



FP7 and RFCS

Clean Coal and Carbon Capture and Storage

European Commission, DG Research

Lionel BOILLOT



1st International Conference on Chemical Looping





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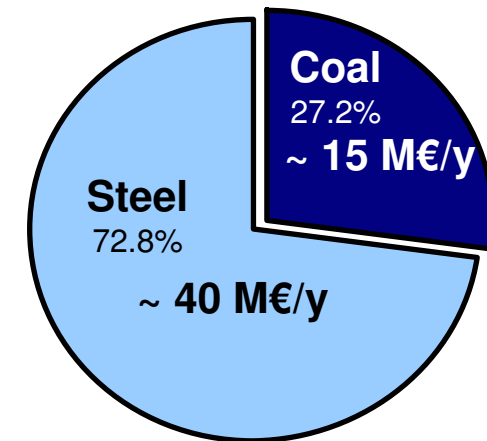
WHAT is the RFCS Programme?

A research fund with a budget of ~55 M€/year...

Promoting industrial research

Open call for proposals for

- ✓ Research projects (60% funding)
- ✓ Pilot & Demonstration projects (50% funding)
- ✓ Accompanying measures



RFCS funding allocation

Deadline: in principle, September 15th of each year



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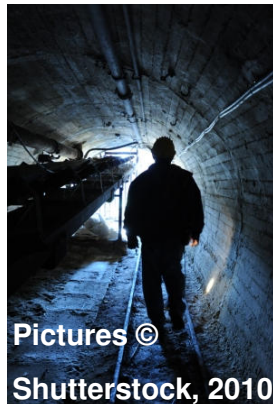
RFCS COAL: Research Programme Objectives

Management of external dependence on energy supply

Improving the competitive position of Community Coal

Health and Safety in Mines

Efficient protection of the environment & improvement of the use of coal as clean energy source



Coal means: Hardcoal - Lignite - Coke - Oil shales

1st International Conference on Chemical Looping

17-19 March 2010



Research Fund
for Coal & Steel

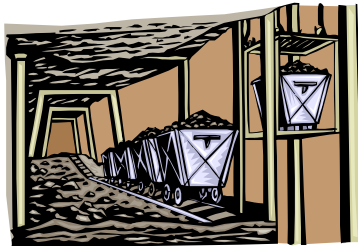


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RFCS - COAL research: Funding distribution & activities

RFCS funding for COAL projects from 2003 to 2010*: 119.7 M€



SOURCING

CONVERSION

COMBUSTION

39%

47 M€

21%

25 M€

40%

48 M€

- Coal mining
- CO₂ geol. storage
- Underground gasification

- Coal preparation
- Coal gasification
- Synfuels
- ...

- Clean coal tech.
- CO₂ capture
- Co-combustion
- ...



1st International Conference on Chemical Looping
(*) 2010 provisional figures

17-19 March 2010



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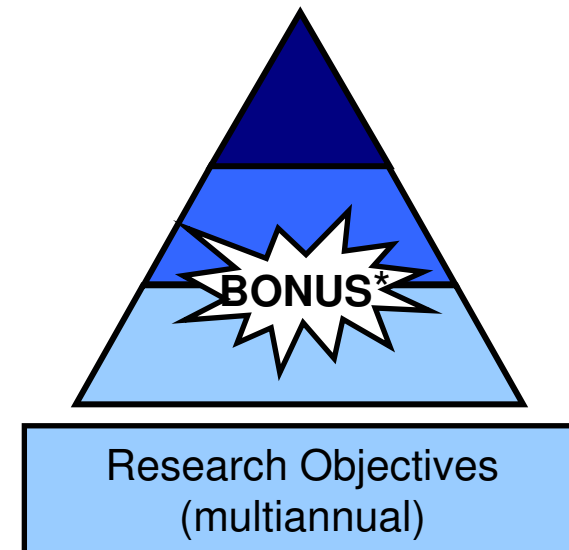
RFCS - WHO can participate?

- ✓ Any legal entity established in the EU27 Member States
- ✓ No threshold nor limit on budget & consortium size
- ✓ Partners outside EU27 are welcome but not eligible for EC funding

Evaluation

- ✓ On-site
- ✓ 5 criteria scored from 0 to 5
- ✓ + 1 point BONUS if priority
- ✓ **Success rate ~ 30%**

Selected proposal





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RFCS Annual Priorities COAL 2010



SOURCING

- *Automation or process optimisation*
- *Geomechanics*
- *Safety (ventilation)*



CONVERSION

- *Coal gasification*
- *Coal carbonisation*
- *Coal preparation*

COMBUSTION

- Technological improvements targeting enhanced efficiency of coal fired power plants.
- Novel CO2 capture technologies for retrofitting to existing coal power plants.
- Pilot project validation of emerging and innovating technologies leading to efficiency improvements and CO2 capture





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RFCS Project Life cycle

Proposal

- Evaluation
- Negotiations

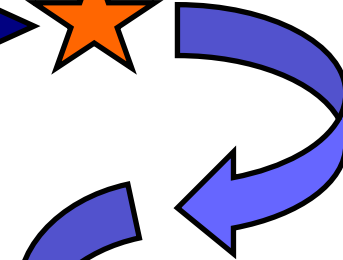


Decision

40% €

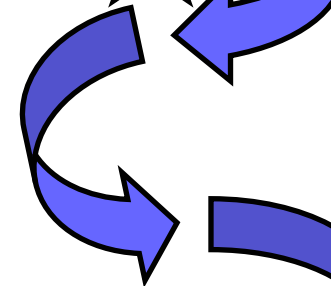
Project

- Technical Reports
(Annual, Mid-term and Final)
- Financial Statements
(Mid-term and Final)



Mid-Term

40% €



Final

20% €

Results

- Publication





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RFCS Flagship projects

COMTES700

Component Test Facility
for a 700°C Power Plant

- ✓ Testing of advanced materials
- ✓ Budget: 15 M€ (initial) - 40% by RFCS
- ✓ 17 partners from 6 EU countries
- ✓ Final Objective:

$\eta > 50\%$ Coal Power Plant



Plant: E-ON Scholven F, Gelsenkirchen (D)

ECLAIR

Emission free chemical looping
coal combustion process

- ✓ Budget: 6.4 M€ - 35% by RFCS
- ✓ 8 partners from 4 EU countries + CH, NO
- ✓ 48 months
- ✓ Final Objective:

Demonstrate the CLC performance

- 100kWth pilot + 1MWth prototype



Research Fund
for Coal & Steel

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FP activities in Clean Coal and Carbon Capture & Storage

The EU Framework Programmes...in CCT / CCS

- ✓ FP5 = 16M€ (1998-2002)
- ✓ FP6 = 70M€ (2002-2006)
- ✓ **FP7 = 62 M€ spent/earmarked so far (2007-2013)**

... and more

- ✓ **European Technology Platform on Zero Emission Fossil Fuel Power Plants** was launched on 1 December 2005
- ✓ Membership in the **Carbon Sequestration Leadership Forum (CSLF)**
- ✓ **The International Energy Agency (IEA)**
- ✓ **Bilateral cooperation** in the frame of agreements on science and technology with e.g. US, Japan, China, India, Canada, Australia.



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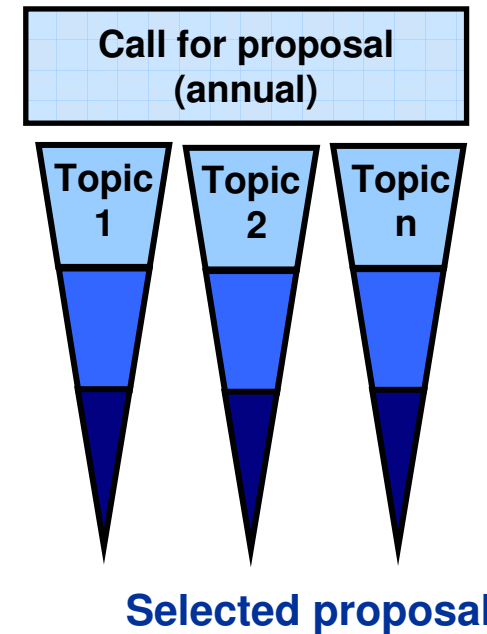
FP Participation?

Participation

- ✓ Annual Calls
- ✓ Types of supported actions:
 - ✓ *Research and Technological development*
 - ✓ *Demonstration activities*
 - ✓ *Other activities*
- ✓ Funding rates depend on type of beneficiary
- ✓ Large cooperation

Examples of funded research

- ✓ Advanced capture techniques
- ✓ Qualification of deep saline aquifers
- ✓ Public acceptance
- ✓ Gas turbines in IGCC power plants
- ✓ Efficiency increases in pulverized coal power plants
- ✓ Support to regulatory activities for CCS





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FP Flagship projects

CASTOR

CO₂ CAPture and STORAge

- ✓ Post-combustion capture, geological storage, strategy for CO₂ reduction
- ✓ **Budget: 15.8 M€ - 8.5M€ by FP**
- ✓ **29 partners** from EU27 + NO
- ✓ **Final Objective:**
Capture and geological storage of 10% of EU CO₂ emissions



ENCAP

Enhanced CAPture of CO₂

- ✓ **Pre-combustion decarbonisation technologies**
- ✓ **Budget: 22.2 M€ - 10.7M€ by FP**
- ✓ **27 partners** from EU27 + CH, NO
- ✓ **60 months**
- ✓ **Final Objectives:**
> 90% of CO₂ captured
50% capture costs reduction





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RFCS ↔ FP

“Bottom-up”
No exclusion of subjects

APPROACH

“Top-down”
Pre- defined subjects

Open Call
Continuity of subjects

PROCEDURE

Annual Call
Changing priorities

Industry
No studies, FEED's, policy maps etc

RFCS

SECTORAL FOCUS

FP

Policy-Industry-Society
Wider thematic span

% of ~15M€ per year

BUDGET FOR CCT/CCS

62M€ spent/earmarked so far (FP7)

ST / MT / LT

TIME HORIZON

ST/MT & MT/LT



Research Fund for Coal & Steel

Whole value chain

SCOPE

Downstream Application



SEVENTH FRAMEWORK PROGRAMME



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Change from “business as usual”

Technology is vital to achieve the ambitious aims of the Energy and Climate Change package (3 x 20%)



- ✓ Time is of the essence
- ✓ While successful, the Framework Programme is NOT sufficient to meet the challenges
- ✓ A collective action of all interested countries and involved stakeholders is needed



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SET-Plan

The essence of the SET-Plan

- ✓ A tool to reach ambitious EU energy policy objectives through accelerating the development of low carbon technologies

The main elements

- ✓ Joint strategic planning
- ✓ Increase in resources, both financial and human.
- ✓ Reinforced international cooperation
- ✓ **Effective implementation: European Industrial Initiatives, European Energy Research Alliance, Trans-European Energy Networks and Systems of the Future**



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Towards early demonstration



European Industrial Initiative on CCS

- ✓ A set of full-scale demonstration projects covering a wide range of CCS technologies, EU-wide
- ✓ Prepare the way for fully commercial implementation

Network of CCS Demo projects



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Web links

RFCS



- ✓ **Website:** <http://cordis.europa.eu/coal-steel-rtd/>
- ✓ **Information Package:** http://cordis.europa.eu/coal-steel-rtd/infopack_en.html
- ✓ **Latest published technical reports:** <http://bookshop.europa.eu/>

FP7



- ✓ **Website:** http://cordis.europa.eu/fp7/home_en.html

SET-Plan

- ✓ **Website:** <http://setis.ec.europa.eu/>

RFCS and FP7

- ✓ **Enrol as an expert for proposals evaluation:**
<https://cordis.europa.eu/emmp7/index.cfm?fuseaction=wel.welcome>



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***Thank you for
your attention***

***And...
Good Luck !***

Contacts

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