STUDY ON UNDERGROUND GAS STORAGE IN EUROPE AND CENTRAL ASIA

OR

STUDY ON UNDERGROUND GAS STORAGE IN THE UNECE REGION

DRAFT OUTLINE – TERMS OF REFERENCE

Introduction

The current and expected increase in natural gas demand in the UNECE region, coupled with the greater complexity of natural gas market operations, requires all natural gas market players to optimize flows of natural gas in order to ensure uninterrupted supply of the fuel, its delivery at affordable prices and flexibility in meeting demand peaks as well as various other consumer needs. While efficient operation of the natural gas industry is certainly a prerequisite for the vast majority of companies for maintaining desirable profitability and meeting prescribed technical standards and safety requirements, it is also considered to be a condition for improving security of supply.

The expected rise in demand for natural gas in the UNECE region over the next 15 to 25 years, in the framework of the sharp increase in import dependency for most of the countries, has further accentuated the pressure on the natural gas industry to guarantee reliable delivery from ever increasing distances at a competitive cost. Underground gas storage within the whole industry chain might play an important role in securing a reliable and efficient supply of natural gas to industrial, residential and other consumers in the region.

Considerable recent and ongoing changes in the functioning of the natural gas market in the UNECE region have also affected the underground natural gas storage sector. New legislation has been introduced, including at the European Union level, which opened the sector to competition together with third-party access provisions. Unlike the past experience, where the key national natural gas industry players had a long investment horizon and little uncertainty with regard to the use of their underground natural gas storage facilities, in the current and expected regulatory framework, investment decision-making becomes more difficult. The regulatory authorities' requirements regarding security of supply, unhindered access to third parties and ever higher standards for transparency of operations and clarity of price mechanisms also make it difficult for the key operators to make timely decisions on the investment needed in this major part of the natural gas industry infrastructure.

Underground gas storage services as the backbone of flexible and reliable natural gas infrastructure

With the deregulation and liberalization of the natural gas industry in the UNECE region, the natural gas industry has come to rely more on the expanded role of underground natural gas storage facilities. In addition, new services have been developed and new roles designed, such as transforming the storage facilities into the heart of hub operations. In turn, they have contributed considerably to the integration of the gas markets in the UNECE region with the development of facilities which serve regional needs and convert a set of national markets into a truly regional or even, as in the case of the European Union, into a European industry.

To ensure the continuing efficient functioning of underground gas storage facilities in the UNECE region, a good understanding of the current and expected industry trends is essential. Also, the consequences of the regulation of the natural gas industry and gas storage must be anticipated and their financial consequences estimated in a timely manner. It is therefore of vital importance both for governments and corporations to undertake a continuous assessment of the key trends in the underground gas storage sector and accordingly adjust their strategic, operational and investment decisions.

The purpose of the UNECE study on underground gas storage is to review the main trends in the sector with a view to increasing the visibility of future capacity and investment needs as well as the regulatory, cost and operational challenges. It should also identify potential problem areas which might inhibit the sector's ability to continue providing the desired services in a timely and affordable manner.

Structure of the UNECE study on underground gas storage

Introduction

Executive summary

Methodology employed and sources

Chapter One: New and emerging technologies and technological improvements in underground gas storage

- Intelligent UGS (operational optimization)
- Commercial optimization software
- Technical developments (delta pressure, horizontal drilling, …)
- Monitoring
- Reducing environment impacts

Chapter Two: Current UGS status in Europe and Central Asia

(Chapter could be brief as it is an update of the existing study)

- Existing UGS by country – Technical analysis
- Minimum data:
- working volume,
- total volume,
- maximal send-out capacity,
- maximal send-in capacity
- focus on a synthesis by market area

- Market structure and regulatory framework analysis
- Current market structure and position of storage
- Commercial reach of storages (possibly by type of storage)
- Current regulation on UGS by country: information about regulated/negotiated regime, Third Party Access (TPA) exemption, recommended process for marketing UGS capacities, etc
- Future market development and direction of market, and specifically UGS, regulation

Chapter Three: UGS projects and technical criteria for the selection of potential UGS facilities

(Chapter could be brief as it is an update of the existing study)

- Planned projects by country and type, and focus on a synthesis by market area
- Estimated working volume and capacities
- Overview of potential sites by country
- Can be rather brief, as it is an update of the existing study

Chapter Four: Legal framework

- Information by country about the legislation and procedures for granting consent/ authorization to Storage Systems Operators (SSO) to implement UGS projects.
- European Union countries with a common regulatory background (directives and Guidelines for Good TPA Practice for Storage Systems Operators (GGPSSO))
- Non-European Union countries

Chapter Five: Cost of storage

(The scope of this chapter should be carefully defined. It is important to be not too ambitious because of confidentiality issues, especially for investment expenses (second part hereunder).

- Cost of existing storages in Europe
    - TPA tariff overview
    - Impact of regulatory framework on costs (qualitative)
    - Other, including cushion gas
- Cost of greenfield construction, preferably in Europe, but United States might serve as proxy
    - Cost specification by storage type (cavern, aquifer, depleted field)
    - Influence of reservoir characteristics on cost range
    - Impact of regulation and /or legislation (environment for example) on costs
- If possible: comparison of the two: commercial outlook for new storages
- Value and viability of UGS as independent asset for energy companies (valuation and potential for mergers and acquisitions)

Chapter Six: Outlook and main expected trends of gas markets and UGS developments (by country)

- Demand prognosis
- Demand structure (households, commercial sector, power, industry, other)
- Storage demand
- Periods: 2015, 2020, 2030
- Baseline projection, plus impact of renewable target (EU 20% in 2020) on storage demand

Conclusion and recommendations

Annexes: Glossary, contact details, maps, database, units, bibliography.

Definition of market areas

The definition of market areas, which is the key issue for the successful execution of the study, could be undertaken in various ways. Following the discussion of the UNECE experts and their written proposals, two potential options emerged, given below. Given their considerable differences and before making a definitive decision on the shape of market areas, it is advisable that the UNECE Task Force address the matter at its meeting on 3 September 2008 in Geneva.

Option One:

- North-western Europe (Germany, Belgium, Netherlands, Luxembourg, Northern France)
- West Mediterranean (Portugal, Spain, Southern France, Italy)

- Central Europe (Austria, Switzerland, Czech Republic, Slovakia) – either to stand alone or to be included in Northwest Europe above
- East Mediterranean (Balkan States, Greece, Turkey, Bulgaria)
- Eastern Europe (Hungary, Poland, Belarus, Ukraine, East Baltic States)
- Nordic countries (Norway, Sweden, Denmark, Finland)
- Others (Ireland, United Kingdom, Russian Federation)
- Central Asian countries

Option Two:

- Area A (Western Europe): Austria – Belgium – France – Germany– Ireland – Luxembourg – Netherlands – Switzerland – United Kingdom
- Area B (Northern Europe): Denmark – Finland – Norway – Sweden,
- Area C (Central Europe): Czech Republic – Estonia – Hungary – Latvia – Lithuania – Poland – Slovakia
- Area D (Mediterranean Europe): Italy – Malta – Spain – Portugal
- Area E (The Balkans and Turkey): Albania – Bosnia and Herzegovina – Bulgaria – Croatia – Greece – Montenegro –Romania – Serbia – Slovenia – The former Yugoslav Republic of Macedonia – Turkey
- Area F: Russian Federation
- Area G (Central Asia) : Armenia – Azerbaijan – Belarus – Georgia – Kazakhstan – Kyrgyzstan – Moldova – Tajikistan – Turkmenistan – Ukraine – Uzbekistan.

Method and organization of work

Once the outline and terms of reference for the Study have been approved, the UNECE Task Force will nominate heads for each chapter. Heads of chapters could also establish their own teams. The depth of each chapter will be discussed and related details agreed.

Particular attention will be devoted to the sources of primary information (focal points in individual countries and relevant corporations) as well as to secondary information, to avoid duplication of effort and make efficient use of already available data (the ongoing work within the International Gas Union as well as the Study on Natural Gas Storage in the EU).

The inclusion of all relevant countries in the Task Force is of paramount importance for the success of the Study. All Task Force members will provide suggestions and recommendations in this regard.

Work progress will be assessed regularly, at three-month intervals with meetings taking place in various UNECE member countries, primarily hosted by the members of the UNECE Task Force.

Time framework

The definitive outline/terms of reference should be presented to the annual session of the UNECE Working Party on Gas, to be held in January 2009.

The Study should be completed by 2010, preferably by mid-year.