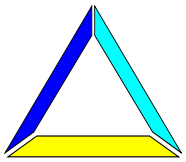
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V 12

Ukrainian Gas Imports:
Towards secure and economically reasonable transactions

Executive Summary

Despite the recent decision to import gas exclusively from Caspian states Ukrainian gas imports are not secured beyond 2007 and future price developments can hardly be predicted. Against this background, we suggest to further improve the agreement by gradually adjusting import prices to economically justified levels and linking future prices to economic developments. In this way, politically independent relations between Ukrainian buyers and their Caspian suppliers could be established and accordingly gas imports be secured over the medium and long run.

Contents

1. Introduction
2. Status quo: Ukrainian gas imports
3. EU gas imports
4. Securing gas imports to Ukraine
5. Summary

1. Introduction

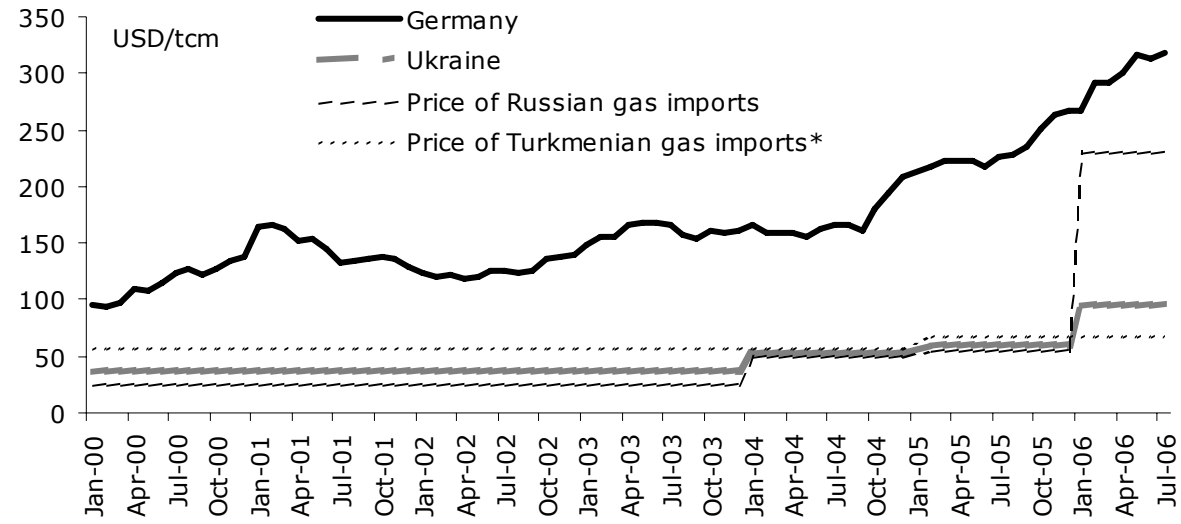
In the light of global energy price hikes, Ukraine faced a severe gas crisis which for a while questioned the security of gas imports. The agreements found in early 2006 as well as the recent decisions on import prices for the end of 2006 and gas imports in 2007 have established temporary solutions. However, import prices remain politically rather than economically determined without that the agreements foresee adjustment mechanisms for future price changes. Accordingly, Ukraine's gas imports cannot be secured beyond 2007 and the economy remains vulnerable to abrupt price changes. Moreover, in the light of the recent gas crises it has been increasingly questioned if simply opting for the lowest-possible prices really benefits the economy, given the high energy intensity and political dependency from cheap imports that it creates, as well as the devastated state of Ukrainian utilities which all lack incentives to invest. Against this background, our paper suggests how gas imports can be secured over the medium and long run by gradually adjusting import prices to economically justified levels and linking future prices to economic developments.

The paper is organized in three sections. We will first review the present situation and future outlook of Ukraine's gas import relations. Then, we will discuss how gas imports are organized in EU countries. Against this background we will finally discuss how import prices should be adjusted and provide recommendations as to how to proceed.

2. Status quo: Ukrainian gas imports

Until 2005, Ukraine's gas imports were safeguarded by single contracts with Russia and Turkmenistan, in which quantities as well as flat annual prices were stipulated. These contracts were typically concluded by Naftogas and the exporting companies of the respective country and lasted for several years. Still, quantities and especially prices were frequently renegotiated in a highly politicized fashion in which national governments and sometimes even the presidents have been significantly involved. In these negotiations, the predominant objective of Ukrainian negotiators has always been to secure the lowest possible prices, typically in return for offering low nominal transit fees for Russian gas shipments to EU markets. This has resulted in significantly lower import prices in Ukraine as compared to EU countries such as Germany (Figure 1).

Figure 1
Average import prices for gas in Ukraine and Germany (USD / tcm)



* Estimated price at Ukrainian border, net of transit costs
Source: Federal Office of Economics and Export Control (BAFA), own calculations.

Although at first glance low gas prices have apparently benefited Ukraine's economy, they also have come at high costs as recent developments have shown. In particular, low gas prices have created a crucial economical and political dependency from import countries (Russia, Turkmenistan) with special importance of Russia serving as import as well as transit country for non-Russian gas. Moreover, the flat and low prices have logged Ukraine's economy into an

energy-intensive consumption pattern since prices have not signaled the economic value of gas to consumers and have thus diminished incentives for improving energy efficiency.

As a result, Ukraine's economy has one of the highest levels of energy intensity in the world.[1] Moreover, the increasing wedge between Ukrainian and European gas prices has created highly profitable arbitrage opportunities. Utilizing them has been the privilege of a few energy traders who have created the intransparent mode of business operations in Ukraine's energy sector and have safeguarded their benefits through intensive rent-seeking activities. Finally, the use of transit fees as a bargaining chip for low import prices from Russia has undermined Ukraine's reputation and reliability as transit country for Russian gas exports to Europe. As a result, Gazprom has started to diminish Ukraine's transit monopoly by bypassing it through Belarus and Poland (Yamal pipeline). In the future, a planned pipeline through the Baltic Sea could circumvent even more shipments. In both cases, the use of alternative pipeline routes imposes forgone transit revenues for Ukraine.

In 2005, Ukraine's gas import relations changed considerably after Gazprom declared it was no longer willing to sell gas to Ukraine at below market prices. Following a significant economical and political crises by the end of 2005, a new agreement was found in January 2006 which decoupled gas transit from imports and stipulated a significant price increase for Russian gas to USD 230 per thousand cubic meters (tcm).[2] However, the agreement also maintains rather low price levels for imports from Caspian states to Ukraine. Accordingly, average import prices have increased considerably but still remain significantly below price levels of major EU countries such as Germany (e.g. about 318 USD per tcm in July 2006, Figure 1).

Recently, Ukraine's government announced an agreement according to which all gas in 2007 will be imported exclusively from Caspian states. However, import prices as well as quantities beyond 2007 still need to be determined.[3] This is likely to require additional, highly political negotiations. The wider the gap between politically intended price levels and benchmark prices on e.g. EU markets the more uncertain their outcomes. Accordingly, Ukraine's gas imports are still not secured beyond 2007 and future price developments remain rather uncertain. Against this background, we will discuss in the next section how gas imports are secured in EU countries. Based on this discussion we will then derive lessons and recommendations for Ukraine.

3. EU gas imports

Due to the ongoing process of regional integration of EU energy markets,[4] import prices for gas into different EU countries are increasingly integrated. Essentially, demand on the four largest markets, Germany, France, Italy and the UK, which together account for more than 65% of EU gas consumption, determines the development of overall gas prices. The main players on the EU gas market as well as main importers are multinational companies such as Eon, RWE, GDF, ENI, Wingas, Exxon, Shell, Total or BP. They all acquire the biggest part of their imports under long-term contracts which are typically negotiated on company levels without direct interventions of national governments. Moreover, rather than relying on a single contract per trading partner, importing companies typically hold a portfolio of different contracts,[5] each of which:

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[1] This has bees pointed to in several GAG/IER publications such as ""*Towards Higher Standards for Living An Economic Agenda for Ukraine*" (2006), "*New Challenges for Economic Policy in Ukraine: Proposals for Immediate Action*" (2006) or advisory paper no. V4: "*The Ukrainian-Russian gas agreement: An economic assessment*" (February 2006) – see www.ier.kiev.ua.

[2] An assessment of the agreement can be found in advisory paper No V4: "The Ukrainian-Russian gas agreement: An economic assessment" (February 2006).

[3] By mid-October 2005 the corresponding agreement was still not signed and also important details such as the terms and conditions of gas transit through Russian pipelines not finally determined.

[4] See e.g. GAG/IER advisory paper no. V8: "*EU Energy Sector Reforms: A benchmark for Ukraine!*" (May 2006) – see www.ier.kiev.ua.

[5] The specific provisions of gas import contracts are typically business secrets of the respective companies. However, there exists information based on which comparable date on different contracts can be collected. The facts presented here stem from a database that has been collected by Technical University of Dresden and consists of about 150 different long term gas contracts (see Neumann, A. and C.v. Hirschhausen (2004): *Less long term gas to Europe?* Zeitschrift für Energiewirtschaft, Vol. 28 No. 3, 175-182) as well as A. Konoplyanik (): Uncertainty surrounds Russia-to-Europe gas agreements. Oil & Gas Financial Journal.

- Specifies relatively small annual quantities from less than one to about 16 bcm per contract[6] plus some small flexible volumes (so-called swing); and
- Has a different maturity, ranging from 2 to more than 30 years.

Traditionally, all import contracts have so-called "Take and/or pay" (ToP) provision which require:

- The seller to deliver given quantities in specified periods, thereby assuming full delivery risk; and
- The buyer to pay for the full contracted quantities, thereby assuming full market risk.

In order to ensure competitiveness over long periods, the prices stipulated in those contracts are not simply fixed but indexed to prices of other energy fuels which compete with gas in given markets (e.g. coal, fuel oil or crude oil and – increasingly – also sport market prices for gas).[7] For example, contract partners determine an initial benchmark price ($\mathbf{P}_0$) and select a number of competing fuels to which future price developments will be indexed. Then, the contract price at any later time ($\mathbf{P}_t$) is approximately determined by the following formula:

formula 1

$$\mathbf{P}_t = \mathbf{P}_0 + \sum_i \mathbf{x}_i \, (\mathbf{a}_{i0} - \mathbf{a}_{it})$$

where **i** is the set of selected competing fuels, $\mathbf{a}_{it}$ denotes the price of fuel **i** at time **t** and $\mathbf{x}_i$ are fuel-specific weight factors.[8]

The indexation of import prices to substitutes not only guarantees competitiveness of gas over long periods, it also induces dynamic price adjustments that follow both, seasonal effects as well as general trends of energy prices. In case of strong price shocks, special adjustment clauses also allow for further renegotiation. In contrast to the flat prices used in Ukraine, dynamically adjusting prices follow economic developments rather than political influences, thereby sending reliable signals to energy consumers (e.g. stimulus for investments in energy efficient technologies). Flexible prices also induce risks on market players since future price developments can not be predicted with certainty. However, on competitive markets such risks can be effectively managed and mitigated through a number of instruments such as forward sales, future options or hedging. Indeed, the necessity to manage price risks on EU energy markets has even stimulated the development of specialized energy traders who disburden price risks from energy suppliers by offering less volatile prices and opting for favorable future price developments.

In summary, the long-term maturity, ToP provisions and price indexation guarantee reliable and economically sound conditions for buyers and sellers with clear division of risks between all parties. From the sellers perspectives, all delivery risks can be managed by own efforts. From the buyer perspective, the together more than 150 contracts with different maturities have proven to guarantee stable and secure gas supplies. In fact, although Russian gas accounts for about 40%, 30% and 25% of domestic gas consumption in Germany, Italy and France[9] the security of gas supplies to the EU has never been effectively endangered, not even when Gazprom stopped gas supplies to Ukraine in early January 2006.[10]

4. Securing gas imports to Ukraine

How can Ukraine's gas imports be secured and how should import prices be set?

Status quo: lowest possible prices

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[6] For comparison, 16 bcm accounts for less than 2% of total annual consumption in the EU-25, or about 35% of annual consumption in France, the smallest of the "big four".

[7] Often, contracts to countries with very different seasonal demand levels or contracts for newly invested capacity stipulate prices as a combination of a fixed capacity charge (for providing the infrastructure) and a flexible component which is indexed to other fuel prices.

[8] The weights $\mathbf{x}_i$ for each fuel **i** are the product of a fuel-specific energy conversion factor, the intended degree of indexation (e.g. 100% for an exact indexation) and the share of the respective fuel **i** in all competing fuels. For details see e.g. R. Donath (1996): Gaspreisbildung in Europa. Köln: Schulz-Kirchner Verlag.

[9] BP Global Energy Statistics.

[10] Rather, the threat of creating a shortfall has been a strong incentive for Gazprom to find a compromise with the Ukrainian side.

As discussed in section 2, maintaining the status quo and focusing on the lowest possible price levels has come at substantial long-term costs:

- A significant economical and political dependency from export countries, in particular from Russia;
- High energy intensity and demand levels with only weak incentives for energy saving; and thus
- A high vulnerability of the whole Ukrainian economy to external shocks.

The current situation also reveals the following problems:

- It creates considerable uncertainty for medium and long-term business planning of all gas customers since reliable estimates on domestic gas prices over a period of 2 to 5 years and beyond are almost impossible.
- Low prices could be regarded by Ukraine's trade partners as implicit subsidies and used as reason for trade sanctions. Irrespectively of whether or not this is justified, it will create costs for the economy, most probably even higher ones as long as Ukraine itself is not member of the WTO.
- Achieving low prices for gas imports in the future is likely to require Ukraine to make serious concessions about its gas transit system (GTS) and its underground gas storage capacities. While cooperation with Russia is important for the future profitability of the GTS[11] Ukraine's position should not be "unnecessarily" weakened.

Obviously, a strategy of securing the lowest-possible price levels is not capable to secure Ukraine's gas imports and to give domestic customers a reliable basis for estimates of future prices. Rather, the regular renegotiations, which can be expected once new price levels have been established, will not provide a stable basis for business planning and are likely to further endanger security of supply.

Alternative: from politics to business:

As the discussion on EU imports (section 3) has demonstrated, gas deliveries can be secured on the basis of import prices that:

- Are economically reasonable; and
- Signal consumers the true value of energy.

In Ukraine, economically reasonable prices for gas imports would prevail if delivering gas to Ukraine were as profitable as delivering it to main EU markets such as Germany. Hence, import prices into Ukraine should follow EU import prices minus transportation costs from Ukraine to the respective EU markets. Without Ukraine's willingness to pay such prices gas supplies can not be secured because:

- Lower prices granted e.g. by Caspian states will require new political concessions and thus, future uncertainties; and
- Gas prices that are kept below market levels cannot signal consumers the full economic value of gas and hence, stimulate higher-than-necessary consumption levels.

Technically, reasonable import prices can be derived from a formula such as:

formula 2

$$\mathbf{P}_{\text{Ukraine}} = \mathbf{P}_{\text{EU}} - \mathbf{C}_{\text{transportation Ukraine-EU}}$$

For average import prices to effectively secure gas imports to Ukraine it must be clear that this formula should set prices for all gas supplies to Ukraine, including the Caspian states. For example, based on the German import price in June 2006 (USD 312 per tcm, see Figure 1) and gas transportation costs from Ukraine to Germany (estimated at USD 35 per tcm, see appendix) an economically justified price is about USD 277 per tcm. This price is so dramatically above the current level of USD 95 per tcm that a transition period of stepwise

[11] See advisory paper S33 "Is the Ukrainian-Russian Gas Consortium in the Economic Interest of Ukraine?" (April 2003)

adjustments is strongly advisable (see the discussion below). Nevertheless, as highlighted above, the general adjustment of prices is without alternative if gas supplies have to be secured.

Once a reasonable import price is specified along the lines of formula 2 it should be indexed to future price developments of either competing fuels such as oil or coal, or – preferably – to price changes on spot markets for natural gas in Europe. Such an indexation further sharpens the price signal to consumers. In particular, it better reflects the costs of winter gas and storage. At the high present prices this would lead to higher payoffs for energy efficiency-increasing measures in e.g. district heating, thereby reducing overall gas demand.[12]

To pursue this suggestion the following issues should be considered:

Transition period: Given the dramatic difference between Ukraine's current import prices and the economically reasonable levels estimated above (e.g. 277 – 95 = USD 182 per tcm in June 2006) a transition period during which import prices will be adjusted to their target levels would help preventing too abrupt shocks on Ukraine's economy and society. However, in order to be transparent and predictable price adjustments should be stipulated in advance over the entire period. For example, the difference between Ukraine's present import price, say $\mathbf{P}_0$, and its target value calculated on the basis of formula 2 ($\mathbf{P}_{Ukraine}$) could be reduced equally over a transition period of **N** years. For each year **n** (=1,..., **N**) within this period, the import price $\mathbf{P}_{U,n}$ could be calculated as follows:

formula 3

$$\mathbf{P}_{U,n} = \mathbf{P}_0 + (\mathbf{P}_{Ukraine} - \mathbf{P}_0)\ \mathbf{n/N}$$

Based on this formula and assuming a six year period (**N** = 6), next year's (**n** = 1) import price would be about USD 125 per tcm.[13] similar to currently discussed price levels. The advantage, however, is that with a formula as given here, price adjustments are transparent and predictable rather than depending time and again on clumsy negotiations. Moreover, indexation of import prices ensures that future price developments will be explicitly considered, thereby reducing the need for renegotiations in the future independently of future prices will rise or decrease. The recent agreement on gas imports from Caspian states provides an excellent starting point for the transition period as it eases the immediate pressure on price increases that Gazprom has exercised and allows Ukraine to tie its alternative suppliers over longer periods by promising gradual price adjustments towards economically reasonable benchmark levels.

Role of energy companies: As in the EU, commercial negotiations and agreements on energy imports should be conducted by energy companies rather than by the government. Competition between firms can preclude abuse of market power. Like on EU markets, firms can acquire gas based on a portfolio of different contracts with suitable provisions for mutual risk allocation such as ToP under which gas supplies can be sustained and ensured.

Role of the government: The key role of the government should be to support market-based gas imports. This requires:

- During the *transition period* a framework contract between all governments involved should specify import prices along a given path as e.g. set up in formula 3. The prices agreed upon by different firms could be allowed to fluctuate within a given band around the framework price. The framework contract should also rule out the possibility that all imports are contracted with a single firm, e.g. by requiring that certain volumes are sold through competitive auctions.
- In the *medium and long run*, pursuing gas imports is only profitable for energy companies when gas can be sold at reasonable prices. This requires a sufficient degree of market opening and competition. Accordingly, government actions must focus on abandoning the

[12] See formula 2 for an example of an indexation formula. Several energy brokers such as Platts or Spectron regularly publish prices developments on EU spot markets. Data on import prices as for example provided by Germany's Federal Office of Economics and Export Control (BAFA) are not appropriate because a) gas exporters have a direct impact on those prices; and b) data are available only ex-post.

[13] 95 + (277-95) 1/6 = 125.3

current import monopoly/oligopoly structure of Naftogaz and RosUkrEnergo. This will inter alia require to ensure equal access to network infrastructure for all gas-trading companies, e.g. by mandatory capacity auctions and independent regulation of transportation tariffs, so that traders can ship their acquired imports at predictable conditions through Ukraine. It should be further supported by opening Ukraine's gas markets to international energy companies. While this will work towards cross-border harmonization of energy prices, particularly with EU countries, sufficient levels of competition on domestic markets can and should be secured through appropriate regulation and competition policies.

5 Summary

We presented a suggestion of how to secure gas imports to Ukraine. In contrast to the present situation, our suggestion does not require additional and not directly related concessions such as linking import prices with tariffs for gas transit and storage. Rather, we opt for establishing economically and politically independent relations while leaving non-related issues to separate, independent negotiations. This suggestion is not alternative but rather complementary to the recent agreement on receiving gas supplies exclusively from Caspian states as it helps to secure deliveries beyond 2007.

The key elements of our suggestion are:

- To express Ukraine's willingness to pay economically reasonable prices at internationally competitive levels;
- To offer gas suppliers a transparent and predictable pricing mechanism, suitable to overcome the long history of economical and political troubles and crises of the past; and
- To request a transition period during which prices can adjust along a pre-specified formula.

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Kyiv, October 2006

Appendix 1

Calculation of costs of gas transportation from Russian / Ukrainian border to Czech Republic / Germany border

For calculation we assume transportation of 10 bcm of gas according to one-year contract through Ukraine (pipeline Sumy/Pskov regions border - Uzgorod) – Slovakia (Velke Kapusany - Lanzhot) - Czech Republic (Lanzhot-Waidhaus) to the German border. There are different tariff calculation methodologies in theses countries:

- Distance-based commodity in Ukraine and the Czech Republic; and
- Entry/exit methodology in Slovakia.

We calculate transit charges through these countries separately. We used information on current tariffs as given in:

Energy Charter Secretariat (January 2006): *Gas transit tariffs in selected ECT countries* (see www.encharter.org)

Transit charges in Ukraine and Czech Republic are a simple product of length of pipeline and the tariffs. Calculation of transit charge in Slovakia is more complicated. The annual fee (P_f) is calculate on the basis of the following formula

$P_f=(P_0*(1-\alpha/1\ 000\ 000*C)*I)*C$

Where:

- α is a daily capacity factor set at 0.008 for users with a maximum daily capacity below 25 million cm and zero for others;
- C is the contracted maximum daily capacity;
- I is a contract duration factor which equals 0.946 for contracts over ten years and 1.006-0.006*D for all contracts over less than 10 years, where D denotes the duration in years.

Hence, for total gas shipments of 10 bcm based on an annual contracts we set

- **C** = 10bcm/365 **= 27** m bcm;
- **a = 0** (since C = 27 m bcm > 25 m); and
- **I = 1** (One year contact).

As Slovakia uses entry/exit tariffs the total transportation costs equal the sum of payments on entry and exit. We assume equal entry and exit quantities. Then, Slovakia's transit charges can be calculated as in table A1.

Table A1
Calculation of transit charge in Slovakia

Tariff, daily booked capacity > 25 m m3			
Entry: Velke Kapusany	1.2245	EUR	
Exit: Lanzhot	1.1502	EUR	
Total tariff, EUR	2.3747		
I	1		
C	27,397	million m3	
Annual payments	EUR 50,800,487		USD 65,075,425
EUR/USD exchange rate = 1.281			

Given the annual payment for transit through Slovakia, total transit charges for transportation of 10bcm of gas can be calculated based on the transit fees in Ukraine and the Czech Republic based on the respective length of the pipeline in both countries. Our results in Table A2 then indicate a total annual payment of USD 350,575,425, or about USD 35.06 per tcm.

Table A2
Gas transit charge calculation

Country	Pipeline	Tariff type	Tariff, USD/tcm/ 100 km	Length, 100 km	Gas volume, tcm	sum
Ukraine			1.6	11.5*	10,000,000	184,000,000
Slovakia	Velke Kapusany - Lanzhot	entry/exit			10,000,000	65,075,425
Czech Republic	Lanzhot-Waidhaus	distance commodity based	2.9	3.5	10,000,000	101,500,000
Total costs of transportation of 10 bcm of gas is					**USD**	**350,575,425**

Note: * average haulage

Our estimated transportation price is rather close to exemplary calculations given in Energy Charter Secretariat (2006) who estimated transit payments through Ukraine, Slovakia and the Czech Republic at 27.9 per tcm and year (differences in both calculations can be sufficiently explained by different assumptions on the contracted shipments).