



European  
Commission



# European Union funding of clean coal and CCS technologies

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

## *Objective*

To accelerate the development of a portfolio of low carbon technologies leading to their market take-off

## *Governance*

Steering Group – European Commission and Member States

- supported by the SET-Plan Information System SETIS

## *Implementation*

1) Innovation creation :

European Energy Research Alliance (EERA)

2) Innovation development and demonstration :

European Industrial Initiatives (EIIs) :

3) Financial and human resources:

European Energy Education and Training Initiative



## European Energy Research Alliance (EERA)

- The CCS Joint Programme was launched in Nov. 2010
- 40 members from 14 MS
- two sub-programmes: CO<sub>2</sub> Capture and CO<sub>2</sub> Storage

## European Industrial Initiative (EII) on CCS

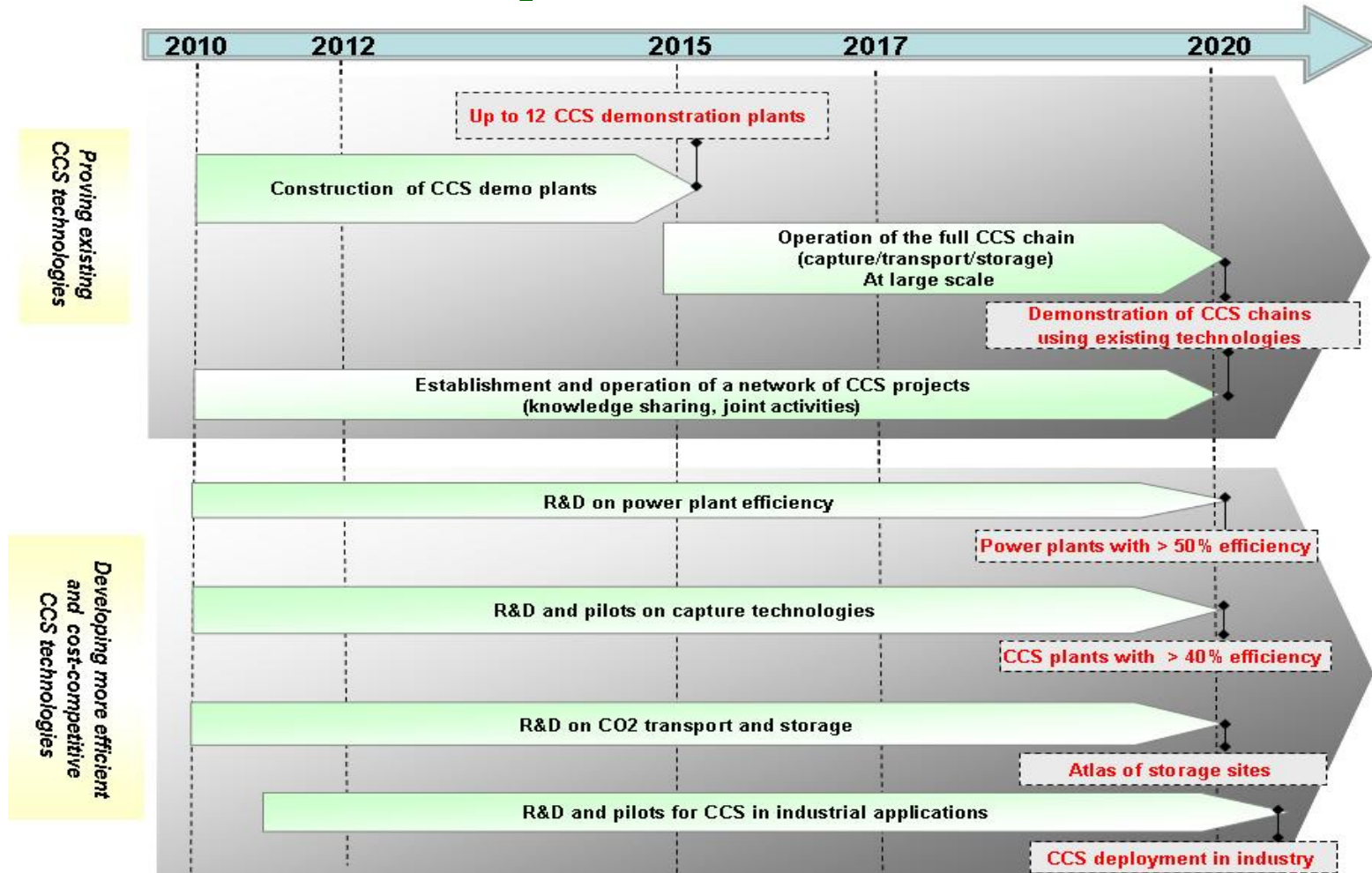
- Launched in June 2010
- EC, MS and industry committed to support:
  - The Technology Roadmap 2010-2020
  - The Implementation Plan 2010-2012
    - A new Implementation Plan is under preparation for 2013-2015

## European Energy Education and Training Initiative

- Kick-off of the Working group on CCS was on 7 March 2012-final report completed

# EI on CCS – Technology Roadmap 2010-2020

## *Innovation development and demonstration*



# **FP support of CCS and CCT research and development**

***FP5 & FP6: About 86 M€ spent on CCS and Clean coal***

***FP7 : 2.3 bn€ for Energy***

- ✓ ***About 180 M€ spent or earmarked for CCS and Clean Coal***
- ✓ ***About 28,5 M€ still available for CCS and Clean Coal in FP7***

## **FP7 support to CCS in 2013 continues**

**FP7 ENERGY -2013-1 call; indicated budget around 28,5M€:**

- **Scale-up of advanced high-efficiency capture processes (2x8M€)**
- **New generation high-efficiency capture processes (beyond the current horizon) - twinning with Australia, SME participation**
- **Mitigation and remediation in case of leakage of CO<sub>2</sub> from geological storage – safety protocols, industry participation**
- **Combined underground coal gasification and CO<sub>2</sub> capture & storage (targeted opening to SA, AU, USA, India, China)**
  - **Info Day - 4 July 2012**
  - **Publication of the call -10 July 2012**
  - **Closure - 28 November 2012 (one stage call)**

# DECARBit – Enabling advanced pre-combustion capture techniques and plants

- Project managed by SINTEF (Norway) with 16 partners from 8 countries including TIPS ( A.V.Topchiev Institute of Petrochemical Synthesis of Russian Academy of Science)
- Duration January 2008 to June 2012
- Total budget: € 15.5 million - EC contribution: € 10.2 million

## Objectives

- Assess and develop cost competitive capture techniques for CO<sub>2</sub> pre-combustion capture
- Decrease the cost of capture by development of most promising technique up to pilot scale and improve plant integration
- Assess the benefit of these capture techniques in other carbon intensive industries

# OCTAVIUS - Industrial Demonstration of Post-Combustion CO<sub>2</sub> Capture

- Project managed by IFPEN (FR) with 16 other partners including TIPS from Russian Federation
- Kick-off meeting on 14 March 2012 -Duration 5 years
- Total budget 13,5M€ - EC contribution 8M€
- Workshop on the research project on 13-14 February 2013 in SA

## Objectives

- First demonstration of post -combustion capture of CO<sub>2</sub> on a thermal power plant –scale by using amine-type solvents
- Demonstrate IFPEN's second generation post-combustion process on an industrial scale



# CoMeth - Coal Mine Methane – New Solutions for Use of CMM

- Project managed by Fraunhofer UMSICHT (Oberhausen, Germany) with partners from 5 countries including Siberian coal and Energy OJSC (SUEK) and Uglemetan Service (Kemerovo)
- Duration November 2008 to June 2012
- Total budget: € 4.45 million - EC contribution: € 3.04 million

## Objectives

- Comparison of technologies
- Test of the new CMM utilisation methods in Russia (use of low concentration CMM) and Poland (LNG)
- Decision guidelines

<http://wiki.umsicht.fraunhofer.de/cometh-wiki>



<http://www.cometh.info>

# Materials Roadmap Enabling Low-Carbon Technologies

***Materials Research Roadmap for Fossil Fuel Energy technology including CCS - Commission Staff Working Paper published on 13 December 2011***

- Focus on R&D and Innovation for 11 low-carbon energy technologies for the next 10 years
- Novel Materials for the fossil fuel energy sectors under Chapter 3.8. - [http://setis.ec.europa.eu/activities/materials-roadmap/Materials\\_Roadmap\\_EN.pdf/view](http://setis.ec.europa.eu/activities/materials-roadmap/Materials_Roadmap_EN.pdf/view)
- Based on scientific assessment – JRC report with in-depth analysis of the state of the art and future challenges for energy technology- related materials and needs for research activities- [http://setis.ec.europa.eu/activities/materials-roadmap/Scientific\\_Assessment\\_CCS\\_Fossil\\_Fuels/view](http://setis.ec.europa.eu/activities/materials-roadmap/Scientific_Assessment_CCS_Fossil_Fuels/view)

# EU FP7 call NMP 2012: Materials and new Production Technologies – CO2 Utilisation

- Call FP7- NMP Small 2012 - 2.2.-3 Advanced materials for high temperature power generation including coal-fired plants
- Call FP7 – NMP Small 2012 – 2.1.-2 Fine Chemicals from CO2 including further products from CO2
- Two stage procedure - first stage 8 November 2011- second stage 5 May 2012 – in negotiation
- Budget for NMP SMALL 2012 – 124 M€

<http://ec.europa.eu/research/participants/portal/page/cooperation?callIdentifier=FP7-NMP-2012-SMALL-6>

## Research Fund for Coal and Steel (RFCS)

- Budget of ~15 M€/year on industrial research
- Covers the entire value chain, from coal mining operation, conversion and processing, to CCT and CCS
- Open call for proposals, cut-off date 15th September every year
- Participants from third countries are welcome but not eligible for funding
- Flagship projects includes COMPTES700 (test facility for 700C power plant; 15M); ECLAIR (emission free chemical looping; 6.4M) and ENCIO (pilot to demonstration for 700 C technology)
- More details on: <http://cordis.europa.eu/coal-steel-rtd/>

## ENCIO ( RFCS funded)

### European network for component integration and optimisation – Flagship project

- Project coordinated by VGB PowerTech with 4 European partners
- Total cost: 24 M€, RFCS contribution 10 M€
- Project from 2011 – 2017

#### Objectives

- Transition from pilot to demo plant for 700°C technology, last step before construction of a 700°C power plant.
- To concentrate all scientific and technological efforts to make the 700°C technology ready for deployment in coal fired power plants.
- The project will focus on practical investigations, aiming at proving manufacturing, welding, repair and life-time concepts for thickwalled components. ENCIO can be seen as perfect transition from pilot towards demo features.

# Horizon 2020

- Commission proposal for a 80 billion euro research and innovation funding programme (2014-20)~ 5. 8 bn€ for secure, clean and efficient energy
- Following and extending the ideas of FP7
- Fosters the EU's strategy for growth and job creation
- Innovation Union Flagship Initiative supports Horizon 2020
- Research and innovation are the key drivers
- A huge technology shift is necessary to meet the targets of 2020 and moreover 2050



The aim will be to enable the commercial deployment of CCS technologies for fossil fuel power plants and other carbon-intensive industries going into operation after 2020.

Support will be given, in particular, to demonstrate the full CCS chain for a representative portfolio of different capture, transport and storage technology options.

- This will be accompanied by innovative research to further develop:
  - more competitive capture technologies, improved components, integrated systems and processes
  - safe geological storage and
  - rational solutions for the large-scale re-use of captured CO<sub>2</sub>



- Horizon 2020: continuation of public research efforts on CCS (and CCUS) as part of the SET plan priorities
- Interaction between research/pilot scale CCS projects and demo projects is important
- Further stakeholder interaction is needed in order to extend CCS to other carbon-intensive industries
- Continuation of international cooperation efforts on CCS and Clean Coal research
- Knowledge sharing at international level has to be continued and further promoted
- Public awareness and acceptance of CCS



# International dimension of Horizon 2020

- *New approach enhancing and focussing EU international cooperation in research and innovation*
- *Strategic choice of partner countries and regions with more targeted actions based on common interest and mutual benefit*
- *More strategic use of S&T agreements with key third countries*
- *Internationalisation of programmatic approaches*
- *Rationalised set of instruments like joint and targeted calls and co-funding of programmes*
- *Continuation of international cooperation efforts on CCS and Clean Coal research*



**Thank you for  
your attention!**