



**29 March 2011**  
**Moscow, Russia**

**ROUND TABLE**  
**Cooperation in carbon capture and storage: demonstration and commercialization of technologies**

**A workshop co-hosted by:**  
International Energy Agency  
NRMC- Skochinsky Institute of Mining

**And supported by:**

Department of Coal and Peat Industry - Ministry of Energy of the Russian Federation  
Siberian Coal Energy Company (SUEK)  
Academy of Mining Sciences

**Venue: Vernadsky State Geological Museum**  
**Building 2, 11 Mokhovaya Str.**  
**(Okhotny Ryad metro station)**



МИНИСТЕРСТВО ЭНЕРГЕТИКИ  
РОССИЙСКОЙ ФЕДЕРАЦИИ



## **Background: The Need for CO<sub>2</sub> Capture and Storage (CCS)**

The International Energy Agency's *Energy Technology Perspectives* report indicates that existing energy policies will see CO<sub>2</sub> emissions increase by 130% between now and 2050, mainly due to higher levels of fossil fuel consumption. Fossil fuels are expected to remain the main global energy source, especially in emerging economies where coal is abundant. An energy technology revolution is needed to address this unsustainable pattern. In particular, we must increase energy efficiency, decarbonise the power sector and revolutionise transportation. CCS is one of the most promising options for decarbonising power generation and industry, with CCS projected to deliver 20% of the total CO<sub>2</sub> savings needed to cut global emissions by 50% by 2050. In particular, CCS holds great potential for coal- and gas-fired power plants, as well as for some activities in the industrial sector, such as cement, steel and chemical production. However, while CCS holds great promise, more needs to be done in major fossil-fuel economies to demonstrate and commercialise CCS technologies. The G8 leaders called upon the IEA to increase global collaboration on CCS, with the aim of accelerating lessons learned from early CCS projects.

## **Introduction to the workshop**

The International Energy Agency (IEA), the leading international source of analysis and information on energy technology solutions for climate change. It has developed a series of technology roadmaps that identify key technology, policy, financing, and public awareness milestones for a suite of important climate change mitigation technologies. One of the most important technologies for international collaboration is carbon dioxide capture and storage (CCS), which the IEA believes will need to deliver fully one-fifth of the necessary greenhouse gas (GHG) emissions reductions to achieve global GHG stabilization by 2050.

Russia is an important partner given its well-established coal industry, technical expertise and an interest in identifying new clean coal technologies. The IEA seeks to engage key stakeholders from the government, business and NGO sectors in Russia to facilitate discussions on global CCS development and possible CCS-related R&D in Russia.

## **The goals of this meeting are:**

- Share knowledge of international trends on CCS
- Learn Russian perspectives on CCS—challenges and opportunities
- Identify areas for international collaboration with Russia on CCS R&D
- Update IEA assumptions on CCS development up to 2020 (?)

## **Questions to be addressed at the workshop**

- Global energy outlook and the role of Russia;
- How does improved power plant efficiency fit with emerging CO<sub>2</sub> capture and storage (CCS) technologies?
- What opportunities are there to demonstrate and deploy CCS in Russia?
- Should governments give policy support to improving the efficiency of power generation and deploying CCS?
- Does Russia have favourable conditions for CCS (location of capture and storage sites, experience with pipelines, new coal technologies facilitating capture, etc.)?

## **Technology demonstration and research**

- Are there any CCS-related pilot projects under development/planning in Russia?
- What CO<sub>2</sub> capture technologies are these projects using (e.g., oxyfuel, post-combustion, or pre-combustion capture)?

- Has there been any investigation into CO<sub>2</sub> storage options and capacity (e.g., enhanced oil/gas recovery, saline formation)?
- Which parties are involved (government, industry)?

#### **Financing**

- What are the financing needs and options for CCS demonstration in the region?
- How much public and private funding is needed for demonstration?
- Are there self-financing models for CCS demonstration in the region?
- How should CCS deployment be financed?

#### **Regulatory Issues**

- What are the regulatory issues associated with CO<sub>2</sub> capture, transport and storage?
- Have there been any regulatory developments to support the early pilot projects (e.g., permits, environmental impact assessments, monitoring requirements)?

#### **CCS awareness**

- What is the current status of government and business awareness and education in the region?
- What is the most effective way to exchange CCS knowledge with stakeholders in the region?
- What is the current status of public awareness and education in the region?

#### **International cooperation**

- What type of cooperation are companies and governments looking for (e.g. format, outcome, etc)?

**Tuesday, 29 March, 2011**  
**Moscow, Russia**  
**Vernadsky State Geological Museum**  
**Building 2, 11 Mokhovaya Str.**

The sessions will be chaired by:

**Juho Lipponen** – International Energy Agency

**Dr. I. Levankovsiy** – Acting Director General NRMC – Skochinsky Institute of Mining

*Each session will be started by a short 10-15 minute presentation to identify issues for the session and provide an update on recent developments, then followed by several 5 minute responses from international and Russian stakeholders on their experiences with the identified issues and then followed by a general discussion.*

**09:00 - 09:30            REGISTRATION OF PARTICIPANTS**

**09:30 - 9:50            WELCOME ADDRESS**

*Mr. K. Alekseev, Ministry of Energy of the Russian Federation*

*Juho Lipponen, Head, CCS Unit, International Energy Agency*

*Dr. I. Levankovsiy – Acting Director General NRMC – Skochinsky Institute of Mining*

**9:50-11:00            SESSION 1: CCS - SETTING THE STAGE**

**Innovative and technical developments of the economy and the effects on the developments in the energy sector** *Y.A. Plakitkin, Russian Institute of Energy Studies*

**Carbon Capture and Storage: Potential, Progress and Challenges,** *Juho Lipponen, Head, CCS Unit, International Energy Agency*

*Discussion*



ИМ.А.А.СКОЧИНСКОГО

11:00-11:15 Coffee-break



11:15-12:15 **SESSION 2: ROLE OF CCS. LATEST TECHNOLOGY DEVELOPMENTS**

**Carbon Sequestration in 3<sup>rd</sup> Generation Biofuel Production**, Mr. Puchkov,  
*Ministry of Education and Science*

**Current status and application of CO<sub>2</sub> capture, transport and transportation technologies**

*Brief reports and discussion:*

- **Current CO<sub>2</sub> capture technologies**, *Juho Lipponen, IEA*
- **CO<sub>2</sub> storage: estimates, challenges, needs**, *Tsukasa Yoshimura, IEA*

12:15 -13:15 **SESSION 3: POLICY, REGULATIONS, COST, INCENTIVES**

**Incentives for CCS, Regulatory Requirements**, *Ellina Levina, IEA*

**GHG mitigation priorities in Russia**, *Igor Kozhukovsky, Director General, Energy Forecasting Agency*

*Brief reports and discussions:*

- **Energy Efficiency Projects in Light of Financing Mechanisms and Kyoto Protocol**, *V.Y. Yuvonin, Federation Council*
- **Olli Pirkanniemi**, Head of Science, Technology, Transport, Energy and Environment Section of the EU Delegation to Russia
- **James Godber**, *DECC, UK*

13:15-14:00 LUNCH

14:00-15:00 **SESSION 4: EARLY OPPORTUNITIES FOR CCS IN THE RUSSIAN COAL SECTOR**

**Role of Standardized Coal Fuel in the Realization of the Clean Coal Energy Programme**, *B.I.Linev, Institute for the Enrichment of Solid Fuel*

*Brief reports and discussions:*

- **Mr. Ryabov**, *All Russia Heat Technical Institute (VTI)*
- **Mr. Gitarsky**, *Institute of Climate*
- **Mr. Butenko**, *SUEK*
- **Dr. Harchenko**, *Moscow State University*

**15:00-15:45            SESSION 5: INTERNATIONAL COOPERATION IN CCS**

*«Knowledge sharing experience», Derek Taylor, GCCSI*

*Brief reports and discussions:*

- **James Godber**, *DECC, UK*
- **I.O. Solovyev**, *General Electric & Energy*

**15:45-16:00            CLOSING REMARKS AND CONCLUSIONS**

**Juho Lipponen**, *International Energy Agency*

**Dr. I. Levankovskiy**, *NRMC – Skochinsky Institute of Mining*

**16:00    RECEPTION**