

# WORKSHOPS

## **Natural Gas as a Climate Change Solution:**

Breaking down the barriers to methane's expanding role



## **Increasing the Pace of Technology Innovation and Application:**

Enabling Climate Change Solutions



**Workshop Programme**  
Key Bridge Marriott, Washington, DC, USA  
26-28 September 2006

IPIECA is grateful for the additional sponsorship from:



**ExxonMobil**



**26 September 2006**

## **Natural Gas as a Climate Change Solution:**

Breaking down the barriers to methane's expanding role

Methane has the potential to play a significant role in a carbon-constrained energy future as a relatively low-carbon fuel source. While much of the technology necessary to increase the supply of methane to the energy market exists today, the application of that technology faces an array of commercial, political, environmental and social barriers before its full potential can be realised. In addition, continued research and development of the technology necessary to commercialise "unconventional" gas holds the promise of unlocking future reserves.

This one-day workshop will focus on the barriers to bringing methane to market, with attention to both increasing supply and decreasing fugitive methane emissions, on the current strategies for breaching these barriers and on case studies that highlight successful implementation of these strategies.

Co-sponsored by the Methane-to-Markets Partnership, US EPA and IPIECA, this day will serve as an in-depth look at the factors influencing the pace of methane development and delivery and will touch on a number of the themes addressed in the Pace of Technology workshop.

### **Workshop Overview**

Key Bridge Marriott, Washington, DC, USA

#### **25 September**

19:00 - 19:30	Workshop Registration	Potomac Foyer
19:30 - 20:30	Welcome Reception	Potomac CD

#### **26 September**

08:30 - 17:30	Workshop Registration	Potomac Foyer
08:30	Workshop Opens	Potomac AD
10:30	Session 2 Begins	Potomac AD
12:30	Lunch, Methane to Markets Natural Gas STAR International Signing Ceremony	Potomac Foyer
14:00	Session 3 Begins	Potomac AD
17:30	Workshop Close	
19:00	Workshop Dinner	Potomac CD

08:30	Welcome	Arthur Lee (Chevron, IPIECA CCWG Chairman, USA)
08:35	Introduction to Workshops	Haroon Kheshgi (ExxonMobil, USA)
08:45	Workshop Scene Set / Speaker Introduction	Roger Fernandez (EPA, USA)

**Session 1: Overview, Opportunities and Barriers**

Fossil fuels represent the only realistic option for meeting global energy demand within the foreseeable future. Access to affordable energy is critical for maintaining living standards in the developed world and for helping countries in the rest of the world meet their development aspirations. At the same time, the risks associated with climate change represent legitimate environmental/socio-economic concerns that must be addressed. Natural gas, as a low carbon fossil fuel, is uniquely positioned to meet this dual challenge. Session 1 of the workshop will provide an overview of the potential for natural gas to help meet the energy/climate change challenge and will review the technological, commercial and social barriers to realizing that potential.

09:00	Introduction by Session Chair	Roger Fernandez (EPA, USA)
09:05	Role of methane in addressing climate change	John Reilly (MIT, USA)
09:35	Overview - Barriers to increasing supply and decreasing emissions	TBA
10:10	Break	

**Session 2: Addressing the Barriers, Initiatives**

The barriers to methane capture and production are not new to either resource owners or the energy industry. Over the years a number of government and government/private sector initiatives have been created with the goal of bringing down the barriers to delivering methane to market. These initiatives have adopted a variety of strategies for meeting that goal, from enhancing technology and knowledge transfer to monetizing the value of GHG reduction associated with methane recovery to streamlining the political and commercial aspects of natural gas development. This session and the panel discussion to follow will focus a critical eye on three such initiatives, looking at both their strengths and weakness for facilitating either increased natural gas production or decreased natural gas emissions.

10:40	Introduction by Session Chair	Bruce Wilcoxon (ConocoPhillips, USA)
10:45	US EPA Natural Gas STAR and MtM	Dina Kruger (EPA, USA)
11:10	CDM/JI and Methane	Collins Gardner (Presidential Implementation Committee on CDM, Nigeria) - TBC
11:35	GGFR	Francois Mouton (World Bank, USA)
12:00	Discussion	
12:30	Lunch, Methane to Markets Natural Gas STAR International Signing Ceremony	
	<p>This will mark the beginning of Natural Gas STAR International, an EPA program under the Methane to Markets initiative. This program provides a framework for identifying, implementing and tracking cost-effective methane emission reduction projects in the global oil and natural gas sector. The Administrator of the U.S. Environmental Protection Agency is invited to attend. All workshop delegates are welcome to attend the ceremony and luncheon.</p>	

**Session 3: Addressing the Barriers, Select Case Studies**

The barriers to natural gas capture, supply and delivery may be grouped into three broad categories - technological, political, and social – all of which have the potential to significantly impact the commerciality of bringing methane to market. The final session provides an opportunity for an in depth look at these categories through the lens of specific actions taken by companies and governments. The session will conclude with a panel discussion aimed at teasing out the common elements inherent to the success or failure of these varied experiences.

14:00	Introduction by Session Chair	Russell Jones (API, USA)
14:05	Economic and Institutional Barriers - Increasing Natural Gas in China and India	Thomas Heller (Stanford University, USA)
14:35	Technical Barriers - Emission Reduction: Gas Star Case Studies	Krish Ravishankar (Occidental, USA)
15:05	Break	
15:35	Commercial Barriers: Russian Natural Gas	Don Robinson (ICF Consulting, USA)
16:05	Consultation on Anticipated Social Issues: Alaska Gas Pipeline Project	Mike Wofford (ConocoPhillips, USA)
16:35	Panel Discussion	Panel Chair: Haroon Khashgi (ExxonMobil, USA)
17:25	Wrap up and links to next day	Arthur Lee (Chevron, USA)
17:30	Workshop Close	
19:00	Workshop Dinner	Potomac CD

# 27-28 September 2006

## Increasing the Pace of Technology Innovation and Application: Enabling Climate Change Solutions

The creation of energy technology options to meet global demand for energy with low greenhouse gas emissions is an essential component of a risk management approach to global climate change. To be effective, the pace of deployment of commercially viable energy technology is an additional, critical factor. This workshop will consider the range of actions and policies to address energy technology in the climate change context: their effectiveness, their depiction in future scenarios, and the implications for business.

This workshop will bring together experts from academia, business, governments, policy makers and international and non governmental organisations to improve understanding of how to increase the pace of technology innovation and application.

The workshop will focus on:

- Energy outlooks and the pace of technological progress
- Technology portfolio strategies to increase the pace of innovation and application
- Opportunities and barriers to technology innovation and diffusion
- Innovation and technology options for efficiency, transport, methane, CO<sub>2</sub> capture and geologic storage and energy supply

### Workshop Overview

Key Bridge Marriott, Washington, DC, USA

#### 27 September

08:30 - 13:00	Workshop Registration	Potomac Foyer
08:30	Workshop Opens	Potomac ABC
11:00	Session 2 Begins	Potomac ABC
12:30	Lunch	Potomac Foyer
13:30	Session 3 Begins	Potomac ABC
15:45	Session 4 Begins	Potomac ABC
17:30	Workshop Close	

#### 28 September

08:30	Session 4 Continued	Potomac ABC
10:45	Session 5 Begins	Potomac ABC
12:00	Workshop Close	

08:30	Scene Set	Haroon Khashgi (ExxonMobil, USA)
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### Session 1: Energy and the Pace of Technological Progress

Technological progress has enabled economic and social development beyond historical precedent. Technology innovation to improve performance, serving practical needs and preferences, has – and will – advance, drawing upon the advancement of science. Transitions in major energy technologies, however, often take many decades and entail massive investment in infrastructure, even for superior technologies with improved performance in multiple dimensions. This session examines the pace of past and future technological progress in meeting and driving society’s demand for energy, and the pace and timing implied in energy outlooks and future scenarios used to examine the mitigation of climate risk.

08:50	Introduction by Session Chair	Haroon Khashgi (ExxonMobil, USA)
08:55	Pace of Technology Change in Energy Outlooks	Fatih Birol (IEA, France)
09:25	Government Roles in the Technological Process	Shingo Takahashi (Ministry of Economy, Trade and Industry, Japan)
09:45	Pace of Technology Change in Mitigation Scenarios	John Reilly (MIT, USA)
10:05	Discussion	
10:30	Break	

### Session 2: Technology Portfolio Strategies

Advancing a portfolio of promising technologies is the preferred strategy to respond to the challenge of providing for energy demand with decreased greenhouse gas emissions, recognizing that: different technologies serve different needs and situations, new technology options will be needed to effectively provide solutions to climate change, decades are required for deployment, and prediction of which options will ultimately be successful over such a time-frame is not possible. This session focuses on strategies to manage: portfolios of R&D for new technologies to ensure innovation, and a wide range of actions to enable the deployment of a portfolio of technologies to meet diverse energy needs.

11:00	Introduction by Session Chair	Bill Thompson (BP, UK)
11:05	Technology Portfolios	James Edmonds (Pacific Northwest National Labs, USA)
11:25	A Low Carbon Innovation Strategy for the UK	Michael Grubb (Carbon Trust, UK)
11:45	Technology Portfolios, Strategy and Milestones	David Hone (WBCSD, UK)
12:05	Discussion	
12:30	Lunch	

### Session 3: Key Factors: Opportunities and Barriers

There is currently great opportunity for expanded use of existing efficient technologies in both developed and developing countries, and great value in increased innovation in energy technology. Barriers limiting the pace of these activities include the limits to capturing value in the marketplace given existing infrastructure and institutions. This session explores opportunities for the innovation of new, and the application of existing superior technologies, barriers that limit their pace, and ways to address barriers.

13:30	Introduction by Session Chair	Arthur Lee (Chevron, USA)
13:35	Technology in a Global Economy: issues and opportunities	Ogunlade Davidson (Co-Chair, IPCC Working Group III, Sierra Leone)
13:55	Opportunity Costs and Clean Development	David Montgomery (Charles River Associates, USA)
14:15	International Arrangements in Influence Clean Development	Brian Fisher (ABARE, Australia)
14:35	PDO CO <sub>2</sub> Management Vision	Faisal Al-Lamki (PDO, Oman)
14:50	Discussion	
15:15	Break	

### Session 4: Consideration of Specific Technology Applications

Technology applications have specific characteristics that influence the pace of technology change and the means by which this pace may be accelerated. This session focuses on increasing the pace of technology change to improve of end-use efficiency, transportation, natural gas utilization, CO<sub>2</sub> capture and geologic storage, and energy supply in managing the risk of climate change.

15:45	Introduction by Session Chair	Dag Christensen (Hydro, Norway)
15:50	Energy R&D for Innovation	John Weyant (Stanford University, USA)
16:10	Efficiency	Diana Üрге-Vorstatz (Central European University, Hungary)
16:30	Transport	TBA
16:50	Discussion	
17:30	Workshop finishes for the day	

**Session 4: Consideration of Specific Technology Applications, Continued**

08:30	Introduction by Session Chair	Faisal Al-Lamki (PDO, Oman)
08:35	Methane	Bruce Wilcoxon (ConocoPhillips, USA)
08:55	CCS	Howard Herzog (MIT, USA)
09:15	Energy Sources	Klaus Lackner (Columbia University, USA)
09:35	Discussion	
10:15	Break	

**Session 5: Panel, Technology Options in Climate Change Risk Management**

This panel discussion will consider activities to accelerate the pace of technological improvement in the context of international, national, and company strategies to manage the risks of climate change.

10:45	Panel Discussion	Haroon Khashgi (ExxonMobil, USA)
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11:50	Workshop Close	Arthur Lee (Chevron, USA)
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Washington, DC, USA

International Petroleum Industry Environmental Conservation Association  
5th Floor, 209-215 Blackfriars Road, London, SE1 8NL, United Kingdom

Telephone: +44 (020) 7633 2388  
Fax: +44 (020) 7633 2389

Email: [info@ipieca.org](mailto:info@ipieca.org) - Web: [www.ipieca.org](http://www.ipieca.org)