ANNA KORPPOO AND ARILD MOE EXAMINE THE ADDITIONALITY ISSUE RELATING TO JOINT IMPLEMENTATION PROJECTS REDUCING GREENHOUSE GAS EMISSIONS FROM RUSSIAN GAS DISTRIBUTION PIPELINES

What about additionality?

Thirty per cent of Russia's joint implementation (JI) project portfolio consists of projects for refurbishing gas distribution pipelines. Some of these are very large – reductions of up to 25 million tonnes of carbon dioxide equivalent ($MtCO_2e$) in the case of a project at Stavropol. Together, they offer a very interesting potential for emission reductions and JI – one of the Kyoto protocol's project-based flexible mechanisms

They do, however, involve complicated issues related to baseline setting and 'additionality' – whether or not the project would have gone ahead without the carbon finance In this article, which is derived from a recent research project* convened by not-for-profit climate change policy research organisation Climate Strategies, we focus on that additionality question

Gas pipeline refurbishment projects reduce methane emissions caused by leaks of natural gas from the low-pressure pipelines that are used to distribute the gas – itself delivered by high-pressure trunk pipeline from a gas field.

The proposed JI projects first identify and measure the leakages of methane from the gas pipelines at all regulator and pressure reduction stations; second, leakages are repaired with modern sealants; and third, the projects continue to monitor pipeline leakage and to repair any leakages detected. Hardly any data is available on the historical trends of leakages from the low-pressure gas distribution pipelines due to the lack of comprehensive measurement programmes

The estimated leakage in the Russia's distribution system was 5.3 billion cubic metres (bcm) in 2004 In addition, an estimated 6.2 bcm leaked from compressor stations and trunk pipelines Since this involves methane, these figures represent very high greenhouse gas (GHG) emissions, some 80Mt of CO_2e from the distribution pipelines alone.

Profitable repairs

There are many possibilities for reducing leakages from distribution networks. Since repairing pipelines entails not only cutting emissions of GHGs, but also reducing losses of a valuable product, natural gas, it would be expected that the value of gas saved would make many repairs profitable

Over Kyoto's first commitment period (2008–2012), projects are forecast to save 5.2 bcm of natural gas. According to Russia's huge natural gas producing monopoly Gazprom, the average price for the country's gas in Europe in mid-2008 was $410 per 1,000$m^3$ The value of the saved volumes in the export market would therefore be some €1,355 million ($2,019 million) Using the price on the domestic market to industrial consumers in 2008, they would provide revenues of €231 million.

The estimated cost of emission reductions from the gas distribution pipeline refurbishment projects, €0.49–2.5 per ton of CO_2e, could be used as a rough estimate of the costs of gas savings. It appears that the abatement cost can be much lower than the domestic price of the saved natural gas, let alone the export price. The potential profits from the sales of the saved gas could also be compared with the expected profits from the sales of the emissions reduction units (ERUs) – carbon credits generated by a JI project. The gain from saving the gas and exporting is higher than the value of the ERUs generated at a price of €9 per ton of CO_2e, €700 million. But this sum exceeds the value of the conserved gas on the domestic market.

All in all, such a macro-perspective on the economics of the refurbishment projects seems to indicate that they are non-additional. But this reasoning presupposes that the value of the saved gas accrues to the entity that has to pay for the repair. This is why the organisational issue is so important when discussing the additionality requirement.

Russia's gas distribution companies do not buy and sell gas They are paid a fee for transmission through their systems, based on volume If gas is conserved, the organisation does not have the possibility to resell that gas Indeed, it could lose money if supplies were cut back.

This is an important argument for the additionality of distribution pipeline refurbishment projects. The distribution company has no economic benefit from the gas that is saved if such a project is implemented. The only economic benefit is derived from the sale of ERUs and thus projects are additional. There are also important local benefits, such as reduced risks of fires and explosions. They are difficult to calculate, though, and the companies argue that they lack the funds to improve the pipelines

But even if the distribution companies are indifferent to saving gas, somebody acquires the conserved volumes: either the supplier of the gas to the distribution networks, namely Gazprom or the final consumers One might think it is the former, since it is Gazprom that actually sells the gas to the consumers If the JI projects mean that less gas has to be pumped through the distribution companies, then Gazprom can sell this gas elsewhere and earn money

Based on this reasoning, one would expect Gazprom to take an increasing interest in conservation measures in gas distribution as the gas price rises In 2001, Gazprom identified a series of measures that could mitigate GHG emissions from the gas distribution sector at a cost of less than $17 per 1,000$m^3$.

Even where gas distribution companies remain independent, one would expect Gazprom to take an active interest in their operations. But with the country's expansion into gas distribution, the institutional barriers between it and the distributors are broken down at the corporate level. If JI refurbishment projects were carried out in Gazprom-owned distribution companies, the company could gain from both selling the saved gas and the sales of the ERUs Under these circumstances one would think it would be difficult to argue for the additionality of a project. In fact, projects being developed by Gazprom-owned organisations are included in the list of JI projects, notably Bryanskoblgaz However, the implications of the corporate ownership are not discussed in the project design document.

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DAVID LYTTLETON

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the distribution network should in principle be metered and paid for accordingly. This is not the case everywhere yet, although the situation is gradually being remedied.

At the other end of the distribution system, where the gas is delivered to the final consumer, metering is very often lacking or not very accurate. The consumption of gas is more often than not just calculated according to a set of parameters. And the total amount of gas delivered from the distribution organisation equals the supplies from Gazprom – minus the calculated losses – 0.6 per cent. Thus, it is in fact the final consumers who pay for losses exceeding this level.

If Gazprom wanted to reclaim this gas after introducing conservation measures in the distribution system, the final consumers might argue that they should be compensated in the form of lower gas bills. Alternatively they might argue that they should receive the conserved gas themselves, since they are already paying for it. But, since the conserved gas would be distributed among a large number of customers the individual gains would be small and not enough to make customers go together and pay for pipeline refurbishment themselves; it is a logical, but theoretical, solution. All this reasoning shows that the calculation – from Gazprom's point of view – is not as simple as one might think.

More generally there is little indication that the company works according to marginal cost/benefit calculations. It has been proved that there are many efficiency measures that could be introduced in Gazprom's system that would pay for themselves in a short time if export prices were applied to the calculation. In the company's own energy conservation programme 11.6 bcm of natural gas was saved in the period 2002–2005. Similar volumes are planned for 2007–2010, with 'minimal financial expenditures', mostly in the trunk pipeline system. Even if specific cost data are not offered, it is obvious that the measures proposed have not been evaluated against an export shadow price.

Such prices are not commonly applied, however, for several reasons. First of all, Gazprom is a vast system with enormous gas flows. There is no mechanism that allows marginal efficiency gains to be translated into investments in such gains. It is also important not to underestimate the inertia of huge systems like the Russian gas industry, and a general point is that there is an endless list of investments that could be made to increase efficiency in the Russian economy. Each project may seem an obvious case, but the total volume meets financial and decision-making barriers.

Moreover, Gazprom makes use of internal transfer prices. This means that the price that the relevant transmission organisation pays for the gas that it transports and then pumps into the distribution network is much lower than the export price. Thus, even if Gazprom had a system for factoring in conservation gains, the proper measure would not be the export price, but a far lower domestic price.

The calculated average price for industry in 2008 is 1,690 rubles per 1,000m³ and 1,290 rubles for households (exclusive of VAT), corresponding to approximately $70 and $53 respectively. If the still quite low domestic price is applied, many refurbishment projects may be uneconomical, even on paper. In other words, the projects cannot be justified without additional incentives.

However, Russian domestic gas prices have been increasing significantly in the last few years. In 2007, they rose by 15 per cent, and from 2008 by a further 25 per cent. The official plan is to reach a level in 2011 where profitability of exports and deliveries to the domestic market is the same (adjusted for extra transportation costs and export taxes etc). Should this plan be implemented, one would expect that incentives for conservation measures would gradually be strengthened.

But the main problem seems to be that there are institutional barriers that prevent economically optimal behaviour, especially the status of the distribution organisations as separate, non-commercial entities. This of course may have consequences for additionality. As hardly any economy works fully according to economic theory, the question is how serious these barriers are in relation to the proposed projects. The fact that projects that on paper seem commercially rational are not being implemented, suggests that the extra benefits of JI are required.

Should the organisational barriers in the gas sector be regarded as long-term or something that can readily be dealt with? The present set-up supports the case for additionality in pipeline refurbishment projects. Change can be expected, but the pace of change is uncertain, even if the direction is clear: a growing interest in conservation measures for purely economic reasons will sooner or later make itself felt. At that point, for instance after 2012, additionality may have to be reviewed. And with proper calculation of opportunity costs it could become evident that the right option is not to patch these pipelines, but to replace them. Of course, this would need investments of another magnitude. »

Anna Korppoo is a senior researcher at the Finnish Institute of International Affairs and an associate research fellow at the Fridtjof Nansen Institute, a Norway-based environmental, energy and resource management research organisation. Arild Moe is a senior research fellow at the Fridtjof Nansen Institute. Email: anna.korppoo@upi-ffia.fi or arild.moe@fni.no.

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