The evolution of gas pricing: Europe & CIS

The question of how best to price natural gas is highly controversial. The post-Soviet transition for FSU states from cost-plus to net-back replacement value pricing can be seen as a primary cause of the Russia-Ukraine gas crises. It also contributed greatly to external misunderstanding of Russia's gas export policies. Yet even net-back replacement value pricing is now subject to challenge or at least adaptation. **Andrey Konoplyanik**

In 1962, the Dutch government proclaimed a new energy policy aimed at the maximization of long-term resource rent from the development of the then newly discovered (in 1958) super-giant Groningen natural gas field. Based on these principles, the concept of the long-term gas export contract (LTGEC) was established, now known around the world as the "Groningen model of LTGEC".

The Groningen model's major characteristics are: long-term contracts; pricing formulae linked to the cost of replacing the gas with an alternative fuel, with the latter's price formed in competitive markets; regular price review, including both the recalculation of the price level for the current period under existing formula and a review procedure of the formula itself; net-back to delivery point; minimum delivery and off-take obligations, such as take-or-pay provisions; and protection from price arbitrage to the detriment of the exporter, i.e. destination restriction clauses.

This mechanism provided an opportunity to sell natural gas within an evolving market structure and competitive pricing environment to the mutual benefit of both producer and consumer. All further development of capital-intensive gas infrastructure in Europe and of the whole European gas industry was based on the implementation of such Groningen-type LTGECs.

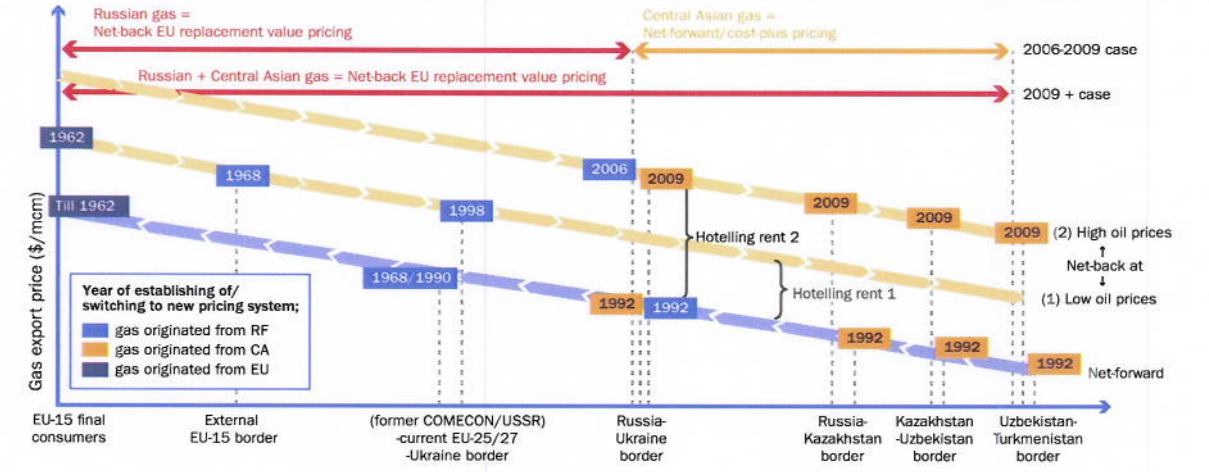
Broadly speaking, there are two other ways of pricing non-renewable energy resources such as gas: cost-plus pricing, or net forward, which takes the cost of producing the gas and delivering it to the customer and adds a profit margin; and exchange or spot pricing, where a price is agreed for the commodity between buyers and sellers based on current market conditions.

If the cost-plus principle is used, the price of gas produced in the east and delivered to the end-users in western markets is calculated by the net-forward approach from the cost of production at the exporter's well-head. If the net-back replacement value principle is used, the price of gas is calculated as replacement value at the end-use market netted-back to the delivery points.

Since the price of gas in European LTGECs is mostly pegged to the price of petroleum products (gasoil/diesel and residual fuel oil), the higher the international oil price, the higher the contractual price of gas calculated by the net-back replacement value principle, and the higher the exporter's resource rent. Equally, a lower international oil price results in a lower resource rent for the exporter.

Before 1962, gas pricing in Europe was organized on the cost-plus basis. Since then, the dominant export gas pricing mechanism in continental Europe, and, indeed, across Eurasia, has been net-back replacement value pricing. However, Russia's state-owned gas company Gazprom retained a cost-plus system of pricing for Soviet-era customers in the COMECON countries and for Russia's FSU partners. The transition from this to net-back replacement pricing has in recent years contributed greatly to external misunderstanding of Russian gas export policies.

Evolution of gas export pricing in Continental Europe & FSU



Source: Andrey Konoplyanik

COMECON, FSU exception

It is the sovereign right of the resource-owning state or exporter to choose whether to provide for an importing country politically-motivated concessions, either in the form of lower export price levels or by establishing pricing formulae to the importer's advantage. In both cases, the exporting state shares the resource rent with the importing state. In effect, this is a reversion to cost-plus pricing.

Such practice was broadly used, inter alia, between the USSR and COMECON countries up to the end of the 1990s; between Russia and Ukraine from 1992 to 2006 for gas originating from Russia; and between Central Asia, Russia and Ukraine between 1992 and 2009/2010 for gas originating from Central Asia.

Towards the end of the 1990s, Russian export contracts with the COMECON countries were transformed in line with standard European practice to Groningen-type LTGECs, with gas pricing based on the replacement-value principle. The immediate impact for gas purchasers was minimal, as 1998 saw oil prices plunge to record lows. The difference between gas priced on a cost-plus basis and gas priced on the replacement-value principle was insignificant. This is why the transition from politically-motivated to economically-justified pricing took place relatively painlessly for Central European importers and did not prompt political tensions with Russia.

However, this was not the case within the FSU. After the dissolution of the USSR at the end of 1991, all gas export pricing within the FSU was organized on the cost-plus principle. It was only in 2006 with Ukraine, and in 2007 with Belarus, that Russia started to transfer its export gas pricing for CIS recipients from the cost-plus to the replacement value principle. Two other important changes were also taking place at this time: first, the contractual separation of gas transit through Ukraine and Belarus and the export of gas for domestic use by these FSU states; and, second, transit tariffs to the EU were being changed towards the "cost of service" principle.

The replacement value for Russian gas was calculated on the basis of the EU end-user market, since it was this market – and not the markets of Ukraine and/or Belarus – that provided the highest marketable price and most prospective demand for Russian gas, and thus the highest resource rent for the resource-owning state. Unfortunately, the time chosen for these transitions was poor. By 2006, the oil market was into its fourth year of steadily rising prices. The gap between politically-motivated cost-plus gas prices and economically-justified replacement-value gas prices was steadily widening.

This explains why the switch from political towards market-based pricing was so economically painful for importing states, why it increased political tensions between the states in question, and why different intermediate/transition schemes were introduced to soften the burden of the price increases on importing states. In the case of Ukraine, a major element in softening the impact of increased gas prices was the continuation of the supply of Central Asian gas to the country via Russia, since Russia was still purchasing gas from its own external suppliers – notably Turkmenistan, but also Uzbekistan and Kazakhstan – on a relatively low cost-plus basis.

By mixing this relatively low-priced gas originating from Central Asia with relatively high priced gas originating from Russia, Russia was able to supply gas to Ukraine from 2006 to 2009 at a substantial discount compared with Russian gas sales to the EU. The sales were conducted through the Russian-Ukraine Swiss-registered intermediary RosUkrEnergo and a weighted average price level was used to blend the two different pricing mechanisms into a single price to be paid by Ukraine.

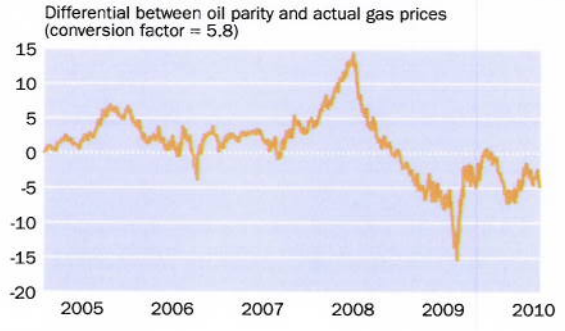
However, Central Asian gas producers, now felt that they were missing out. They wanted to receive the full value for their gas. So, in 2009, the principle of net-back replacement value pricing was extended to Russian purchases from Central Asian producers.

This had the following consequences within the Central Asia–Russia–Ukraine triangle. For Central Asian exporting states, it meant that they were finally beginning to receive the full value of their gas exported westward. Formerly, they had transferred a large portion of their resource rent to FSU customers receiving a mixture of Central Asian and Russian gas, notably to Ukraine.

For Ukraine, it meant that it could no longer receive gas at a discounted price and thereby monetize a resource rent that originated from Central Asia. For Russia, it meant that it had to pay the full EU-based price for gas imported from Central Asia, and as a result it could no longer continue to subsidize the Ukrainian economy at the expense of Central Asian gas producers, in effect, the chief characteristic of the 2006-2008 period. For 1992-2006, both Russia and the Central Asian states subsidized Ukraine with cheap cost plus gas.

Since 2009, Russia has been subsidizing the Ukrainian economy at its own cost. Russian gas sales to Ukraine for the year 2009, regardless of whether the gas originated from Russia or Central Asia, were priced on

Nymex natural gas versus crude



Source: Platts

the basis of net-back replacement value, but with a 20% discount. For 2010 – and for the whole period until the end of 2019 – the price of Russian gas supplies to Ukraine is fashioned to include a 30% discount to a price calculated on net-back replacement value.

In practice, this latter discount constitutes a direct subsidy to Ukraine from the Russian state budget, since the Russian government has given Gazprom a tax allowance (in the form of an exemption from export customs duty equal to 30% of the contract price for the ten-year period) that compensates the Russian gas giant for the losses it would otherwise sustain. The 30% discount was, of course, arranged as part of a political deal, and serves to offset the costs that Russia would otherwise incur through its agreement to continue leasing the Sevastopol Navy Base in the Crimea (which is part of the Ukraine) for a further 25 years from 2017-2042.

New challenger

It took almost 50 years to expand the net-back replacement value pricing principle to the whole of both continental Europe and the FSU area through the existing EU-oriented gas value chains. The final expansion of this pricing principle to cover Russian imports from the Central Asian states in 2009/2010 has had another important consequence. Changing the pricing mechanism has altered the export priorities of the Central Asian gas exporting states: supplying the EU market (western routes) has gone significantly down in the hierarchy of priorities for Central Asian gas producers, well below China (eastern route), Iran (southern routes) and Russia (northern routes). This is because Central Asian producers now receive the highest possible value for their gas through the existing Russian pipeline system and have less need to pursue alternative pipeline routes.

Meanwhile, there has been a sudden and marked divergence in gas prices based on LTGECs and those formed on exchanges through gas-to-gas competition, or for spot cargoes of LNG. Does this difference between spot and LTGEC prices threaten the LTGEC model? Will gas-to-gas competition sweep eastwards just as the LTGEC model displaced cost-plus?

Spot pricing will not replace the pricing formulas in LTGECs in the same way that the latter replaced cost plus. But there will be change, for example a process of adaptation of current mostly oil-based gas price indexation formulas. This is most likely to take place through linking gas prices to a more diversified basket of formula ingredients, including an increasing number of non-oil replacement fuels, and an increasing role for gas-to-gas competition as an ingredient in LTGEC pricing formulas.

How this will evolve is uncertain, but most likely as a two-dimensional process. First, the role of spot/futures gas pricing in western Europe will grow in line with the development of the concept of the common internal EU gas market. According to EU gas market directives, the market is to be organized as a number of regional zones with liquid hubs – centers of spot trade – inside each of them. This will take some time.

Today European hubs are not liquid at all – except perhaps for the UK National Balancing Point, where the liquidity level, measured by the so-called "churn" parameter, has been reaching the level of marginal low liquidity, when the churn equals 15. The hubs in continental Europe have churn rates at 3-5 maximum. For comparison, the churn level at the major US gas center Henry Hub is approaching 400. Churn is the ratio between exchange-traded volumes and volumes that are physically delivered.

Second, the desirability of gas-to-gas competition will depend on the oil market. The rapid recent development of US shale gas has squeezed imported LNG out of the US market, leaving it for European and Asian importers. This occurred alongside the economic crisis, which resulted in a decrease in global – and European – gas demand, which in turn created an oversupply of gas in Europe and increasing spot trade and falling gas prices – the natural characteristic feature of any period of oversupply.

The surplus of spot LNG has increased the role of gas-to gas competition as an element in LTGEC pricing formulas. For instance, in order not to lose further market share, Gazprom has adapted some contracts so that its counterparties purchase gas volumes exceeding minimum take-or-pay obligations not at contract prices, but at current spot quotations.

The continuing oversupply of LNG will last at least until European gas demand starts to grow again. If this occurs as LNG production from the new projects currently coming on stream worldwide plateaus, the gas glut will start to disappear and the gap between spot and contract prices in Europe will close, reducing or even eliminating tension between spot and LTGEC pricing.

Finally, all major gas exporters will continue to adapt their contract pricing formulas in line with a more competitive market environment. This is likely to occur through slightly different avenues in the eastern and western parts of Europe, with the latter providing an example for the former.

In the CIS, this is likely to mean, firstly, the spread of the simplified LTGEC pricing formula concept to all countries of the region – similar to Russia-Ukraine's 50-50 gasoil-fuel oil indexation formula in their 10-year 2009 contract – and, secondly, the adaptation of formulae to use a more diversified basket of replacement fuels. In the EU, LTGECs from non-EU suppliers will be adapted towards more flexible and shorter-term structures. These will include more diversified pricing formulas, comprising both a more sophisticated basket of ingredients and a continuously increasing role for gas-to-gas competition as an element in the new LTGEC pricing formulas.

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