



# Update from the European Commission initiatives on Carbon Capture and Storage from the research and innovation perspective

*10th CO2GeoNet Open Forum, May 11-12 2015 – Venice, San Servolo Island*

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# EU Energy policy goals and priorities

European  
Commission

**Competitiveness**

Smart infrastructure

Competitive markets

Diversified supply

Energy efficiency

Renewable sources

**Security of  
supply**

**Sustainability**

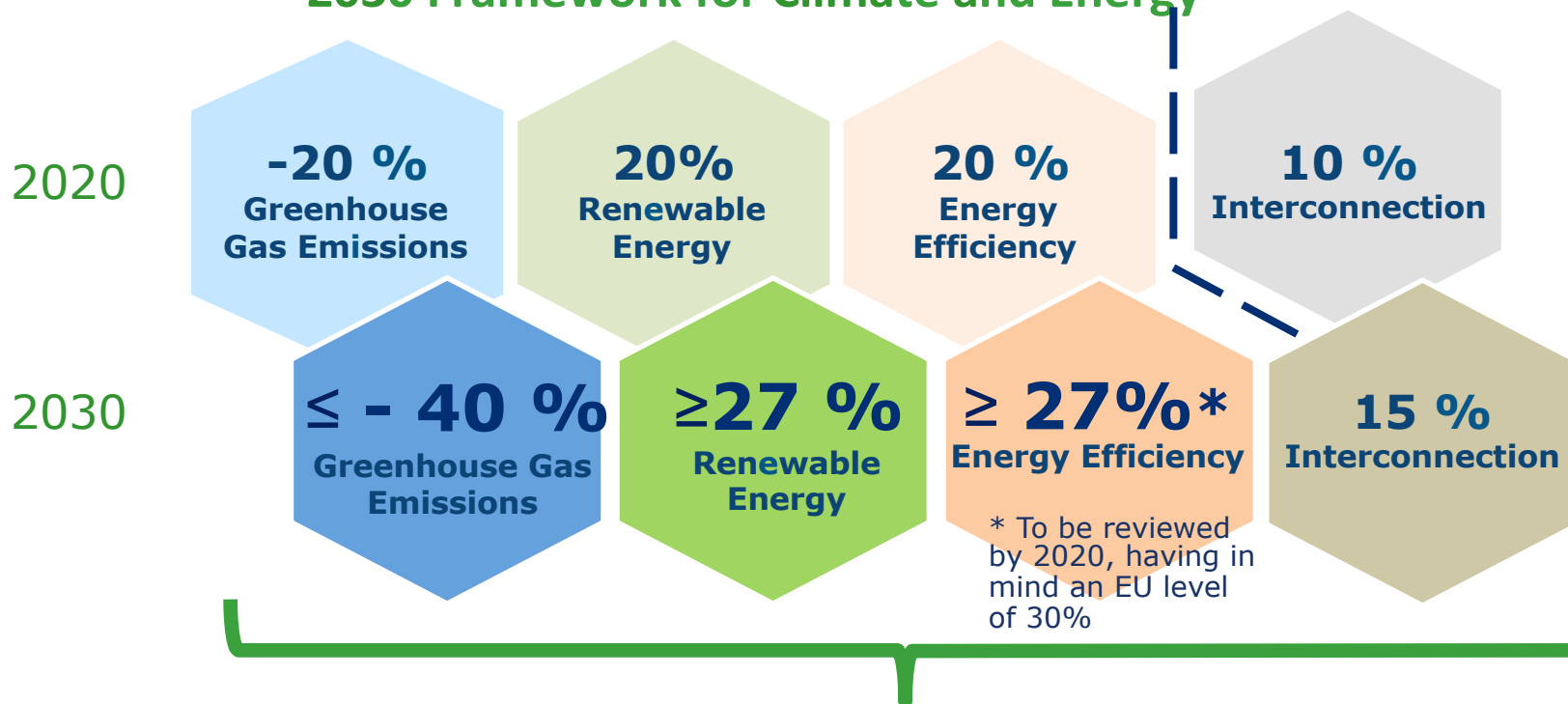
**HORIZON 2020**

Research &  
Innovation



# Agreed headline targets Oct. 2014 European Council

## 2030 Framework for Climate and Energy



**New governance system + indicators**

GHG Emissions



## Innovation fund

**400 million allowances**, amount depending on carbon price

Building on **existing NER300** programme for carbon capture and storage and renewables

**New: extension of scope** to low carbon innovation in industrial sectors

Open for **projects** in **all Member States**

## **Energy Union**

**A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy, 25.02.2015, COM(2015)80**

### ***5 Guiding dimensions***

- ✓ **Energy security, solidarity and trust**
- ✓ **A fully integrated European energy market**
- ✓ **Energy efficiency contributing to moderation of demand**
- ✓ **Decarbonising the economy**
- ✓ **Research, Innovation and Competitiveness**

## ***Energy Union Package:***

- ***"A forward-looking approach to CCS and CCU is needed for the power and industrial sectors, which will be critical to reaching the 2050 climate objectives in a cost-effective way.***
- ***This will require an enabling policy framework, including a reform of the Emissions Trading System and the new Innovation Fund, (NER 400) to increase business and investor clarity, which is needed to further develop this technology"***

## ***EU Energy Security Strategy paper (COM 28 May 2014):***

***Further efforts in research, development and deployment of CCS are needed***



- **Economic Recovery Programme (EEPR) 1 B€**  
*on-going projects are ROAD and Don Valley*
- **European Emission Trading Scheme (NER 300- White Rose project award decision of up to 300M€)**
- **CCS Demonstration Project Network** *(the knowledge sharing network)*
- **CCS Directive** *under review (Evaluation study by consultants – conclusion: the Directive is fit-for-purpose)*
- **Transport Infrastructure:** *cross-border CCS projects that could benefit from support from the Connecting Europe Facility*
- **R&D Funding: FP7, Horizon 2020**



## **SET-Plan – the technology pillar of EU energy and climate change policy**

- ***European Industrial Initiative (EII) on CCS***
- ***European Energy Research Alliance-Joint Programme on CCS***

### ***Communication on Energy Technologies and Innovation 2 May 2013***

- ***Toward an Integrated Roadmap and Action Plan of public investments (EC and MSs)***

### ***SET Plan Conference 2014, Rome 10,11 December 2014***

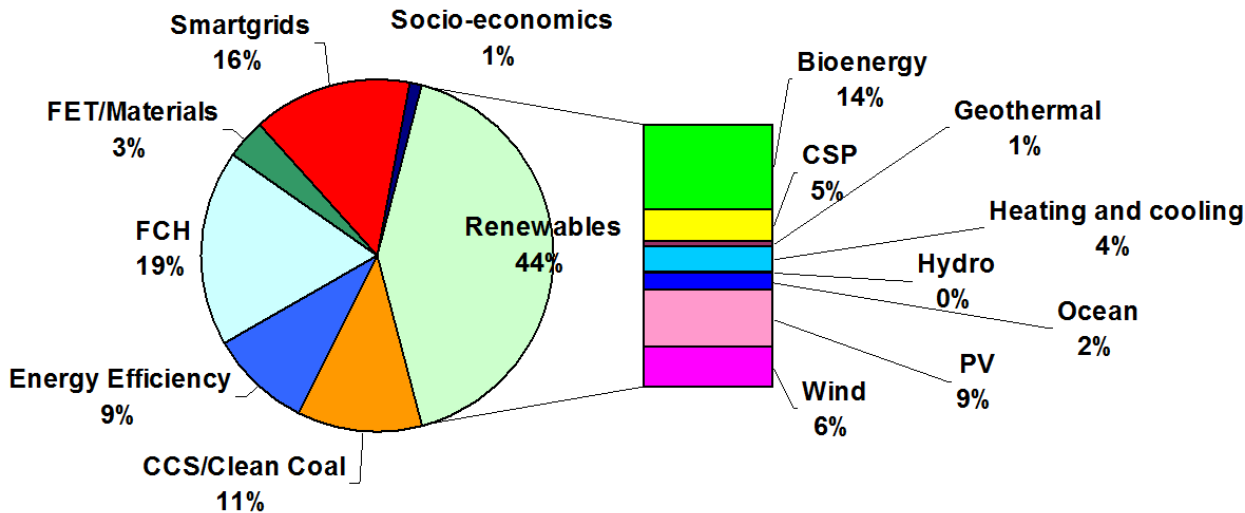
# International Cooperation on CCS



- EC Membership at: **IEA, CSLE, Global CCS Institute**
- Bilateral S&T cooperation:
  - **China** – **NZEC project, Phase IIA under preparation, – multiple Chinese participation in FP6 & FP7**
  - **USA** – **EU-US Energy Council, 11-13 May 2015, EU-US knowledge sharing event on Demonstration plants**
  - **India** **EU-funded demo-gasifier OPTIMASH**
  - **South Korea** – **EU-Korea twinning workshop on CCS, 9 Feb. 2015, Twinning topics identified: dry sorption, wet sorption and membranes**
  - **Australia** – **EC visit to Australia, Dec. 2011, March 2014 – AU Gov. visit to EU, Oct. 2012, June 2013**
    - **Twinning in FP7 2013 call on high efficiency capture processes - 6 on going twinning projects**
    - **EU-AU Workshop on CCS foreseen, Jun. 2015**

## ***FP7 : 2.3 b€ for Energy for 2007-2013***

Distribution of budget (projects and contributions 2007-2011)



- ***Around 220 M€ in FP7 for CCS and Clean Coal***

## **FP7: EC support to CO<sub>2</sub> storage**

- ✓ ***Support to regulatory activities for CCS***
- ✓ ***Public acceptance***
- ✓ ***Storage safety***
- ✓ ***Site characterisation***
- ✓ ***Site abandonment***
- ✓ ***Trans-national cooperation***
- ✓ ***Understanding the long-term fate of stored CO<sub>2</sub>***
- ✓ ***Sizeable pilot tests for CO<sub>2</sub> geological storage***
- ✓ ***Remediation and mitigation of CO<sub>2</sub> leakage***

## **FP7: EC support to CO<sub>2</sub> Capture/Transport**

- ***Advanced capture techniques***
- ***Transport infrastructure***
- ***Impact of the quality of CO<sub>2</sub> on transport and storage behaviour***
- ***New liquid solvents for post-combustion capture***
- ***Scale-up of advanced high-efficiency capture processes***
- ***New generation high-efficiency capture processes twinning with Australia***



# Horizon 2020

*The EU Framework  
Programme for  
Research and Innovation  
2014-2020*

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Research and  
Innovation

# Horizon 2020 - What's new

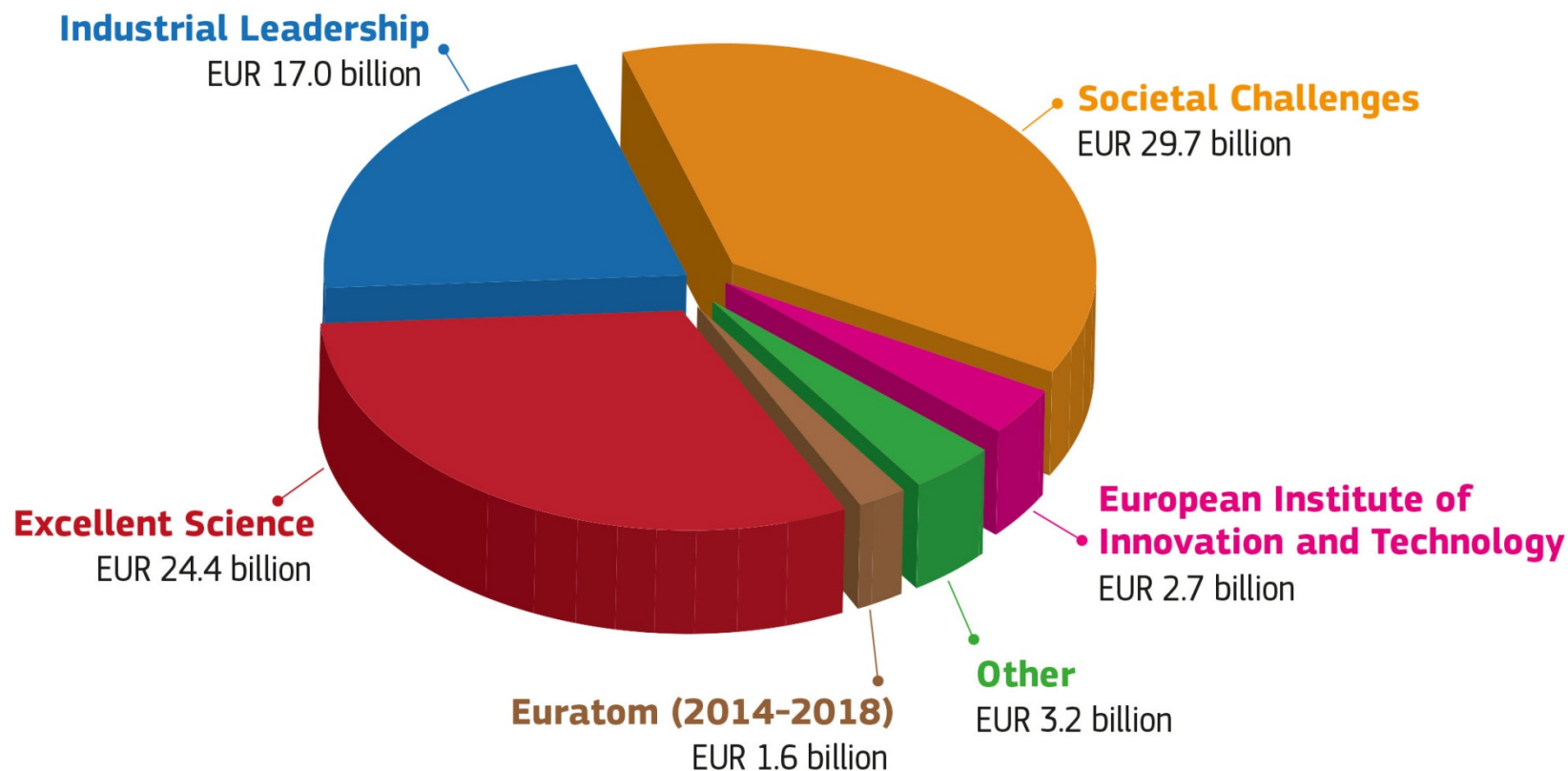
- **A single programme** bringing together three separate programmes/initiatives (former FP7, CIP, EIT)
- **Coupling research to innovation** – from research to retail, all forms of innovation
- **Focus on societal challenges** facing EU society, e.g. clean energy, health and transport
- **Simplified access**, for all companies, universities, institutes in all EU countries and beyond
- **New approach** to international cooperation (EU interests will be protected better but all calls are open to international participants)
- Focus on **SME's (20% of total budget for societal challenges )**

# Three priorities

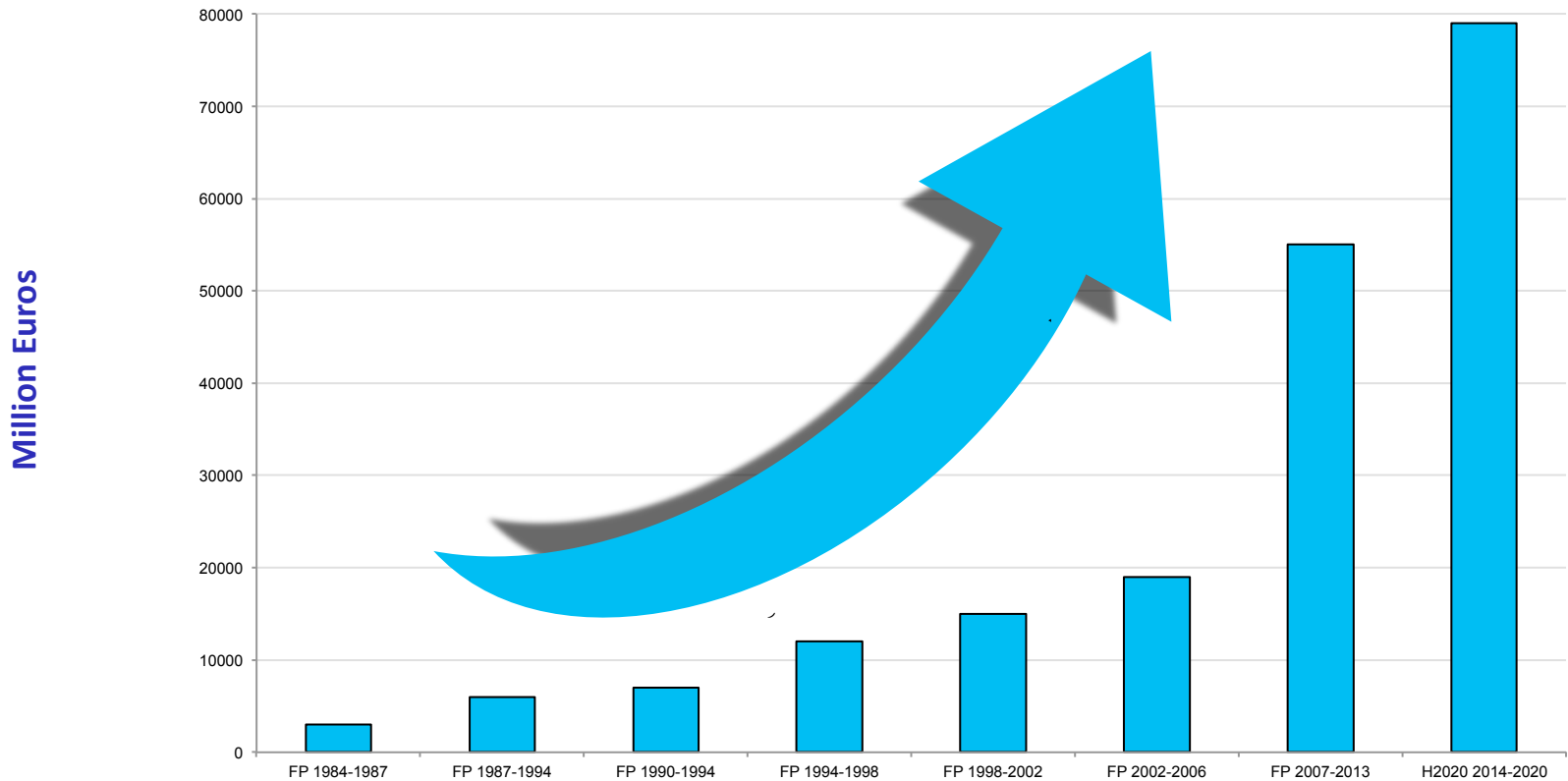


# € 79 billion from 2014 to 2020

## HORIZON 2020 BUDGET (in current prices)



# Growth of EU Framework Programme Funding



HORIZON 2020

# Basic principles

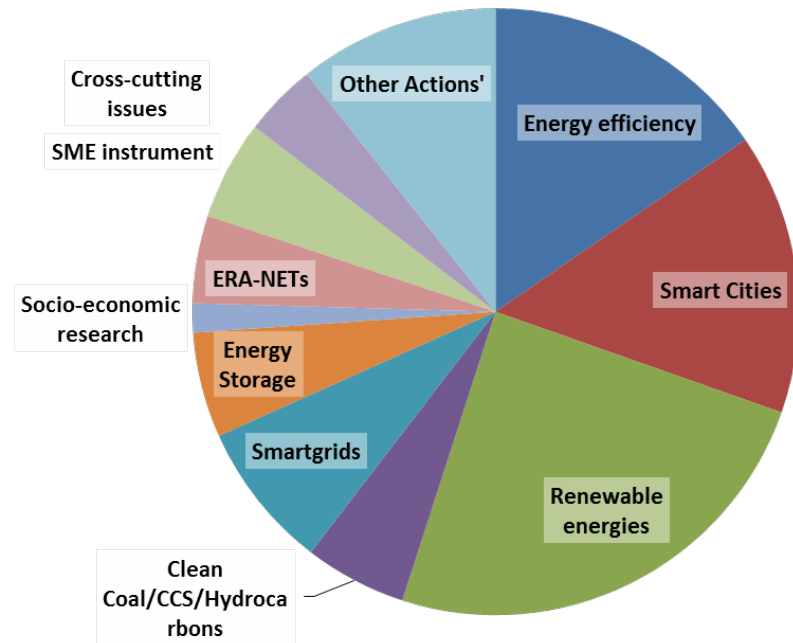
- **2-year work programme** to allow for better preparation of applicants
- **Challenge-based** approach
  - Definition of specific challenge to be tackled - broader scope of topics
  - Applicant can propose the most appropriate solution to the challenge
- Integration of **cross-cutting issues** (social sciences, international cooperation, etc.)
- Cross-thematic cooperation in strategic '**focus areas**'
- Covering the **full innovation cycle** (use of TRLs to specify scope of activities)



# Key challenge "Secure, clean and efficient energy"

- **Objective:** towards a reliable, sustainable and competitive energy system
- Support the implementation of the SET-Plan.
- Broad lines of activities for WP 2014-2015:
  - **Energy Efficiency**
  - **Competitive low-carbon energy**
  - **Smart Cities and Communities**

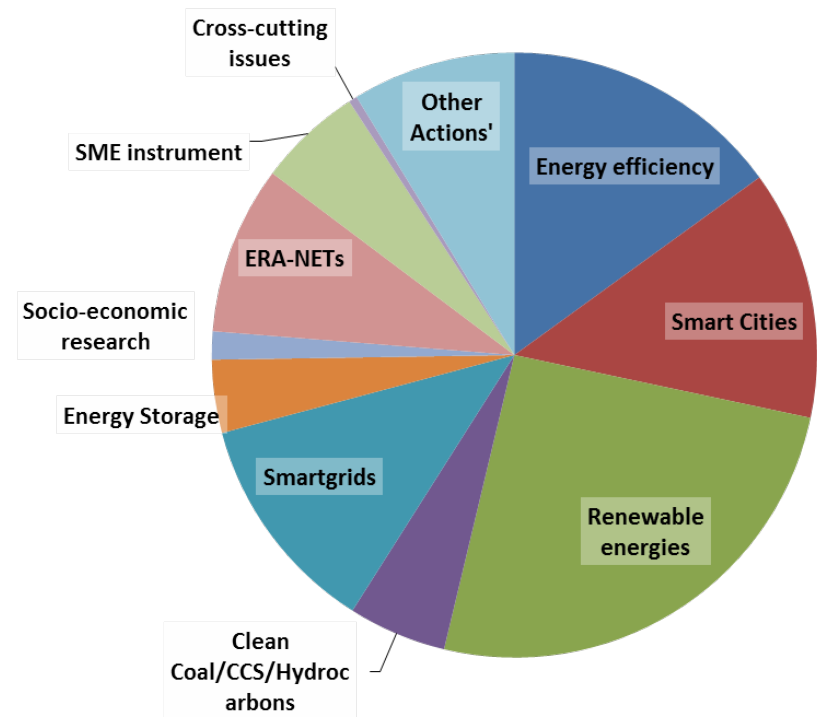
## Budget allocation of the Energy WP (2014)



TOTAL budget for 2014: **EUR 607 million**

Contribution to fossil fuels in 2014: **EUR 33 million**

## Budget allocation of the Energy WP (2015)



TOTAL budget for 2015: **EUR 647 million**

Contribution to fossil fuels in 2015: **EUR 35 million**

## **Call Low Carbon Energy : areas to be addressed in relation to Fossil Fuels**

	AREA	TRL	TYPE
<b>Enabling the decarbonisation of the use of fossil fuels</b>			
LCE 15	Enabling decarbonisation of the fossil fuel-based power sector and energy intensive industry through CCS	4-5 > 6	RIA
LCE 16	Understanding, preventing and mitigating the potential environmental impacts and risks of shale gas exploration and extraction		RIA
LCE 17	Highly flexible and efficient fossil fuel power plants	3 > 4-6	RIA
<b>Supporting the development of a European Research Area in the field of Energy</b>			
LCE 18	Supporting Joint Actions on demonstration and validation of innovative energy solutions	5-6 > 6-7	ERA-NET
LCE 19	Supporting coordination of national R&D activities	2 > 5	CSA

# Call Deadlines



***2014 Call (LCE 15, LCE 16): calls closed***

***2015 call (LCE 15, LCE 17):***

***03/09/2014 (Stage 1) closed***

***05/05/2015 (Stage 2) closed***

***LCE 18 –2015 : ERA-NET***

***05/05/2015 closed***

# Calls 2014 Successful projects



**CEMCAP:** CO<sub>2</sub> capture from cement production, EU Contribution 8.8 M€, Coordinator: SINTEF

**STEPWISE:** SEWGS Technology Platform for cost effective CO<sub>2</sub> reduction the in the Iron and Steel Industry, EU Contribution: 12.97 M€, Coordinator : ECN

**GATEWAY:** Developing a Pilot Case aimed at establishing a European infrastructure project for CO<sub>2</sub> transport, EU Contribution: 787,701 € Coordinator: SINTEF

## 2016/2017 Proposed initiatives

- Twinning cooperation between EU and Korea on new generation high efficiency CO<sub>2</sub> Capture technologies.
- Support to Zero Emission Technology Platform
- Utilisation of captured CO<sub>2</sub> as feedstock for the process industry
- *CCS in industry, including Bio-CCS (possible twinning with China)*
- *Geological Storage pilots*
- *ERA-NET Co-fund on Large-Scale Demonstration of CCS*



# HORIZON 2020

**Thank you  
for your attention!**

**Find out more:**  
[www.ec.europa/research/horizon2020](http://www.ec.europa/research/horizon2020)