

# Tariffs for European Gas Transmission Networks. Report on workshop proceedings

Vincent Rious, Michelle Hallack

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FLORENCE SCHOOL OF REGULATION

# *TARIFFS FOR EUROPEAN GAS TRANSMISSION NETWORKS*

**Vincent Rious and Michelle Hallack**

Florence, Italy
6 March 2009

**Report on Workshop Proceedings**

# Florence School of Regulation

Workshop

# TARIFFS FOR EUROPEAN GAS TRANSMISSION NETWORKS

6 March, 2009

Report - Vincent Rious and Michelle Hallack

*The mainline of the workshop was the transmission tariffs on gas network from a European perspective. Transmission tariff is a key issue for the European gas system for two reasons. First, transmission tariff should incentivize the efficient use of infrastructure and so facilitate the development of competition. Second, transmission tariff should also give enough return to network investors so that they upgrade the network efficiently compared to their current and future uses not only for national infrastructures but also for cross-border pipelines.*

*Three issues were especially treated in the different sessions during the workshop, namely:*

*1° competition and efficient use of the network,*

*2° investment in national infrastructures, and*

*3° investment in cross-border infrastructures.*

*Key conclusions and open questions from the debate among regulators, TSOs, stakeholders and academic delegates are reported here.*

# The European perspective of gas transport tariff

Considering, the quite broad and explicit frame from the current EU guidelines for tariff and investment in the directive 2003/55/EC and the regulation 1775/2005, the 3rd package aims at giving a more explicit set of rules to ensure an efficient use and development of the gas transmission network in a competitive gas market. The 3rd package then aims to harmonize the tariffs in order to make network use more transparent and non-discriminatory, to reduce possible distortions and to increase the gas trade between the countries. The 3rd package is also highly concerned with new transmission investments that are either internal or cross-border ones. The gas transmission investment and the allocation of its capacity become a central issue with the increasing transport demand to bring gas from outside the European borders and to increase the gas security of supply. To ensure efficiency of these new investments, the EU institutions prompt that they should be based on market signals. Ownership unbundling has then returned on the discussion table for two issues: how to limit vertical market power of suppliers and, second, how to guarantee that the market signals are the main trigger of investments. Some regulators tools that might be included in the tariffs guidelines are also currently explored.

The 3rd package then aims at giving more explicit rules about tariff with a decoupled entry-exit tariff and the reduction of the distance component in the tariffs. The 3rd package also aims at giving more explicit rules about investment with the increase of incentive regulation for new investments, the development of a European transmission plan for the next 10 years and the establishment of an Agency at the EU level to arbitrate conflict when national regulatory agencies don't agree on cross-border issues.

## But the current methodologies to calculate tariffs and to balance the network flows in Europe are very different from one country to another.

The convergence of these methodologies cannot be achieved without difficulties because of the high heterogeneity of the national needs in gas and network, in particular for the Eastern European countries. Some works have already been

initiated to harmonize or at least increase the compatibility between the national rules. The EU Commission has just launched a study of current tariffs to understand the internal logic of the national methodology of tariff setting and to discover the differences in these methodologies that can create barriers to the integration of the EU gas market.[1] This study should result in developing policy recommendations focusing on the tariff harmonization and on the cooperation between TSOs.

## How to ensure that competition can develop and the use of the network is optimized?

To ensure that the gas network is optimally used and developed and so facilitates competition on the gas market commodity, several elements are required. Through the first part of the workshop, as reported below, we saw that 1° investor should have enough incentive to develop the capacity of the gas transmission network, 2° various tools can be applied to increase competition in the transport capacity market.

### One of the main challenges to design tariff is currently the impact of the financial crisis.

Indeed, the financial crisis increases the difficulty to predict the interest rate. As a consequence, the financial crisis negatively affects the calculation of the correct cost of capital through the Capital Asset Price Model. It results that the regulators can underestimate or overestimate the capital costs. The financial crisis can also change the expected demand for gas and gas transport. These changes may create instability in the tariff calculation which can harm the regulator credibility and decrease the expected perspectives of revenue for investor, increasing uncertainty and so the costs associated to the new investments.

This kind of instability in tariff calculation for gas transport originated from wide economic crises can be seen in some historical examples. It was the case for example of the Argentine crisis in 2001 and of the USA crisis in the 80's. In the case of the USA, after the financial crisis in 1987, the regulator has decreased the parameter which measures the risks associated to the sector compared to the other

[1] "Gas transmission network tariffs and balancing fees in Europe", project developed by KEMA to the European Commission.
http://www.kema.com/search_results.asp?query=publishes

economic assets. As a consequence of this decision, the tariffs were pushed down artificially.

Most of the regulators currently calculate the rate of return on investment Re with the CAPM models, Re = Rf + Beta*MRP, where the two main inputs are the free risk interest rate Rf and the risk associated to the sector or Market Risk Premium MRP (the beta coefficient describes how is the expected return of the asset is correlated with the financial market as a whole). Risk free rates have been extremely volatile recently. But now they seem to be extremely low. It means that in the next five years it may increase, although there is high uncertainty about its future value. Beside this problem linked to the cost of capital of gas transmission investment, it is necessary to ensure that even in the context of the crisis, the regulators are not influenced by the political matters. The tariff stability in this context may be one of the main pillars to guarantee investments in an environment with high market instability. This tariff stability in the gas transport however is not easy to be achieved even outside the turbulence of the financial crisis. This is because tariff setting for gas transmission is a new task for the regulatory bodies. For example, in the calculation for the CAPM, the value of the Market Risk Premium considered by the regulators has varied between 4 and 5%. But the methodology to arrive to this value is, until now, quite unclear. In the last years, some mechanisms were applied in order to reduce uncertainty in the regulated tariffs. For example, the new Greek legislation has decreased the regulatory discretion power in setting the transport tariffs. Another mechanism is to use long term arrangements between investors in gas transport and network users to give certainty to investors.

In the tariff setting, the rules that apply to the transport capacity rights are also crucial for an efficient use and development of the gas network. In particular, firm cross-border backhaul[2] capacity will be useful to facilitate gas transportation over the European gas network. And the impact of the rule of “use it or lose it” (UIOLI) has to be carefully evaluated. Of course, the UIOLI rule avoids foreclosing the transport

[2] Backhaul is a transportation of gas in a direction opposite to the aggregate physical flow of gas in a pipeline. This service is typical when the transporting pipeline redelivers gas at a point upstream from the point of receipt. A backhaul condition will exist as long as the aggregate backhaul transactions are lesser in volume that the aggregate forward haul transactions. A backhaul transaction can result in a delivery by displacement (reduction) of physical flow at the delivery point or even by the change of gas flow.

capacity. However, it also creates uncertainty for the investor in case of exemption for gas transmission investment.

The UK system has a long experience in allocating and developing a gas network in a competitive gas market. The UK system has then developed a mechanism to allocate capacity based on market signals through auctions. The regulator then sets basic capacity levels jointly with the UK gas system operator National Grid that auctions these capacities to different time horizons. In particular, the transport capacities are yearly auctioned giving rights to long term firm capacity auctions on a unique marginal price basis. A reserve price calculated by the regulator sets a minimum price to the transport capacity. The capacity allocation is linked to the entry-exit system. The auctions are based on the capacity of each entry and exit point of the network. The revenue of the auctions is allocated to pay the capacity owners and the cost of congestion management. When there is a physical constraint on the network day-ahead, the buyback mechanism is applied. In this mechanism, the TSO buys back transport capacity to make the rights to transport gas acquired by shippers in previous auctions match the physical capacity of the network. The buyback mechanism is built under an incentive based regulation, since the cost of congestion is partly born by the transmission owner. As a consequence, if the cost of congestion increases, there is an incentive for the transmission owner to increase investment in capacity in order to reduce congestion.

## Along the discussion between the stakeholders, the main controversial issues were about the tools which have been applied on national bases to increase competition in the transport capacity market.

The discussion has focused mainly on the French release policy that forces the incumbent to release a part of its transmission capacity for new entrants and on the problem raised by auctions to manage congestion in Spain.

The gas release program in France was essential to increase the liquidity in the French wholesale market, especially in the South balancing region where it is difficult to book capacity for new entrants. This program has been seen by some French market players as crucial to allow new entrants in the gas market and decrease the barriers to entry.

In the Spanish case, according to some gas suppliers, the auctions of transport capacity to manage congestion may prevent these suppliers to respect their firm contracts with final consumers. Still according to some gas suppliers the policy makers in Spain need to keep in mind that gas is mostly imported (in particular by LNG). It creates important congestion in some period of year on pipelines linking LNG terminals to the national network. It was also recalled that auctions are useful only if there are enough competitors for the capacity.

## How to ensure investment in national infrastructure?

In this part, tariff was discussed as a mean to ensure investment in national infrastructure. Then national specificities and problems were underlined. Specific questions from some EU countries like France, Austria, Hungary, Portugal, Germany, Hungary and Holland have been presented showing the heterogeneity of the issues which the EU needs to take account.

In **France**, the gas transport tariffs have followed a process of harmonization. Harmonisations have taken place between the TSOs (GRTgaz and TIGF) and between regions inside the TSOs' areas. It has been a long process of negotiation between the market players that has allowed in January 2009 to decrease the number of regions and improve the compatibility between the transport capacity markets ruled by the two French TSOs. An investment program was necessary to increase transmission capacity between the zones of the two TSOs and the balancing zones in the GRTgaz area. This investment plan was actually a consequence of direct negotiations between the transport owners and the regulator body. In France the gas transport is not a legal monopoly. However the entrance of new gas transporters does not seem to be a policy incentivized by the regulation in France. The regulator worries that a bigger number of gas transporters will increase the cost of coordination and harmonization while this will not really increase the competition in the final gas market.

In **Austria**, there is basically only one gas source. The gas transport system in Austria attends the internal demand but also has transit functions for gas from Russia to Germany, France, Italy and Slovenia. The tariff setting is done based on the distance model. In the Austrian case, as the network is not meshed, the entry and exit model seems then to have less advantages, even if this tariff model is

preferred by the EU institutions. And changing from a distance-based tariff to an entry-exit one would increase the costs of tariffs regulation without improving its efficiency. In Austria, the main concern about tariff is its level as it provides money that ensures the long term funding.

**Hungary** is a transit country from Russia to Serbia and Bosnia. The tariff is not calculated with an asset based model contrary to the EU guidelines. The main argument of this divergence is that it is too long for the regulator to realize such a calculation. It rather realizes an indexation of the asset base value following a sector-specific inflation rate. However it was underlined that this model does not accurately reflect the cost from an economic point of view. The regulator actually has an important degree of discretion to stabilize what is the asset cost. This discretion power is in the definition of some variables of the models that stabilize the economic value of the assets like the calculation of amortization, cash flow and capital cost. Moreover, to stabilize the authorized revenue to remunerate efficiently the network investment, the regulator needs to make hypothesis about the capital structure which gives still more discretional power to the regulator to determine the economic value of infrastructure.

Beside the characteristics of the regulation in Hungary, it was also highlighted that, following unbundling, the network expansion was dramatically boosted. This exemplifies that unbundling can have a strong impact on the network development. However ownership unbundling may be a problem for the development of new transport capacity. Indeed, it is still mainly incentivized by long term contract signed before the pipeline construction. And Gazprom is one of the main buyers of the Hungarian gas transport capacity. This situation raises concerns about the power of Gazprom to influence the gas network development, since this firm might have not too much interest to increase gas competition in Europe.

## One of the biggest differences between Hungary and Austria is the storage infrastructure.

In Hungary the storage capacity is not owned by the gas transporters anymore, as it is usually the case in Europe. All the existent storage capacity is owned now by EON

Hungary group[3]. Moreover, this storage capacity seems to be smaller in Hungary. The development of new demand for gas from electricity generation has created some needs for change in the gas network operation. The gas demand from electricity generation is more volatile than other gas demand. And this increases the importance of storage capacity and its ownership. Besides, there is no guarantee of alignment between the gas and electricity regulation, which increases the uncertainty of gas demand.

Another issue underlined for the Hungarian case is the impact of currency risks on investments. It cannot be underestimated for the Eastern European countries and should be taken into account by the European Commission to differentiate the countries using the euro from the other countries. Otherwise there will be an under investment in the transit countries at least in the medium term.

In **Portugal**, the context of strong increase of gas demand from electricity generation has become a main issue for the gas regulator and for the electricity regulator. It makes the development of the power and gas transmission networks interdependent. It may be efficient to realize tradeoffs between investment in the development of the power transmission network and of the gas transmission network. And consequently it increases the necessity of coordination between electricity and gas regulators. The electricity flow comes from the North while most of consumption is localized in the centre-south of Portugal. This situation creates important energy transits from North to South, which generates important losses if this transit is realized by electricity. To the contrary, if this energy is transmitted through gas pipelines with electricity generation located close to demand in the Centre-South, the energy losses are smaller, especially with the LNG technologies. In Portugal the positive externality from the gas transport network to the electricity network, which has not been entirely taken into account until now, is one of the key element in order to incentivize the efficient level of investment in gas transport capacity.

In **Germany**, the main issue is not only to create a capacity market to facilitate cross-border trades, but also to create a capacity market inside Germany between the different German TSOs. It is another way to deal with the same problems as in

[3] This group is a supplier of gas and electricity in Hungary. Through merger and acquisitions, it has acquired some assets of the previous national incumbents.

France to make several TSOs cooperate inside a country. The German solution through the formation of an interregional market is different from the French solution. In France, the goal is to decrease the number of regions, whereas in Germany, the idea is to create a liquid capacity market between the regions. However, the final objective is the same: increasing harmonization between the gas transport networks.

The harmonization of tariffs as it was discussed is central to increase trade between regions. However, in Germany, it is the capacity allocation that seems to be the main worry of the stakeholders. The market participants are then asking for a better market design which allows to trade transport capacity. Policies like tradable transmission rights and platforms for exchange of these rights would be essential as a first step in this way.

In the **Netherlands**, the context seems different from all the others national contexts which have been discussed along the workshop. It is the unique country that is a net gas exporter. The structure of the TSOs in the Netherlands is in accordance with the EU guidelines for the ownership of transport and storage infrastructures, open season mechanism to allocate new capacity and incentive based regulation of tariffs. However, even if the current investment rates in transport capacity are high compared with other EU countries like Germany, it does not seem sufficient. In 2009 the capacity commitment has reached the current capacity level. In the Netherlands, investment in new capacity is becoming a complex matter because the demand for the Dutch gas transport capacity depends on demand for Dutch gas from other European countries.

The lack of investment seems to be currently motivated by the uncertainty on demand for gas and so for transport. The demand in the last years has grown faster than what was expected. But for the years to come, it is difficult to make good predictions about the demand evolution for two reasons. First, an important part of gas demand comes from electricity generation. And it is not clear now how this particular demand will increase in the next years. This uncertainty stems from some unclear regulatory directions about CO2 emissions and the potential technological changes from Carbon Capture and Storage. The second reason is related to gas supply. The gas transport demand is also unclear since most of gas consumed in Europe comes from outside Europe through international pipelines. Considering that

the network planning is currently mainly national, this situation creates uncertainty through a potential misalignment between the national interest and the European interest as a whole in developing the gas transport network.

In conclusion, there is a wide diversity of national needs in tariff setting and gas transport infrastructures. This diversity is sometimes extended inside some countries, as France and Germany, where the transport regulations within the regions and at the national level are not perfectly compatible. A high diversity implies the question of harmonization at the European Level. In a EU perspective, there is indeed no purely national infrastructures. And it is one important contribution of the workshop to feed the dialog between the national and European perspectives about the problems faced by the gas transport sector.

## How to ensure investment in cross-border infrastructure?

When the formation of a European Market is considered, the national and the European regulations must be compatible. However, at the European level, the processes of convergence are more complex. This is because there is currently no unified EU regulatory body (or other similar institution) which could interfere inside and between the countries. And the design of a European market is done mostly in a non coordinated and decentralised way by the national regulators and their cooperation.

The different characteristics of gas supply and demand in these different countries increase the heterogeneity between the needs for gas transport at the national level. As an obvious consequence, it increases the difficulty to harmonize the rules. Because of this heterogeneity, the adoption of rules in one country from another one can be a mistake from a national perspective only, as underlined by the different issues exemplified by the French, German, Austrian, Spanish, Hungarian, Portuguese and Dutch cases. That is why a harmonization of tariffs and capacity allocation rules does not seem easily feasible in the current context. However the harmonization between these rules is necessary to avoid distortion and to decrease the costs of transport between the national limits. This might be the EU cornerstone guideline to develop an integrated European gas market.

Beside the harmonization of tariffs, the development of gas trade between countries also depends on investments in the cross-border transport capacity. In most of the cases, the investments in cross-border pipelines result from a negotiation between the TSOs of each country with the participation of the regulators. However, TSOs, which have guaranteed revenues in their national business, may obviously refuse to take a risk in investing in new cross border capacities with no guarantee of revenue for these investments. In this context, the policy about the merchant lines may be an important policy tool to the EU commission to give incentives to investors for such risky infrastructures.

Until now, it is not clear if the cross border issue will become an EU issue or if it will remain a national issue.

### Would bilateral negotiations be the best way to develop cross border transport capacities?

It is clear that this process requires important transaction cost, since the investors need to negotiate to receive approvals from different institutions. Nevertheless is there another feasible mechanism in the current context? It seems that, until now, the bilateral negotiation and agreement between regulators is the main pillars for the development of cross-border gas infrastructures. Negotiations between France and Belgium or between France and Spain are examples where this process gives visible and well ongoing results.

The whole discussion along the workshop day results in two main opened questions. What is an efficient gas transport network or an efficient network taking into account the possible different objectives of policy makers (e.g. the three pillars of the EU energy policy: competition, security of supply, sustainability)? Is there a feasible first best? These two questions were controversial points that have emphasized some conclusions and opened new discussions.

## Conclusions and new up-to-date questions for policy makers about network development:

Efficiency for the gas network should result from a combination of technical and economic features. Efficiency of the network capacity should be the result of an optimisation based on cost minimization limited by technical constraints. The

equilibrium should then be reached between the cost to offer transport service and the demand value for this service, which can be measured as the geographical difference of value between the offer and demand for the gas commodity. In Europe many tools and models are applied by the TSOs in order to figure out what is the efficient development of the gas networks. The regulator bodies have also worked in the direction and/or supervision of these investment decisions in order to ensure that decisions for the gas transport infrastructures are efficient.

However, even if in theory the equilibrium between offer and demand could answer some of the questions about network efficiency, the definitions of efficiency and equilibrium in the gas network are currently not clear for the moment.

## So, how to define the tariffs, which should be the efficient price of gas transport service?

One hypothesis is that this efficiency point actually depends on the institutional characteristics of the gas industry. Comparing the EU with the USA, it seems that the institutional differences lead the development of transport capacity through different paths. And these two cases may be seen as efficient, if this means equilibrium between offer and demand. However the EU model and the USA model are different if we compare them from the point of view of competition.

Many of the policies considered as essential in the EU to build a transport capacity market have never been applied to develop the USA capacity market, the most liquid of the world. For example, some policies like ‘use it or lose it’ or gas transport release programs which have been seen as the best tools to build the capacity market in Europe have never been considered relevant in the USA to allocate capacity or to define tariffs. The reason of this difference lies in the fact that the US model is built on private decisions helped by rules and institutions that permits efficient decisions to be taken. The rationale of this model is based on the fact that if somebody takes his own money to build a transport asset, this agent will be the best one to look for the efficiency of his investment. And if the system in itself is competitive, the investor will be forced to act as efficiently as possible.

The gas transport can be a competitive activity if the institutional frame provides the initial competitive conditions. In the US institutional framework, these conditions are the following ones: 1- an open and competitive capacity market 2- a gas commodity

market open and competitive 3- an open book system of the gas flows through the networks. The combination of this *ex ante* rules and markets allows investors to take efficient transport investment decisions in the US context of Federal organisation of the gas market.

Unfortunately, the US organisation is not the 'best practice' that should be applied or pursue in the institutional settings of Europe, because it is far from being past and copy in the EU frame. Nevertheless, it means that there is an open range of mechanisms to seek and to develop in the gas network from the diversity of centralized mechanisms like in the EU to decentralized ones like in the US. Likewise, until now, it seems that it is not clear if there is an inter-temporal first best equilibrium for an efficient network.

**All the papers and presentations of the workshop can be downloaded from:**
**http://www.iue.it/RSCAS/Research/FSR/**