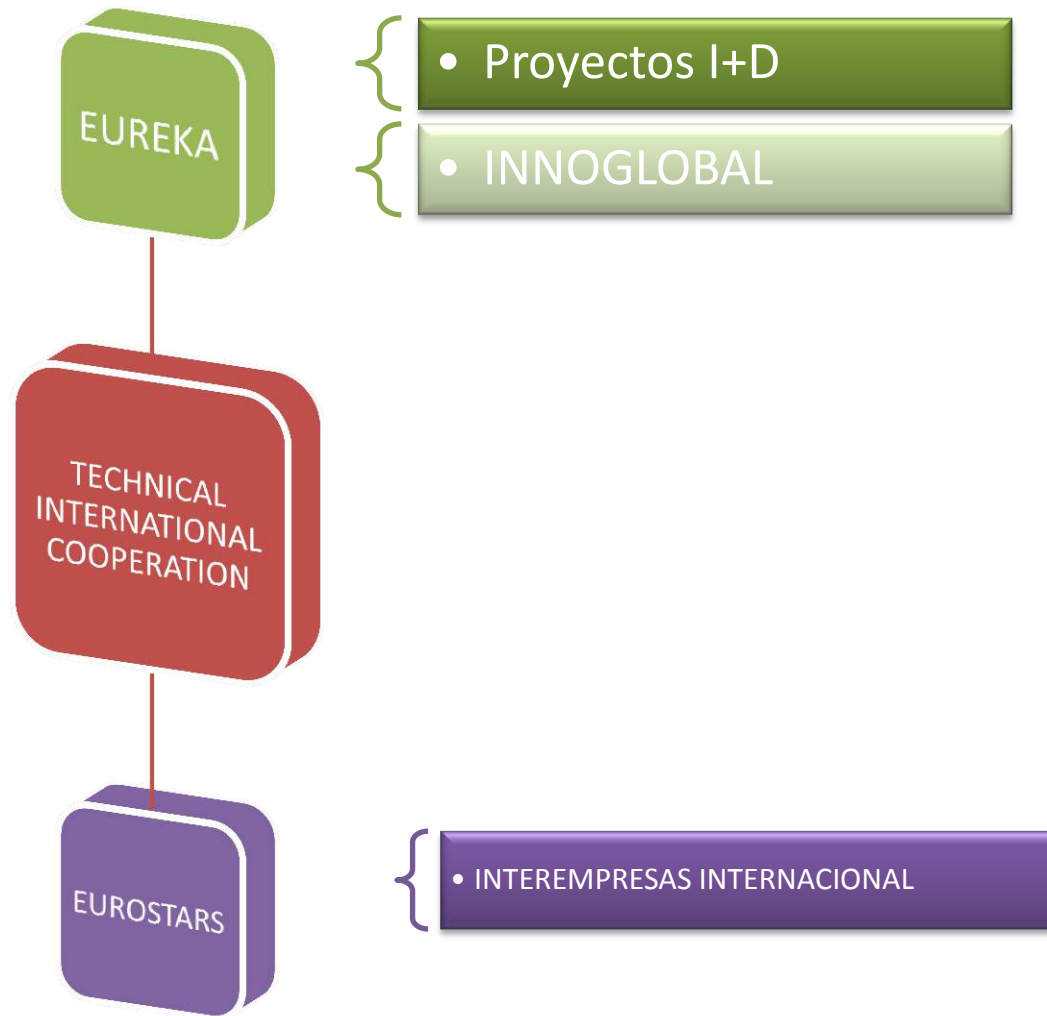
1,517 companies

37%
New companies

RTDI FINANCIAL INSTRUMENTS

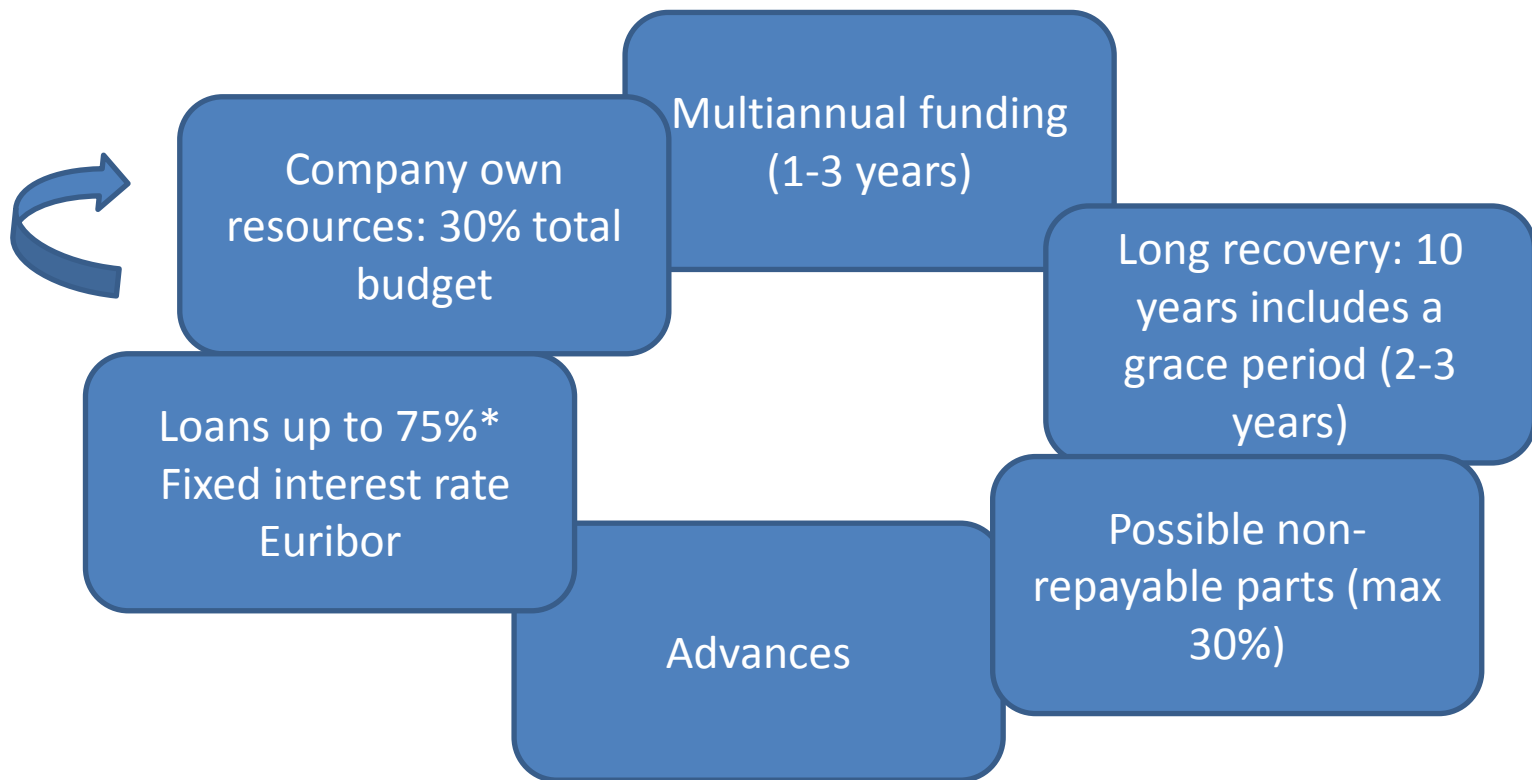


RTDI PROJECTs: INTERNATIONAL COOPERATION



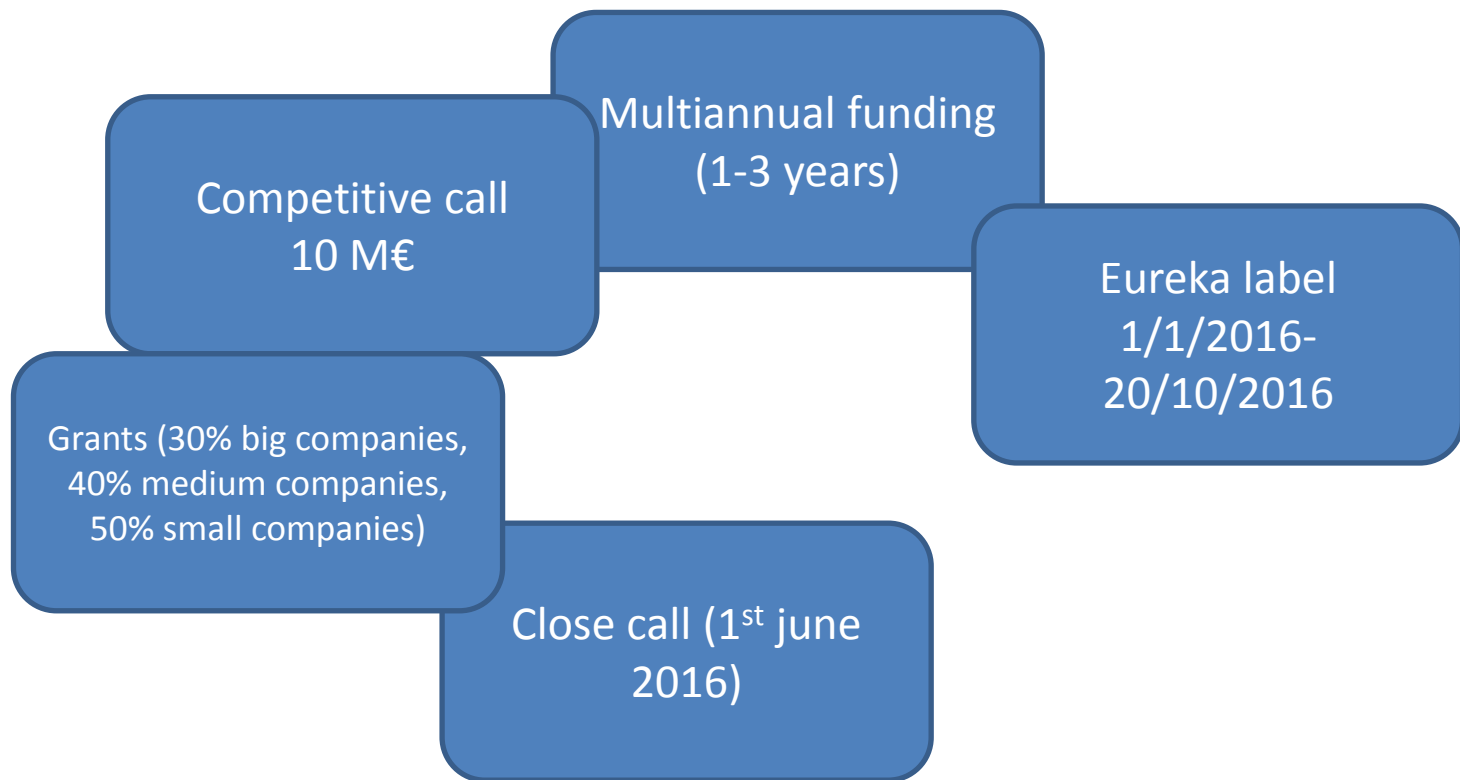
PROYECTOS I+D

- Funding for national & international projects
- Individual or in cooperation
- Min. budget: 175.000 € (cooperation: ~ 500.000)



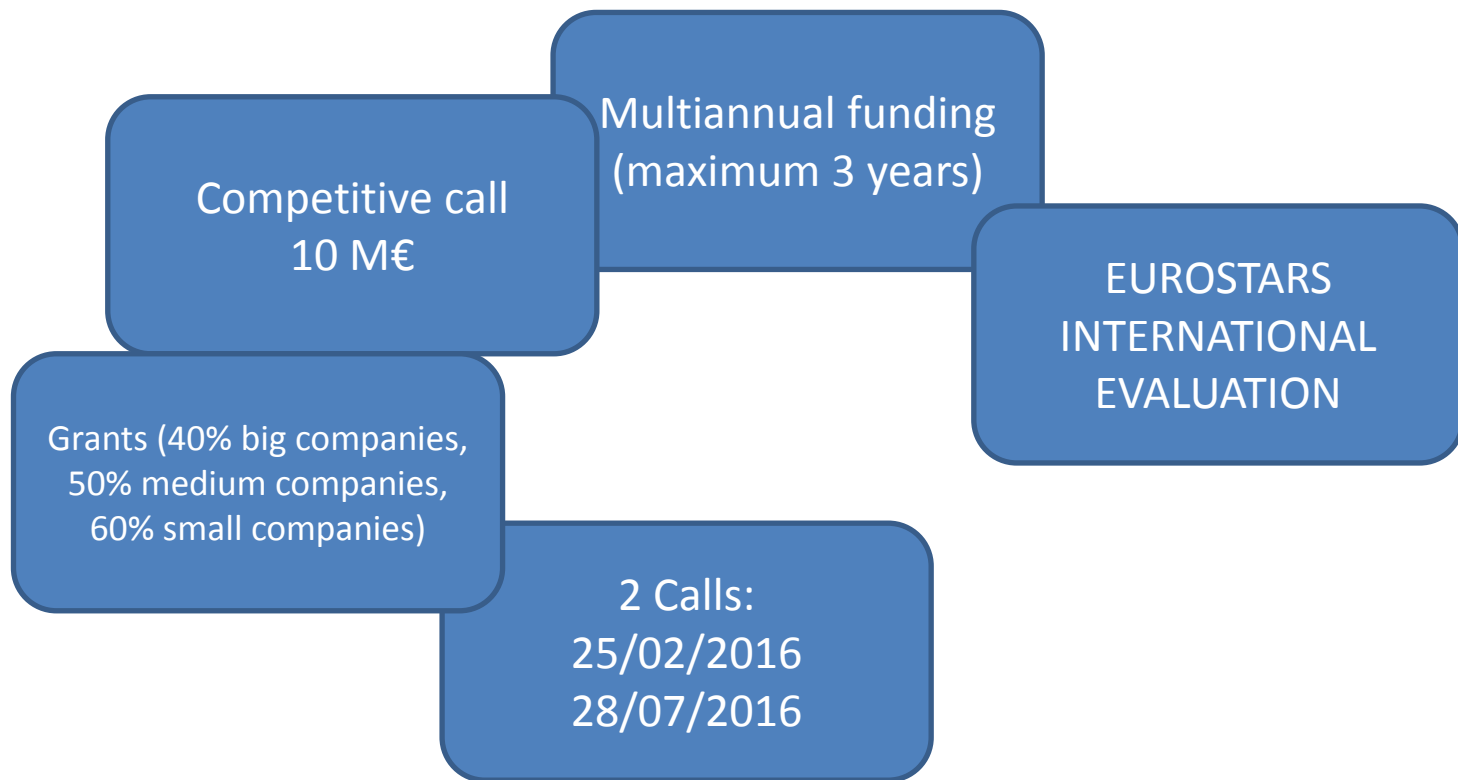
INNOGLOBAL

- Funding for international projects
- Cooperation
- Min. budget: 175.000 €



INTEREMPRESAS INTERNACIONAL

- Funding for international projects
- Cooperation
- EUROSTARS



RTDI PROJECTs: INTERNATIONAL COOPERATION

EUREKA		EUROSTARS
Proyectos I+D	INNOGLOBAL	INTEREMPRESAS INTERNACIONAL
LOANS+GRANTS (30%)	GRANTS (30%,40%,50%)	GRANTS (40%,50%,60%)
OPEN CALL	CLOSE CALL	CLOSE CALL
MIN BUDGET 175K€	MIN BUDGET 175K€	XXXX
NATIONAL EVALUATION	NATIONAL EVALUATION	INTERNATIONAL EVALUATION

THANKS

Raúl García Esparza
Department of Energy, Transport, Manufacturing & Digital Society
DIRECTORATE, PROMOTION & COOPERATION
MADRID, 18 October 2016
raul.garcia@cdti.es

Norwegian participation in Eureka

Madrid, 18 October 2016

History of Participation






- Since 1985
- Good participation - both in Eureka Network Projects and in Eurostars
- Eureka Chairmanship 2013 - 2014



EUREKA – national co- financing

- No earmarked budgets
- Most national programmes for research, development and innovation are relevant as source of financing
- Also some Innovation Norway programmes

Eureka funding in Norway

	
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 Eureka Network	<p>Grant Will differ according to different national funding programs.</p>
Participants	<p>Mainly Companies but Universities and Research Institutes can be partners</p>

National organisation

- **The Research Council of Norway is the national coordinator**
 - Help with national financing
 - Partner search
 - Project development support (funding)
 - Submitting the application when Norwegian project coordinator
- **Innovation Norway**
 - Support and mobilization
 - EEN Partner search

EUREKA – linked to Horizon 2020

**H O R I S O N T
2 0 2 0**

**Research, research and
innovation
development activities**



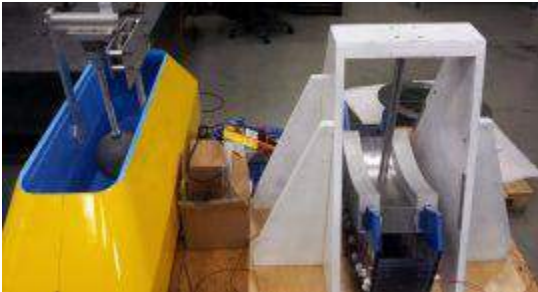
eurostars™

**For research intensive
SMEs**

**H O R I S O N T
2 0 2 0**

**SME Instrument
for SMEs with business
driven innovations near
the market
Fast Track to Innovation**

Example of Spanish - Norwegian cooperation



- Mecanica Industrial Buelna (MIB) and Norwegian University of Science and Technology (NTNU)
- Development of a prototype to capture wave energy
- CDTI and SINTEF involved with financing

H2020 SOCIETAL CHALLENGE 3: SECURE, CLEAN AND EFFICIENT ENERGY



Pilar González Gotor
NCP Energía H2020
División de Programas de la UE
CDTI
mpilar.gonzalez@cdti.es

*Promoting bilateral cooperation through the EEA Grants
2009-2014 - Madrid 18 -10-2016*

Summary

- **Policy Context**
- **Relevant Calls – WP2016-2017**
 - **Energy Efficiency**
 - **Competitive Low Carbon**
 - **Smart Cities and Communities**

Summary

- **Policy Context**
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Political Context

2030 Climate-Energy Package

- 40% reduction of Greenhouse Gases
- 27% of renewable energy
- 27% improvement in energy efficiency



Energy Union

- *Energy security, solidarity and trust*
- *A fully integrated internal energy market*
- *Energy efficiency first*
- *Transition to a low-carbon society*
- *An Energy Union for Research, Innovation and Competiveness*

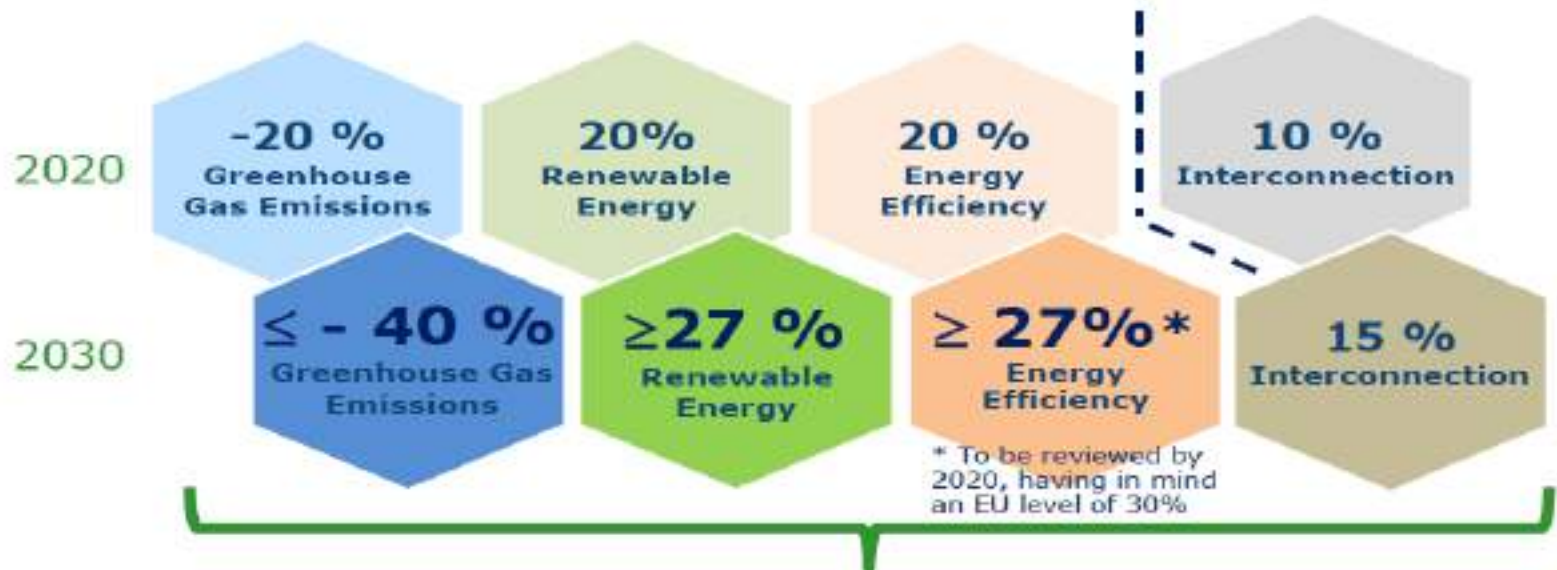
SET-Plan

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





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>

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H2020: Structure and Budget

HORIZONTE 2020		74.828
I. Prioridad «Ciencia excelente»		24.232
1. El Consejo Europeo de Investigación (CEI)		13.095
2. Las Tecnologías Futuras y Emergentes (FET)		2.585
3. Las acciones Marie Skłodowska-Curie		6.162
4. Las infraestructuras de investigación		2.390
II. Prioridad «Liderazgo industrial»		16.466
1. Liderazgo en tecnologías industriales y de capacitación:		13.035
1.1 Tecnologías de la información y la comunicación (TIC)		7.423
1.2 Nanotecnologías, 1.3 Materiales avanzados y 1.5 Fabricación y transformación avanzadas		3.741
1.4 Biotecnología		501
1.6 Espacio		1.403
2. Acceso a la financiación de riesgo		2.842
3. Innovación en las PYME		589
III. Prioridad «Retos de la sociedad»		28.630
1. Salud, cambio demográfico y bienestar		7.257
2. Seguridad alimentaria, agricultura y silvicultura sostenibles, investigación marina, marítima y de aguas interiores y Bioeconomía		3.708
3. Energía segura, limpia y eficiente		5.688
4. Transporte inteligente, ecológico e integrado		6.149
5. Acción por el clima, medio ambiente, eficiencia de los recursos y materias primas		2.956
6. Europa en un mundo cambiante – Sociedades inclusivas, innovadoras y reflexivas		1.258
7. Sociedades seguras – Proteger la libertad y la seguridad de Europa y de sus ciudadanos		1.613
IV. Difundir la excelencia y ampliar la participación		816
V. Ciencia con y para la sociedad		445
VI. Acciones directas no nucleares del Centro Común de Investigación (JRC)		1.856
VII. Instituto Europeo de Innovación y Tecnología (EIT)		2.383

Precios corrientes en M€

RS3: Programme Structure Call 2016-2017

Secure Clean end efficient
Energy

Cross-Cutting
activities

Energy Efficiency

25 Topics

Budget: 194 M.€

Low Carbon Technologies

36 topics

Budget: 720,22 M.€

Smart Cities and Communities

1 topic

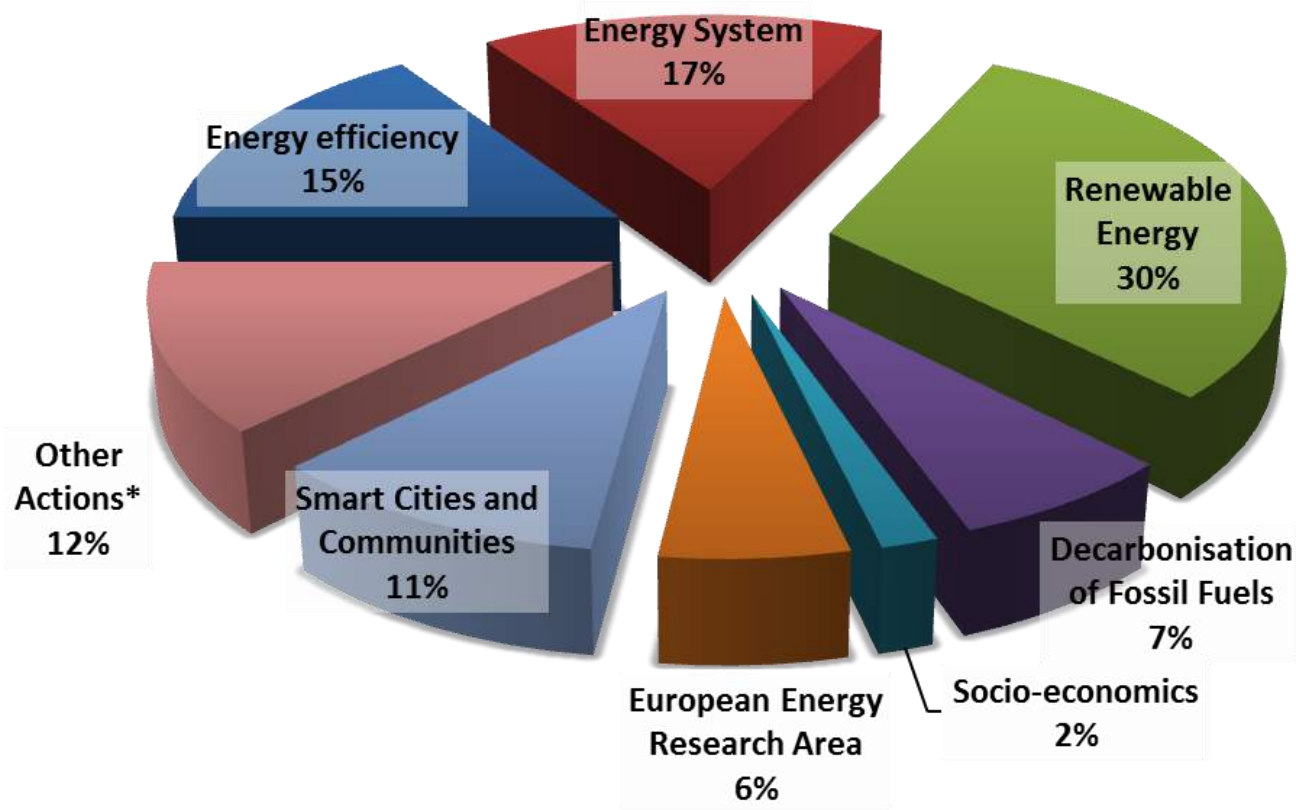
Budget: 131,5 M.€



EASME
(EACI)

INEA
(TEN-T EA)

Indicative budget distribution per area for Energy calls 2016-2017



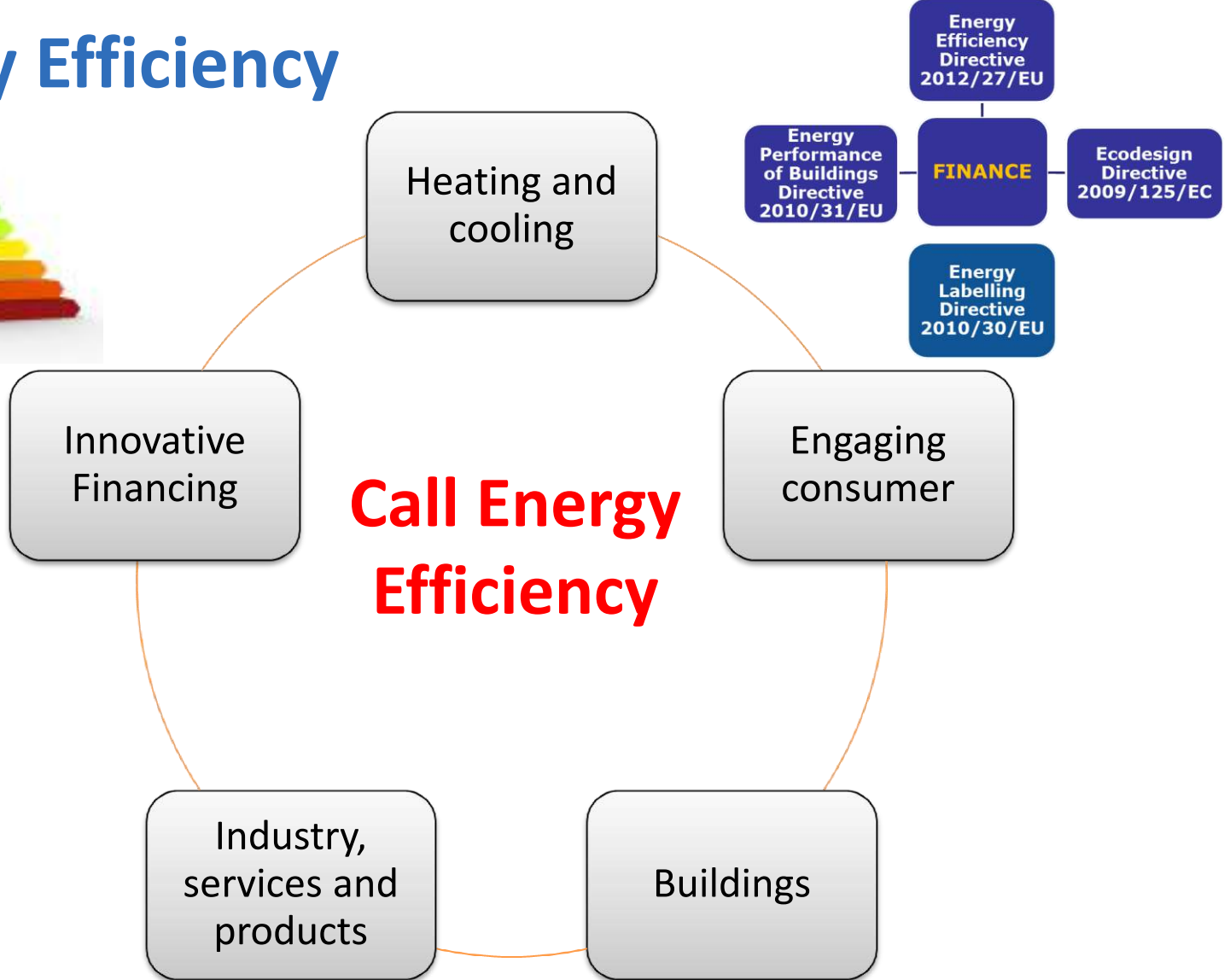
Total budget 2016-2017: **EUR 1 344 million**

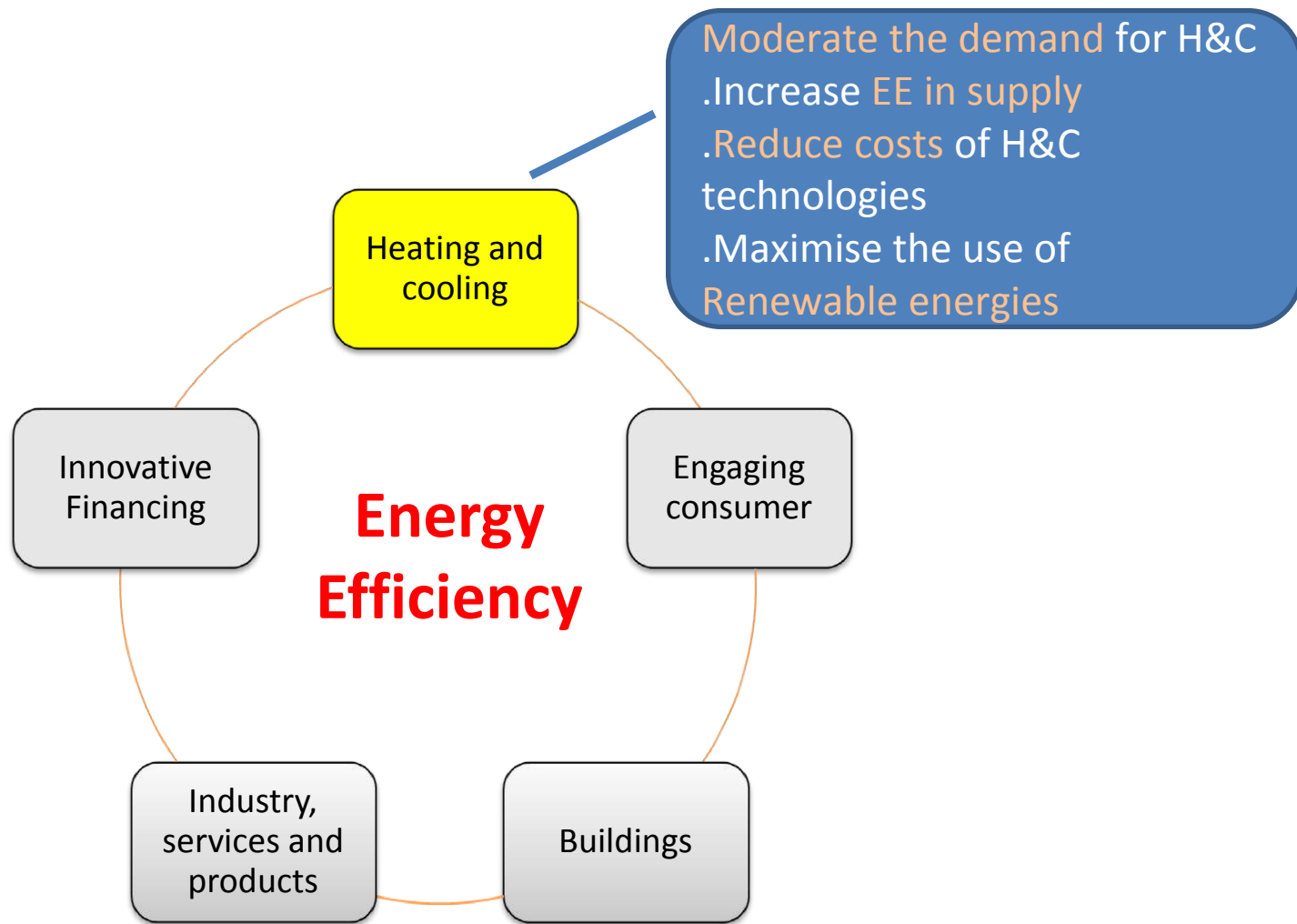
* *Other Actions* = actions not implemented through calls for proposals (e.g. Risk Finance, procurements, subscriptions, contributions, grant to identified beneficiaries)

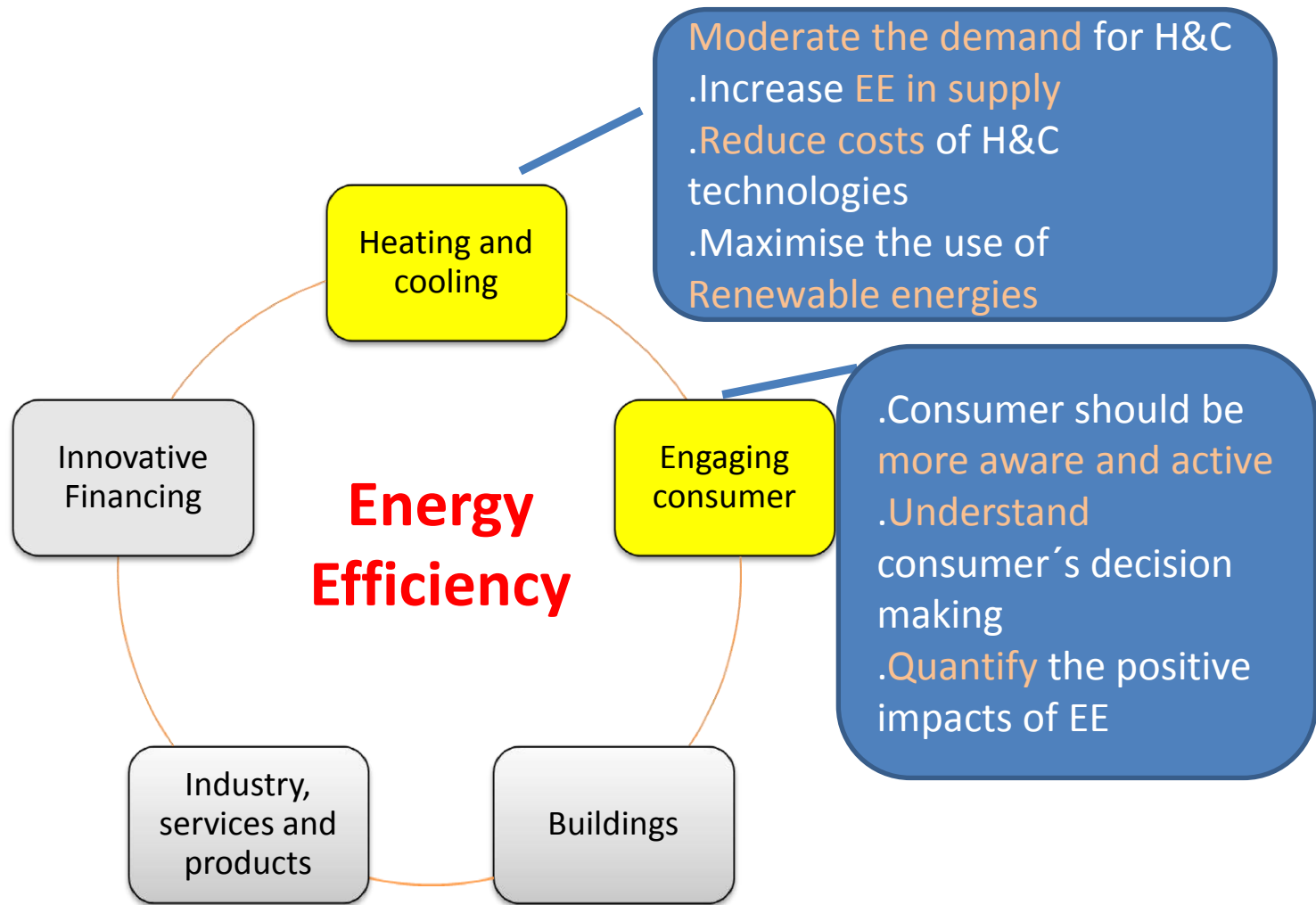
Summary

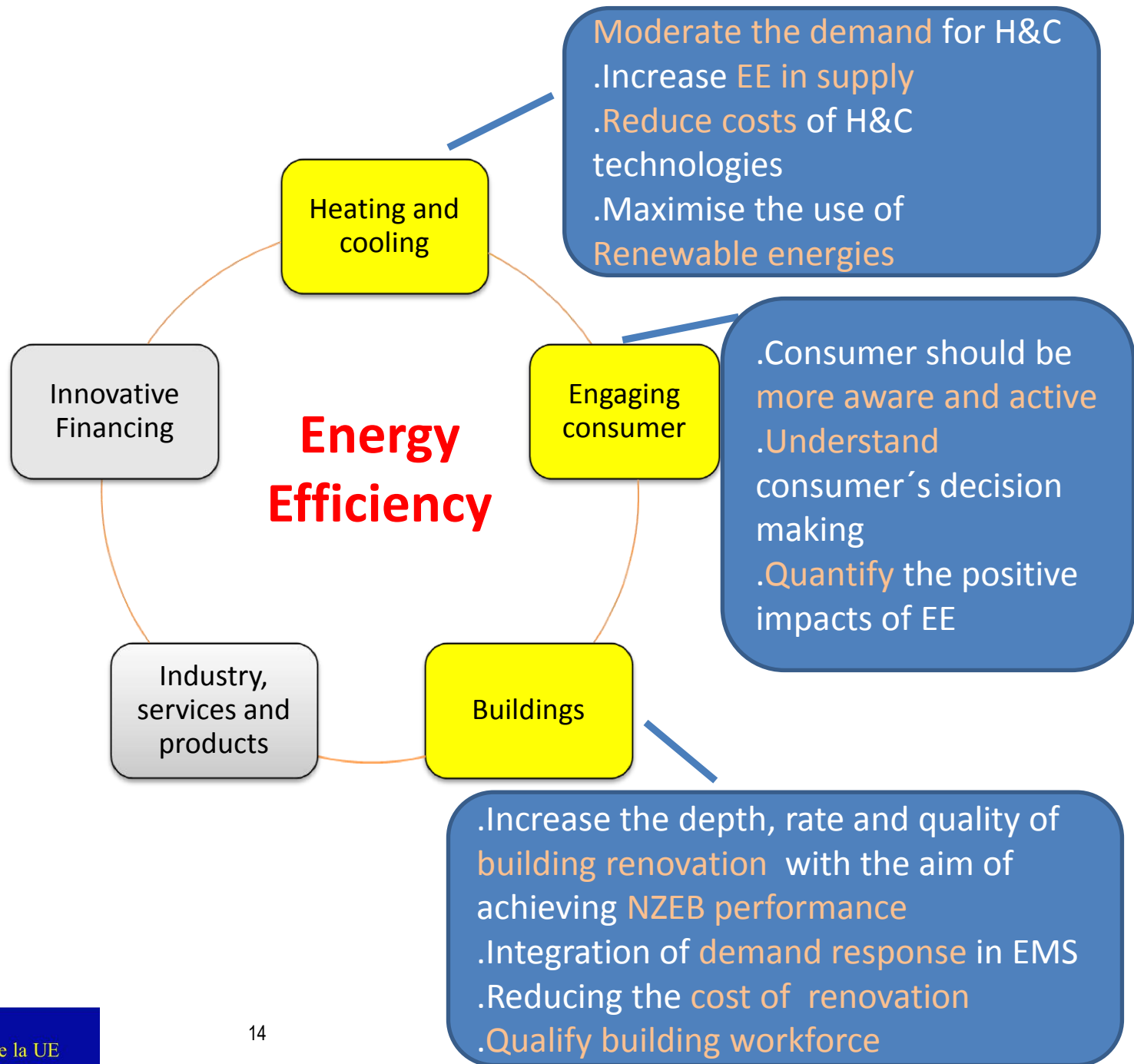
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Energy Efficiency

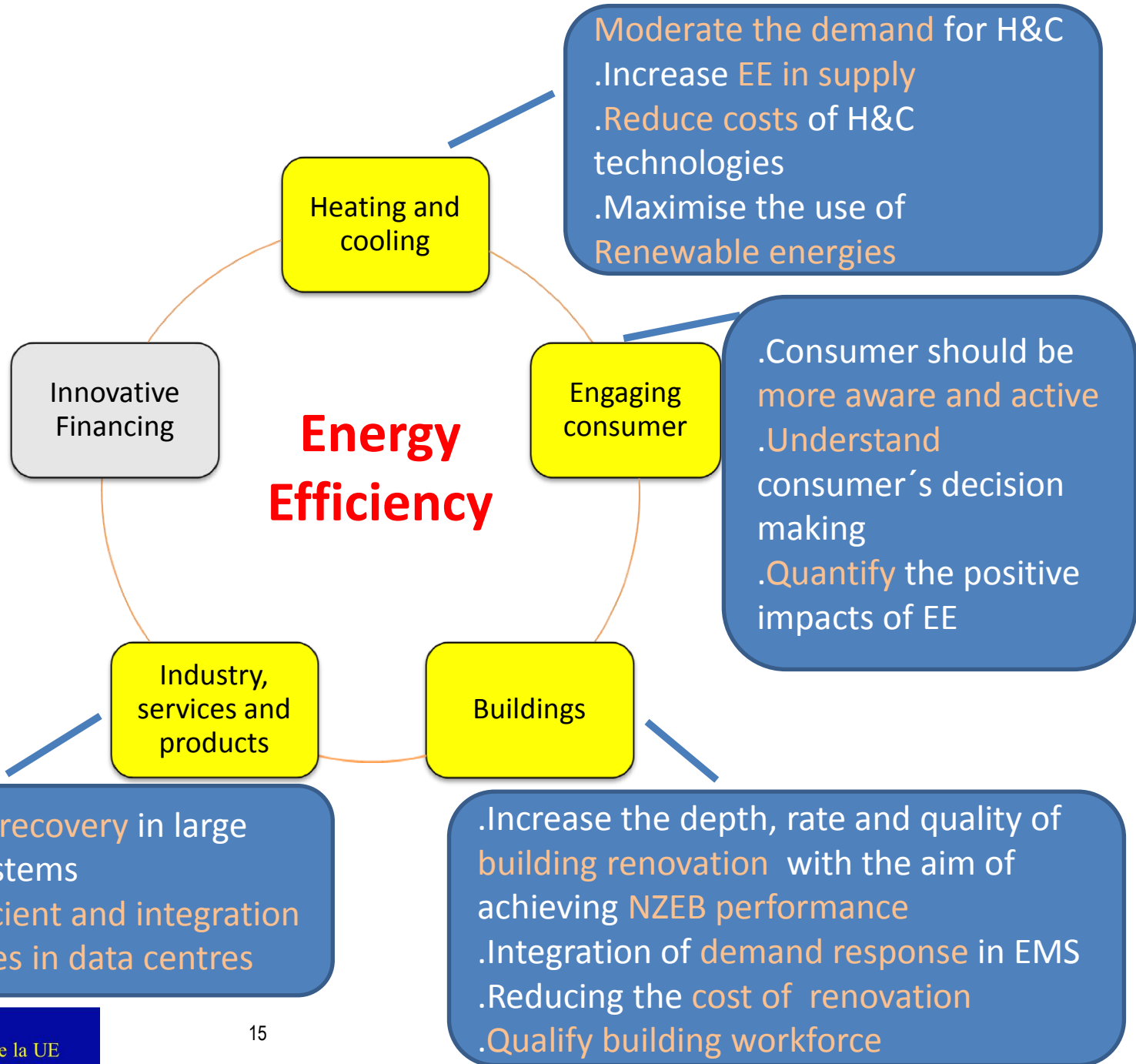








Energy Efficiency



Energy Efficiency

Heating and cooling

- .Moderate the demand for H&C
- .Increase EE in supply
- .Reduce costs of H&C technologies
- .Maximise the use of Renewable energies

- .Consumer should be more aware and active
- .Understand consumer's decision making
- .Quantify the positive impacts of EE

Engaging consumer

Buildings

- .Increase the depth, rate and quality of building renovation with the aim of achieving NZEB performance
- .Integration of demand response in EMS
- .Reducing the cost of renovation
- .Qualify building workforce

Industry, services and products

- .Waste heat recovery in large industrial systems
- .Energy efficient and integration of renewables in data centres

- .Develop innovative financing mechanism, investment instrument and schemes for EE
- .EE services and BM,
- .Provide Project Development Assistance

Innovative Financing

Energy Efficiency call 2017 - Overview

Deadline 19 January 2017

- Sub-budget: EUR 8 million
 - EE-12
- Sub-budget: EUR 11 million
 - EE-17
- Sub-budget: EUR 16 million
 - EE-1
 - EE-4
- Sub-budget: EUR 8 million
 - EE-7
- Sub-budget: EUR 6 million
 - EE-20

IA – green
CSA- orange
ERA-NET – black
PPI - purple

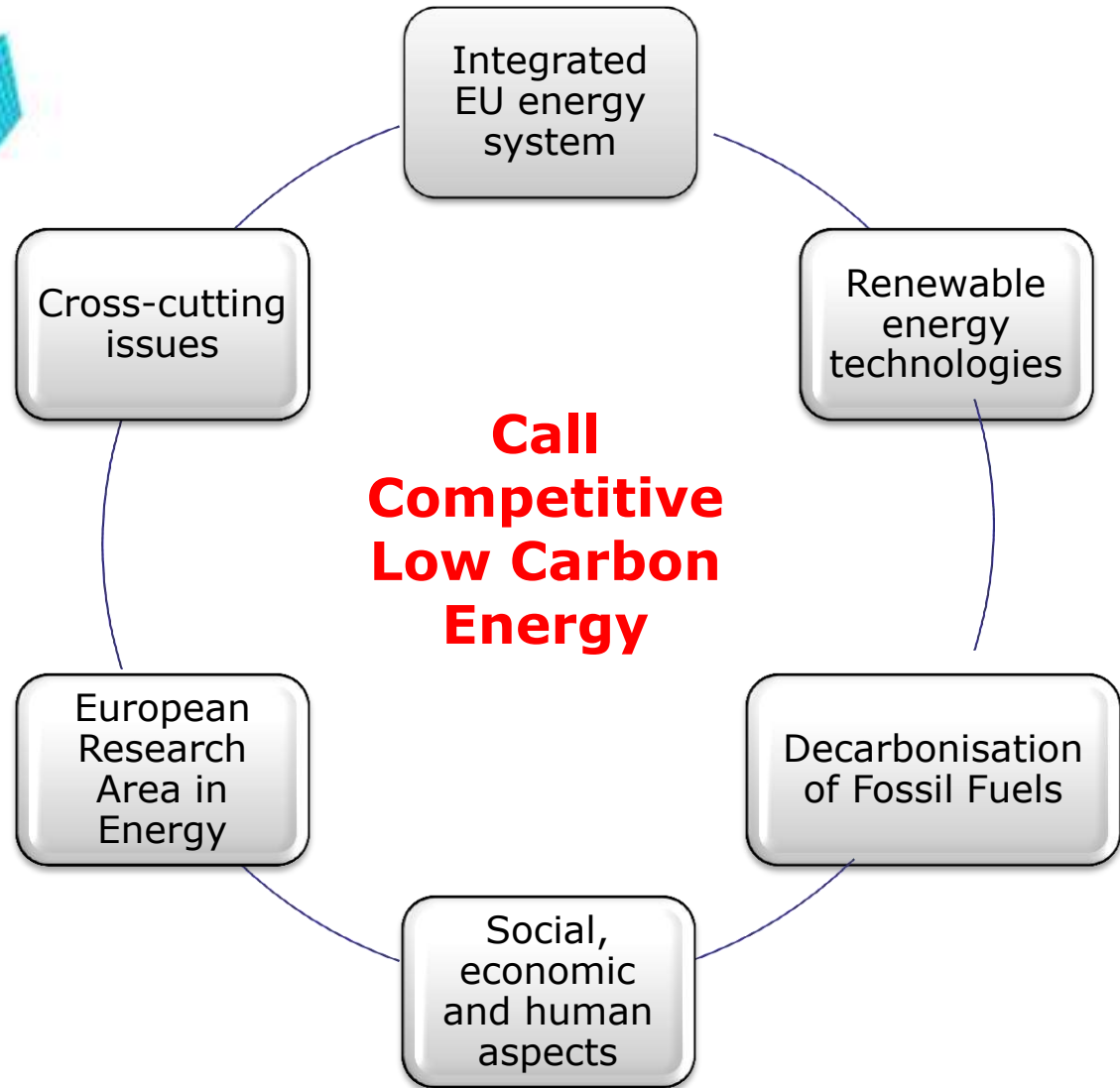
Deadline 7 June 2017

- EE-2 EUR 4 million
- EE-6 EUR 5 million
- EE-9 EUR 7 million
- EE-11 } EUR 8 million
- EE-14 }
- EE-15 } EUR 11 million
- EE-16 }
- EE-18 }
- EE-19 EUR 4 million
- EE-23 } EUR 8 million
- EE-24 }
- EE-22 EUR 8 million

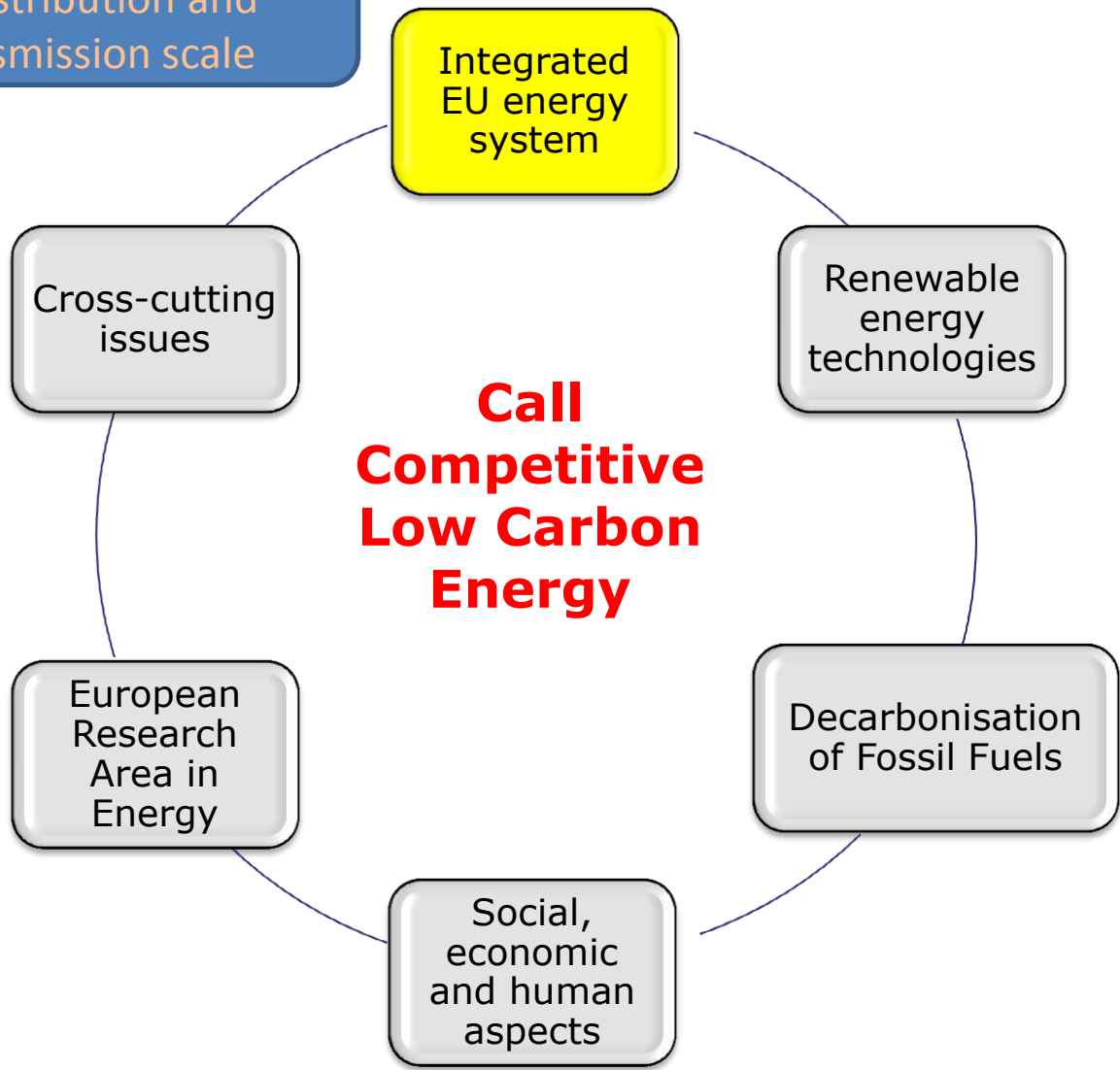
Summary

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 - **Competitive Low Carbon**
 - Smart Cities and Communities

Low Carbon Technologies



Smart Grids and Storage
at distribution and
transmission scale



Smart Grids and Storage
at distribution and
transmission scale

Integrated
EU energy
system

R&D + market
uptake: PV, CSP,
Wind, Ocean,
Geothermal, CHP,
SHC, Hydropower,
Biofuels

Cross-cutting
issues

Renewable
energy
technologies

Call Competitive Low Carbon Energy

European
Research
Area in
Energy

Decarbonisation
of Fossil Fuels

Social,
economic
and human
aspects

Smart Grids and Storage
at distribution and
transmission scale

Integrated
EU energy
system

R&D + market
uptake: PV, CSP,
Wind, Ocean,
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Biofuels

Cross-cutting
issues

Call Competitive Low Carbon Energy

Renewable
energy
technologies

European
Research
Area in
Energy

Decarbonisation
of Fossil Fuels

Social,
economic
and human
aspects

Carbon Capture and Storage
and Carbon Capture and Use ;
solutions for fossil fuel power
plants –more flexibility.

Smart Grids and Storage
at distribution and
transmission scale

Integrated
EU energy
system

R&D + market
uptake: PV, CSP,
Wind, Ocean,
Geothermal, CHP,
SHC, Hydropower,
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Cross-cutting
issues

Call Competitive Low Carbon Energy

Renewable
energy
technologies

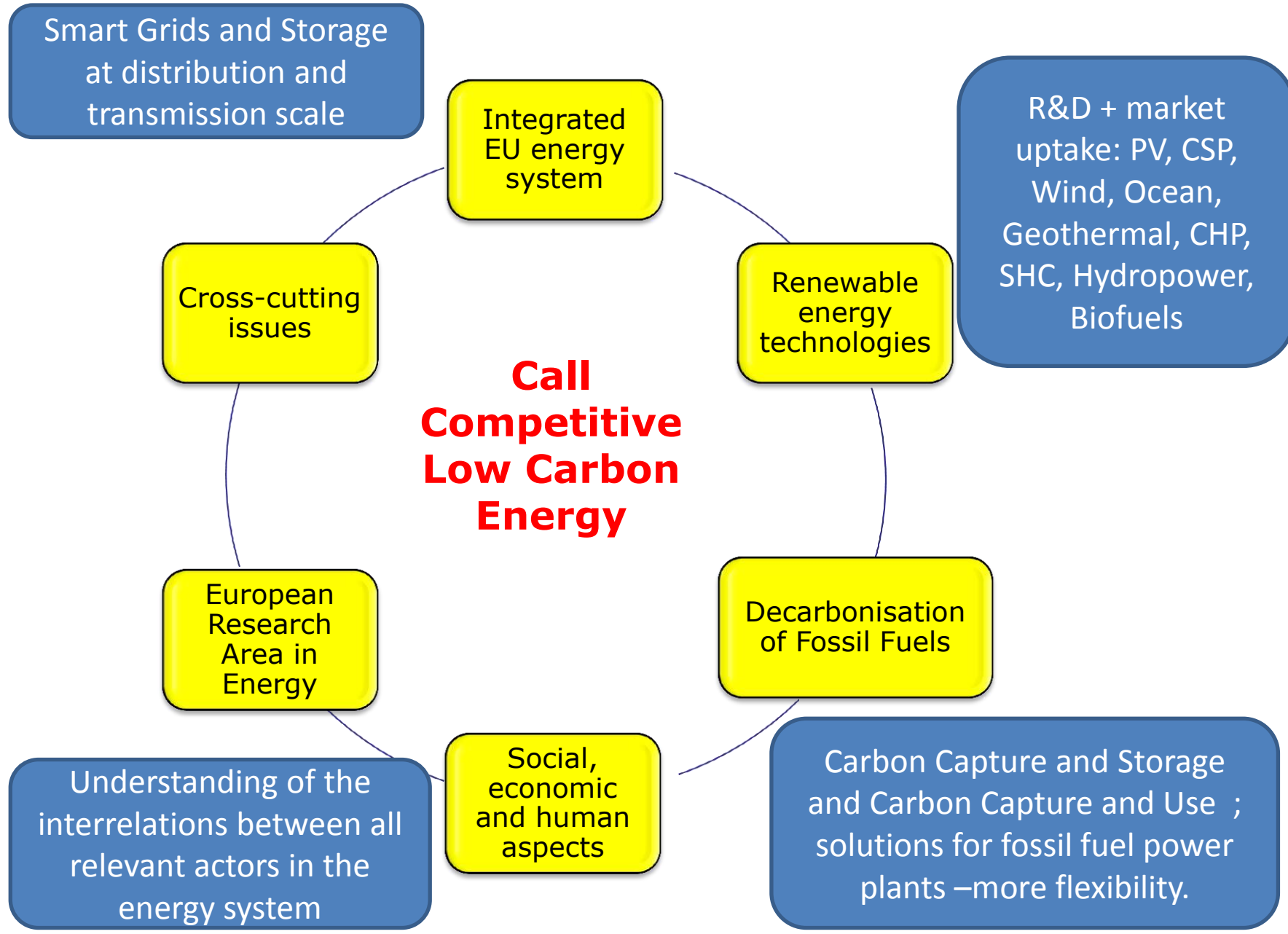
European
Research
Area in
Energy

Decarbonisation
of Fossil Fuels

Understanding the
interrelations between all
relevant actors in the
energy system

Social,
economic
and human
aspects

Carbon Capture and Storage
and Carbon Capture and Use ;
solutions for fossil fuel power
plants –more flexibility.



LCE – Topic overview

Deadline 5 January 2017

- LCE-8 – budget - 10 M€
- LCE-21 – budget - 15 M€
- LCE-27 – budget - 15 M€
- LCE-28 – budget - 15M€
- LCE-29, 30 – budget - 20 M€

Deadlines: 1st stage: 29/11/2016

2nd: 22/8/2017

- LCE-6 – budget 20 M€
- LCE-7 – budget 64,5 M€
- LCE-31 – budget 10M€

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€

RIA – blue
IA – green
CSA- orange

Summary

- **Policy Context**
- **Relevant Calls – WP2016-2017**
 - Energy Efficiency
 - Competitive Low Carbon
 - **Smart Cities and Communities**

Call Smart Cities and Communities



- Improving **quality of live, competitiveness and sustainability**
- Exporting European knowledge in a **strong growth market** estimated globally at **€1.3 trillion** in 2020



WP 2016-2017

Topic SCC-01

- **Smart and Sustainable Cities**
- **Sustainable, cost-effective and replicable** district-scale solutions at the intersection of **energy, transport** enabled by **ICT**
- Intelligent, **user-driven** and **demand-oriented** city infrastructure and services
- '**Lighthouse project**' approach continue



CALL CONDITIONS

Type of action: Innovation Action (IA)

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

Call 2017:

Deadline: 14 February 2017

Budget: 71,5 M.€

FAQ:

<https://ec.europa.eu/research/participants/portal/desktop/en/support/faq.html>

ESHORIZONTE 2020

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



THANK YOU!

mpilar.gonzalez@cdti.es

Societal Challenge 5

Environment
WaterInnovation
RawMaterials EcolInnovation
CircularEconomy
ClimateAction ResourceEfficiency
Recycling
Research
Waste
Horizon 2020
NaturalResources
EarthObservation
Innovation

OPPORTUNITIES FOR COLLABORATION

HORIZONTE 2020

H2020-Societal Challenge 5

- **Objectives and lines of activity**
- **Work Programme 2016-2017**
- **Some results NO-ES**

Additional possibilities

Support and additional information

What is Horizon 2020?

**Budget
74.828 M€**

**Focus on
Societal Challenges**

Simplification

**Different
Instruments**

HORIZON 2020
EU Research and Innovation
Framework Programme (2014-2020)

**International
Cooperation**

**Collaborative
Projects***

Europe 2020

Europe 2020¹

Tr

2030 Framework for CLIMATE and ENERGY policies →

- Reducing greenhouse gas emissions by 40%
- Increasing the share of renewable energy to at least 27%
- Increasing energy efficiency by 30%

5 of
1

2050 Low Carbon economy² →

- By 2050, the EU should cut emissions to 80%
- 40% emissions cuts by 2030 and 60% by 2040
- All sectors need to contribute
- The low-carbon transition is feasible & affordable

Conclusions
COP21

Sustainable
Development
Goals (SDGs)

New CIRCULAR ECONOMY package (02/12/2016)³ →

- EU Action Plan (funding, ecodesign, strategy on plastics, reduction of food waste and marine litter, water, etc).
- Legislative proposals on waste (new targets, landfilling reduction, etc).

than 1990

and social exclusion

¹COM(2010) 2010, Brussels, 3.3.2010; http://ec.europa.eu/europe2020/index_es.htm

² http://ec.europa.eu/clima/policies/strategies/2050/index_en.htm

³ http://ec.europa.eu/environment/circular-economy/index_en.htm



17 Sustainable Development Goals (SDGs)



SUSTAINABLE DEVELOPMENT
KNOWLEDGE PLATFORM



HOME

SDGS

TOPICS

HIGH-LEVEL POLITICAL FORUM

PROCESSES & UN SYSTEM

STAKEHOLDER ENGAGEMENT

PARTNERSHIPS

RESOURCES

ABOUT

Sustainable Development Goals



18/10/2016

<https://sustainabledevelopment.un.org/?menu=1300>



The Commission and its Priorities*



Jobs, Growth and Investment



Digital Single Market



Energy Union and Climate



Internal Market



Economic and Monetary Union

EU-US Free Trade

Justice and Fundamental Rights

Migration

EU as a Global Actor



Democratic Change

*http://ec.europa.eu/index_es.htm#priorities

Types of Action* ("Instruments")

Research & Innovation Actions

100%

Innovation Actions

70%**

* **Except for "non-profit" organizations → 100%

Coordination & Support Actions

100%

ERA-Net CoFund

33%

PCP & PPI

90-35%

SME Instrument

Fase I: 50 k€ (*lump sum*)
Fase II: 0,5 – 2M€ (70%)

Fast Track to Innovation (2015)

Max.: 3M€ (70%)

Prizes

0,5M€



H2020 budget



HORIZONTE 2020

74.828

I. Prioridad «Ciencia excelente»	24.232
1. El Consejo Europeo de Investigación (CEI)	13.095
2. Las Tecnologías Futuras y Emergentes (FET)	2.585
3. Las acciones Marie Skłodowska-Curie	6.162
4. Las infraestructuras de investigación	2.390
II. Prioridad «Liderazgo industrial»	16.466
1. Liderazgo en tecnologías industriales y de capacitación:	13.035
1.1 Tecnologías de la información y la comunicación (TIC)	7.423
1.2 Nanotecnologías, 1.3 Materiales avanzados y 1.5 Fabricación y transformación avanzadas	3.741
1.4 Biotecnología	501
1.6 Espacio	1.403
2. Acceso a la financiación de riesgo	2.842
3. Innovación en las PYME	589
III. Prioridad «Retos de la sociedad»	28.630
1. Salud, cambio demográfico y bienestar	7.257
2. Seguridad alimentaria, agricultura y silvicultura sostenibles, investigación marina, marítima y de aguas interiores y Bioeconomía	3.708
3. Energía segura, limpia y eficiente	5.688
4. Transporte inteligente, ecológico e integrado	6.149
5. Acción por el clima, medio ambiente, eficiencia de los recursos y materias primas	2.956
6. Europa en un mundo cambiante – Sociedades inclusivas, innovadoras y reflexivas	1.258
7. Sociedades seguras – Proteger la libertad y la seguridad de Europa y de sus ciudadanos	1.613
IV. Difundir la excelencia y ampliar la participación	816
V. Ciencia con y para la sociedad	445
VI. Acciones directas no nucleares del Centro Común de Investigación (JRC)	1.856
VII. Instituto Europeo de Innovación y Tecnología (EIT)	2.383



Horizon 2020 – «Cross-cutting issues»

- International Cooperation
- Social and economic science and humanities
- Climate change and sustainable development

- At least, **60% of overall Horizon 2020 budget** should be related to **sustainable development**
- **35% to climate-related expenditure**

- SME involvement in research and innovation and the

20% Industrial Leadership and Societal Challenges budget should go to **SMEs** (including the SME instrument).

HORIZONTE 2020

H2020-Societal Challenge 5

- **Objectives and lines of activity**
- **Work Programme 2016-2017**
- **Some results NO-ES**

Additional possibilities

Support and additional information

H2020 – Societal Challenge 5 (SC5)

Horizon 2020

Societal Challenges

Climate Action,
Environment,
Resource Efficiency
and Raw Materials

H2020 – Societal Challenge 5 (SC5)

Climate Action, Environment, Resource Efficiency and Raw Materials

€2.956 million

4,00% H2020



Objective: *"to achieve a resource – and water – efficient and climate change resilient economy and society, the protection and sustainable management of natural resources and ecosystems, and a sustainable supply and use of raw materials, in order to meet the needs of a growing global population within the sustainable limits of the planet's natural resources and eco-systems."*

40140010

H2020 – SC5 → Broad lines of activity

5.1 Fighting and adapting to climate change



5.2 Sustainably managing natural resources and ecosystems



5.3 Sustainable supply of non-energy and non-agricultural raw materials

Raw Materials
Alternate
Recycle
Extract

5.4 Transition towards a green economy through eco-innovation



5.5 Global environmental observation and information systems



5.6 Cultural heritage



From FP7-MA to H2020 – SC5



Some novelties....

- Focus on the transformation to a **«green» economy and a «green» society.**
- More **eco-innovation**, including **social innovation** and **other types of innovation.**
- More **economic and social dimension** and with impact in the future.
- **Raw Materials** are included into this Societal Challenge.
- **ICT applications to environment.**
- **Environment and Health** is included in SC1 (Health).

HORIZONTE 2020

H2020-Societal Challenge 5

- Objectives and lines of activity
- Work Programme 2016-2017
- Some results NO-ES

Additional possibilities

Support and additional information

SC5 – Work Programmes

WP 2014-2015, structure and contents after FP7

- Priorities (“focus areas”): WASTE and WATER

*Call – Water Innovation:
Boosting its value for Europe*

*Call – Waste: A Resource to Recycle,
Reuse and Recover Raw Materials*

*Call - Growing a Low Carbon, Resource Efficient
Economy with a Sustainable Supply of Raw Materials.*

- *Fighting And Adapting To Climate Change*
- *Protecting The Environment, Sustainably Managing Natural Resources, Water, Biodiversity And Ecosystems*
- *Ensuring The Sustainable Supply Of Non-energy And Non-agricultural Raw Materials*
- *Enabling The Transition Towards A Green Economy And Society Through Eco-innovation*
- *Developing Comprehensive And Sustained Global Environmental Observation And Information Systems*

Contribución a otras Focus Areas:

Blue Growth, Energy Efficiency, Disaster Resilience.

SC5 – Work Programmes

WP 2014-2015, structure and contents “similar” to FP7

- Priorities (“focus areas”): WASTE and WATER

WP 2016-2017,.....a change

- Transition to a **circular economy** requires a “**systemic innovation**” approach: multi- and trans-disciplinarity, integrate technology-business models-regulation-social innovation , multiple stakeholders.
- **Solutions for the future**, which unlock public investment and....also private.
- **Large-scale demonstration projects with replication potential**, (50% of the budget, IAs).
- Other topics, IAs and CSAs, are complementary to the Innovation Actions (IAs).



SC5 – WP 2016-2017 → Priorities

Climate Action:

- Climate Services
- Low-Carbon Europe
- Artic Dimension

Raw Materials

“Mainstreaming”
Water R&I

Nature-based solutions:

- For Territorial Resilience
- For Sustainable Cities

Systemic Eco-Innovation
for a Circular Economy

Sustainable Growth:

- Earth Observation
- Cultural Heritage

SC5 – WP 2016-2017 → Priorities

Climate Action:

- Climate Services
- Low-Carbon Europe
- Artic Dimension (SC2)

Raw Materials

“Mainstreaming”
Water R&I

Nature-based solutions:

- For Territorial Resilience
- For Sustainable Cities

Systemic Eco-Innovation
for a Circular Economy

Sustainable Growth:

- Earth Observation
- Cultural Heritage

To understand SC5 – WP 2016-2017 priorities

Relevant DOCUMENTS

From Niche to Norm

From Niche to Norm

Suggestions by the Group
Approach to Eco-
a low-carbon,



A European research
and innovation **Roadmap**
for Climate Services

o for

Towards an EU Research and Innovation policy agenda for Nature-Based Solutions & Re-Naturing Cities

Final Report of the Horizon 2020
Expert Group on 'Nature-Based Solutions
and Re-Naturing Cities'
(full version)



Getting cultural heritage to work for Europe

Report of the Horizon 2020 Expert Group on
Cultural Heritage



Centro para el
Desarrollo
Tecnológico
Industrial

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ng

SC5 –WP 2016-2017...and the topics???

INTRODUCTION to 12. “Climate action, environment, resource efficiency and raw materials”

“In addition to the call [H2020-SC5-2016-2017 'Greening the economy'](#), activities relating to climate action, environment, resource efficiency and raw materials are also found in the calls:

- ***H2020-IND-CE-2016/17 'Industry 2020 in the Circular Economy'** (on eco-innovation),*
- ***H2020-SCC-2016/17 'Smart and Sustainable Cities'** (on sustainable cities through nature-based solutions),*
- ***H2020-BG-2016-2017 'Blue growth – demonstrating an ocean of opportunities'** (on the Arctic),*
- ***H2020-SFS-2016-2017 'Sustainable Food Security – Resilient and resource-efficient value chains'** (on Earth Observation for Africa),*
- ***H2020-LCE-2016-2017 'Competitive low-carbon energy'** (on applied geo-sciences)*
- *and in the SME Instrument call **H2020-SMEInst-2016-2017.**”*

SC5 –WP 2016-2017...and the topics????

- **Call – Industry 2020 in the Circular Economy**

- Circular Economy

- **Call – Smart and Sustainable Cities**

- Sustainable cities through nature-based solutions

17-Cross Cutting
Activities

- **Call – Greening the Economy**

- Climate services

- Towards a Low-Carbon Europe

- Nature-Based Solutions for Territorial Resilience

- Water

- Raw Materials

- Earth Observation

- Cultural Heritage for Sustainable Growth

- Support to Policy and Preparing for Innovation Procurement

12-Climate Action,
Environment...

Contributions to other Societal Challenges:

Blue Growth (SC2), Sustainable Food Security (SC2), Competitive low-carbon energy (SC3)



RESEARCH & INNOVATION

Participant Portal

European Commission > Research & Innovation > Participant Portal > Reference Documents

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FUNDING OPPORTUNITIES

HOW TO PARTICIPATE

EXPERTS

SUPPORT

Search PP



LOGIN



REGISTER

Reference Documents

H2020 Online Manual

Reference Documents

Beneficiary Register

Financial Viability Self-Check

SME Participation



This page includes all the H2020 & FP7 reference documents starting with legal documents and the Commission



Specific guidelines



ERC rules for submission and evaluation



Work Programmes



2014-15



2016-17



Templates & forms



Proposal templates



2014-15



2016-17



Proposal evaluation forms



2014-15



2016-17



Project reporting templates

H2020



European Commission > Res

HOME FUNDS

- H2020 Online Manual
- Reference Documents
- Beneficiary Register
- Financial Viability Self-C
- SME Participation



Work Programmes

- 2014-15
- 2016-17

Main WP

1. Introduction 2016-17 >
2. Future and Emerging Technologies (FETs) 2016-17 >
3. Marie Skłodowska-Curie actions (MSCA) 2016-17 >
4. Research infrastructures (including e-Infrastructures) 2016-17 >
5. Introduction to Leadership in enabling and industrial technologies (LEITs) 2016-17 >
- 5i. Information and communication technologies (ICT) 2016-17 >
- 5ii. Nanotechnologies, advanced materials, advanced manufacturing and processing, biotechnology 2016-17 >
- 5iii. Space 2016-17 >
6. Access to risk finance 2016-17 >
7. Innovation in SMEs 2016-17 >
8. Health, demographic change and wellbeing 2016-17 >
9. Food security, sustainable agriculture and forestry, marine and maritime and inland water research and the bioeconomy 2016-17 >
10. Secure, clean and efficient energy 2016-17 >
11. Smart, green and integrated transport 2016-17 >
12. Climate action, environment, resource efficiency and raw materials 2016-17 >
13. Europe in a changing world - inclusive, innovative and reflective societies 2016-17 >
14. Secure societies - protecting freedom and security of Europe and its citizens 2016-17 >
15. Spreading excellence and widening participation 2016-17 >
16. Science with and for society 2016-17 >
17. Cross-cutting activities (Focus Areas) 2016-17 (NEW) >
18. Fast Track to Innovation Pilot 2016-17 >
19. Dissemination, Exploitation and Evaluation 2016-17 >

General Annexes to the Main WP

SC5 – WP 2016-2017...some DETAILS



IMPORTANT.-

Very **relevant information**, (besides the topics):

- **Introduction** to the WPs (two documents)
- **Introduction** to the “calls” and “sub-calls”
- **“Call-conditions”** at the end of the call

SC5 – WP 2016-2017...some DETAILS

“Demonstration projects”

Sinergies with other funds

“Because of the substantial investments that might be necessary for implementing, additional or follow-up funding (private or public) should be sought, including from relevant regional/national schemes under the European Structural and Investment Funds (ESIF), in particular under the European Regional Development Fund (ERDF), or other relevant funds such as the Instrument for Pre-accession Assistance (IPA II). To this end, projects could seek contact with ERDF/IPA managing authorities and with the authorities who developed the Research and Innovation Smart Specialisation Strategies (RIS3). Please note, however, that reference to such additional or follow-up funding will not lead automatically to a higher score in the evaluation of the proposal.”*

*<http://s3platform.jrc.ec.europa.eu/>18/10/2016

SC5 – WP 2016-2017...some DETAILS

Introduction to the calls SC5_WP 2016-2017

“Pilot on Open Research Data”- H2020 →

*“A **novelty in Horizon 2020** is the Pilot on Open Research Data which aims to improve and maximise access to and re-use of research data generated by projects. Projects under the Societal Challenge 5 ...Work Programme 2016-17 will **by default participate in the Pilot on Open Research Data in Horizon 2020**, except for topicsProjects funded under the other calls of this Work Programme may participate in the Open Research Data Pilot in Horizon 2020 on a voluntary basis.*

*Projects have the possibility to **opt out** of the Pilot. Participation in the Pilot is not taken into account during the evaluation procedure.....*

*A **further new element in Horizon 2020** is the **use of Data Management Plans (DMPs)** detailing what data the project will generate, whether and how it will be exploited or made accessible for verification and re-use, and how it will be curated and preserved. **The use of a DMP is required for projects participating in the Open Research Data Pilot.** Other projects are invited.....*

*Beneficiaries in projects participating in the Pilot on Open Research Data are invited to follow the **GEOSS Data Sharing Principles** and to register in GEOSS the geospatial data, metadata and information generated as foreground of the project. ...”*

SC5 – WP 2016-2017...some DETAILS

Some topics in the Circular Economy part:

“Innovation Deals”

*“..... This call introduces in topics **CIRC-01-2016-2017** and **CIRC-02-2016-2017** the possibility for beneficiaries of funded projects to apply for 'Innovation Deals'. **Innovation Deals** are meant as **voluntary agreements**, initiated by funded projects which expect or already have knowledge about EU regulatory provisions that may pose barriers to the development, replication or scaling up of their innovative solutions. After assessment of the application, the European Commission may launch an Innovation Deal with the project and relevant local/regional/central authorities to analyse the EU regulatory barrier and develop practical lines of action to address the barrier. These actions may not jeopardize any environmental or societal protection and will have to be fully in line with existing EU provisions regarding competition law and internal market principles. After the Innovation Deal, which would not be linked to the signed grant agreement and to the funding of the project, the European Commission will investigate and may take action to address the EU regulatory barrier at EU level as part of its better regulation agenda....”*

SC5 – WP 2016-2017...some DETAILS

IMPORTANT.....

Look and find **some other opportunities** beyond this WP:

- **Blow Growth (SC2)**
- **Sustainable Food Security (SC2),**
- **Competitive Low-carbon Energy (SC3)**
- **Understanding Europe - Promoting the European Public and Cultural Space (SC6)**
- **SME-Instrument (SMEinst-11-2016-2017)**
- **LEIT - NMBP**
- **.....others**

SC5 – WP 2016-2017...some DETAILS

Presupuesto 2016-2017 → 3 CALLs	290 M€ 341 M€
CALL - Industry 2020 in the Circular Economy - Circular Economy 17-Cross Cutting Activities	87,5 M€ 74 M€
CALL - Smart and Sustainable Cities - Sustainable cities through nature-based solutions 17-Cross Cutting Activities	60 M€ 44 M€
CALL - Greening the Economy Climate services / Towards a Low-Carbon Europe / Nature-Based Solutions for Territorial Resilience / Water / Raw Materials / Earth Observation / Cultural Heritage for Sustainable Growth / Support to Policy and Preparing for Innovation Procurement 12-Societal Challenge 5	143M€ 223 M€ (99 M€)



Reto Social 5: Calls 2017, 2-Stage topics →

Demonstration projects with replication potential (IA)

Circular Economy

Nature-based solutions:

- For Sustainable Cities

Climate Action:

- Climate Services

Raw Materials

Sustainable Growth:

- Cultural Heritage

“Systemic” approach:


- Co-design, co-development, co-implementation; user-driven; empowering end-users
- Participatory, multi-stakeholder, trans-disciplinary process
- Citizens’ engagement & ownership
- Addressing the gender dimension
- Innovative business, financing and governance models
- Identifying potential regulatory, economic, technical, social (gender/age/ disability), cultural barriers
- Demonstrating economic, cultural, social, environmental sustainability

SC5 – WP 2016-2017...some DETAILS

Greening the Economy (12-Societal Challenge 5)

Sustainable cities through nature-based solutions (17-Cross Cutting Activities)

Circular Economy (17-Cross Cutting Activities)

AÑO		FECHA APERTURA	FECHA CIERRE Single Stage o 1st Step (Two Stages)	FECHA CIERRE 2nd Step (Two Stages)
2016	Single Stage	10/11/2016	08/11/2016	
2016	Two Stages			06/09/2016
2017	Single Stage	08/11/2016	07/03/2017	 IAs
2017	Two Stages	08/11/2016	07/03/2017	

CERRADOS

SME Instrument and Fast Track to Innovation

SME Instrument (2016-2017): SMEInst-11-2016-2017	Phase 1	Phase 2
(Open call with «cut-off» dates)	24 Feb 2016 03 May 2016 07 Sep 2016 09 Nov 2016 15 Feb 2017 03 May 2017 06 Sep 2017 08 Nov 2017	03 Feb 2016 14 Apr 2016 15 Jun 2016 13 Oct 2016 18 Jan 2017 06 Apr 2017 01 Jun 2017 18 Oct 2017

Fast Track to Innovation Pilot (2015-2016)	2015 - 2016
Opening: 02 Dec 2015(Open call with «cut-off» dates)	15/03/2016 01/06/2016 25/10/2016

SC5 – WP 2017 → NOVELTIES (i)

Main changes in the calls:

Greening the Economy,

Circular Economy sub-call Circular Economy

Sustainable Cities sub-call Sustainable Cities through Nature-based solutions:

- Changes in the challenge, scope or impact description of several topics related with the implementation of the United Nations (UN) **Sustainable Development Goals**, as well as of the **Paris Agreement** under the UN Framework Convention on Climate Change.
- Increase in available budget for:
 - **SC5-08-2017, SC5-21-2017, SC5-23-2017**
 - **CIRC-01-2017**
 - **SCC-02-2017**

SC5 – WP 2017 → NOVELTIES (ii)

Call - Greening the Economy

Additional topics

- *Climate Services*

SC5-30-2017: ERA-NET on Climate Services Roadmap: Cross-sector impact assessments (evaluation, comparison and integration) (ERA-NET)

SC5-31-2017: Widening international cooperation activities on climate adaptation and mitigation (CSA)

- *Nature-based solutions for territorial resilience*

SC5-32-2017: Biodiversity scenarios (ERA-NET)

- *Water*

SC5-33-2017: Closing the water gap (ERA-NET)

SC5 – WP 2017 → NOVELTIES (iii)

Conditions for the Call - Industry 2020 in the Circular Economy

- *Circular Economy*

Evaluation criteria, scoring and threshold: The criteria, scoring and threshold are described in General Annex H of the work programme. The following exceptions apply:



For single-stage and second-stage evaluations, the threshold for the criteria Excellence and Impact will be 4. The overall threshold, applying to the sum of the three individual scores, will be 12. Except for Coordination and Support Actions and ERA-NET Cofund Actions in calls with an opening date on or after 26/07/2016.

Evaluation Criteria^(*)

	Threshold mín/máx.; Weight ⁽¹⁾				
	RIA	IA	SME Instr.		FTI
			Fase1	Fase2	
1. Excellence	3/5; 1				
2. Impact*	3/5; 1		3/5; 1,5	4/5; 1	
3. Implementation	3/5; 1		3/5; 1	3/5; 1	

“standard”

“Two-stage” submission → 1st stage:

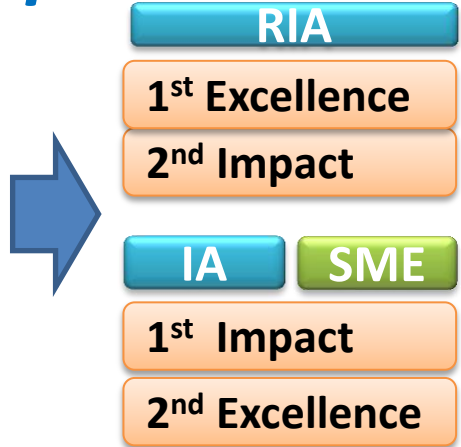
- Only the criteria ‘excellence’ and “impact” will be evaluated
- The threshold for both individual criteria will be 4

CIRC-1 y CIRC-2 (2nd stage):

- Excellence and Impact th.:4
- Overall threshold: 12

«ex-aequo»

Topics not otherwise covered by more highly-ranked proposals



- Budget to SMEs
- Gender balance

- Synergies between projects, or other factors related to the objectives of the call or to Horizon 2020 in general

(*)Anexo H_WP 2016-2017.-

SC5 – WP 2017 → NOVELTIES (iv)

Conditions for the Call – Smart and Sustainable Cities

- *Sustainable Cities through Nature-Based Solutions*

Eligibility and admissibility conditions: The conditions are described in General Annexes B and C of the work programme.. The following exceptions apply:

SCC-02-2016-2017



- Each project shall involve at least 2 'front-runner' cities and 3 'follower' cities, as defined in the topic text, from different Member States and/or Associated Countries, due to the nature and objectives of the action and in order to maximise benefits at EU level.
- A city acting as a 'front-runner city' in a demonstration project funded in the context of 'Sustainable cities through nature-based solutions' can be funded only once over the course of the entire Horizon 2020.

HORIZONTE 2020

H2020-Societal Challenge 5

- Objectives and lines of activity
- Work Programme 2016-2017
- **Some results NO-ES**

Additional possibilities

Support and additional information

SC5 – Some results

Calls 2014-2015 and 2016 “single stage”

PARTICIPATION in funded activities									
	Activities		Partners	Budget		EC Contribution			Position
	Nº	Coords.	Nº	€ millions	%	€ millions	%	%UE	
SPAIN	98	27	188	110.4	11%	87.4	11.6%	12.5%	3
NORWAY	30	2	23	28.9	4%	19.2	2.6%	0,0%	13

Funded activities with NO and ES participation: 23

	Nº Act. Coord	Nº Partners
SPAIN	5	46
NORWAY	1	20

Projects* with NO and ES participation

- **New_Innonet**, “The Near-zero European Waste Innovation Network”
- **CABRISS**, “Implementation of a Circular economy Based on Recycled, reused and recovered Indium, Silicon and Silver materials for photovoltaic and other applications”
.....
- **ConnectinGEO**, “Coordinating an Observation Network of Networks EnCompassing saTellite and IN-situ to fill the Gaps in European Observations”
- **ECOPOTENTIAL**, “ Ecopotential: Improving Future Ecosystem Benefits Through Earth Observations”
.....
- **REFRESH**, “Resource Efficient Food and dRink for the Entire Supply cHain”
- **BINGO**, “Bringing INnovation to onGOing water management – A better future under climate change”
- **REMEB**, “Eco-friendly Ceramic Membrane Bioreactor (MBR) Based on Recycled Agricultural and Industrial Wastes for Waste Water Reuse”
- **WaterWorks2014**, “Water Works 2014-2019 in Support of the Water JPI”
(ERA-NET Cofund)
.....
- **BiodivERsA3**, “Consolidating the European Research Area on biodiversity and ecosystem services” **(ERA-NET Cofund)**

*CORDIS.- http://cordis.europa.eu/projects/home_en.html

Projects with NO and ES participation

- **Blue Nodules**, “Breakthrough Solutions for the Sustainable Harvesting and Processing of Deep Sea Polymetallic Nodules”
- **EQUINOX**, “A novel process for manufacturing complex shaped Fe-Al intermetallic parts resistant to extreme environments”
- **MICA**, “Mineral Intelligence Capacity Analysis”
- **INTCATCH**, “Development and Application of Novel, Integrated Tools for Monitoring and Managing Catchments”
- **MAGIC**, “Moving Towards Adaptive Governance in Complexity: Informing Nexus Security”
- **SMART-PLANT**, “Scale-up of Low-carbon Footprint Material Recovery Techniques in Existing Wastewater Treatment Plants”
- **MERCES**, “Marine Ecosystem Restoration in Changing European Seas”
- **WaterWorks2015**, “Water Works 2016-2020 in Support of the Water JPI (WaterWorks2015) - Sustainable water use in agriculture, to increase water use” (**ERA-NET Cofund**)
- **ERA-PLANET**, “The European network for observing our changing planet” (**ERA-NET Cofund**)
- **ERA4CS**, “European Research Area for Climate Services” (**ERA-NET Cofund**)

Projects with NO and ES participation

Calls 2016 “single stage”

- **PLATIRUS**, “PLATInum group metals Recovery Using Secondary raw materials”
- **IC4WATER**, “Tackling Water Challenges in the International Context”
- **NextGEOSS** “Next Generation GEOSS for Innovation Business”
- **MinFuture**, “Global material flows and demand-supply forecasting for mineral strategies ”

HORIZONTE 2020

H2020-Societal Challenge 5

- Objectives and lines of activity
- Work Programme 2016-2017
- Some results NO-ES

Additional possibilities

Support and additional information

ES-NO, other schemes/possibilities....

INITIATIVES ("strategy")

This collage displays four distinct JPI (European Innovation Partnership) initiatives. Each initiative is represented by a screenshot of its respective website, showing the header, navigation menu, and main content area. The initiatives are: Water JPI (www.waterjpi.eu), JPI Climate (www.jpi-climate.eu), JPI Cultural Heritage (www.jpi-culturalheritage.eu), and JPI Oceans (www.jpi-oceans.eu). The websites feature various logos, navigation menus, and introductory text about their respective fields.

This screenshot shows the EIP Water website (http://www.eip-water.eu/). The page features a navigation bar with options like 'HOME', 'EIP WATER', 'ABOUT EIP WATER', 'CONTACT US', and 'EIP WATER ROAD'. Below the navigation bar, there are four main sections: 'People' (Who innovates in the water sector?), 'Projects' (Get inspired by innovative water projects), 'Organisations' (Build your network of partners), and 'Products & Services' (Which innovation do you offer?). A large banner at the bottom reads 'Why and how to drive water innovation in Europe' and includes a quote from the Leeuwarden declaration.

This screenshot shows the EIP on Raw Materials website. The page is titled 'GROWTH' and 'EIP on Raw Materials'. It features a navigation bar with options like 'Single Market and Standards', 'Industry', 'Entrepreneurship and SMEs', 'Access to finance for SMEs', and 'Sectors'. The main content area includes a section titled 'The European Innovation Partnership (EIP) on Raw Materials' and a sidebar with 'About' information, including 'Strategic Implementation Plan', 'Monitoring and evaluation', 'EIP Governance', 'EIP Operational Groups', and 'EIP Activities'. A 'Latest News' section is also visible at the bottom.

ES-NO, other schemes/possibilities....

ERA-NETs Cofund calls

- **BiodivERsA3 2014**: ES (MINECO + Canary Islands. Gov.)
NO (RCN)
- **WaterWorks 2014**: ES (MINECO + CDTI), NO (RCN)
- **WaterWorks 2015**: ES (MINECO + CDTI), NO (RCN)
- **ERA4CS (2015)**: NO (RCN, MET Norway), ES (MINECO, CSIC, AEMET, BSC, UC-IHC, URC-C3)
- **ERA-PLANET (2015)**: NO (NILU), ES (CREAF, CNIG)

JPI-Water

JPI-Climate

WP 2017

- **SC5-30-2017**: ERA-NET on Climate Services Roadmap: Cross-sector impact assessments
- **SC5-32-2017**: Biodiversity scenarios
- **SC5-33-2017**: Closing the water gap

JPI Climate

Biodiversa

JPI Water

SC5 ↔ JPIs



Water JPI Water challenges for a changing world



JPI Climate

The Water JPI 2016 Joint Call is open!

WATER-3-2014/2015
ERANET – Cofund



The Water and FACCE JPIs announce the launching of a call for international and transnational collaborative research projects on **“Sustainable management of water resources in agriculture, forestry and freshwater aquaculture sectors”**.

The call is open from 16.2.2016 with a closing date for the submissions pre-proposals on 19.4.2016.

For detailed information on how to apply and to access all the support documentation and templates (Call Announcement, National/Regional Regulations, Pre-Proposal Templates), please consult the [2016 Joint Call Official Webpage](#).

A total of around € 25,5 million has been provisionally allocated for this call by 25 FPOs from 22 countries (including 0,4 M€ for the loans to private companies provided by MIUR) and the EC.

To facilitate networking & collaboration between applicants, the Water JPI has set up a Discussion Forum on LinkedIn: [“Water JPI - Researchers Forum”](#)

www.jpi-culturalheritage.eu

SC5 ↔ JPIs



Water JPI Water challenges for a changing world

JPI Climate

HOME | CONTACT | EXTRANET

ERA4CS European Research Area for Climate Services

SC5-2-2015
ERANET – Cofund

About ERA4CS | Activities | Publications | News & Events | JPI Climate

ERA-NET Cofund for Climate Services

The ERA-NET Consortium “European Research Area for Climate Services”, so-called **ERA4CS**, has been designed to boost the development of efficient Climate Services in Europe, by supporting research for developing better tools, methods and standards on how to produce, transfer, communicate and use reliable climate information to cope with current and future climate variability.

Subscribe to our mailing list

About ERA4CS

Joint Call

Who we are

Recent news

- **ERA4CS Joint Call launched**
The overall objective of this call is to enhance user adoption of and satisfaction with Climate Services (incl. adaptation services). Improving the quality of Climate Services is also within the scope of this call.
JPI Climate Central Secretariat, Tuesday 1 March

Recent documents

- **Save the Date - Side event AF2016**
At the occasion of the start of a large 72k M€ project dedicated to user-oriented climate services ERA4CS, JPI Climate, an intergovernmental initiative of major European research funding bodies cordially invites you to a workshop on the potential contribution of

SC5 – ERANETs



Results of the BiodivERsA 2015-2016 COFUND call

26 pan-European projects recommended for funding for over 33 Million euro

SC5-9-2014
ERANET – Cofund

Theme #1: Understanding and managing the biodiversity dynamics of soils and sediments to improve ecosystem functioning and delivery of ecosystem services;

Theme #2: Understanding and managing biodiversity dynamics in land-, river- and sea-scapes (habitat connectivity, green and blue infrastructures, and naturing cities) to improve ecosystem functioning and delivery of ecosystem services.

Also in 2016

Working towards **2018 – 2019 – 2020** WPs:

- Consultation of Stakeholders ✓
- Advisory Group report ✓
- Report on **strategic foresight**: report, annex I-III ✓
- **Programme Committee (“strategic approach”)**

Also in 2016

Work

- Sustainable Development Goals (SDGs),
- COP21,
- Sendai framework for Disaster Risk Reduction,
- Circular Economy Package,
- 2030 Climate and Energy Framework,
-current context of migration

– **Consultation**

'Open innovation',
'Open science' and of
being 'Open to the
world'

Strategic f

EC Priorities.-

"Growth, jobs and investment",
'Energy Union and Climate',
'Digital Single Market' and 'A
Stronger Global Actor'

– **Programme**

Strategic Areas.-

- Climate action in support of the Paris Agreement
- Circular economy
- Water for our environment, economy and society
- Innovating cities for sustainability and resilience
- Raw materials
- Protecting and valorising our natural and cultural assets
(Earth observation; Heritage alive,; NBS, disaster risk
reduction and natural capital accounting)

HORIZONTE 2020

H2020-Societal Challenge 5

- Objectives and lines of activity
- Work Programme 2016-2017
- Some results NO-ES

Additional possibilities

Support and additional information

Participant Portal

<http://ec.europa.eu/research/participants/portal/desktop/en/home.html>

The screenshot shows the 'RESEARCH & INNOVATION Participant Portal' with the European Commission logo. The navigation menu includes HOME, FUNDING OPPORTUNITIES, HOW TO PARTICIPATE, EXPERTS, and SUPPORT. A red arrow points from the SUPPORT menu to a red-bordered box containing a list of services: Horizon 2020 Helpdesk, Enterprise Europe Network, National Contact Points, Glossary, FAQ, IT Helpdesk, Other Help Services, and Terms and Conditions. A green-bordered box highlights a central menu with items: H2020 Online Manual, Reference Documents, Beneficiary Register, Financial Viability Self-Check, and SME Participation. A blue-bordered box highlights the 'EU Programmes 2014-2020' section, which includes a search bar for topics, updates, and calls, with 'H2020' entered in the search field. At the bottom, a row of six icons represents different portal sections: 'WHAT'S NEW?', 'FUNDING OPPORTUNITIES', 'HOW TO PARTICIPATE', 'WORK AS AN EXPERT' (highlighted with a red circle), 'MY PERSONAL AREA', and 'INFORMATION AND SUPPORT'. Logos for the Spanish government and CDTI are visible in the bottom right corner.

Participant portal

<http://ec.europa.eu/research/participants/portal/desktop/en/home.html>



Frequently Asked Questions (FAQ)

Welcome to the new Participant Portal FAQ section.

These pages are updated with the answers to the most frequent questions that have been submitted to the Horizon 2020 Helpdesk, IT Helpdesk, Call Coordinators and H2020 NCP correspondents.

896



Filter by CATEGORY

Participant Portal roles and access rights

Beneficiary registration and validation...

Funding opportunities, calls

Proposals submission and evaluation

Ethics and research integrity

Grant preparation and signature; reporting...

Audits and certificates

Experts evaluators, reviewers, monitors

European research policy

Q. How do I update the information related to my organisation once I have obtained a Participant Identification Code (PIC)?

A. Before the organisation is validated (i.e. still in the status "declared"): the data entered during first registration remain editable for the person having registered the organisat...

Q. I am the LEAR of my organisation and have made an update in the beneficiary register some days ago, but it seems that nothing has been updated.

A. Your request to change information is being processed by the Validation Services (VS). Modifications of legal information (e.g. legal name, address, VAT number, registration number,...

Q. I have sent the LEAR appointment documents. When may I receive access to modify the data on the beneficiary register of the Participant Portal?

A. It may take a few weeks before the appointed LEAR is validated. First the legal entity needs to be validated by the Validation Services. You will receive a confirmation e-mail expli...

Q. I have an ECAS account for accessing the Participant Portal but how can I acquire roles and access rights for proposals, projects or organisations?

A. As a general principle, the user who has created the content on the Participant Portal manages access to this content by other users. In other words, there is no centrally controlled...

Q. How can I change my email address in my ECAS account?

A. When you are logged in in the Participant Portal, click on the button with your user name (top-right

- Horizon 2020 Helpdesk
- Enterprise Europe Network
- National Contact Points
- Glossary
- FAQ**
- IT Helpdesk
- Other Help Services
- Terms and Conditions
- What's New

Participant Portal

<http://ec.europa.eu/research/participants/portal/desktop/en/home.html>

RESEARCH & INNOVATION
Participant Portal

European Commission > Research & Innovation > Participant Portal > National Contact Points

HOME FUNDING OPPORTUNITIES HOW TO PARTICIPATE EXPERTS SUPPORT Search

National Contact Points

The network of National Contact Points (NCPs) is the main structure to provide guidance and assistance on all aspects of participation in Horizon 2020. NCPs are also established in **associated** countries ("third countries").

- Horizon 2020 Helpdesk
- Enterprise Europe Network
- National Contact Points
- Glossary
- FAQ
- IT Helpdesk
- Other Help Services
- Terms and Conditions

Ms Janicke Anne Gæver - Norway

Climate action, resource efficiency and raw materials

Organisation name: Research Council of Norway

Address: P.O. Box 564, 1327, Lysaker, Norway

Tel: 4793253372 - Fax: 4722037001

[Send Mail](#) - Website: <http://www.rcn.no>

Update date: 25-Mar-15 - **Record Control Number:** 3001079

Ms Ingunn Borlaug Lid - Norway

Climate action, resource efficiency and raw materials

Organisation name: Research Council of Norway

Address: P.O. Box 564, 1327, Lysaker, Norway

Tel: 95778007 - Fax: (47)22037001

[Send Mail](#) - Website: <http://www.rcn.no>

Update date: 25-Mar-15 - **Record Control Number:** 3000629

Mr Juan Carlos Garcia Carrasco - Spain

Climate action, resource efficiency and raw materials

Organisation name: Centro para el Desarrollo Tecnológico Industrial – CDTI

Address: C/ Cid, 4, 28001, Madrid, Spain

Tel: +34 91 581 55 62 - Fax: +34 91 581 55 86

[Send Mail](#) - Website: <http://eshorizonte2020.es/>

Update date: 24-MAY-16 - **Record Control Number:** 5000006

Dra Ana Tardón Ibañez - Spain

Climate action, resource efficiency and raw materials

Organisation name: Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas

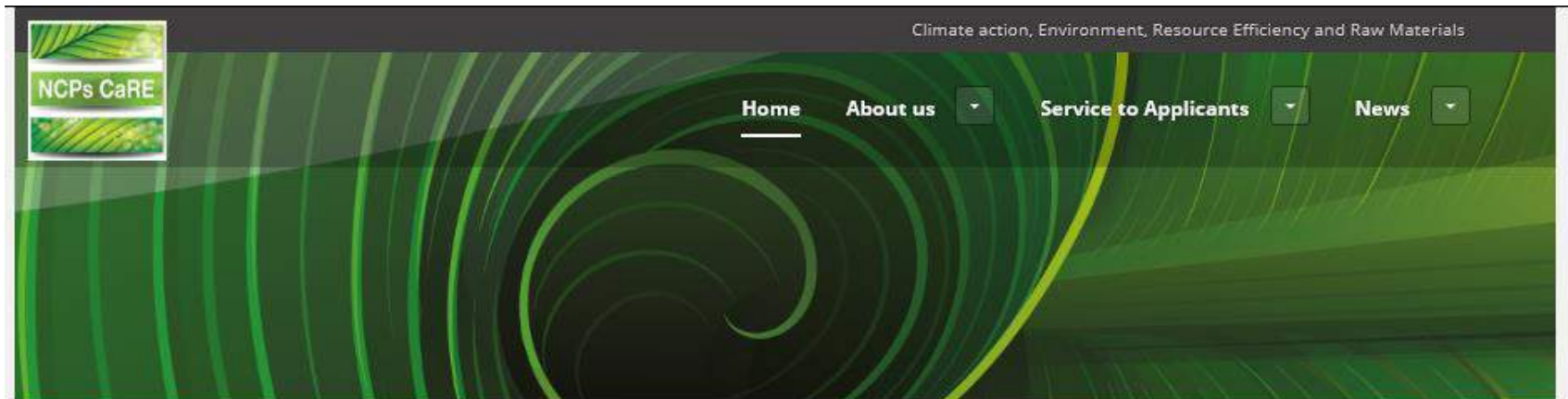
Address: Avda. Complutense, 22, 28040, Madrid, Spain

Tel: +34 91 346 08 20 - Fax:

[Send Mail](#) - Website: <http://eshorizonte2020.es/>

Update date: 08-JUN-15 - **Record Control Number:** 30115163

SC5 NCPs network → NCPs CaRE



NCPs CaRE, Red de NCPs del Reto Social 5.- <http://www.ncps-care.eu/>



Forum

Meet people like you, share ideas & get feedback. Join our community and share your experiences!

[Read more](#)



Partner search tool

Are you looking for a suitable project partner in Horizon 2020? This tool helps you to find the best opportunities.

[Read more](#)



Useful guides

Find the guides developed by the NCPs Network, and simplify your Horizon 2020 experience

[Read more](#)

18/10/2016

Information



Some events:

- 14/09/2015 (Bruselas), [InfoDay Reto Social 5-Convocatorias 2017](#)
- [InfoDay de la CE, Convocatorias 2016-Reto Social 5](#) (21/09/2015, presentaciones y video del evento disponibles)

Other events in 2016:

- 18-19/10 (Athens), [Second Major eafip Event on Innovation Procurement](#)
- 23-24/11 (Bruselas), [WssTP annual Brokerage & Working Groups](#)
- 28/11-02/12 (Bruselas), "[Raw Materials Week](#)"

More information:

- [EC- R&I-Environment](#)
- [Horizon 2020](#)
- [esHorizonte2020](#)

Projects and possible partners



[Investing in European success](#) .-
Environmental research and innovation
(FP7 projects)



[Research & Innovation Projects - CALLS 2014 to 2016](#)
Climate action, environment, resource efficiency and raw materials
(H2020 projects)



More projects related to SC5:

- [CORDIS - EU research projects](#)
- [LIFE](#)
- See projects under JPIs y ERANETs calls

DISCLAIMER



*In **no circumstance** the content of these slices can substitute the information provided in the official call documents and guidelines as available from the Participant Portal.*

<http://ec.europa.eu/research/participants/portal/desktop/en/home.html>

Thank you all

Lydia González

Dir. Programas Internacionales - CDTI

Mail.- lydia.gonzalez@cdti.es

Tel.- +34 91 581 5562/5500

Web.- www.cdti.es

@EsHorizonte2020



Horizon 2020

Smart, green and integrated Transport

Promoting bilateral cooperation through the EEA Grants 2009-2014
18th October 2016

Julio Dolado
EU Programmes Division, CDTI

Policy Context

Horizon 2020. Smart, green and integrated Transport

ES – NO Collaboration in Transport

2011 Transport White Paper



Roadmap to a Single European Transport Area - Towards a competitive and resource efficient transport system

2.5. Ten goals for a competitive and resource-efficient transport system: benchmarks for achieving the 60 % GHG emission reduction target

Developing and deploying new and sustainable fuels and propulsion systems

1. Halve the use of conventionally fuelled cars in urban transport by 2030; phase them out in cities by 2050; achieve essentially CO₂-free city logistics in major urban centres by 2050 (*)
2. Low-carbon sustainable fuels in aviation to reach 40% by 2050; also by 2050 reduce EU CO₂ emissions from maritime bunker fuels by 40% (if feasible 50%) (**).

Optimising the performance of multimodal logistic chains, including by making greater use of more energy-efficient modes

3. Thirty per cent of road freight over 300 km should shift to other modes such as rail or waterborne transport by 2030, and more than 50% by 2050, facilitated by efficient and green freight corridors. To meet this goal will also require appropriate infrastructure to be developed.
4. By 2050, complete a European high-speed rail network. Triple the length of the existing high-speed rail network by 2030 and maintain a dense railway network in all Member States. By 2050 the majority of medium-distance passenger transport should go by rail.
5. A fully functional and EU-wide multimodal TEN-T 'core network' by 2030, with a high-quality and capacity network by 2050 and a corresponding set of information services.
6. By 2050, connect all core network airports to the rail network, preferably high-speed; ensure that all core seaports are sufficiently connected to the rail freight and, where possible, inland waterway system.

Increasing the efficiency of transport and of infrastructure use with information systems and market-based incentives

7. Deployment of the modernised air traffic management infrastructure (SESAR) (13) in Europe by 2020 and completion of the European common aviation area. Deployment of equivalent land and waterborne transport management systems (ERTMS) (14), (ITS) (15), (ISN and LRIT) (16), (IRIS) (17). Deployment of the European global navigation satellite system (Galileo).
8. By 2020, establish the framework for a European multimodal transport information, management and payment system.
9. By 2050, move close to zero fatalities in road transport. In line with this goal, the EU aims at halving road casualties by 2020. Make sure that the EU is a world leader in safety and security of transport in all modes of transport.
10. Move towards full application of 'user pays' and 'polluter pays' principles and private sector engagement to eliminate distortions, including harmful subsidies, generate revenues and ensure financing for future transport investments.

OBJECTIVES OF EU INITIATIVE:

(a) A reduction of **GHG emissions** that is consistent with the long-term requirements for limiting climate change to 2 °C and with the overall target for the EU of reducing emissions by 80% by 2050 compared to 1990. Transport-related emissions of CO₂ should be reduced by around 60% by 2050 compared to 1990. (b) A drastic decrease in the **oil dependency ratio** of transport-related activities by 2050 as requested by the EU 2020 Strategy for transport calling for “decarbonised transport”. (c) **Limit the growth of congestion.**



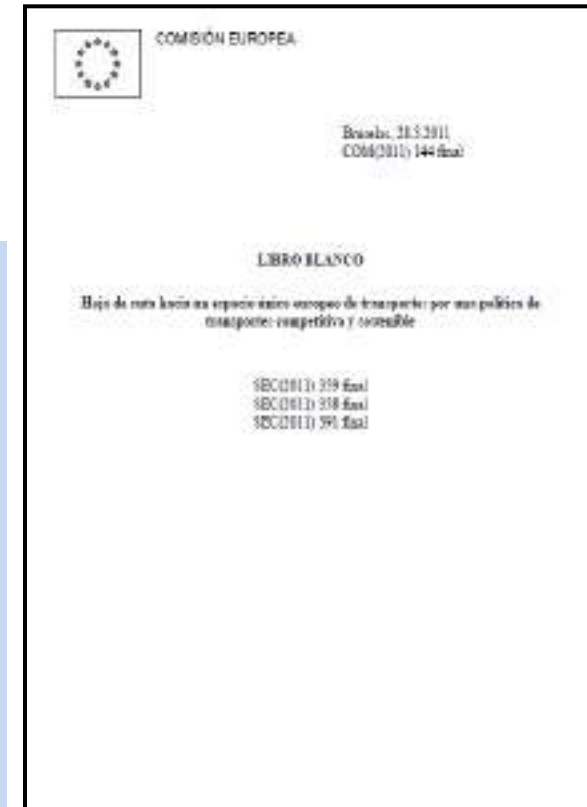
http://ec.europa.eu/transport/themes/strategies/2011_white_paper_en.htm

2011 Transport White Paper

40 concrete initiatives for the next decade to build a competitive transport system that will **increase mobility, remove major barriers** in key areas and **fuel growth** and employment.

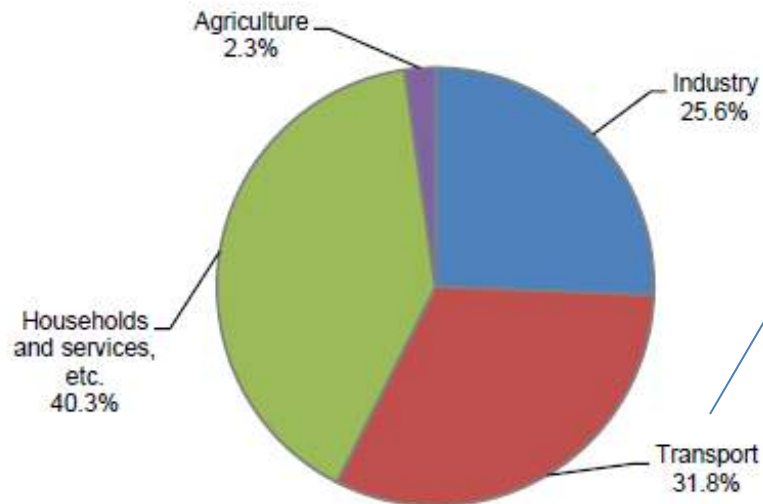
By **2050**, key goals will include:

- 60% reduction in CO2 emissions** (against 1990 baseline)
- zero fatalities on the road network**
- 50% shift in medium distance inter-city passenger trips from road to rail**
- 50% of freight tonne-kms > 300k from road to rail and water**
- emission-free city logistics**



Transport Sector and Environmental Impact

State of the Art on Alternative Fuels Transport Systems in the European Union (June 2015)



EU transport was responsible for 32% of final energy consumption (352 Mtoe) in 2012 (Figure 2-1).

Figure 2-1: Final Energy Consumption, by sector (EU28)

<http://ec.europa.eu/transport/themes/sustainable/studies/doc/2015-07-alter-fuels-transport-syst-in-eu.pdf>

Transport Sector and Environmental Impact

State of the Art on Alternative Fuels Transport Systems in the European Union (June 2015)

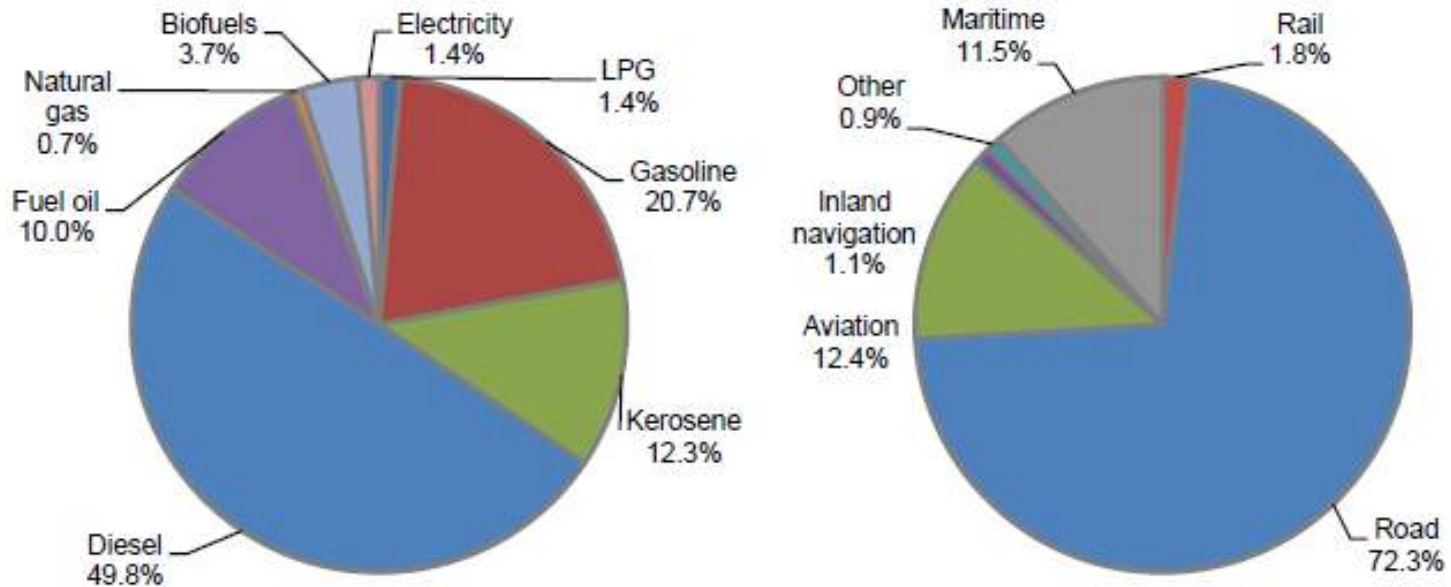


Figure 2-2: Share of transport energy demand by source and mode in 2012 (%)

<http://ec.europa.eu/transport/themes/sustainable/studies/doc/2015-07-alter-fuels-transport-syst-in-eu.pdf>

Policy Context

Horizon 2020. Smart, green and integrated Transport

ES – NO Collaboration in Transport

Junker's Plan (final proposal)



Horizon 2020 Budget
(Million EUR)

Junker's Plan Impact
(Million EUR)

I Excellent science	24.232	-209
II Industrial leadership	16.467	-550
III Societal challenges	28.630	-1.049
IV Spreading excellence and widening participation	817	0
V Science with and for society	445	-17
VI Non-nuclear direct actions of the Joint Research Centre (JRC)	1.856	-47
VII The European Institute of Innovation and Technology (EIT)	2.383	-328
TOTAL	74.828	-2.200

4. Smart, green and integrated transport

6.339

-189,60

<http://data.consilium.europa.eu/doc/document/ST-9627-2015-INIT/en/pdf>

Junker's Plan (initial proposal)



European Fund for Strategic Investments



€315 bn Investment Plan: Fund for Strategic Investments proposed

The EU guarantee will be backed up by existing EU funds from the existing margins of the EU budget (€ 2 billion), the Connecting Europe Facility (€ 3.3 billion) and the Horizon 2020 programme (€ 2.7 billion), to a total amount of € 8 billion

http://ec.europa.eu/priorities/jobs-growth-investment/plan/index_en.htm

http://ec.europa.eu/priorities/jobs-growth-investment/plan/docs/factsheet2-where-from_en.pdf

http://europa.eu/rapid/press-release_MEMO-15-3223_en.htm

http://ec.europa.eu/priorities/jobs-growth-investment/plan/docs/proposal_regulation_efsi_annex_en.pdf

Horizonte 2020 & Transporte

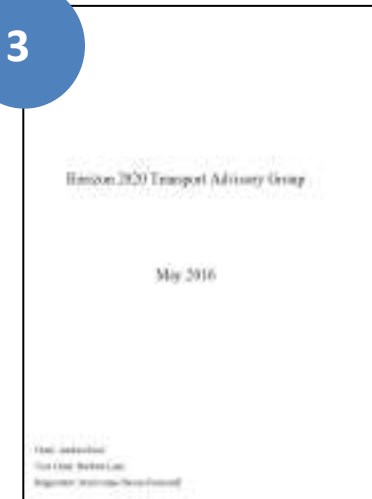
Transport Advisory Group

1



Response of the Transport
Advisory Group
June 2014

3



Horizon 2020 Transport
Advisory Group
May 2016

2



European Transport
Decarbonization: a review of
the research requirements

Dissemination,
Commercialization and
Adoption of Transport Research Outputs
December 2015

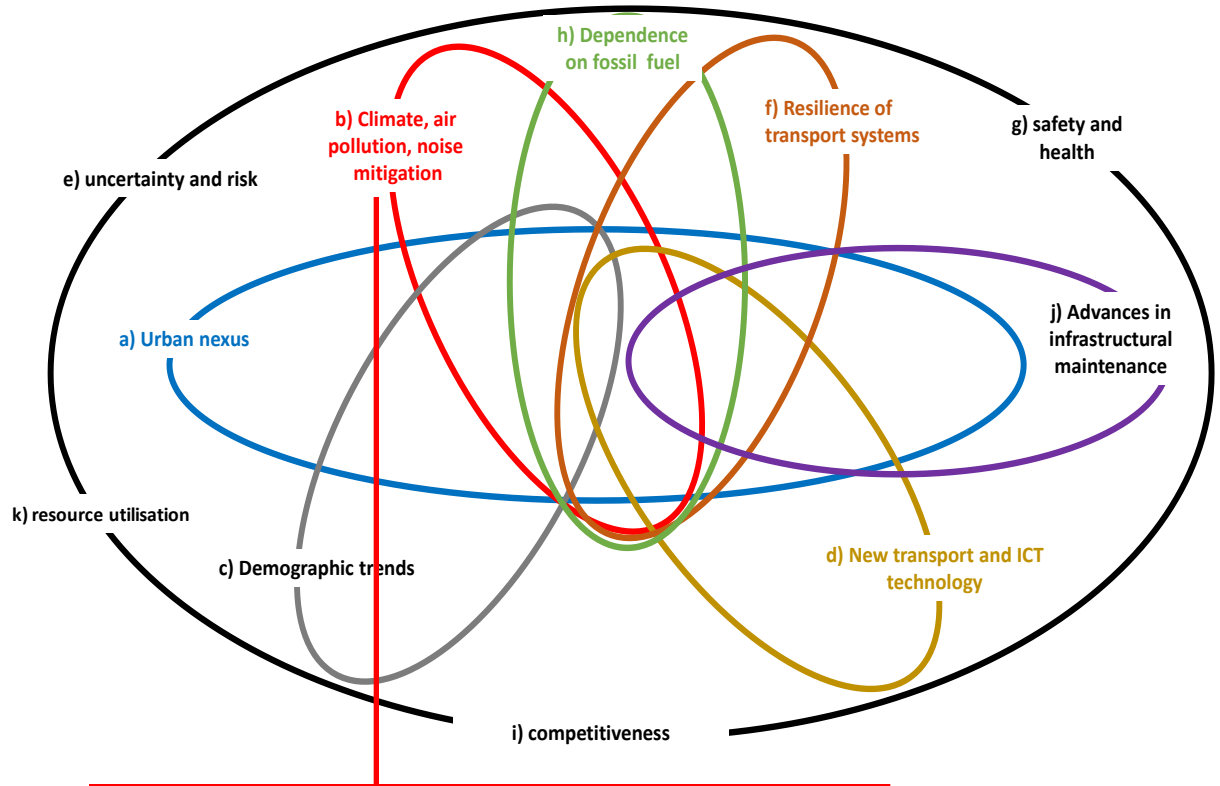
Transporte en Horizonte 2020

Transport Advisory Group

1



Mapping the inter-relationships between the 11 challenges



b) Climate, air pollution, noise mitigation

Transporte en Horizonte 2020

Transport Advisory Group

2



Decarbonization of European Transport: a review of the research requirements

Section 1: Most promising methods of reducing carbon emissions from European transport.

1. Demand management ;
2. Modal shift;
3. Vehicle utilization;
4. Energy efficiency;
5. Alternative energy

Section 2: Most promising areas for future EU-funded research on the decarbonization of transport.

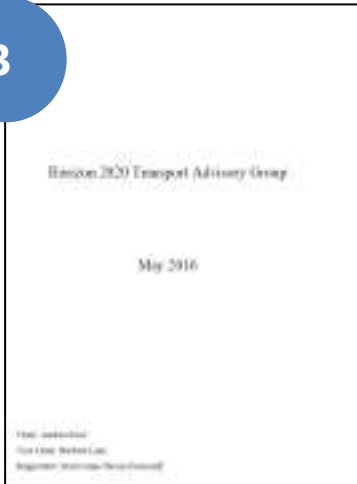
Life cycle analysis; Internalising the cost of carbon emissions; Political and governance frameworks; Sectoral interactions; Co-benefits; Roadmapping' the transport decarbonisation process; Living labs; City re-design; Rebound effects

The Dissemination, Commercialization and Adoption of Transport Research Outputs

Transporte en Horizonte 2020

Transport Advisory Group

3



Background/ Challenges/Innovation gaps and game changers/R&I Integration, Research priorities,

4. **Accelerating decarbonization** with energy efficiency in all transport modes

5. Supporting the shift of transport offer and mobility choices **towards environment friendly transport**

6. Establishing health as a driver for transport, with **pollution free, less noisy** transport solutions

16

5

7. Restoring maintenance as an efficient & effective management of assets in support of mobility for all, **smart decarbonization, smart greening** and eu leadership

13. Advancing electromobility, including energy harvesting and storage for **clean and competitive transport**

Horizon 2020. Transport

Transport main challenges

GHG emissions – climate + health impacts

Oil dependency - volatile oil prices

Congestion – liveability of cities

Infrastructure capacity vs mobility demand

Urbanisation – role of public transport

Demographic trends – ageing populations

Global competition

Policy goals:

efficiency and sustainability Contribute to EU Transport Policy goals and other priorities: Growth and Jobs, Energy Union, Digital Single Market,....

Support the Goals of European Strategy for Low Emission Mobility



Horizon 2020. Transport

The challenge: achieve a transport system that is...

Resource efficient

Environmentally friendly

Safe and seamless

Beneficial for the citizens, the economy and society and promote globally competitive transport industries

Four broad lines of activities addressing:

Resource efficient transport that respects the environment

Better mobility, less congestion, more safety and security

Global leadership for the European transport industry

Socio-economic and behavioural research and forward-looking activities for policy-making



Horizon 2020. Transport. WP2016/2017

Call "Mobility for Growth"

(H2020-MG-2016-2017) – Total EU contribution: EUR 226 Million 2017

Mode-specific challenges

Aviation

Waterborne

Cross-modal / transport integration challenges

Safety

Urban

Logistics

Infrastructure

Cross-cutting issues

Socio-economic and behavioural research and forward-looking activities for policy making

Horizon 2020. Transport. WP2016/2017

Call "Automated Road Transport"

H2020-ART-2016-17– Total EU contribution: EUR 50 Million 2017

3 topics (innovation actions) focusing on demonstrations of automation driving systems for trucks and urban transport as well as on ICT-infrastructure for road automation

Call "Green Vehicles"

H2020-GV-2016-17– Total EU contribution: EUR 133 Million 2017

9 topics supporting research, technological development and demonstration of low-carbon vehicles –
New topic on "Production of next generation battery cells in Europe for transport applications"

Horizon 2020. Transport. WP2016/2017

What's new?

A new topic in Mobility for Growth - “Future research needs and priorities”

A new topic in Green Vehicles to support the development of a battery cells production base in Europe

A more explicit reference to climate relevance in several topics

Open Access to Data policy as a pivotal factor to boost innovation: applies by default to the whole H2020 and not only to pilot areas → opt-out option

Policy Context

Horizon 2020. Smart, green and integrated Transport

ES – NO Collaboration in Transport

Horizon 2020. Transport. ES - NO

Limited

FP7 Transport (Clean Sky, SESAR, Green Cars)

+ 1000 Projects

4.700 Million EUR

ES NO Colaboration: 32 projects



Horizon 2020. Green Vehicles

2 call

17 Projects

148 Million EUR (Total: 750 Million EUR)

ES NO Colaboration: 0

Limited

Horizon 2020. Smart, green and integrated Transport

3 calls

47 Projects

409 Million EUR

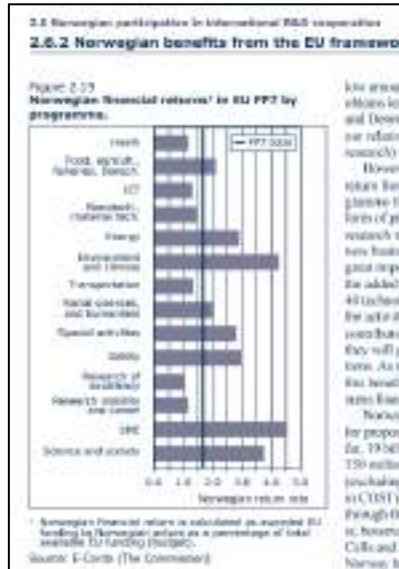
ES NO Colaboration: 7 projects. Rail (1), Road (2), Waterbone (2),
Intelligent Transport System (1), Logistics (1)

Improving?

Horizon 2020. Transport. ES - NO



Report on Science & Technology Indicators for Norway 2013



<http://bit.ly/1HTiviP>

FP7 Transport NO financial return



FP7 TOTAL NO financial return in FP7 is now at **1.7 %**

Strength collaboration in:

Aviation, Rail , Waterborne , ITS , Logistics

Improve collaboration in:

Urban Mobility, Infrastructures and Socio

Explore collaboration in new areas!

Automated Road Transport

SPAIN has a legal framework for «self driving» tests since Nov 2015 (<http://bit.ly/1Pw35U3>)

Thank you very much!

Julio Dolado (H2020 Transport)
julio.dolado@cdti.es

<http://eshorizonte2020.es/>

División de Programas de la UE, CDTI



HORIZON 2020

The EU Framework Programme for Research and Innovation



E2B – SPIRE CALLS

JAVIER GARCÍA SERRANO

18 OCTOBER 2016

Disclaimer



- The contents of this presentation are for informal guidance and discussion purposes only.
- These slides do not replace any **formal legal or guidance texts** published by the European Commission!!!



<http://ec.europa.eu/research/participants/portal/desktop/en/home.html>

Contents

- PPP and H2020
- Energy Efficient Buildings (E2B PPP). Objectives and opportunities
- SPIRE PPP. Objectives and opportunities
- Conclusions

What is a PPP?

DICTIONARY THESAURUS GRAMMAR EXPLORE BLOG

SIGN IN

Powered by OXFORD

English
Oxford Living Dictionaries

DICTIONARY

PPP

PPP

Home > British & World English > PPP

Definition of *PPP* in English:

PPP



- 1 Pakistan People's Party.
- 2 *Computing*
Point to point protocol, which allows data conforming to the Internet protocol IP to be handled on a serial line.
- 3 Purchasing power parity (a way of measuring what an amount of money will buy in different countries).
- 4 *British* Public-private partnership, an arrangement whereby a public project or service is partially financed or run by a private company.

The role of Public Private Partnerships in H2020

Horizon 2020 may be implemented through PPP,
and all the partners concerned commit to
support:

- ✓ Development and implementation of research and innovation activities
- ✓ with Strategic importance to the Union's competitiveness and industrial leadership
- ✓ Addressing specific societal challenges

There are two ways of implementing PPP: through WPs (c-PPP) or through Joint Undertakings (i-PPP)

c-PPP (PPP in FP7)

MoU

European
Commission
+
ETP/Association

WP

EC commitment
H2020 rules
Management EA

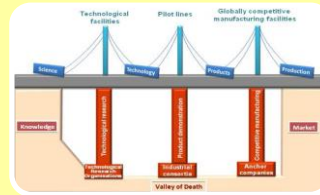
i-PPP (JTI in FP7)

Creation
of a JU

Call management
Budget
Evaluation

EC
Outsources

Budget
Management
EC only
monitors



Excellent Science

Industrial Leadership

Societal Challenges

European Research Council (ERC)

Future and Emerging Technologies (FET)

Marie Skłodowska-Curie actions on skills, training and career development

European research infrastructures

ICT

Nanotechnology

Biotechnology

Advanced Materials

Advanced Manufacturing & Processing

Space

Access to Risk Finance

Innovation in SMEs

Health, demographic change and wellbeing

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

Secure, clean and efficient energy;

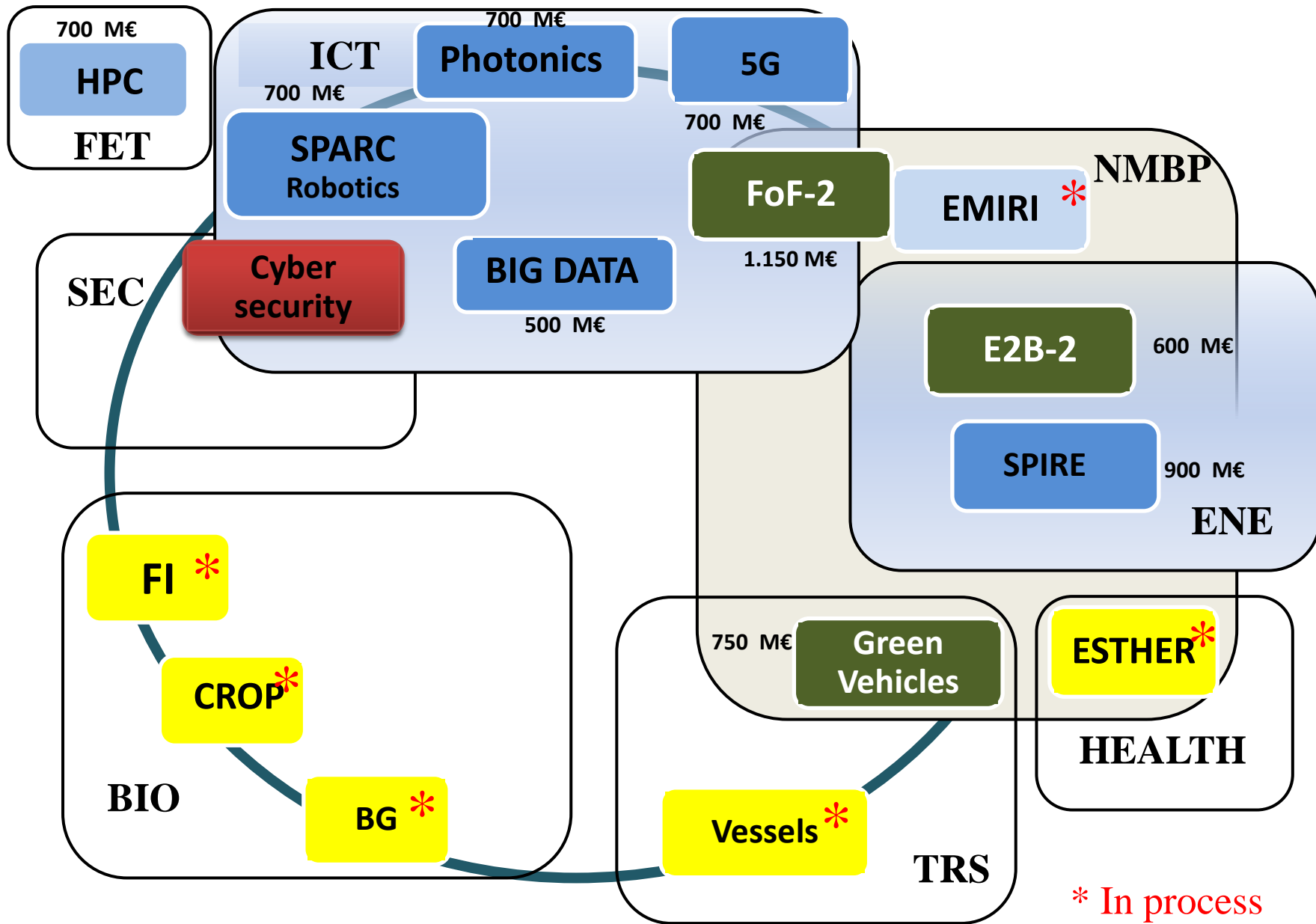
Smart, green and integrated transport;

Climate action, environment, resource efficiency and raw materials

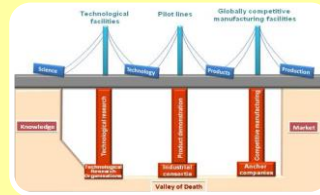
Europe in a changing world-Inclusive, innovative and reflexive societies

Secure Societies: Protecting freedom and security of Europe and its citizens

c-PPP en H2020



E2B and SPIRE: Where are the funds coming from



Excellent Science

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LEIT

Health, demographic change and wellbeing

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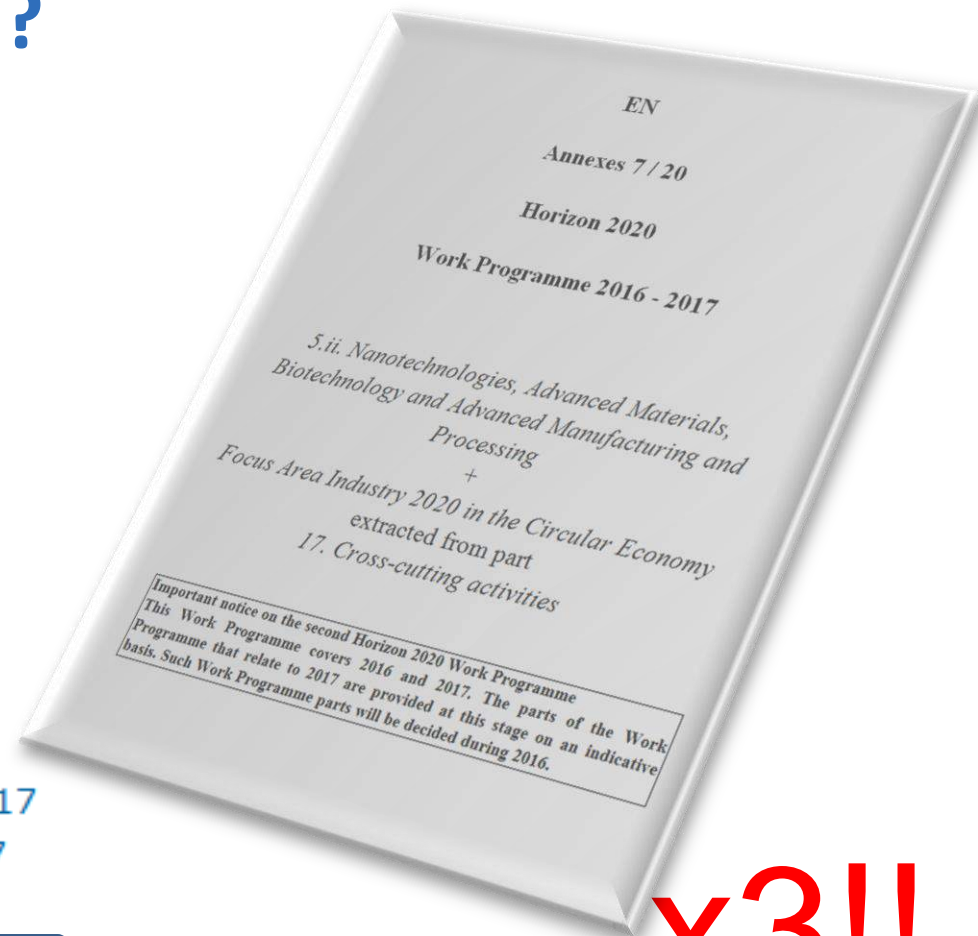
Climate action, environment, resource efficiency and raw materials

Europe in a changing world-Inclusive, innovative and reflexive societies

Secure Societies: Protecting freedom and security of Europe and its citizens

Where to find them?

-  02. FET 2016-2017
-  03. MSCA 2016-2017
-  04. Infrastructures 2016-2017
-  05. LEIT Introduction 2016-2017
-  05i. LEIT-ICT 2016-2017
-  05ii. LEIT-NMBP 2016-2017
-  05iii. LEIT-Space 2016-2017
-  08. SC1-Health 2016-2017
-  09. SC2-Food 2016-2017
-  10. SC3-Energy 2016-2017
-  11. SC4-Transport 2016-2017
-  12. SC5-Climate Action 2016-2017
-  13. SC6-Inclusive Societies 2016-2017
-  14. SC7-Secure Societies 2016-2017
-  16. SWAFS 2016-2017
-  17. Cross-Cutting Activities 2016-2017



x3!!



E2B

Energy Efficient Buildings

Energy Efficiency in Buildings (E2B PPP)

Today, the construction sector is the highest energy consumer in the EU (about 40%) and main contributor to GHG emissions (about 36% of the EU's total CO₂ emissions and about half of the CO₂ emissions which are not covered by the Emission Trading System)

Goals of the E2B PPP



Technologies to enable the efficiency in the reduction of energy and GHG

Reduction of energy use by 50% compared to 2010

Reduction of CO₂ by 80% compared to 2010

Improving competitiveness of EU building industry

Cost-effective

User-friendly

Healthy

Indicative funding for 2017

H2020 funding	NMBP RTD	ICT CNECT	Transport RTD	Energy RTD + ENER	Environment RTD	TOTAL M€
FoF	86	33	-	-	-	119
EeB	55	-	-	8	-	63
EGVI	-	-	133	-	-	133
SPIRE	82	-	-	8	10	100
TOTAL	223	33	133	16	10	415

EEB 2016 Call. Deadline 19.01.2017. Single stage

54.88 M€ from NMBP (RTD)

EEB-5: Development of near zero energy building renovation, IA

EEB-6: Highly efficient hybrid storage solutions for power and heat in residential buildings and district areas, balancing the supply and demand conditions, RIA

EEB-7: Integration of energy harvesting at building and district level, IA

EEB-8: New business models for energy-efficient buildings through adaptable refurbishment solutions, CSA

8 M€ from Energy (RTD + ENER)

EE12: Integration of Demand Response in energy Management Systems while ensuring interoperability, IA

E2B 2014-2015 calls

41 projects
funded. EU
contribution
183 M€

- Relevant business participation (100 M€, 55%)
- RTOs + Public Adm. 49 M€ (27%)
- Universities 34 M€ (18%)

Excellent
Spanish
participation

- Spain was the first country (27 M€, 15%)
- 48 Spanish entities (29 companies) participated in 30 projects, 4 of them coordinated
- Business (52%) and RTOs (43%)

Norway's
participation

- Three Norwegian entities participated as partners in two funded projects (both with Spanish participation)
- Unlike other countries there is no business participation

SPiRE



Sustainable Process Industry through Resource and Energy Efficiency

Sustainable Process Industry (SPIRE) PPP

The process industry is traditionally a very energy and resource intensive industrial domain. There is a lack of competitiveness on the world stage since a significant part of raw materials are imported and energy in Europe is expensive

Goals of the SPIRE PPP



Integration and demonstration of innovative processes and systems for increased resource efficiency

Reduction of fossil energy intensity up to 30% by 2030

Reduction of up to 20% in non-renewable, primary raw material intensity by 2030

Reduction in GHG of up to 40% by 2030 compared to 1999 levels

Indicative funding for 2017

H2020 funding	NMBP RTD	ICT CNECT	Transport RTD	Energy RTD + ENER	Environment RTD	TOTAL M€
FoF	86	33	-	-	-	119
EeB	55	-	-	8	-	63
EGVI	-	-	133	-	-	133
SPIRE	82	-	-	8	10	100
TOTAL	223	33	133	16	10	415

SPIRE 2017 Call. Deadline 19.01.2017. Single stage

82 M€ from NMBP (RTD)

SPIRE-7: Integrated approach to process optimisation for raw material resources efficiency, excluding recovery technologies of waste streams, IA

SPIRE-8: CO₂ utilisation to produce added value chemicals, RIA

SPIRE-9: Pilot lines based on more flexible and down-scaled high performance processing, IA

SPIRE-10: New electrochemical solutions for industrial processing, which contribute to a reduction of carbon dioxide emissions, RIA

SPIRE-11: Support to enhance impact of SPIRE PPP projects, CSA

SPIRE-12: Assessment of standardisation needs and ways to overcome regulatory bottlenecks in the process industry, CSA

SPIRE-13: Potential of Industrial Symbiosis in Europe, CSA

SPIRE 2017 Call

8 M€ from Energy (RTD + ENER)

Deadline 19.01.2017. Single stage

EE 17: Valorization of waste heat in industrial systems, IA

10 M€ from Environment (RTD)

Deadline 7.03.2017. Two stage 2nd stage Deadline 05,09,2017

CIRC-01: Systemic, eco-innovative approaches for the circular economy: large-scale demonstration projects

b) Systemic services for the circular economy (2017), IA

SPIRE 2014-2015 calls

45 projects
funded. EU
contribution
241M€

- Relevant business participation (125 M€, 52%)
- RTOs + Public Adm. 77 M€ (32%)
- Universities 39 M€ (16%)

Excellent
Spanish
participation

- Spain was the second country (31 M€, 13%) behind Germany
- 79 Spanish entities (44 companies) participated in 32 projects, 10 of them coordinated
- Business (52%) and RTOs (41%)

Very good
Norwegian
participation

- 9 Norwegian entities participated as partners in 7 funded projects (6 with Spanish participation)
- Like other countries there is a relevant business participation

Good opportunities in E2B/SPIRE 2017 calls

163 M€ for 2017 in business-oriented programs

Excellent Spanish participation
(Spanish entities are present in 72% of the funded projects)

There is particular room for collaboration between Norway and Spain especially in the business sector

***ESTEYCO's
experience on EEA
Grants funded
projects and other
European
Programmes on the
Energy Sector***

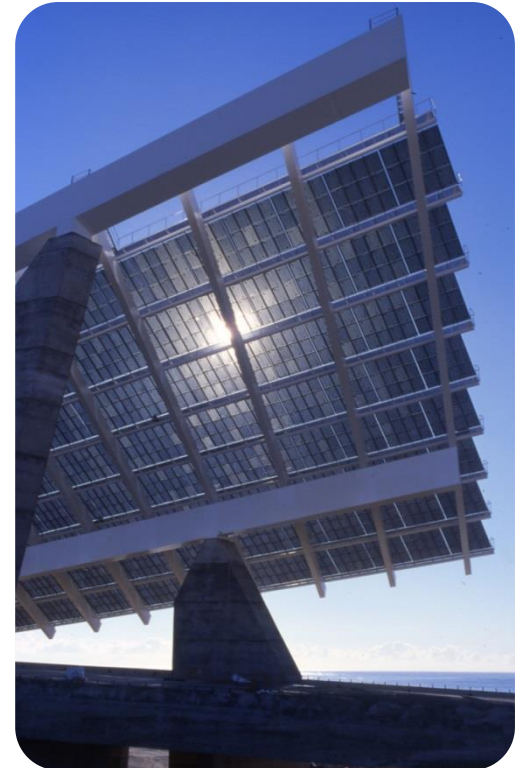




Esteyco has developed two successful projects funded by EEA Grants, which showcase two different strategies in the development of innovative projects in the Energy Sector

1. “DEVELOPMENT OF BRACED PRECAST FOUNDATION FOR WIND TURBINES”
2. “EXPERIMENTAL DEMONSTRATION AND CERTIFICATION OF OFFSHORE WIND SELF-INSTALLING FOUNDATION AND TELESCOPIC TOWER”

ESTEYCO: 45 YEAR EXPERIENCE CONSULTING ENGINEERING



ESTEYCO'S TRACK RECORD IN THE WIND ENERGY INDUSTRY



- **19 year track-record** of specialized civil engineering services for a large client portfolio
- More than **5000 turbines** in around 300 wind farms
- Nearly **9GW** of installed power in 31 countries
- Pioneers in **precast concrete tower** engineering covering design, certification, manufacturing and erection
- Over a dozen certified tower models for **6 main turbine manufacturers**
- Around **500 towers** and nearly 7000 panels manufactured in 6 countries



DEVELOPMENT OF A BRACED PRECAST CONCRETE FOUNDATION FOR WIND TURBINES

REPRESENTANTE

ESTEYCO SAP



ESTEYCO



A civil engineering and architecture consulting firm, created in 1970, Esteyco is a group of companies, with international presence and an extensive track record of years in the wind energy sector, with over 4,500 foundations and 400 precast concrete towers designed for over 300 wind farms in over 30 countries.

- FOUNDATION DESIGN (STRUCTURAL ENGINEERING FOR FOUNDATION DESIGN)
- WIND FARM CIVIL WORKS DESIGN
- GEOTECHNICAL ENGINEERING
- MONITORING AND PATHOLOGY ANALYSES
- CONCRETE WIND TOWERS DESIGN



STATE OF THE ART



CLASSIC FOUNDATIONS:

- Simple construction process
- Large amounts of concrete and reinforcing steel
- Highly competitive for current turbine heights



NEW FOUNDATION TYPOLOGIES:

In situ:

- Complicated geometries lead to large construction times

Precast:

- Large elements lead to complex processes and large amounts of prestressing steel



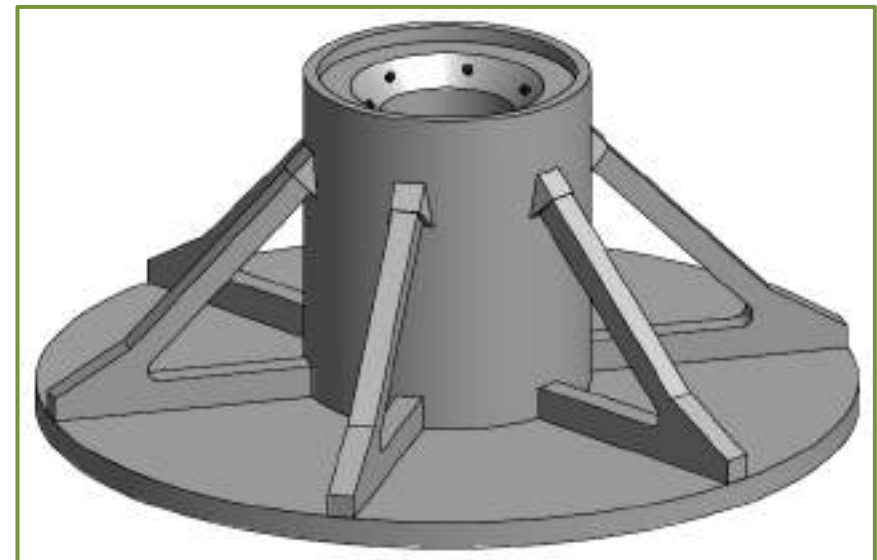
PRECAST BRACED FOUNDATION



A set of precast braces connect the bottom slab with the tower base, resulting in a structurally robust and easily constructible solution.

ADVANTAGES

- Up to 65% in volume reduction
- Low weight precast elements allow easy installation and industrialization
- Optimized mobilization of soil self weight
- Reduced construction time
- Combination of precast and in situ elements
- Allows for economic increment of Hub Height



COMPARISON



CLASSIC FOUNDATIONS

LARGE amount of materials

SIMPLE construction processes

LARGE construction times



WALLED FOUNDATIONS

REDUCED amount of materials

COMPLEX construction processes

TIME CONSUMING processes

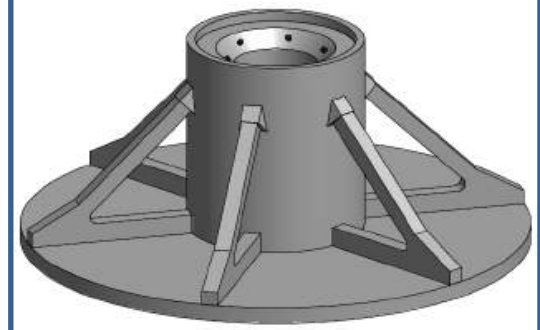


ESTEYCO BRACED FOUNDATION

VERY REDUCED amount of materials

SIMPLE construction processes

REDUCED construction times





CIMENTACIÓN (cota sobre TN)	AUMENTO	REDUCCIÓN	
	AEP	MATERIAL (acero, hormigón)	COSTES
+0	-	40%-50%	20%-25%
+4/+5	0.8%-2.0%	30%-40%	10%-15%



$1,5\% \times 3700 \text{ h/año} \times 20 \text{ años} \times 60 \text{ MW} \times \$ 70/\text{MWh} = \$ 4.7\text{M}/20 \text{ años}$

- Reducción del CoE
 - Reducción de costes de ejecución material
 - Proceso industrializado
 - Mayor rendimiento en la ejecución - **2 días/cim** comparado con **2.5-3 días/cim**-. (PE > 14 wtg)
 - Aumento de AEP



Colocación de encofrado, malla y ejecución del hormigón de limpieza



Excavación de zanja perimetral



Hormigonado de limpieza en la zanja



Ejecución de armadura



Colocación del encofrado-plantilla y montaje de los jabalcones



Ejecución del hormigonado de la losa inferior



Ferrallado, encofrado y ejecución del hormigonado del anillo



Relleno en el exterior del anillo (tongadas de 40cm)



Relleno en el interior del anillo y compactación con la cuchara



Resultado colocación armadura y jaula de pernos de la losa superior



Resultado zona anclaje activo en la losa superior



Resultado hormigonado de la losa superior

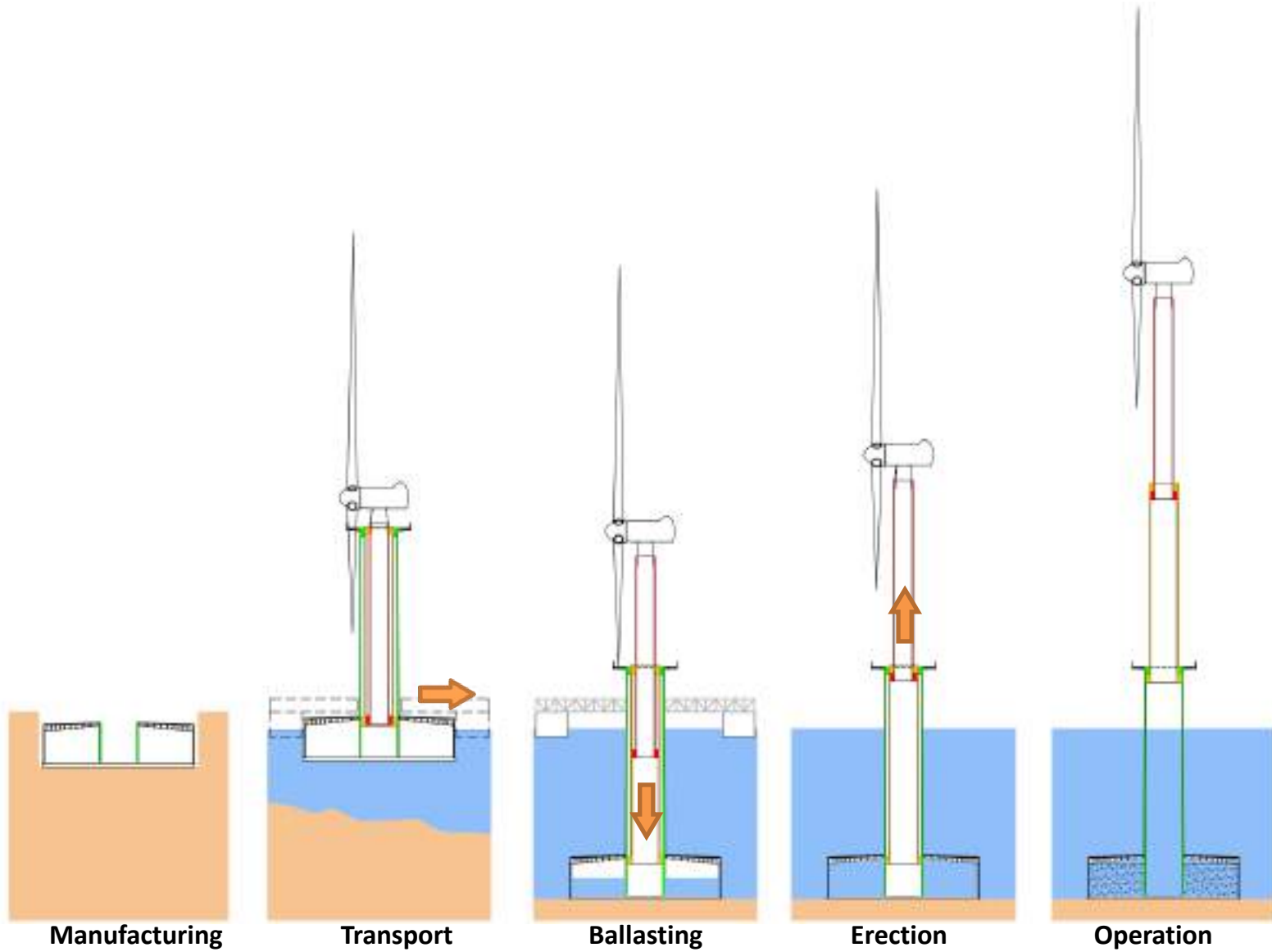


ELISA PROJECT

SELF-INSTALLING OFFSHORE SUBSTRUCTURE

- **Telescopic tower** configuration allowing for both **self-transportation** and **self-installation** of the complete wind turbine, to be **fully assembled onshore**
- Make the most out of the required gravity based foundation, using it also as a temporary **self-buoyant platform** with virtually no extra-cost.





2.2.5. Proceso general de instalación: renders (I)



2.2.5. Proceso general de instalación: renders (II)



2.2.5. Proceso general de instalación: renders (III)



2.2.5. Proceso general de instalación: renders(IV)



2.2.5. Proceso general de instalación: renders (V)



2.3. Principales ventajas respecto a JACKETS (I - general)



VS

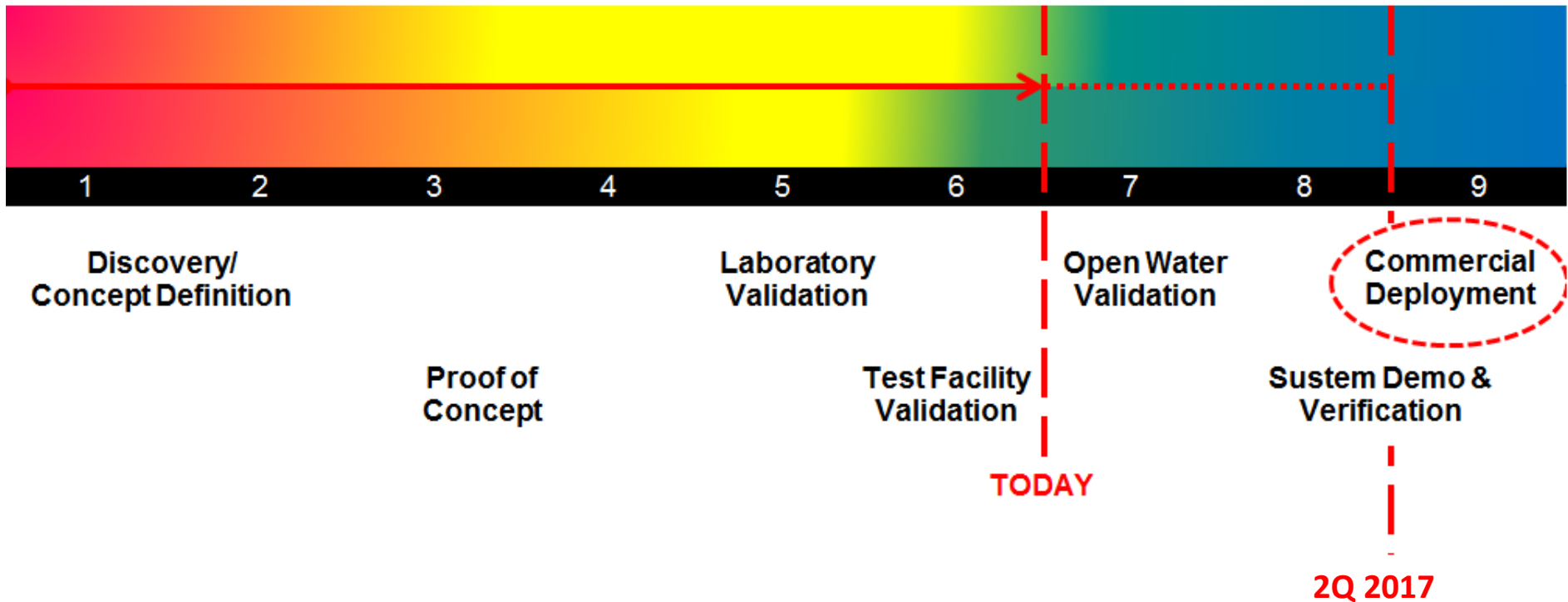


TECHNOLOGY READINESS LEVELS



Basic Research → Applied Development → Operational Deployment

Feasibility → Demonstration



FROM THE IDEA TO A HIGH TECHNOLOGY READINESS LEVEL



Intensive R&D development supported by reference institutions. Current investment has reached nearly 5M€, with resources allocated for experimental demonstration which shall sum up to 9M€ in development by 2017



(2009-2010)

Ministry of Industry

Initial research and first patents

(2010-2012)

CDTI

Research and theoretical development

(2012-2014)

CDTI

Scale Tank Testing + Design optimization

(2012-2014)

ACCIO

Advanced numerical modelling

(2013-2014)

EUROSTARS

Telescopic Tower full scale prototype

(2014-2015)

EEA GRANTS

Experimental testing + Design Certification

(2015-2017)

HORIZON 2020

Open Water Full Scale Foundation Demonstrator

SPECIALIST COLLABORATORS



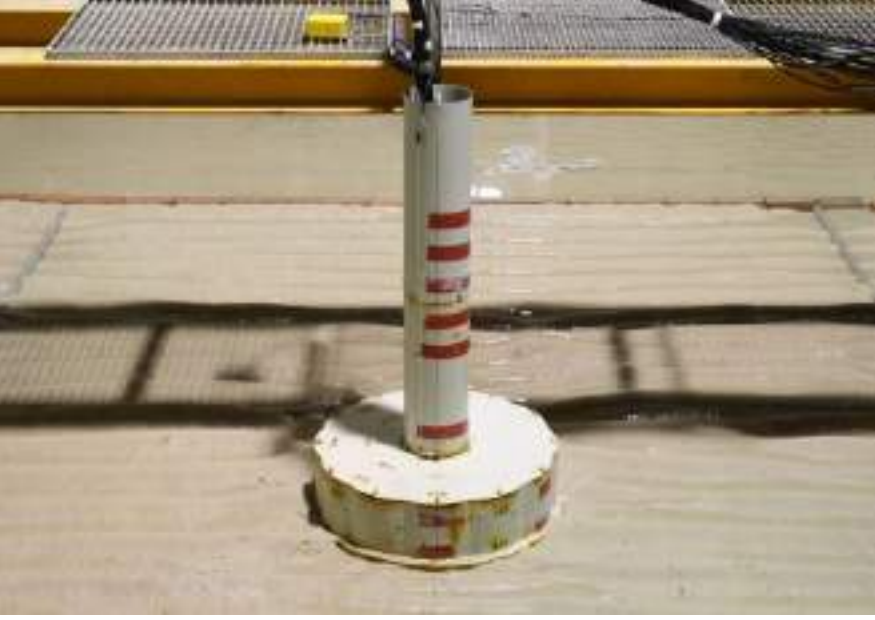
Intellectual property protection:
MULTIPLE INTERNATIONAL PATENTS



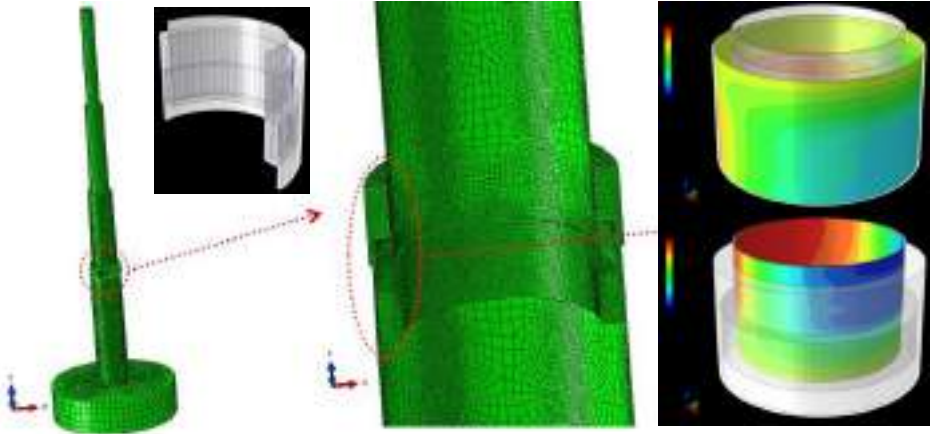
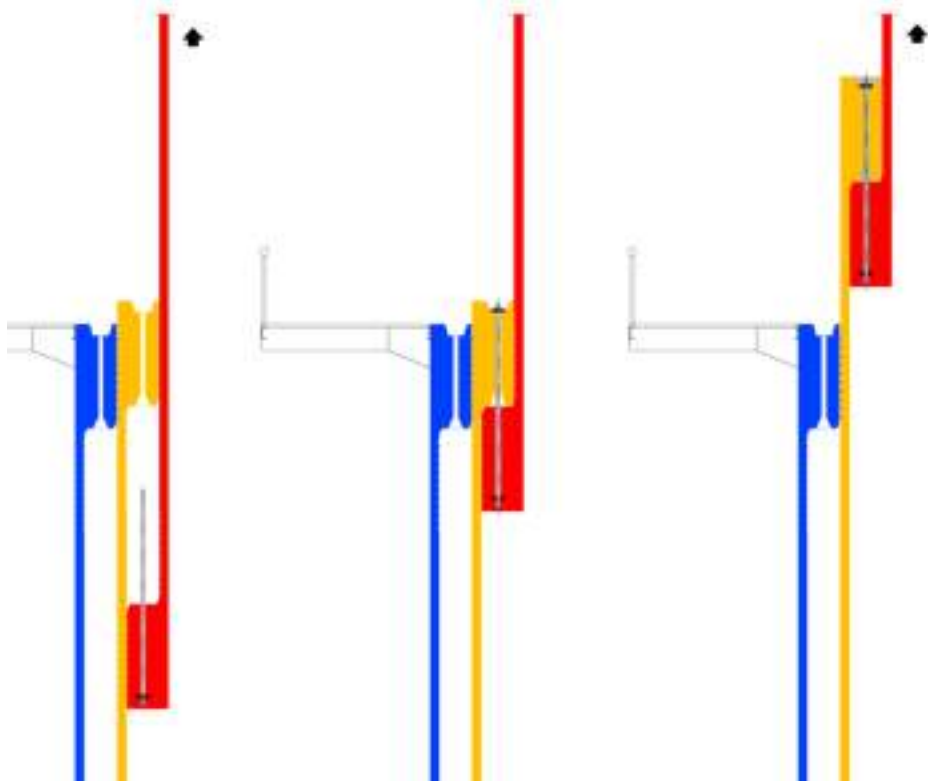
FULL SCALE PROTOTYPE OF THE TELESCOPIC TOWER



EXTENSIVE TANK TESTING CAMPAIGN OF THE TOWED TRANSPORT



LAB TESTING OF CRITICAL STRUCTURAL COMPONENTS



DNV-GL CERTIFICATION OF THE SELF-ERECTING TOWER SYSTEM



Statement of Compliance

GL

GL Renewables Statement No. DAA-GL-628-0914

This Statement of Compliance is for the A-Design Assessment of the Erection Manual for the Wind Turbine Component

Esteyco Telescopic Tower

is issued to: **Esteyco Energía, S.L.**
C/ Marqués, 21
40043 Barcoena
Spain

This statement attests compliance with the normative references stated below concerning the erection manual. The A-Design Assessment is based on the documentation listed in the Certification Report referenced below and the characteristic data given in the attached Annex.

Certification Report number and file:

75211	2014-12-17	Esteyco Telescopic Tower, Erection Manual of Prototype
75215	2014-12-17	Esteyco Telescopic Tower, Inspection of Telescoping Process

Normative references: GL Rules and Guidelines – IV Technical Services – Part I - Guidelines for the Certification of Wind Turbines, Edition 2510, Sections 1.2.3.6 and 6.1

Changes in the erection manual are to be approved by GL Renewables Certification (GL RC), otherwise this statement loses its validity.

Hamburg, 2014-12-17
KLAHM

GL Renewables Certification

[Signatures]

By Mail number 04 00 0000 7900
International Public Key for signature
This certificate is valid for the following conditions:
Attributes: critical

DAKKS
Approved
Accreditation number:
0 2 0007 03 01

Renewable Guidelines
Certification of Wind Turbines
Revision 14
2007 Hamburg, Germany

The legal effect of the "Contract" being part of the contract of "Investment Agreement" between "Client" is applicable for the contract.



Description	Turbine	Power	Turbine Manufacturer / Client	Date	Certification extent	Certification Body
HH 80m	AW1500	1.5MW	Gacciona	06/2006	Design	GL
HH 100m	AW3000	3.0MW	Gacciona	04/2009	Design	GL
HH 80m	AW1500	1.5MW	Gacciona	05/2010	Design	GL
HH 100m	AW3000	3.0MW	Gacciona	09/2010	Design	GL
HH 100m	Generic	3.0MW		04/2011	Design	GL
HH 100m	Generic	1.5MW		05/2011	Design	GL
HH 100m	IV77	1.5MW	VENSYS	05/2011	Design	GL
HH 100m	TWT2.5	2.5MW	Joules	12/2011	Design	GL
HH 100m	G97	2.0MW	Gamesa	07/2012	Design	GL
HH 100m	AW3000	3.0MW	Gacciona	09/2012	Design, IPE	GL
HH 120m	AW3000	3.0MW	Gacciona	09/2012	Design, IPE	GL
HH 100m	ECO110	3.0MW	ALSTOM	11/2012	Design, IPE	GL
HH 80m	SWT2.3	2.3MW	SIEMENS	02/2013	Design, IPE	GL
HH100m, foundation	ECO110	3.0MW	ALSTOM	05/2013	Design	DEWI-OCC
HH100m, internals	ECO110	3.0MW	ALSTOM	09/2013	Design, on-site inspection	TÜV-Rheinland
HH 100m	IV82	1.5MW	VENSYS	11/2013	Design	GL
HH 100m	Generic	3.0MW		11/2013	Design	GL
HH 120m	Generic	3.0MW		11/2013	Design	GL
HH 80m	SWT2.3	2.3MW	SIEMENS	12/2013	Design, IPE	GL

1.2. Programas de la Comisión Europea (II)

Prototipo de cimentación y torre off-shore (2/2)
 H2020 LC3 ELICAN



- Construcción de prototipo a escala real de torre telescópica en hormigón prefabricado en Arinaga (Las Palmas de Gran Canaria).
 - Subvención aprobada: 13,7 M€
- Consorcio formado por: ESTEYCO(coordinador), ADWEN, ALE Heavylift, DEWI.
- Plazo: 01/01/2016 – 01/01/2019
 - Estado: primera anualidad en curso



Proposal Evaluation Form

EUROPEAN COMMISSION
 Project: SME Research and Innovation Research Programme

Project title: **DEVELOPING TELESCOPIC SUBSTRUCTURE FOR A LOW-COST OFFSHORE WIND TURBINE**

N	Project name	Country	Year/Year	%	Grant allocated	%
1	ESTEYCO S.A.	ES	2016/2019	48.3%	4,300,000	41.8%
2	ADWEN OFFSHORE S.L.	ES	2016/2019	48.3%	4,300,000	42.2%
3	ALE HEAVYLIFT S.L.	ES	2016/2019	4.8%	1,100,000	10.7%
4	DEWI S.A.	ES	2016/2019	8.6%	800,000	7.8%
Total:				100.0%	10,300,000	100.0%

ELISA 5MW DEEP WATER PROTOTYPE



ELISA 5MW DEEP WATER PROTOTYPE



Dry dock. Arinaga Port



Foundation Construction

















Link: <https://vimeo.com/182759028>

Password: ESTEYCO

Tower manufacturing





ULSTEIN®

*EEA Grants Event,
Madrid, Spain 18th October 2016*

.....

▶ **THE EDSOMA PROJECT: ELECTRICAL DC DISTRIBUTION SYSTEM OPTIMISATION FOR MARINE APPLICATIONS**

Reflections and experiences from a collaborative EEA Grants Program project initiative



José Jorge García Agís
ULSTEIN INTERNATIONAL AS
18th October 2016

EDSOMA PROJECT – INTRODUCTION

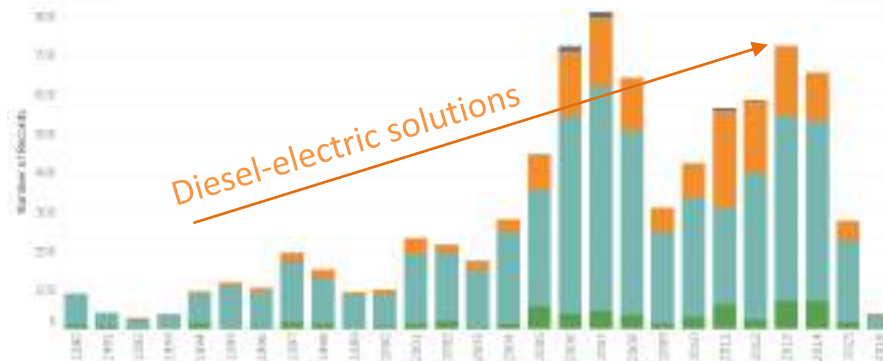
Ulstein Power & Control (Ulstein) and Ingeteam Power Technology Industry & Marine Drives Unit (Ingeteam) have been collaborating in an R&D project, pursuing smarter and greener solutions of hybrid power plants for safer operations of vessels

Project main objectives:

- Development of a new technology of Power Generation and Distribution System for Marine Applications
- Improving the nowadays existing AC based classic solutions in terms of: Energy Efficiency, Fuel consumption and Emissions (20%*), Volume (25%*), Weight (25%*), Maintenance requirements, Cost, and Ship functionality
- Complying and fulfilling the requirements of classification standards in terms of system protection and operation availability



Offshore vessels contracted per year – by engine type



EDSOMA PROJECT - BACKGROUND

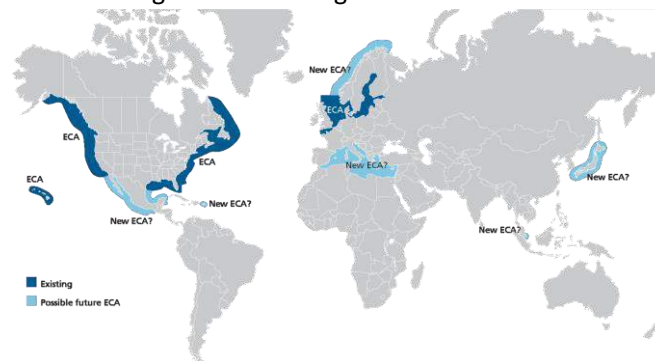
Emissions from international shipping were 2.18 million tonnes CO2 per day or 90,868 tonnes CO2 per hour in 2012



Source: shipmap.org (2016)



New regulations limiting the level of emissions



Need for smarter and greener energy solutions in the shipping industry

VESSEL ENERGY MODEL



Onboard power profiles measurements

Onboard measurements

Vessel

Speed

Sea cond.

HULL ENERGY MODEL

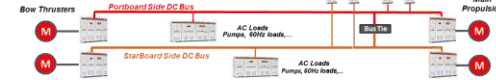
- ❖ Hull and propeller design data required
- ❖ Hydrodynamics models and statistical data about sea conditions and weather are used

Propulsion loads power demand

Auxiliary, hotel loads, (pumps, cranes, ...) power demand

Energy Management Strategy

DC BASED POWER PLANTS



POWER PLANT ENERGY MODEL

Backward Modelling approach:
“From propeller to Energy Source”

- ❖ Energy losses in all power conversion stages (motors, converters, engines, generators, energy storage subsystems, transformers, etc.)

Energy Efficiency

Fuel consumpt.

Emissions



EDSOMA PROJECT CONCLUSIONS

Integrated systems engineering approach is required for the design of any key subsystem in the vessel power plant.

Model based design approach to guarantee a successful subsystem design from the early design stages. Different tools and models have been developed to support the design.

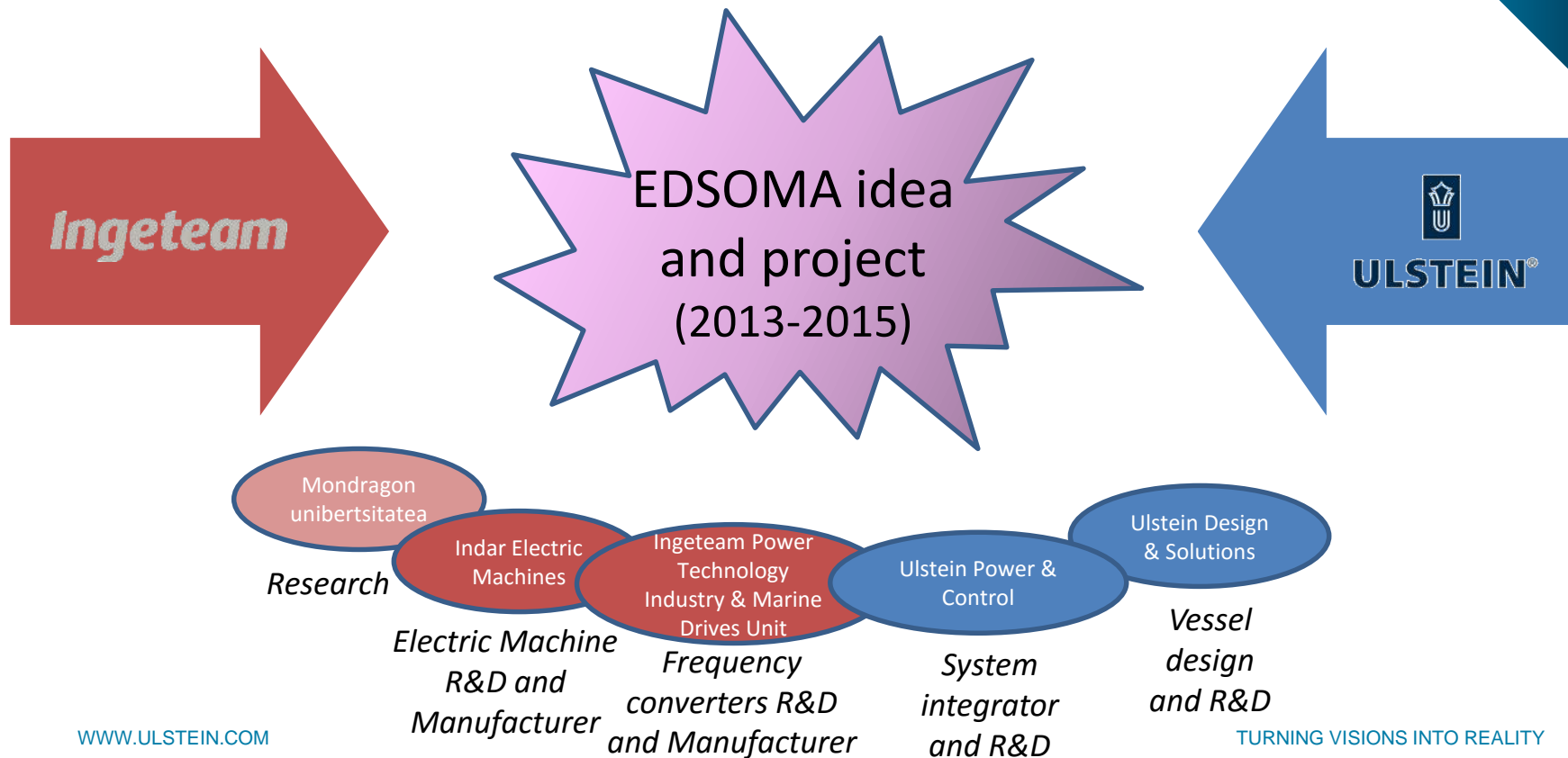


Impedance/admittance characteristic of the power electronics based converters connected to the DC distribution system must be known in order **to ensure the stability and power quality of the power plant by design**. The ship & machinery room layouts and thus the electrical power distribution lines (cables/bus ducts) have strong influence in the stability and power quality of the DC system. In-depth analysis must be done.

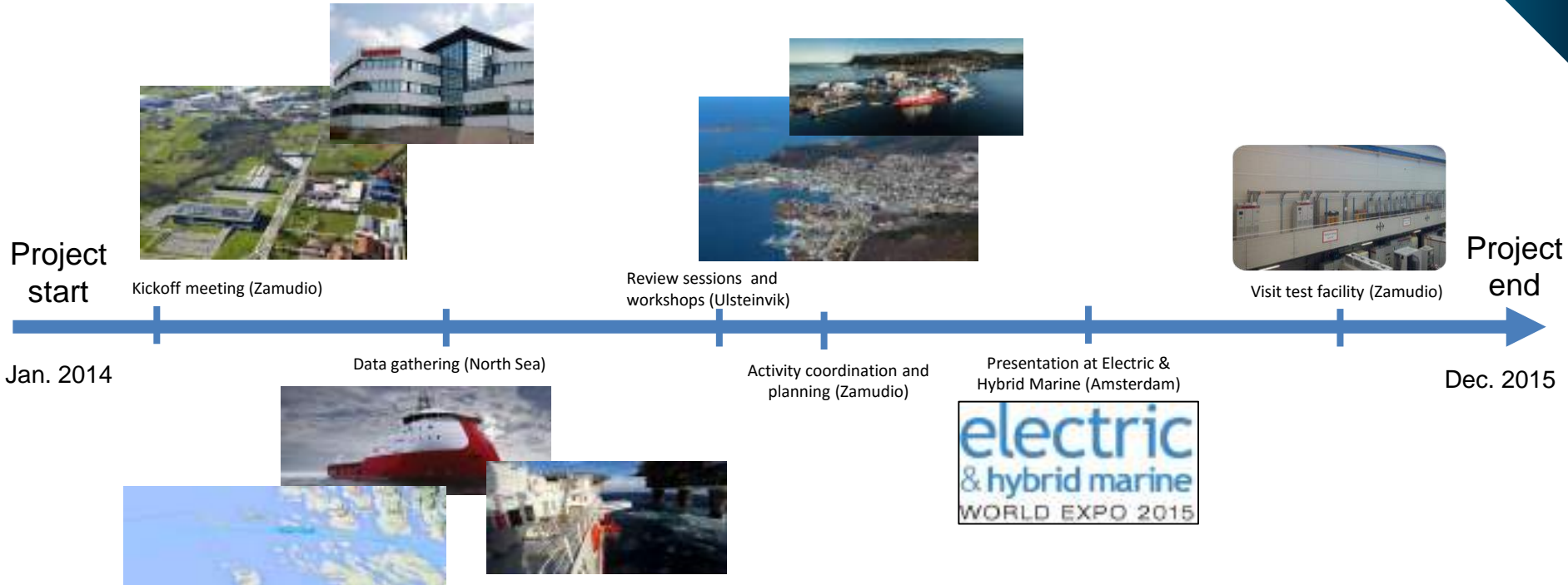
The **DC Bus stability**, its **power signal quality** (voltage and current ripples), and the primary **protection selectivity** (by DC fuses) are **coupled objectives in the DC bus design problem**.

Full scale test is paramount in order to be able to promote and sell the new developed products to the market.

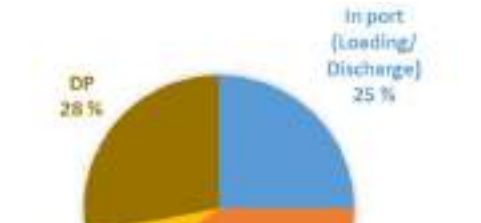
EDSOMA – PROJECT CONTEXT



PROJECT ACTIVITY TIMELINE



PROJECT DEVELOPMENT – A COLLABORATIVE MODEL



DP 28%

In port (Loading/Discharge) 25%

Waiting 47%

Operational profile

- Data measured on real vessels

ULSTEIN®



Laboratory tests

- Full scale testing facilities
- Test new solutions

Ingeteam



Implementation

- Solution available for market implementation

Ingeteam
ULSTEIN®

EDSOMA EXPERIENCES



ULSTEIN®

- It was a great advantage that an established collaboration between Ulstein and Ingeteam was in place prior to starting such a project. Both companies knew well each other from beforehand
- The actual collaboration format was quickly established
- Project partners both mastered English as the project language at an acceptable level
- A slow start made it possible for the partners to adjust and free up resources at the time of scheduled activities and the first kick-off meeting was held in March 2014
- Flexibility from both parties made it possible to adjust part-projects and tasks continually as research project advanced
- Proven behavior by both parties was quite similar and matched quite well
- Both parties were quite professional in their project dealings
- Frequent communication and visitations at an early stage
- One point of contact both at Ingeteam and at Ulstein – very easy communication and exchange of data
- Mutual efforts to cross-sell services and products to 3rd party customers
- Involving students on both sides was a positive experience but the exchange among students could be better catered for – by collaboration between the universities (MU and NTNU)



EDSOMA DELIVERABLES – PRODUCTS & KNOWLEDGE

Products

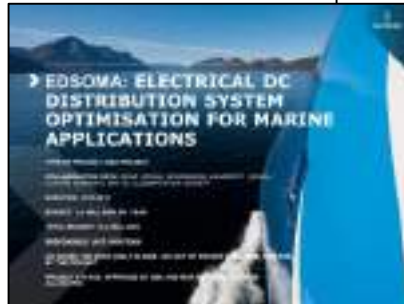
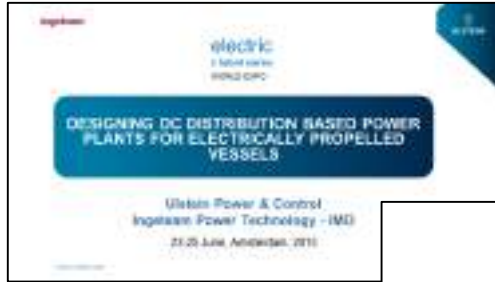
- › It has become much more clear during the project period that to be able to promote and sell new EDSOMA solutions, full scale testing and display of such test data is paramount – the idea of EDSOMA to establish a full scale test lab was a substantial success
- › More product solutions could be developed from EDSOMA knowledge platform/lab
- › The partners have been able to develop and test an alternative power train and power distribution system being different to existing and competing solutions already available in the market but not properly tested to our knowledge

Knowledge

- › Updated and revised real life operational profiles of all relevant offshore service and merchant vessels
- › Originally, it was planned and foreseen to collect a one year's logbook data – this was not possible because of budget restrictions
- › Real operational data was still provided from a couple of months operations, which made the trick and was fully acceptable to make progress of the analyses in the project
- › It was explored how to develop annual prognoses of operational data from short-term measurements
- › It has proven a fact that these estimates were quite robust based on later calibrations and verifications from additional simulations (Ulstein)
- › Another issue being subject to a lot of discussion is the aspect of unit of analysis and not least sampling frequency (how often should operational records be collected)
- › A particular verification methodology of full scale test data has been developed and is now being used



EDSOMA DELIVERABLES – TECHNICAL AND SCIENTIFIC PRESENTATIONS





FUTURE INITIATIVES?

Activities

- ▶ New research proposals from Ingeteam

Topics

- ▶ More efforts to be put in studies of how to integrate EDSOMA solutions effectively in vessels both in the design and construction periods

SUMMARY

- Positive collaboration
- Relevant achievements and findings
- Interesting future collaborative opportunities





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