CO₂ Transportation Summit 2010
Translating the Potential into the Commercial

23-24 November 2010 • The Manhattan Hotel, Rotterdam, The Netherlands

Hear From the Top CCS Operators:
Vattenfall
E.ON
GDF Suez
Fortum

Get the latest insight from the European Commission:
Chris Bolesta
Directorate General for Energy
EUROPEAN COMMISSION

Conference Chairs:
Professor Haroun Mahgerefteh
UCL
Mike Bilio
Special Inspector, HSE

Benchmark with your European counterparts as they uncover solutions to solve the complex technical, regulatory and PR challenges of CO₂ transportation. Gain critical insights into:

• The legislative framework for CO₂ transport and geological storage in Europe
• Strategies for CO₂ pipeline infrastructure finance
• Technical, regulatory and financial challenges around implementing CO₂ EOR offshore
• Cutting-edge developments from Project ROAD with E.ON
• Transporting CO₂ by ship: what are the challenges, where are the opportunities?

Post Conference Workshop:
‘How Can CCS Transport Networks Be Delivered?’

Led by:
Harsh Pershad
Senior Consultant, ELEMENT ENERGY

To register call +44 (0) 20 7878 6888 or register online at www.C5-Online.com/Carbontransport
Despite the inarguable fact that CCS technology is being more and more widely accepted, the transportation component, vital for the overall growth of the industry, has been largely neglected - until now. Evaluating the pros and cons of pipeline and shipping methods of CO₂ transportation is becoming increasingly important as the fast paced power and energy industry embrace the Kyoto Protocol and reduce emissions. As we progress with implementing CCS, CO₂ transportation must be given the highest priority to realize the commercial opportunities within the sector, which is why C5 has developed the very first CO₂ Transportation Summit designed to bring together the key industry stakeholders to share the fresh experiences and exciting innovations that are driving the sector right now.

Whether you are interested in building, retrofitting or in financing a workable pipeline infrastructure network, or in transporting CO₂ by ship, this programme will identify the safest and most cost effective methods for transporting CO₂ and help you evaluate the opportunities. This program will combine regulations and policy, as well as safety and technology to give you the best overview of CO₂ transportation as we move into 2011. Gather not only an insider's view of up-to-the-minute ground-breaking CO₂ transportation strategies, but open up the opportunity for you to personally meet and network with your peers.

Leading authorities will share their knowledge and experience with specifically tailored case studies including:

- What funds are available and are they sufficient to move the industry forward?
- Making the business case for CO₂ shipping: do the numbers really add up?
- Investigating consequences of CO₂ composition from oxyfuel mixed with CO₂ composition from IGCC
- How implementing CO₂ EOR in offshore fields compares with current successful implementation of CO₂ EOR onshore in the USA
- Financing projects using a recovery package plus Emission Trading Scheme (ETS)

Don't miss our special session: Creating a Successful CCS Transport System – the View from Vattenfall

You simply cannot afford to miss the ONE conference your colleagues – and competitors – need to attend. Join us at the inaugural CO₂ Transportation Summit 2010 for an unparalleled learning and networking opportunity.

Call us on +44 (0) 20 7878 6888
Fax your registration form to +44 (0) 20 7878 6896
Register online at www.c5-online.com/Carbontransport

The CO₂ Transportation Summit 2010 is a must for leading industry players in the pipeline, shipping and construction industry including:

- Power plant operators
- Oil and gas operators
- Pipeline manufacturers
- Pipeline engineers
- Port and terminal representatives
- Gas plant engineers
- Shipbuilders and shipbrokers
- Financial and legal professionals
- Academic institutions
- Regulators

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C5, along with our affiliate organisations in New York, American Conference Institute (ACI) and in Toronto, The Canadian Institute (CI), works closely with sponsors to create the perfect business development solution catered exclusively to the needs of any practice group, business line or corporation. With over 500 conferences held in Europe, Russia and the CIS, China, India, the US and Canada, C5, ACI and CI provide a diverse portfolio of first-class events tailored to the senior level executive.

For more information about this program or our global portfolio, please contact Brian Reffell on +44 (0)20 7878 6933 or email b.reffell@C5-Online.com
08:15 Registration and Coffee

09:00 Opening Remarks from the Chair

Mike Bilio
Special Inspector, HSE

09:10 Understanding How the Latest Developments in Pan-European CCS Initiatives Impact Your Project Strategy

Maarten de Hoog
Director of Industry, DCMR (Rotterdam Climate Initiative)

Weero Koster
Partner, NORTON ROSE

Ian Phillips
Director CO₂ Infrastructure, CO₂ DeepStore

• How do the latest developments affect business strategy for operators?
• What will the 300 million Euros from the EU Emissions Trading Scheme for CCS demonstration projects go towards?
  - how to be the project selected for funding?
• Focusing business strategy to operate CCS in Europe by 2015
  - how close are we to hitting this target?
  - what are the main barriers?
• What is the proposed CCS strategy of the new UK government?
  - developing 4 CCS projects funded by the governments CCS levy
  - what is the future for CCS funding in times of austerity?
  - will any future funding include CCS networks for transporting CO₂?
  - how is the rest of Europe affected by this proposed strategy?
• An overview of the role of infrastructure in terms of enabling future projects to be developed
  - who is doing what and where?
  - best practises from the natural gas industry?
  - what are the lessons learned? what have been pitfalls and innovations?

10:00 The Very Latest CCS Strategy of the European Commission

Chris Bolesta
Directorate General for Energy
EUROPEAN COMMISSION

• What is the legislative framework for CO₂ transport and geological storage
• Financing projects using a Recovery Package plus Emission Trading Scheme (ETS)
• Developing demo projects to prove technology commercially viable around 2020
• What is the current latest development in the deployment of CO₂ infrastructure
• Best practice knowledge sharing to generate synergies

11:00 Financing a CO₂ Pipeline Infrastructure

Tom Greenwood
CCS Analyst, BLOOMBERG ENERGY FINANCE

Jim Fitzgerald
Director, ERNST AND YOUNG

• What funds are available and are they sufficient to move the industry forward?
• What are private investors looking for?
  - what should we expect as liquidity comes back?
  - impact of carbon price movements
• Possible areas for government intervention
  - would PPP structures help or hinder?
  - possible risk sharing models between emitters transporters and storers
• What are the latest developments from the Rotterdam Climate Initiative?

12:00 Establishing a Widespread European CO₂ Transportation Pipeline Network

Harsh Pershad
Senior Consultant, ELEMENT ENERGY

Filip Neele
Project Leader, TNO

• Challenges and opportunities for the development of integrated CO₂ pipeline infrastructure
• What is the timeline of the development of EU transport infrastructure?
• What are the volumes and distances?
• Where are the storage areas in Europe?
• How can we ensure efficiency in infrastructure development from the first projects onward?
• What are the CO₂ pipeline requirements for CCS?
• What are the costs involved?
  - pipeline costs
  - material costs
  - cost implications for network development?

13:00 Creating a Successful CCS Transport System: The View from Vattenfall

Jenny-Ann Nilsson
Consultant, VATTENFALL

• What are the barriers for building a CO₂ infrastructure?
• Safety and protection distances and measures for CO₂ pipelines in Europe
• Investigating consequences of CO₂ composition from oxyfuel mixed with CO₂ composition from IGCC
• Finding ways to investigate physical behaviour and material impact of CO₂ composition in ship transport
• “Latest news” as of November 2010

13:30 Lunch

14:30 Capture, Transport and Storage of CO₂ that comes from Biomass: A Technical and Economic Assessment of the System

Antonin Fabri
Research Engineer, BRGM

This presentation will deal with an alternative CCS system where the CO₂ to be stored comes from biomass instead of fossil fuels. The goal is to estimate the feasibility of its application on bio-refineries in the Paris Basin, France.
15:00 Using CO₂ Shipping as a CCS Enabler

Klass Kersemakers
Business Development Manager, ANTHONY VEDER

- Anthony Veder: a brief introduction to the company and latest developments
- Anthony Veder CO₂ shipping and CCS
  - past, present and future
- Liquid CO₂ shipping
  - an introduction to the concept
  - what advantages are there?
  - how can this concept be applied?
- Next steps needed in CCS market: what hurdles are needed to be overcome?

15:20 Transporting CO₂ by Ship: What are the Challenges, Where are the Opportunities?

Klass Kersemakers
Business Development Manager, ANTHONY VEDER

Joonas Raumaro
Business Development, FORTUM

Ernest Groensmit
Business Development Manager, VOPAK

Maurice Hanegraaf
Senior Consultant, ROTTERDAM CLIMATE INITIATIVE

- Making the business case for CO₂ shipping: do the numbers really add up?
  - how is the role of shipping viewed by operators?
  - what is the commercial potential of CO₂ shipping?
  - is it a long or short term solution?
  - how does it compare to pipeline transportation?
  - how can CO₂ shipping benefit your business
  - striking the correct balance: how will shipping complement CO₂ pipeline transport?
  - what figures are we talking about and what is the scale of the operation?
- Exploring large scale transport of CO₂
  - outlining existing CO₂ fleet for use today?
  - what are the specific numbers?
  - examining the technical challenges involved
  - exploring offshore discharge concepts
  - is the transport at a higher pressure than LNG
- What are the financial benefits of CO₂ shipping?
  - understanding what the business case is for CCS?
  - understanding the flexibility that CO₂ shipping offers for the operator
  - what steps have Fortum taken in realising CO₂ shipping as the primary method for transport?
  - how do we maximise ROI for stakeholders?
- Overcoming the technical challenges of dual purpose vessels?

(afternoon refreshments will be taken at a suitable point during this panel discussion)

16:45 Chairman’s Closing Remarks and Conference Adjourns

DAY TWO – WEDNESDAY, 24th NOVEMBER

08:15 Registration and Coffee

09:00 Opening Remarks from the Chair

Professor Haroun Mahgerefteh
UCL

09:10 Thermodynamic Behaviour of CO₂ in Pipelines and Injection Systems

Daan D’Hoore
Project Leader, GDF Suez

- Uncovering the phase behaviour of CO₂
- What are the effects of gravity?
- Behaviour of CO₂ during injection in empty gas reservoirs
- Pressure and temperature calculations in well tubing and well head
- Results from single phase (gas) injection: warm injection
- Results from two phase injection (cold injection)
- How do these results affect business strategy?

09:50 CCS Project ROAD Update: The View From E.ON

Andy Read
Capture Director Maasvlakte CCS Project, E.ON

In February 2009, E.ON announced that it had teamed up with the Rotterdam Climate Initiative to add CCS to the Maasvlakte plant. This stand out case study based presentation will delve into the latest developments from the Maasvlakte CCS project in the Netherlands, with a special focus on CO₂ transportation.

10:30 Morning Refreshments

11:00 OCAP: The Solution for CO₂ Transport – The View From an Industrial Gas Supplier

Fred Hage
Director, LINDE GAS

- Treating CO₂ as a waste or valuable product and why this is important
- CO₂ applications in general and what does the future hold?
- What are the CO₂ quality issue considerations for storage and reuse?
- CO₂ transportation: truck, ship or pipeline?
- OCAP: an existing CO₂ pipeline grid contributing to a long term CCS solution
- A proposal for CO₂ transportation and storage

11:40 New Pipeline Safety Regulations in the UK

Caroline May
Partner, NORTON ROSE

- What are the current regulations and how will they change?
- How do the regulations compare with Denmark, Holland, France and Germany
- What does the regulator expect for CO₂ pipeline design?
- What are the European Commission’s plans on wider regulation?
- What are the legal issues?

12:20 Lunch

13:30 Safety Challenges Associated with the Next Generation CO₂ Pipelines

Professor Haroun Mahgerefteh
UCL

This presentation presents an overview of some of the unique technical and operational challenges associated with the safe and economical transportation of captured CO₂ using pressurised pipelines. The topics include:
• Impact of impurities on the CO₂ phase equilibrium behavior and equations of state
• Ductile and brittle fracture propagation
• Hydrate formation
• Corrosion
• Explosive decompression

The presentation concludes with a progress overview of the European Commission FP7 CO₂ PipeHaz designed to address some of the above issues. Led by UCL in collaboration with scientists, industrialists and legislative organizations in France, Greece, Norway and the UK the project involves the controlled rupture of an industrial scale CO₂ pipeline in China to validate rupture of an industrial scale CO₂ pipeline in Greece, Norway and the UK the project involves the controlled rupture of an industrial scale CO₂ pipeline in China to validate rupture of an industrial scale CO₂ pipeline in Greece, Norway and the UK the project involves the controlled rupture of an industrial scale CO₂ pipeline in China to validate rupture of an industrial scale CO₂ pipeline in Greece, Norway and the UK the project involves the controlled rupture of an industrial scale CO₂ pipeline in China to validate rupture of an industrial scale CO₂ pipeline in Greece, Norway and the UK the project involves the controlled rupture of an industrial scale CO₂ pipeline in China to validate rupture of an industrial scale CO₂ pipeline in Greece, Norway and the UK the project involves the controlled rupture of an industrial scale CO₂ pipeline in China to validate rupture of an industrial scale CO₂ pipeline in Greece, Norway and the UK the project involves the controlled rupture of an industrial scale CO₂ pipeline in China to validate rupture of an industrial scale CO₂ pipeline in Greece, Norway and the UK the project involves the controlled rupture of an industrial scale CO₂ pipeline in China to validate rupture of an industrial scale CO₂ pipeline in Greece, Norway and the UK the project involves the controlled rupture of an industrial scale CO₂ pipeline in China to validate rupture of an industrial scale CO₂ pipeline in Greece, Norway and the UK the project involves the controlled rupture of an industrial scale CO₂ pipeline in China to validate rupture of an industrial scale CO₂ pipeline in Greece, Norway and the UK the project involves the controlled rupture of an industrial scale CO₂ pipeline in China to validate rupture of an industrial scale CO₂ pipeline in Greece, Norway and the UK the project involves the controlled rupture of an industrial scale CO₂ pipeline in China to validate rupture of an industrial scale CO₂ pipeline in Greece, Norway and the UK the project involves the controlled rupture of...
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Date: 23 - 24 November 2010

Time: 08:15 - 16:30

Venue: The Manhattan Hotel

Address: Weena 686, 3012 CN Rotterdam

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11.0 hours (conference only) plus 3.0 hours per master class towards Continuing Professional Developments hours (Solicitors Regulation Authority). Please contact C5 for further information on claiming your CPD points.

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