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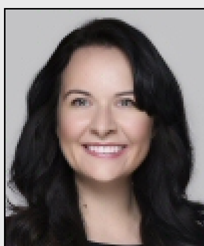

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Natural Gas Price Reviews: Commercial Lessons Learned in Continental Europe

Andrej Pustišek[1], Christoph Merkel[2], Michael Karasz[3]

Executive Summary

Long-term natural gas supply contracts (delivered by pipeline or LNG) often have a value of several billions of US dollars. Price clauses in such contracts are thus of particular importance. However, they may require additional amendments, in particular if the value of natural gas in the market is no longer appropriately reflected by the contract price. To this end, parties to long-term gas supply contracts typically include price review clauses allowing each party to request a price adjustment. In the past decades, price review clauses have been applied successfully in European contracts, in particular using the common three-year interval. Based on these clauses, parties have renegotiated prices and eventually transferred the case to arbitration or ordinary courts. In some renegotiations, parties also agreed to amend other non-price terms in their contracts. Starting in the 2000s, more and more cases have been brought to arbitration. Arbitral tribunals worked fast and efficiently but the costs were not negligible. The main consequence of renegotiations and arbitral decisions was that prices of many long-term gas sales agreements have been changed from oil indexation to gas-hub indexation. European experience in price review renegotiation and arbitration may be useful in other markets – to avoid pitfalls and achieve the desired results.

1. Introduction

Natural gas is, despite the vision of the European Union becoming CO_2-neutral by 2050, still an indispensable source of energy – be it for heating purposes, industrial processes or production of electricity. Yet, the EU and the major consuming countries in Asia depend largely on natural gas imports. While Continental Europe is mainly supplied via pipeline, natural gas is imported to Asia mainly in form of LNG.[4] LNG is transported by carriers from the liquefaction plants located in the producing countries/regions (e.g., Australia, Qatar) to regasification plants located in the consuming regions (e.g., China, Japan, Korea or Europe).

Both pipeline transportation and transportation of LNG (incl. liquefaction and regasification) require huge investments. In order to finance such investments, natural gas (and/or the LNG)

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[4] LNG is an acronym for Liquefied Natural Gas, i.e., the natural is cooled down to -161.5°C where it becomes liquid (and reduces its volume to approximately 1/600th).

was traded (and transported) under long-term contracts.[5] E.g., in 2018, 68% of global LNG was imported based on mid- or long-term contracts.[6]

Both buyers and sellers of natural gas and/or LNG under long-term sales and purchase agreements (“GSAs”) had and have a vested and strong interest in the marketability of natural gas. The natural gas prices agreed in such contracts have to reflect, to match or to correspond to market prices and have been defined as a function of other fuels’ prices, e.g., coal or oil products, the so-called oil-product-price indexation (or, shorter, oil (-price) indexation). Yet distortions between contractual natural gas prices and market prices have nonetheless been observed.

This resulted in the introduction of price review clauses in GSAs, providing sellers and buyers a contractual tool to periodically review contract prices. Such a tool was accepted and deemed both useful and powerful. However, an amicable mutual agreement on how to re-set prices was not always reached. In these cases, the matter had to be referred to arbitration or an ordinary court.

In Continental Europe[7], parties have more than three decades experience with such price review negotiations, arbitration, or litigation. In Asia, price review clauses have not been adopted before the 1990s.[8]

2. Price Clauses and Price Review Provisions

2.1. Price Clauses

Price clauses are key to GSAs.[9] Such clauses include stipulations on how to calculate/determine the contractual price, i.e., the amount of money to be paid by the buyer to the seller for a defined unit of natural gas delivered under a GSA. Yet, the price level agreed upon between seller and buyer depends on all (other) terms and conditions of the contract. E.g., GSAs may contain flexibilities either for seller and/or for buyer. Such flexibilities might either be ‘geographical’, e.g., the seller might have the right to choose (with a certain notice period) between different delivery points, or they might contain – which is most common – certain volume offtake flexibilities for the buyer. From a commercial point of view, both examples are options – either to the seller or to the buyer. As any option is constituting a right but not an obligation to the holder, it has a positive ‘value’[10], and the more flexibilities/options are provided to a buyer, the higher the price level (ceteris paribus), and vice versa.

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[5] There is no generally accepted definition of a ‘long-term’ GSA. However, in this article, contracts with a term exceeding four years are regarded to be long-term.
[6] Deducted from information provided in: (GIIGNL, 2019, p. 4)
[7] In the following ‘Europe’ refers to ‘Continental Europe’
[8] See (Stern, 2016)
[9] For a more detailed general description see: (Roberts, 2014, p. 61 et seq.)
[10] For a detailed description of options see, e.g., (Hull, 2017, p. 235 et seq.) or with reference to natural gas trading, e.g., (Pustisek & Karasz, 2017, p. 87 et seq.). Simplified, flexibility, granted by a seller to a buyer in a GSA is the buyer’s option to off-take volumes between a contractually defined minimum quantity and a contractually defined maximum quantity at each point in time or period during the term of the GSA.

Parties might have different views regarding the value of such flexibilities and the (future) value of natural gas. Furthermore, prices as well as other contractual stipulations are the result of negotiations between the parties, taking into account also soft factors like negotiation power.

The traditional form of defining a price in a GSA – in the absence of liquid natural gas markets – was the so-called indexed pricing. Here, based on the notion that sources of energy such as oil products, coal and natural gas are substitutable, natural gas prices are expressed as a function of the alternative fuels' prices for each point in time.[11] This pricing was adapted in Continental Europe (and partly still is), in Southeast Asia and, with modifications, in Japan.[12] To determine the parameters of an indexed-pricing formula, the parties to a GSA used and use either the analysis of prices in an end user market ('indifference' or 'netback' principle)[13]; or compare the price of the natural gas delivery to be concluded with prices agreed in other contracts which are considered by the parties to be comparable ('landscape' or 'benchmark' principle); or (taking the seller's perspective and) add all cost elements ('cost-plus' principle) and determine the cost-based price.[14]

Starting in the US in the 1990s, natural gas was traded and priced independent of other fuels.[15] Such gas-on-gas pricing was also established in Europe. In other words, in polypolistic, i.e., competitive, natural gas markets, as, e.g., North America, the UK, or in some parts of Continental Europe, natural gas prices are set in relation to supply and demand of natural gas itself.[16]

Hence, once a liquid and transparent natural gas market has been established, parties to a GSA often opted for linking the contract price to (changes of) price indices directly determined at hubs, i.e., combine the formula-based, indexed price structure known from traditional markets with gas-on-gas pricing.

2.2. Price Review Clauses

Generally, it is the parties' intention to ensure competitiveness of natural gas in the target market. In anticipation of the value of natural gas in the market not being appropriately reflected by the contract price, the parties to a GSA typically agreed on the introduction of a price review clause.[17] Based on this clause, the parties could enter in negotiations to change price level and/or price structure, if they do consider the actual contract price (formula) to not adequately reflecting the market.[18]

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[11] the indexation could also refer to, e.g., inflation.
[12] See (Pustisek & Karasz, 2017, p. 112).
[13] frequently the German term 'Anlegbarkeitsprinzip' is used and equated with the 'net-back principle'.
[14] See (Pustisek & Karasz, 2017, p. 113); in the following the cost-plus principle will not be discussed, as price review negotiation and arbitration in past years did not focus on this principle. Further, regulated pricing is not discussed in this article.
[15] Of crucial importance to this "liberalization" of the US natural gas markets were the introduction of FERC order 436 (October 1985) and FERC order 636 (April 1992) (for a detailed reference see: (FERC, 2020)), which introduced third party access to interstate pipelines and unbundling.
[16] See (Pustisek & Karasz, 2017, p. 112).
[17] Price review clauses are also referred to as price re-opener or price-revision clauses.
[18] See (Pustisek & Karasz, 2017, p. 130).

Next to this, the parties of a GSA could enter at any time into (price-review-independent) commercial negotiations in order to modify any price-related terms (and/or other conditions) of the GSA.[19] As during such negotiations, the parties are usually not obliged to come to an agreement, results of such commercial negotiations either tend to be neutral for the parties, i.e., they give neither the buyer nor the seller an advantage compared to the status quo ante or they lead to more positive results for both parties, i.e., to a win-win situation. Any one-sided price reduction (or price increase) is an unlikely result during such commercial negotiations.

Price review clauses contain clear rules to change the contract price and related formulae.[20]

A typical price review clause is likely to read along the following lines:

> *a. lf the circumstances beyond the control of the Parties change significantly compared to the underlying assumptions in the prevailing price provisions, each Party is entitled to an adjustment of the price provisions reflecting such changes. The price provisions shall in any case allow the gas to be economically marketed based on sound marketing operation*
>
> *b. Either Party shall be entitled to request a review of the price provisions for the first time with effect of dd/mm/yyyy and thereafter every three years.*
>
> *c. Each Party shall provide the necessary information to substantiate its claim.*
>
> *d. Following a request for a price review the Parties shall meet to examine whether an adjustment of the price provisions is justified. Failing an agreement within 120 days either Party may refer the matter to arbitration in line with the provisions on arbitration of the Contract.*
>
> *e. As long as no agreement has been reached or no arbitration award has been rendered all rights and obligations under the agreement - including the price provisions – shall remain applicable unchanged. Unless otherwise agreed or decided by the arbitral award, differences to the newly established price shall be retroactively compensated inclusive of interest on the difference calculated at a rate reflecting the conditions on the international financing market.“*[21]

In order to start a price review, certain defined trigger criteria have to be met. These might include,

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[19] See section 3.1

[20] However, price review clauses do not automatically lead to a change of the price provisions. Instead, they provide the right to demand a change. Further, the wording of price review clauses is usually vague. They are never a second indexation. I.e., price review clauses do not provide a clear, quantifiable rule or second formula to adjust the contract price in case a defined (market-) parameter has changed, e.g., by a certain percentage. Price reviews are typically limited to changes of price provisions. Any changes of other (non-price) parts of the agreement (e.g., volumes, quality, delivery point, flexibility) are not common outcomes of price review negotiations or arbitral decisions, as, at least typically, the price review clauses do not give an entitlement to request such changes. Nonetheless, amendments of other terms and conditions of a GSA might be the result of renegotiations.

[21] (Energy Charter Secretariat, 2007, p. 155)

- e.g., reference to a specific market in which pre-defined conditions are deemed to have changed during a review period. This specific market may be delineated, e.g., geographically or by segments;
- further, the condition that the market changes must have caused the value of natural gas in this market to change and such change is, inter alia, not reflected in the price (formula), and the indices used in the price formula change independently of the triggering market changes, and
- such changes must be considered significant, and
- beyond the control of any party to the respective contract; and,
- again, in general, that each party has acted reasonably and prudently.[22]

Such rules include that only changes in the market outside the sphere of influence of the contracting parties could be asserted.

Most price review clauses allow for a price review only at certain pre-defined dates or after a certain period of time has elapsed. Typically, three-year-periods are included. However, some clauses allow for a certain number of extraordinary price reviews (so-called 'jokers').[23] Irrespective of the definition of the 'market change', any discussion of market change starts with the definition of the relevant market. This is not necessarily an entire national market (or group of national markets) but may be restricted to either regions, a company's sales market or even segments in a regional or national market. Once the market is defined, the relevant changes, i.e., the changes considered to influence the price are analysed.

Yet, the term "market change" is frequently used but not clearly defined. In our experience, some parties may consider a market change to be (sufficiently) justified and defined if, e.g.

- the price level or pricing structure (i.e., the indexation chosen for determining natural gas prices (or, mathematically, the independent variable)) prevailing in the market has changed,
- while others require certain regulatory rules as, e.g., unbundling of companies or non-discriminatory rules for the access of transportation or storage facilities to be implemented,
- while, again others, require the establishment, operation and (sufficient) liquidity of a hub.

It is essential to clarify the causality between the market change and the (alleged) price change – market changes being either not causal or irrelevant for the price change have to be neglected.

Some price review clauses, in our experience, contain so-called 'in-any-case' clauses, typically phrased as: "[Whatever adjustment is made] in any case the buyer should be entitled to market the gas economically".[24] These clauses are intended to support the buyer to be able to market the natural gas economically. It is assumed that if the buyer is using sound and

[22] See (Pustisek & Karasz, 2017, p. 132)
[23] These "jokers" are usually applicable only once or twice during the term of the contract. See, e.g., (Zajdler, 2012, p. 37)
[24] (Levy, The Guide to Energy Arbitrations - Second Edition, 2017, p. fn 5)

reasonable marketing practices, he might request a price enabling him to market the natural gas economically.[25]

After evaluation of the price level and structure, the price level might be adjusted, i.e., the base price might be increased or decreased. At the same time the price structure, i.e., the variables' values or the variables itself might be changed.[26] The price level and structure are adjusted in such a way that afterwards the contract price will be in line with the sales market (indifference/netback principle) or other comparable GSAs (landscape/benchmark principle). Whether relative changes (existing price differences are observed) or absolute changes (existing price differences will be eliminated or at least diminished) apply, is either defined in the price review clause or during the price review negotiations or arbitration.

From a procedural point of view, it is common that – before referring the matter to arbitration – the parties shall for a certain pre-defined time period discuss and negotiate in good faith a revision of the contract price (formula). Only as ultima ratio, the case could be referred to arbitration.[27]

The set-up of the arbitrational tribunal as well as other detailed procedural rules are defined either explicitly in the GSA or by reference to arbitrational rules. Yet, some parties to GSAs do not rely on arbitration but prefer to refer the case to courts or, in specific, rare cases, to expert determination.

2.3. Differences between Pipeline Gas and LNG Contracts in Europe

The pricing concept applied for pipeline gas deliveries in Europe was to index the natural gas prices to prices of oil products. This principle helped the sellers at each market-level to monetize the maximum price from their respective customers. The key difference between pricing of pipeline gas and LNG is, that while parties to a pipeline GSA accepted this pricing principle, parties to LNG GSAs (usually) did not accept it.

In the infancy of the European LNG market development by Algerian and Libyan producers, the (politically) induced Algerian request for a crude price parity blocked the LNG development in Europe, as it resulted at that time in higher prices than the ones European importers paid for natural gas delivered under pipeline GSAs. Only some countries contracted North African LNG in that period for special reasons.[28]

Once LNG markets matured and LNG supply increased, the first changes could be observed. After the turn of the millennium few LNG sellers were willing to accept European hub-based pricing, but still insisted on options to divert LNG cargoes to higher priced markets.

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[25] See also 4.1.5

[26] This was already the case in the 1980s and 1990s, when market changes were taken into account without changing the principle of the "indifference" of gas, such as changed equivalent factors, changed market shares of natural gas in the sales sectors, changes in the price premia for gas compared to competitive energies, changes in taxes for gas and its competitive energies, competition with coal-fired power plants, various ceiling and bottom price regulations.

[27] See (Pustisek & Karasz, 2017, p. 133).

[28] See detailed historical description by (Koyama & Stern, 2016)

In recent years, North American LNG exporters asked for Henry hub pricing plus additional costs, e.g., to cover cost for transportation, liquefaction, and LNG shipping. To the extent LNG is delivered under long-term contracts no significant differences in price reviews are observed.

3. European Experience with Price Reviews

Four phases may be distinguished for the brief historical description of price reviews in Continental Europe in the last three decades (see Figure 1).

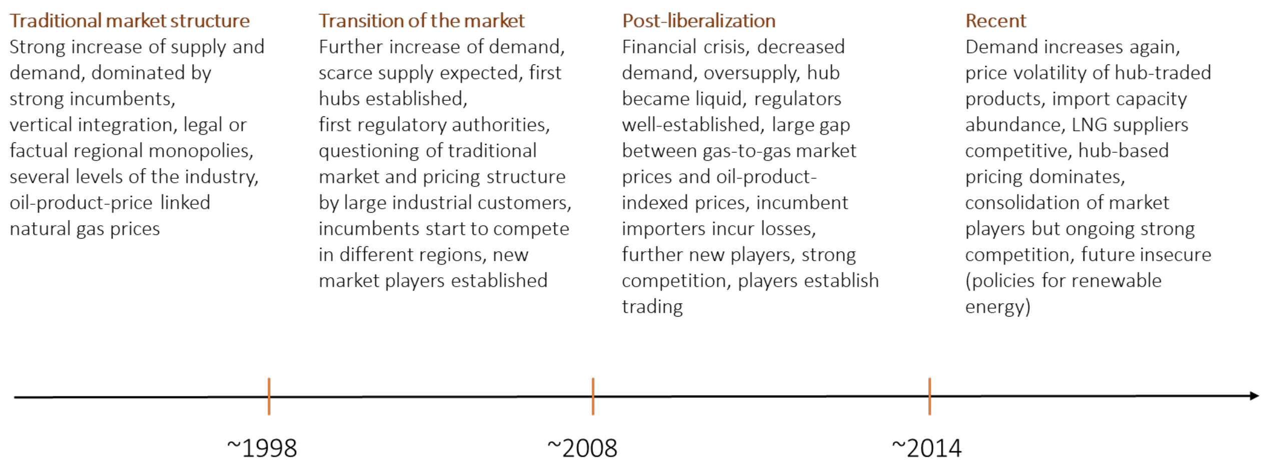

Figure 1. Brief sketch of historical development of the natural gas market in Continental Europe.

3.1. Traditional Market Structure (Pre-Liberalization; before 1998)

This phase was characterized by a strongly growing European natural gas market dominated by few (mostly national) incumbent players on the buyer's side and powerful producers (or groups of producers) on the seller's side. Vertical integration, import monopolies and regional sales monopolies and practically no third-party access characterized many European natural gas markets at that time. Therefore, gas-to gas competition[29] was non-existent in most European countries and natural gas prices were mostly oil-price indexed (see also Figure 1).

During this phase, after the Dutch Government's intervention in European GSAs in order to reach oil product parity in gas pricing after the second oil price crisis in 1979/80[30], price reviews were predominantly characterized by mutually benevolent discussions between buyers and sellers. Parties tried to defend their position but endeavoured not to deteriorate the contractual relationship, which was aimed to be long-term.[31] In this phase, most of the price reviews have been resolved in a non-adversarial manner, primarily at the pre-arbitration

[29] If a new market entrant wanted to compete with an incumbent player this usually required huge investments for the construction of own pipelines and/or storages. One example of such a new entrant was Wingas, at the time a joint venture between German BASF and Russian Gazprom.
[30] the so-called the Spierenburg case, named after the Dutch Government's commissioner for gas export prices, see e.g. (Correljé, Linde, & Westerwoudt, 2003, p. 93)
[31] This was a similar attitude like in Japan, where the commencement of arbitration was considered detrimental to a long-term business relationship between the parties. See (Ason, 2019, p. 16)

stage. Yet, sometimes it took long-lasting and intense negotiations.[32] In doing so, the traditional risk-sharing principle was kept alive: the seller bore (largely) the price risk and the buyer the volume risk.

In more detail, typically, there are two “ways” to review the price:

a) following the strict formal stipulations of the GSA, the parties might perform a “contractual price review”. I.e., until the agreed review dates, the need for adjustment, resulting from the application of the above-mentioned provisions, had to be brought forward. Both parties might submit their request and substantiate the content.
b) At the end of the 1990s, the idea of creating win-win situations between the parties and avoiding a lengthy dispute increased. In practice, the tactical behaviour changed: price reviews were initiated by written exchange of claims and counterclaims under the respective GSA. However, frequently, the parties suspended the formal process for a fixed time-period and started – without prejudice – commercial negotiations to seek a solution and agreement in which also non-price components of the GSA and other aspects outside the contract could be adjusted[33] (this might be called “commercial price review”). If an agreement had been reached by the specified deadline[34], the price review was terminated. Otherwise, the contractual price review began exactly at the point where these procedures had been suspended previously.

3.2. Transition Phase (1998 - 2008)

This phase was characterized by a further increase of European natural gas demand. At the same time, market participants expected a scarce supply situation. Regulatory authorities (partly newly founded) started to question market and price structures. First hubs were established, and new players started to enter the market. However, incumbent players managed to keep relatively strong market positions (see also Figure 1).

The liberalization efforts of the EU Commission questioned the market structure and established a complete set of new rules for the European natural gas industry. Consequently, the market was “liberalized” at the turn of the millennium.[35] At that time, oil- indexed prices still dominated in GSAs in Continental Europe. The sellers, trying to increase prices, triggered various price review negotiations. One of the typical results of these price review negotiations, which were mostly not referred to arbitration, was the introduction of caps and/or floors[36] on natural gas prices.

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[32] However, market-related problems were “small”, compared to the later market developments.
[33] This included, e.g., adjusting quantities in the tail-off-period, adjusting daily and other minimum quantities, granting quantity options, or extending deferred off-take rights or enhanced carry forward rights. There were also numerous other elements, such as, e.g., changes to other contracts existing between the parties.
[34] If the parties progressed in the commercial negotiations and expect an agreement, the deadline could be further extended.
[35] For a more detailed description see, e.g., (Haase, 2008, p. 22 et seq.).
[36] Caps stipulate for a price not rising above a certain pre-defined limit (which itself might also be variable over time, e.g., by linking the cap-level to hub prices). Floors stipulate for a price not falling below a certain

In our experience, most parties preferred this amicable solution, as the long-term character of the contracts was not questioned, therefore parties were genuinely interested in a mutually beneficial cooperation; enabling them inter alia to retain their market position.

3.3. Post-Liberalization Phase (2008 - 2014)

After most European markets[37] had been liberalized in early 2000s, overall economic circumstances deteriorated during the financial crisis starting in 2008. The significant decrease in natural gas demand, a substantial increase in supply[38] and the (resulting) increased liquidity at hubs, caused hub-based gas prices to fall dramatically.[39] As oil-product-indexed prices did not decrease as significantly as hub-based gas prices, the spread between hub-based and oil-indexed prices widened. In parallel, new market entrants – able to source natural gas cheaply from increasingly liquid gas hubs, could enter the Continental European natural gas markets. As a reaction, the buyers, i.e., incumbent importers, priced their national (downstream) natural gas sales based on hub prices in order to maintain their market share and as physical outlet for their large long-term purchase volumes, incurring huge losses as their purchases were still priced at the higher, oil-indexed prices (see also Figure 1).

In order to avoid (or at least reduce) such losses, the buyers asked for massive price reductions during price reviews. Yet, they did not limit the requests to a price decrease only, they also asked for structural changes, i.e., indexing the prices in GSAs to hub-based prices. These requests triggered frictions between buyers and sellers, i.e., producers who did not follow the buyers' arguments. Since price adjustments could not be agreed upon mutually, most cases were brought to arbitration – being perceived by both parties to be independent – and resulted in decisions to adjust the price.

3.4. Recent Developments (since 2014)

This phase is again characterized by an increase of European natural gas demand and competition. In North-West Europe the level of competition is particularly high and hub-based pricing and gas-to-gas competition dominate. But due to abundant LNG import capacities, developments in North-West Europe are strongly dependent on developments in North America and Asia (and vice versa) (see also Figure 1).

As most GSAs (in particular on international level) have been structurally modified to contain prices linked to hub quotations, some recent price reviews have been triggered by parties asking for re-installing oil-indexed pricing. The tendency to refer nearly each price review case to arbitration, as this was the case in the "post-liberalization"-phase, has decreased.

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pre-defined limit (which itself might also be variable over time, e.g., by linking the floor-level to hub prices). The combination of caps and floors is referred to as collar.

[37] With exceptions, particularly in Eastern Europe.

[38] As, inter alia, several infrastructure projects had been finalized, LNG supplies to the US were diverted to Europe as a consequence of the shale gas revolution in the US.

[39] See e.g., (IEA, 2013, pp. 21,35)

As also the location and time spreads of forward prices for natural gas delivered at hubs changed, arbitration proceedings for other contracts along the value chain, like contracts for natural gas storage and natural gas transportation services were initiated.

4. Commercial Lessons

The commercial lessons learned from price reviews in Continental Europe can be categorized as a) the lessons learned from the application of price review clauses, b) lessons learned from price review arbitrations, and c) lessons learned from the renegotiation of non-price terms.

4.1. Lessons Learned from the Application of Price Review Clauses

Generally, any price review clause should be drafted with renegotiation and arbitration in mind[40], as price review negotiations and arbitration proceedings have repeatedly shown that the subsequent correction of contractual deficiencies can prove costly.

4.1.1. Well-functioning of Price Review Principle

Contractual price review mechanisms in Europe have generally produced fast, fair, market related and appropriate results. Many lines of argument of European price reviews relied on an increased competition in downstream markets which were – at least to a certain extent – the result of regulatory changes. With the aid of price review clauses, even far-reaching regulatory changes in some European markets could have been handled by the market participants.

4.1.2. Three-year Interval Adequate

The system with the relatively short three-year intervals and a limited number of jokers[41] has also proven to be practical and reasonable. Even if not each three-year term was used for an adjustment, the mere possibility of an adjustment and the confidence in the feasibility provided the gas industry with the strength to develop the sales and market share of natural gas successfully.

4.1.3. “Speaking” Clauses

Various price review provisions, i.e., wordings of clauses, exist in GSAs, and, of course, there are no ‘incorrect’ price review provisions as the contractual provisions have been negotiated and agreed individually by the parties. However, it has turned out, that some clauses have proven disadvantageous in price renegotiations and arbitration proceedings.

One example frequently discussed in this context is the so-called “speaking clause”: in contrast to the “typical” price review clause, the price review provision of the speaking clause stipulates that the parties do not have to demand and justify a concrete adjustment of the price formula and price level at the outset, but only that one party informs the other party that it considers a price adjustment to be necessary – without being obliged to request and justify a

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[40] In addition, non-inclusion of price review clauses has proven to be problematic: E.g., British natural gas producers were often sceptical on price review clauses.
[41] As without jokers waiting in case of serious market changes would not have been economically justifiable.

specific new pricing. Experience has shown that given a missing requirement for quantification and concretization, reaching an agreement is time consuming, costly and inefficient.

4.1.4. Need for Price Review Provisions?

Linking the contract price to hub prices leads to a different risk-sharing scheme between seller and buyer, as, under such pricing scheme, the buyer suddenly runs no volume risk although at low wholesale margins, whereby the seller has to accept price risks. In such a scheme, the buyer will always be able to sell any volume of natural gas at market price.

In a GSA, where hub-based pricing is defined, the existence of a price revision clause might be considered obsolete. The market-based pricing, per definition, reflects "a" liquid, competitive, polypolistic market. Any adjustment could therefore only result in a price, not reflecting the market price. Hence, any adjustment would jeopardize its own principle, as the adjusted price could not be market-based anymore.

Accordingly, several GSAs with a price linked to gas hub prices have been concluded without a price review clause. In such a case, it becomes common practice that at least a stipulation providing a tool to the parties to adapt the contract if the relevant gas market changes structurally (e.g., other relevant price quotations, changed definition of the hub, different price reporting, etc.) is included in the respective GSA.

4.1.5. Experience with "in any case"-Clauses

In general, the "in any case" clause might be regarded as the only one-sided provision, which might be a feature in a price review clause. Practically, the seller will typically 'receive' something in return for the 'in any case' clause granted to the buyer. However, the buyer, despite any alleged 'insurance character' of such clause, has to be aware that it cannot be a universal margin and/or profit guarantee. Thus, inclusion of such clause, has to be evaluated carefully.

4.2. Lessons Learned from Price Review Arbitrations

In addition to the above sketched experience with the application of price review clauses, arbitral proceedings itself have a strong impact on the commercial results. In general, Continental European arbitral tribunals have been sympathetic to the new hub-based prices over the past years and have often supported the switch from natural gas pricing indexed to oil products to hub-based pricing. Because arbitrators have to adopt a commercial approach to their decision-making, they rely heavily on testimony provided by experts, who play a central role in these arbitrations.[42] Arbitrations have often produced fair, market related and appropriate results. Albeit, strongly depending on the (market) knowledge of the tribunal and potentially causing non-negligible costs. Nonetheless, arbitral decisions resulted in massive revenue cuts for the sellers and/or reductions of buyers' margins.

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[42] See (Levy, 2017)

4.2.1. *Confidentiality*

Arbitral proceedings awards are typically confidential. This has helped European sellers and buyers to maintain their market position.

Such confidentiality applies to, e.g., prices, price formulae, flexibilities (volume, geographical) and payment terms, as parties are not interested in having these results of arbitration revealed to the public domain. The same applies to methods (e.g., evaluation of flexibilities or market positions) and arguments used during the arbitration proceedings. In particular, as the latter might contain industrial secrets.

4.2.2. *Party-appointed Experts vs. Tribunal-appointed Experts*

Depending on the applicable arbitral rules, or preferences of the parties, there might be multiple submissions by the parties in a proceeding. In general, each expert has to issue a neutral opinion. However, in practice some expert opinions may be regarded biased, in particular, if parties call on their experts to respond to specific reports of the counterparty by means of counter-opinions. During this process, significant market knowledge threatens to be spilled by the wealth of material and opinions, i.e., there may be an information overload for the tribunal. Yet, all information and arguments regarded relevant by the parties are discussed during such process. To handle such potential information overload and to provide guidance during the price adjustment, some tribunals appoint (an) expert(s).

4.2.3. *Observed Risks (Even After Tribunal's Decision)*

There have been very few cases where arbitral tribunals issued decisions that have been challenged by the losing party in national courts.[43] This gave rise to considerable long-term risks for one of the parties and the relationship between sellers and buyers, i.e., confidence in the reliability of the European natural gas market may have been deteriorated. Such cases might also have far-reaching economic consequences:

- price increases due to a reduced credibility of the European natural gas industry,
- new lawsuits,
- deterioration of long-term contractual relations.

As a consequence, some sellers might be inclined to rather sell natural gas in other parts of the world, e.g., Asia.

4.2.4. *Limitation of the Authority of the tribunal?*

A key question arises repeatedly (also commercially): should the parties to a GSA instead of introducing a wide definition of the price review clause like in the above example limit the authority of the arbitral tribunal?

[43] E.g., in the case Gazprom vs. Naftogaz the decisions of the Stockholm arbitration panel, Gazprom accepted the decision in 2017 only at the very end of 2019 under assistance of the EU Commission, see (Pirani, 2018) and (Perry, 2020)

Three examples illustrate the issue:

First, in the Atlantic LNG case[44], the parties (unsuccessfully) challenged the tribunal's authority to decide upon a new price.

Second, arbitrators installed, according to our experience, contract prices, which were not related to hub prices but to rebated hub prices. The decisions contradicted to economic principles that a gas hub is a market where the market price is determined by supply and demand balance of the commodity.

Third, due to market liberalization the buyers who had agreed in their pipeline GSAs an upstream delivery point obtained an option to supply gas not only to their home market but also to other markets, although the pricing formulae was referring to the home market. The buyer obtained a value by selling also to markets closer to the delivery point, thus avoiding transportation costs and eventually realizing higher sales margins in the markets in between.

These examples demonstrate the real risks and uncertainties involved when buyer and seller delegate the determination of the gas price to an independent third party. However, frequently the experience of arbitration panels together with experts' advice has resulted in solutions accepted and implemented by the parties.

One example to limit the panel's authority is the so-called 'baseball arbitration'. In such case both parties have to present their pricing proposal to the arbitral tribunal. Then, the tribunal has only the power to decide on one of the two proposals after deciding which of the two proposals best represents a fair and adequate price formulae. To the authors knowledge, such baseball arbitration clause was never implemented in any GSA for deliveries to Continental Europe.

4.3. Lessons learned from renegotiations of non-price terms

4.3.1. Volume Flexibility

No natural gas delivery can be valued properly without putting a price tag on volume flexibility. Such flexibility is typically not granted to buyers under standardised hub-contracts. It constitutes an additional positive value to the buyer.

Flexibility elements were introduced in GSAs to allow buyers to adjust volumes[45] in order to comply with increased or decreased demand of their customers being a result of weather, i.e., temperature, or economic development.

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[44] Case of Gas Natural Aprovisionamientos, SDG, S.A. v. Atlantic LNG Company of Trinidad and Tobago in the United States District Court for the Southern District of New York (2008 WL 4344525 (S.D.N.Y.)); See (Petersen, 2009)

These flexibility elements have to be distinguished from tools, which provide flexibility. Sources of flexibility are "devices" for the "production" of flexibility. These are restricted to natural gas production, short-, mid- and long-term storage[46] and utilization of other energy sources.[47]

This implies that

- any contractual flexibility element requires a physical back up. Therefore, contracts cannot be regarded as sources of flexibility, but are a contractual transformation of the flexibility provided by the tools mentioned above, and
- natural gas hubs are no flexibility tools but trading at hubs can provide flexibility.

There is no generally accepted marketplace where a "price for flexibility" is quoted. Hence, such price has to be deducted, preferably by choosing appropriate, necessarily market based indicators. Available indicators are:

- published tariffs of storage system operators (SSOs)[48],
- capacity charges defined in GSAs[49],
- results of storage capacity auctions[50],
- by considering flexibility to be an option:
  - summer/winter-spreads of forward prices of natural gas at hubs indicate the intrinsic value[51],
  - the development of the volatility of such prices may indicate the time value of the option[52], and
  - the (additional) value of flexibility in a trader's portfolio.[53]

The approaches to determine the value of flexibility are generally independent of costs for making flexibility available. Consequently, different approaches have been used successfully to determine the value of flexibility in price reviews.

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[45] Some GSAs include stipulations giving volume flexibilities to the sellers, e.g., by introducing interruption rights or seller's nomination.

[46] *i.e.,* caverns, depleted fields, aquifers, LNG storage, small scale compressed natural gas and line-pack.

[47] Such "utilization of other energy sources" is reflected by interruptible delivery contracts. Flexibility is provided by other sources of energy, different from natural gas.

[48] As storage tariffs are not regulated, e.g., in Germany, other than in some neighbouring countries in the EU, a wide range of storage products and tariffs is available. Yet, a transparent (albeit regulated) indication of the value of flexibility is missing.

[49] Some GSAs include capacity charges. They are paid for the maximum hourly (or daily) natural gas volume taken or expected to be taken under the contract during a contract year. The number of such GSAs has been massively reduced during the post-liberalization phase.

[50] Storage capacity auctions are not performed regularly. The products offered are often subject to (substantial) restrictions. Hence, the applicability for valuing flexibility might be limited.

[51] This is the price differential the contract owner can realize given the forward prices at a certain point in time, i.e., principally the spread between the forward prices for deliveries in winter and summer.

[52] The (positive) time value is the potential additional value the contract owner expects to realize due to future movements of prices.

[53] In cases where the option is part of a portfolio a (positive) portfolio effect might occur, i.e., the overall value of a portfolio consisting of (contractual or physical) options might be higher than the sum of the values of the individual options.

As the value of flexibility provided in GSAs has often given rise to long-lasting disputes and discussions during the price reviews, in modern GSAs some parties have successfully either defined the value of flexibility beforehand or, at least, the methodology to determine such value.

An optimization, or rather monetization, of flexibility against the spot market was not foreseen at the time of development and conclusion of GSAs until the early 2000s. It requires the existence of a well-established trading hub with sufficient liquidity, which did not exist in (Continental) Europe at this time. Therefore, it is often the seller's attitude to reduce or withdraw (the option of) flexibility in case the buyer is not willing to pay an adequate price.

4.3.2. Delivery Point

Choosing or changing the delivery point does not only have financial implications because of transportation costs but may also influence the buyer's or seller's strategic options or position in a market. E.g., the more upstream the delivery point is located the higher the fixed (mainly transportation) costs but the more options to deliver the natural gas purchased to different markets for the buyer. On the other hand, the more downstream the delivery point, the higher the fixed (mainly transportation) costs for the seller, yet, providing an option to price the natural gas sold in accordance with the market requirements, thus potentially increasing profitability. Hence, the detailed assessment of the value of the natural gas to be delivered at different delivery points (incl. their potential flexibility) in a GSA has to be performed carefully with due regard to buyer's and seller's strategic position.

Changing the delivery point might have the following implications:

- Other transportation costs (i.e., for other routes) might become relevant.
- A delivery at a hub instead of a beach or border delivery point implies additional transportations costs for the seller but creates advantages as well. E.g., the option to optimize the portfolio to balance production shortfalls or to stabilize flows even if the buyer nominates lower volumes.
- Introducing one or even more additional delivery points will provide geographical flexibility to one party while (considerably) increasing the other party's (transportation and transaction) costs. This, because in particular in an unbundled market environment, it has to be assumed that additional transportation and/or regasification capacity will have to be booked and paid, potentially irrespective of its utilization.[54] Consequently, implications on the marketability and price level and/or structure have to be considered.
- In the pre-liberalization phase the delivery point was often coupled with a market destination clause, i.e., a clause forbidding the buyer to resell the natural gas

[54] In addition, it is important to observe the (potential) change of quality specifications at the new or additional delivery point. Any TSO will have to observe its national rules and, at least as a general rule, it has to be assumed that such national rules in respect to quality specifications are not identical, see e.g., (Drasdo, Karasz, & Pustisek, 2016).

purchased under the respective GSA in any market other than the one defined in the GSA.[55]

4.3.3. Contract Term

Originally, being long-term was one of the constitutive elements of GSAs. It was the buyers' commercial objective to have volumes available and, consequently, their own market position secured over a long period. As most buyers were vertically integrated, the long-term character of the contracts enabled them also to finance major downstream investments and promote the market penetration of natural gas in their respective market. Sellers, on the other hand, were interested in financing and reducing the risk of their upstream investments and were confident to reach such objective by the same tools as buyers, i.e., GSAs.

Hence, the impact of modifying the term of a contract is, at least at a first glance, significant. Yet, in connection with pricing, the impact is restricted. If a truly liquid natural gas market is assumed and the price agreed in a GSA is indexed to hub-prices, then a long-term contract might even be a burden for the parties rather than an advantage.

When natural gas producers were confronted with the demand for price reductions to the level of gas hub products (primarily in the post-liberalization phase) and could see no reasonable reward for their long-term relationships with the buyers, for some producers the question arose: what is the value of a GSA? Hence, in 2013, some Norwegian producers recognized the opportunities offered by optimizing their wholesale trading utilizing their own production, rather than being restricted by rigorous rules of individual GSAs. Thus, they agreed with some of their buyers to terminate GSAs, which were originally intended to last for another two decades.

4.3.4. Other

Other contractual elements as, e.g., payment terms and credit standards have also a financial impact and could be changed as well during commercial negotiations. Typically, in times of high interest rates or if seller or buyer face liquidity problems a modification of payment terms might become important. The same applies to the adjustment of some technical provisions (e.g., pressure, quality, or even the definitions of time periods (as day or year) used in the contract). Adjustment of such definitions to (national) TSO's or regulator's requirements might influence the risk position of the parties.

5. Conclusion

Natural gas markets across the globe tend to develop in a sequence. Considering that most of the developments in the North American natural gas markets in the 1990s were repeated in Europe, it may be anticipated that European developments (influenced by and commingled with) North American ones, will be mirrored in Middle East and Asia in the future. The stakeholders with links to these markets will likely benefit most from lessons learned from European price reviews.

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[55] In general, market destination clauses are considered illegal under EU law. It remains to be seen whether destination dependence can also be reflected by choosing a country specific price indexation.

Nevertheless, particularities of specific markets always have to be taken into consideration when discussing adaptions of natural gas prices. This includes not only individual supply and demand conditions but also regulatory issues. Of course, any price review can only be discussed in light of the respective contract and its individual negotiation history. It might become difficult to agree a change in an existing contract, especially in the absence of a price review clause. The expiry of an existing contract or the negotiation of a new contract provides an opportunity to negotiate a price review mechanism. Our experience demonstrates that buyer and seller should devote at least as much attention and efforts to an adequate price review clause as they do to the original gas price and price formula.

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