INTERNATIONAL INVESTMENT IN STORAGE INFRASTRUCTURE
SUPPORTING WINGAS’ SALES ACTIVITIES

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ABSTRACT

BACKGROUND

WINGAS is the owner and operator of the biggest storage facility in Western Europe with a working gas capacity of over 4 billion cbm and a withdrawal rate of over 57 mio. cbm/d representing almost 20% of Germany’s total installed working gas capacity.

AIMS

The importance of underground storage is widely recognized as a vital element in the gas value chain. In order to support the expansion of WINGAS’ European sales activities, WINGAS has decided to invest in storage infrastructure.

A substantial investment programme has been agreed upon to participate in the Austrian storage facility “Haidach” as a Joint Venture partner with Gazprom Export and RAG.

In order to enhance improved flexibility of supply in the UK gas market WINGAS has also acquired the largest onshore gas field in the UK for conversion into a fully functional underground storage facility.

METHODS AND RESULTS

The paper describes the commercial, technical and regulatory challenges involved in the conversion of producing gas fields into underground storage facilities.

The technical benefits in terms of security of supply and the associated economic benefits are an integral part of the value chain. This will be discussed taking into account the UK and the continental gas markets.
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The requirement for storage is widely regarded as a vital element in the gas value chain. There are four major functions which are mentioned below.

1. Security of supply
2. Balancing winter/summer demand
3. Introducing flexibility
4. Providing arbitrage opportunities on daily, weekly, monthly and yearly basis.

Given the fact that a ten-year perspective is not a long time span to develop new storage projects, WINGAS has decided to follow a strategic investment program to add infrastructure in the form of storage facilities to distribution systems in supporting sales activities in Europe.

The pressure is increasing to compensate for at least the imbalances that have been forecast. The further away the future sources of supply, the greater the need to install new storage facilities.

How did WINGAS provide for sufficient storage in the past and how will WINGAS respond to the challenges which are ahead of us?

Germany as the second largest gas market in the 25 EU countries has a total working gas volume of about 19 billion m³ followed by Italy of approx. 13 billion m³ and France with 11 billion m³, the Netherlands and Hungary.
The comparison between the actual annual consumption of gas and the working gas volume shows an interesting picture. Whilst Germany has a ratio of 22% working gas compared to overall consumption and this ratio is very similar in France, it is clearly recognizable that the ratio for the UK (Europe’s biggest gas market) is only 4%!

During the first development phase of WINGAS as a gas sales company in the early 90s it was widely accepted that the need for secured deliveries was of utmost importance.
field between 1956 until 1992 when it was converted into a storage facility. The facility has 16 wells with horizontal deviation.

Furthermore it has a total volume of 7 billion m³ gas in place of which 4.2 billion m³ is working gas. 3.8 billion m³ remain, as cushion gas with a withdrawal rate of 2.4 million m³/h. Rehden is the most effective porous rock storage facility in Western Europe for seasonal storage.

Access to Rehden storage is provided on a negotiated basis, other companies may book capacity according to their needs.
In order to strengthen our system from the South WINGAS has decided to participate in a Joint Venture between RAG (Rohöl-Aufsuchungs-Gesellschaft) and OAO Gazprom Export for converting the depleted gas field at Haidach into the second largest gas storage facility in Central Europe.

The proposed capacity will be up to 2.4 billion m³ working gas volume. This equals approx. 30% of the total annual gas consumption of Austria. The estimated investment is about EUR 250 million and construction on site has already commenced in autumn 2005.

Underground Storage Haidach (Austria)
Under Construction.....

The available capacities will be divided equally between the three joint venture partners.

The aim of WINGAS is to structure the anticipated gas flows, which are earmarked for the south German markets via Burghausen.
Further investment has been decided upon in the UK as a response to the desperate need for storage capacity there.

In contrast to the continental situation whereby the storage vs. consumption ratio is roughly about 1:5, the UK market has a ratio of 1:25! An exposure that is reflected in the unpredictable rise of spot gas prices in winter.

The UK was traditionally self reliant on North Sea production providing flexibility by operating the wells according to demand. With liberalisation, and even more important, with the dramatic decline in its production, the UK has become a net importer of natural gas. The imported volumes will rise significantly in the near future. Infrastructure projects like BBL, Langeled Ormen-Lange, the Interconnector enhancement between Bacton and Zeebrugge and expansion of LNG facilities are currently being developed to meet this shortfall.

Taking into account the distance between the gas productions, i.e. Russian or Norwegian gas, the necessity to have functional storage facilities in the UK is obvious. This is the reason why WINGAS bought in 2005, the largest onshore gas field Saltfleetby, from RocOil, an Australian E&P-company, in order to convert the gas field, located near the Theddlethorpe terminal, into a gas storage facility.
The gas field that was in full production until last year has a connection to the English National Grid System via the Theddlethorpe gas terminal which is about 8 km away.

An ariel view of the location of the future site of the gas treatment plant at Greyfleet East has been included in the planning application that was sent out at the beginning of this year.
The 3-dimensional model shows the following, air cooler, dehydration unit, heater, compression units (where we have 3 by 50% for redundancy reasons), the ground flare, the condensate storage, workshops and the office. The volume of the reservoir will be approx. 700 million m³.

The next chart shows the seismic model that has been produced by the reservoir engineers to show the mushroom shaped form of the gas Saltfleetby field. The water horizon can clearly be seen as well as the existing producing wells which are already in place but not suitable for storage operation due to the small tube diameters.
The next slide shows the Saltfleetby dynamic reservoir simulation with the additional wells and the gas in place which was roughly 155 billion standard cubic feet which is about 4.4 billion m³ of gas in place. The following simulation shows the development from the production phase to the subsequent cycling operation of the facility.

Moving from the underground to the surface, we have taken immense care to minimize the visual impact of the facility in the Lincolnshire countryside and in this photomontage you see the appearance of this facility from one of the farms looking northwest.

The next slide shows an overview of the UK storage facilities, listed in order of size.

Slide to be handed in later: “Long Range Storage”
With the development of Haidach and Saltfleetby WINGAS will rank third amongst the storage operators in Europe behind the Italian Stogit and French GdF.

WINGAS as a prudent operator and reliable gas supplier has with foresight decided to invest in an infrastructure program to improve security of supply. I'm sure that our efforts will make an important contribution to secure future supplies of gas to the European markets.

Thank you for your attention!