

(Agenda Item nr.11. PHLG Meeting 30-31 May 2006)

SECURITY OF GAS SUPPLY (SoS) IN SEE IN THE SHORT TERM

The purpose of this paper is to outline some key issues on the topic of gas supply in SEE in the **short term (winter season 2006/2007)**. It does not aim at giving recipes on how to avoid or handle crises, but rather to provide rules which could be applied (taking the specifics of the countries into account) in case a supply shortage should arise.

Analyses of Security of Supply in ECSEE

The monitoring of SoS is mainly delegated to the relevant ministries or regulatory authorities. The energy development plans, supply/demand balance, the level of storage, expected future demand, peak capacity etc. are being elaborated under the auspices of the concerned ministries.

In case of crisis in the energy market the relevant ministries are in charge of taking measures in the respective country, regarding to safeguard measures

The key factors that strengthening SOS either on national or regional level are:¹⁾

- Multiple supply sources by country/company; multiple connections to other countries
- Domestic production
- Fungible sources, notably LNG terminals
- Significant storage and linepack capacity
- Long term contracts
- Interruptible uses, e.g. in multifuel power stations and industrial plants

The following table illustrates the **imported natural gas** in % of imports by source²⁾

| | ALB | B&H | BU | CRO | FYR | MN | RO | SER | TU | UNM | AU | GR | HU | IT | SLO |
|-------------|-----|-----|-----|-----|-----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| RUS. FED. | | 100 | 100 | 100 | 100 | | 100 | 100 | 60 | | 76 | 75 | 88 | 36 | 59 |
| NORWAY | | | | | | | | | | | 14 | | | | |
| GERMANY | | | | | | | | | | | 10 | | | | |
| ALGERIA | | | | | | | | | 19 | | | 25 | | 34 | 37 |
| UKRAINE | | | | | | | | | | | | | 2 | | |
| FRANCE | | | | | | | | | | | | | 4 | | |
| GERMANY/AU | | | | | | | | | | | | | 6 | | 4 |
| NORWAY | | | | | | | | | | | | | | 17 | |
| TURKMENIST. | | | | | | | | | | | | | | 7 | |
| NIGERIA | | | | | | | | | 5 | | | | | 6 | |
| IRAN | | | | | | | | | 16 | | | | | | |
| TOTAL | 0 | 100 | 100 | 100 | 100 | 0 | 100 | 100 | 100 | 0 | 100 | 100 | 100 | 100 | |

As a first observation, a very high concentration on a single import source can be noted in most countries.

¹ CEER "The South East Europe Natural Gas Market", Final Version January 2005, page 13

² The same page 10

Factors strengthening SoS in the SEE countries are presented in the following table:³⁾

| Security of supply features | | | | | | | |
|------------------------------------|--------------------------------|------------------------------|---|--|------------------|-------------------------------------|------------------------|
| Country | Multiple import sources | Multiple supply comp. | Multiple connections gas sources | Significant domestic production | LNG Term. | Significant storage/linepack | Long term cont. |
| Albania | No | No | No | No | No | No | No |
| Bos.& Herz. | No | No | No | No | No | No | Yes |
| Bulgaria | No | No | Yes | No | No | Yes | Yes |
| Croatia | No | No | Yes | Yes | No | Yes | Yes |
| F.Y.R.o.M | No | No | No | No | No | No | Yes |
| Romania | No | Yes | No | Yes | No | Yes | Yes |
| Montenegro | No | No | No | No | No | No | No |
| Serbia | No | No | No | Yes | No | No | Yes |
| Turkey | Yes | No | Yes | No | Yes | No | Yes |
| UNMIK | No | No | No | No | No | No | No |
| | | | | | | | |
| Austria | Yes | Yes | Yes | Yes | No | Yes | Yes |
| Greece | Yes | No | Yes | No | Yes | No | Yes |
| Hungary | Yes | No | Yes | No | No | Yes | Yes |
| Italy | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Slovenia | Yes | No data | Yes | No | No | No data | Yes |

It can be noted that some security factors like domestic production, storage, supply sources, and long term contracts are found in most SEE countries. However, most countries in the region lack at least two of these basic securities of supply factors.

Key figures of the gas industry in SEE/partially EU are presented in the following table:

| Key Figures of the gas industry in SEE/partially EU | | | | | | | |
|--|---------------------------------|------------------------------|-------------------------------|-------------------------------|---|-------------------------------|----------------------|
| Country | Annual Consumption (bcm) | Number Storage plants | Storage Capacity (bcm) | hourly Capacity Mio./h | Supply out of Storage (average days) | Number of Entry points | supply routes |
| Bosnia & Herzegovina | 0,18 | 0 | 0 | 0 | 0 | 1 | 1 |
| Bulgaria | 2,9 | 1 | 0,45 | 0,17 | 56 | 1 | 1 |
| Croatia | 2,65 | 1 | 0,558 | | 77 | 1 | 1 |
| F.Y.R. of Macedonia | 0,11 | 0 | 0 | 0 | 0 | 1 | 1 |
| Romania | 18,3 | 7 | 2,5 | 0,8 | < 50 | 2 | 2 |
| Serbia | 2,22 | 0 | 0 | collection ongoing | 0 | 1 | 1 |
| Turkey | 21,2 | 1 | 1,3 | collection ongoing | 22 | 4 | 4 |
| | | | | | | | |
| Austria | 8.9 | 5 | 2,3 -2,8 | 1,3 | > 60 | 2 | 2 |
| Greece | 2,4 | 0 | 0 | 0 | 0 | 1 | 1 |
| Hungary | 14,56 | 5 | 3,36 | 1,8 | > 60 | 2 | 2 |
| Italy | 76,4 | 9 | 12,42 | collection ongoing | < 60 | >4 | >4 |
| Slovenia | 1,1 | 0 | 0 | 0 | 0 | 3 | 3 |

It can be seen that most of the countries rely on 1 or 2 import entries (except Turkey which relies on 4 import entry points) and most of the import entries are via Ukraine (upstream).

³ The same page 19

According to data which are available to the Secretariat, it seems that there is probably enough working volume available (presumed that it is used to cover the seasonal fluctuations; in accordance with Directive 2004/67/EC concerning measures to safeguard of natural gas supply⁴), national obligations to store enough gas to cope with seasonal fluctuations could be imposed on suppliers); although the availability of working volume appears to be right, the major problem remains to provide enough gas grid **injection capacity** in order to balance supply and demand in peak hours. This is what happened in most of the countries during the “gas crisis” was not having **sufficient storage withdrawal capacity** to cover peak demand, even when including domestic production and remaining import capacity.

To the knowledge of the Secretariat **no significant** increases concerning **peak domestic** production capacity and **peak storage withdrawal** capacity have taken place since the supply restriction at the beginning of the year 2006. So the same problems which occurred at that time could **reappear** in the winter season 2006/2007 when assuming that the peak demand will be the same or **even higher**.

Even if the peak domestic production and peak storage withdrawal capacity had been increased, it depends on the extension of the enhancement and if this extension could **offset** import peak supply shortages.

Regardless of gas not being transported to the EU, respectively to SEE because of technical, political, commercial etc., problems, the **effect remains the same, in the short term** (assumption: technical problems can be solved within a short period although large parts of the existing infrastructure are relatively old, redundancy is decreasing because of the increasing load factors and production/transportation peak-capacity seems to be not aligned to sharp weather conditions).

CONCLUSIONS

The following near term measures with their **subsequent consequences** on national level, could be taken in order to **avoid**, or at least **mitigate impacts** of a possible gas supply shortages, before the conversion of the possible remedies of infrastructural nature to supply shortage (**missing peak capacity**) can be achieved (lead time + 5 years for huge pipelines):

- a. **Identify** large customers, like gas fired thermal power plants or industry where gas is either used in the production process or for heating etc.; co-operate with industry representatives to find the best near term solutions;
- b. Analyse if gas fired power plants can also be operated with **other fuels**; take the start up/switching procedure of such plants into account;
- c. Analyse if industry production could be **reduced** (shut down of the production process is the last step), by what percentage and determine how to proceed in such a situation;
- d. Analyse if **production** could be **shifted** to another time of the day in order to shave the peaks of all industry companies; this measure could also be helpful for the electricity peak demand;

⁴Article 8 (2) of Directive 2004/67/EC : Member States emergency measures shall ensure, where appropriate, that market players are given sufficient opportunity to provide an initial response to the emergency situation

- e. Analyse if production could be shut down by **bringing forward** annual closing/maintenance;
- f. Analyse possible **increases** of domestic production/storage withdrawal capacity for the peak period;
- g. Put in place **incentives** for providing all possible capacity of the suppliers to customers;
- h. Determine the institution which is the main partner in foreseeing and handling such shortages; take the time component into account (usually the TSO has the newest and most accurate information of the conditions of the gas grid);
- i. Make sure that this institution –probably TSO- has the **following information**:
 - The daily forecasted natural gas **demand** (as a sum of all suppliers)
 - The daily possible natural gas **injection rate** into the system (including import, domestic production and storage withdrawal capacity)
 - Forecasted gas demand for the next six weeks on a daily/hourly- basis; if possible
 - Available **storage volume**
 - Available **linepack**
 - **Reserve** storage withdrawal capacity (not contracted capacity); if any
 - **Pressure and flow data** of the grid
 - Information above the daily forecasted **demand of electricity**. There should be a close co-operation between gas and electricity TSOs
 - Information above the forecasted electricity demand of the next six weeks on a daily/ hourly basis; if possible. Storage amount of alternative fuels should be also available.
- j. Determine the **information flow** between the TSOs (electricity and gas) and the institution which is responsible for gathering, analysing the data and for initiating the necessary actions;
- k. Determine the **information flow** between TSOs (electricity and gas);
- l. Determine the **flow** of information and **instructions** between the responsible institutions on one hand, and the gas fired power plants and industry on the other hand;
- m. Provide the **legal basis** for these procedure and the necessary measures
- n. **Watch** closely the prices for gas and electricity on hubs and bourses, in particular futures;
- o. If the gas grid system injection rate is lower than demand, measures have to be taken in accordance to a determined crises plan (restrict gas fired power plants/industry production and shut down gas fired power plants/industry, if necessary).

In future, when a **regional approach** has been achieved the “peak shave” measures could be implemented on regional level in order to gain the “pooling” benefits of a **larger** supply area.

In fact, given the current situation of infrastructure interconnection, the availability of a security of supply factors in one country may offer very limited protection to other countries of the region, and not even to the neighboring countries.

As a whole, the security of supply characteristics of SEE countries fall short of those found in EU countries. The main sources of concern are probably the high dependence on imports from a single source and the uneven availability of storage facilities and LNG terminals and lack of interconnection of pipelines.