Gas Processors Association – Europe

promoting technical and operational excellence throughout the European Gas Industry

Spring Conference 2010
May 19th – May 21st

VIENNA

"Unconventional Gas"

Venue: Hilton Vienna Danube
Handelskai 269, A-1020 Vienna

"Unconventional Gas"

There are many questions to be answered in bringing new sources of gas to the markets. This conference looks at some of these gas sources and how they are being developed. This conference looks as some of these aspects, touching on these questions:

What is "unconventional gas"?

- "Conventional" methane gas found in unconventional, low permeability reservoirs:
- Gas shales ("Shale Gas"),
- Coal seams, (Coal Bed Methane" or CBM),
- Tight sandstone reservoirs ("tight gas").
- "Methane Hydrates"
- "Biogas"

What and where are the reserves?

Where are the markets – pipeline or LNG?

Why Unconventional gas can now be extracted?

- Advances in horizontal drilling techniques.
- Advances in high volume, hydraulic fracturing techniques, needed to improve the matrix permeability of the reservoir.
- Historic increases in the natural gas price.

What are the potential economic, technical and environmental challenges associated with producing unconventional gas?

What are the Political and Economic Drivers?

Associated Events:

Wednesday 19th May	**18:00**	**Registration**
	18:30 – 20:00	**Welcome Reception**
Thursday 20th May	**19:30 – 20:00**	**Pre Dinner Drink**
	20:00 – 23:00	**Conference Dinner**
Friday 21st May	**08:30 – 13:00**	**Site Visit to OMV Plants In Lower Austria**

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Thursday 20th May 2010 - Morning

09:00	**Morning Session: Moderator –**
09:15	**Biogas – A Never Ending Source of Natural Gas** *Luisa Shelenko, Martin Brown, GL Noble Denton, UK* This paper presents a techno-economic analysis of the gas processing requirements for the upgrading of biogas for suitability of injection into the natural gas grid. Injection of biogas into the natural gas grid is not currently occurring in the UK, and currently the biogas production facilities are using the gas in engines to generate electricity directly. Grid injection of biogas, often termed "renewable gas", could make a significant contribution to the UK's renewable energy and carbon emission reduction targets by enabling renewable heat to be used directly in UK homes. It is recognised that biogas production, clean-up, measurement and monitoring to ensure compliance with any HSE issues for gas grids all comes at a cost but with the right support and incentives, renewable gas could meet a significant proportion of the UK residential gas demand. This paper provides a high-level techno-economic comparison of the different biogas clean-up technologies and reviews the National Grid / United Utilities Davyhulme waste water biogas facility in Manchester which is aiming to design a demonstration project to inject biogas into the natural gas grid.
09:45	**BIOgas - Bring It On -** *Christian Riemann, BASF SE, Germany* "Green energy" has been playing an increasingly important role, politically, in recent years. It is no coincidence that the number of biogas plants built over the last 10 years has also increased rapidly. Produced for decades on farms and landfills, biogas has now become an interesting feed for natural gas grids. Biogases are mostly burned in combustion engines to generate power and heat. Unfortunately, biogases are often generated in remote locations and the produced heat cannot be utilized. This reduces the efficiency of the process by around half. In such cases, injection of the collected biogas into the natural gas grid, and burning the gas wherever it is needed, can be a more lucrative alternative. Before injection into a grid, however, the raw biogas has to be turned into a clean bio-methane which meets the local grid specification. Unfortunately, the gas treating process must be customized to fit the particular type of raw biogas. As "biogas" is an umbrella term, and encompasses very different types of gases (landfill, sewer gases and fermentation gases). Most interest is currently centred on fermentation gases as these gases are "tailor made" and therefore can maintain a certain gas quality. This is an important advantage for *standardized* gas treating unit designs. This is an ongoing story - biogas is an interesting prospect.
10:15	**BMW Doubles Output of Landfill "Gas to Energy" Project in South Carolina** *Nathan Vetter, Cameron Compression, USA* This paper presents the challenges of corrosive landfill gas delivery to a power generation turbine, which requires oil free gas to ensure lowest emissions and maximum service life. The solution provided by integrally geared centrifugal compressor technology is then explored. The partnership of Solar Turbine and Cameron Compression is provided as a case study. Together they upgraded BMW's Spartanburg, South Carolina, landfill gas power generation capabilities to double the output power of the previous system, while keeping the amount of landfill gas consumed constant. Two Solar Taurus 70 turbines were each teamed with a TG2040 Centrifugal Compressor from Cameron Compression to produce 11MW of power. The value proposition of integrally geared centrifugal compressor technology versus the rotary screw compressors in the previous installation, as well as the alternate solution of reciprocating compressors, is explored. Considerations such as material selection and leakage sealing technology of the compressor are investigated. A detailed analysis of the patented low loss babbitted labyrinth type seal, which ensures oil free gas delivery, is then presented.
10:45	**Coffee Break**
11:15	**An overview of Underground Coal Gasification, the issues of taking a new technology to market** *Julie Lauder, UCG Association* Underground Coal Gasification (UCG) is gathering momentum all over the world and is at last being recognised as truly viable clean coal technology with the potential to access millions of tonnes of otherwise unrecoverable coal, experts believe UCG could double global coal resources. It offers many economic, environmental and social benefits and is also amenable to CCS. UCG is a technology that has evolved in recent years, much of this due to technical advances originally created for the Oil and Gas industry. The need to find cleaner sources of energy and the requirements to cut emissions and to incorporate CCS without ramping up costs is a major focus for all in energy. UCG technology can address all of these. The presentation provides an overview of modern UCG technology, how and why it has evolved and gives an understanding of the level of recent global activity. The UCG Association works to promote, educate and inform all of the commercial opportunities UCG offers and the various issues faced in taking, not only UCG, but any new technology to market.
11:45	**Underground Coal Gasification in Europe – a road map for success** *Rohan Courtney, Clean Coal Limited* Clean Coal Limited ("CCL") is a UCG operator with projects around the world. CCL have been awarded five UCG offshore licences by the UK Coal Authority, a project in Turkey and have signed Memoranda of Understanding with clients in the Slovak Republic and Poland. UCG is also being undertaken in Ireland, Hungary with interest shown from the Czech Republic, Spain, Italy, Romania and Slovenia. Early trials for UCG have taken place in Belgium and Spain. The presentation will concentrate on the specific issues relating to UCG in Europe (including offshore UCG), security of supply, carbon capture and storage, what happens to the syngas, the regulatory framework, how UCG fits in to EU's energy mix, its potential in Europe and the likely timetable of development.
12:15	**Networking Lunch**

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Thursday 20th May 2010 - Afternoon

	Afternoon Session: Moderator –
14:00	**Shale Gas in Europe: The significance of a new unconventional gas resource** *Hans-Martin Schulz, German Research Centre for Geosciences, Potsdam, Germany* Shale Gas is an unconventional gas resource. Currently, about 8-10% of the domestic gas produced in the US comes from this resource in fine-grained sediments (shale) which are thick and rich in organic matter. US agencies forecast that shale gas will account for 20 % of the gas production in the US until 2020. Today, nearly all wells in shale gas targets are being drilled horizontally and fracture stimulated due to the low matrix permeability of shale. Increasing prices for fossil fuels and tax credits led to an intensified exploration and production of shale gas in the US. In Europe shale gas exploration is still in its infancy, but European sedimentary basins offer the potential for shale gas occurrence as thick, organic matter-rich sediments occur widely. Even so there is little knowledge about the factors controlling shale gas generation in European basins yet, the energy companies are in a battle for exploration licences.
14:30	**Shale Gas and its future role in the European Energy Market** *Dik Paul, Shell Upstream International – Europe* A gas company view of this unconventional gas source and its role in the European energy market.
15:00	**How separations technology can improve the efficiency, economics and environmental impact of the exploitation of unconventional gas sources.** – *Doug Harris, Pall Europe* The need for sustainable development, combined in many cases with environmental issues, is driving advances in utilising gases from unusual sources as either fuel or as source gases for chemical synthesis. In many cases, these gases are produced with very low pressures and/or are contaminated with materials that may impact on the economic or environmentally acceptable exploitation of the source. This paper presents case studies that describe the technical and operational drivers behind the use of separations equipment such as filters, coalescers and cross-flow membrane technologies in overcoming some of these challenges, enabling the efficient, economical use of these gas sources while minimising impact on the environment.
15:30	**Coffee Break**
16:00	**Purification Technology for CNG used in Road Transport** *Matthew Humphrys, Johnson Matthey PLC,U.K.* CNG an ideal fuel for road transport vehicles. It produces less green house gas, much lower levels of harmful chemicals and no particulates. Additionally, many city centres are better served with natural gas distribution systems than they are with gasoline and diesel. However, pipeline gas produced for the industrial and domestic fuel markets can contain high levels of sulphur and mercury. Car exhausts rely on precious metal catalysts for the combustion of carbon monoxide and unburned hydrocarbons and for the destruction of NOx. These catalysts are remarkably effective but are poisoned by sulphur compounds and possibly also by heavy metals. Also, latest generation lightweight storage tanks on NGV vehicles are aluminium-lined, which can be corroded by mercury with catastrophic results. Johnson Matthey has developed fixed bed absorbents for the removal of these impurities from natural gas. No byproducts are formed, the process is essentially "carbon free" during operation and the spent absorbents are completely reprocessed. This technology is being used for the removal of sulphur at CNG refuelling stations. This paper shows the variation in the composition of natural gas and uses actual illustrations to demonstrate how this technology can be applied to the auto-gas industry.
16:30	**Meeting new sulfur specification regulations in Austria** *Nawid Kashani BASF SE, Germany* Austria's gas quality regulation (ÖVGW G31) gives very strict specifications for the total sulfur content in natural gases to be fed into the national grid. In order to comply with these regulations, OMV asked BASF for a solvent that would be able to optimize their acid gas removal unit in this regard. Within a record time of only 4 months the companies managed to conduct a study, to produce and transport the solvent to the site near Vienna and to start up the plant successfully. By doing so, OMV managed to implement the new solvent during a standard plant turnaround and therefore without losing any production time. Achieving the desired total sulfur specification in the product gas stream from the beginning, BASF also conducted an on-site optimization, resulting in substantial energy savings. The key factor for success was improved COS absorption by adding the new BASF solvent. Moreover BASF's process simulation tool giving precise predictions together with OMV's plant experience allowed for a professional plant optimization. As a result, the process is not only suitable for conventional but also unconventional gas containing sulphur components.

The GPA reserves the right to alter the timings of the papers presented or to substitute alternative papers should circumstances so dictate.

19:30 Welcome Drink and Conference Dinner