Response of GasTerra to the Brattle Report

Research into gas flexibility services

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1 Outline and summary of the response

Our response is structured in a number of sections, covering the main issues of disagreement with the Brattle report. It should be noted that more generally the methodology underlying the report is in many places not sufficiently clear, and therefore there are numerous further more specific areas where we might take issue with their approach. This paper focuses on the major issues of disagreement, but should not be considered a complete record of our concerns over their approach and assumptions.

- In the **Section 2** we will shortly give our **answers to the questions** raised in the consultation document. We will refer, where appropriate, to the sections in this document where the issues are dealt with in more detail.
- In **Section 3** we argue that the relevant **geographic market** should be considered to be wider than the Netherlands, to include the rest of North West Europe – and moreover that even if this position is not accepted, it is essential to consider the competitive constraint arising from the potential to re-import exports, and not only to import gas originating outside the Netherlands.
- In **Section 4** we deal with Brattle Group's approach to **product market** definition. We argue that although the relevant market is clearly a differentiated one (in terms of the costs of the various sources, and therefore their importance to providing different types of flexibility service), there are no "hard lines" between the possible market segmentations – suggesting that a more reasonable approach to addressing this differentiation would be to calculate market shares in a way that reflects this differentiation (as done for example by the UK authorities in the Centrica/Rough investigation).
- In **Section 5** we deal with perhaps the single most problematic element of the Brattle Report, its entirely inappropriate measurement of the **costs** of using different sources. Brattle appear to use a long run cost measures that includes returns on investments: but while this may be a relevant measure to calculating incentives to invest, it tells us nothing at all about the incentives to *use* a particular facility once it is in existence.
- In **Section 6** we explain why Brattle Group's methods for **assessing dominance** are in any case flawed. We would first note that Brattle's methodology is in many cases not at all transparent (particularly in relation to the withholding analysis, but even in relation to the measurement of flexibility shares). These flaws include several very specific problems:
    i. We believe that Brattle appear to have understated the extent to which GasTerra has transferred both control and profits from flexibility services to third parties under long term as well as annual contracts. This will mean that GasTerra's role in the market will be overstated under all measures.
    ii. The method of calculating "weekly" flexibility shares appears entirely incoherent: mixing elements of weekly and seasonal data to generate a measure which, as described, could in principle even suggest *negative* market sizes at shoulder periods. Moreover the measures described provide no assistance in determining whether any player has market power in relation to the specific weekly flexibility products that GasTerra is forced to provide to the market if such a finding is made. The measure also appears to base flexibility measures on historic flows in 2009: but clearly as new facilities are built it cannot be simply assumed that flows are unaffected in the 2012-16 period to which the results are supposed to apply. Moreover it is not clear what steps, if any, have been taken to ensure that assumptions

made on the development of supply and demand between 2009 and 2012 are consistent with one another.

iii. The pivotality measure used is in any case not a particularly powerful measure of market power: being an imperfect measure even of ability to withhold (as players who are not pivotal may still be able to and have the incentive to withhold), and giving no guidance on the incentive to do so. Moreover, Brattle Group appear to have attempted to adjust this measure to only include sources that are close in cost to the forecast competitive price: based on an apparent fundamental misunderstanding of the nature of the SSNIP test, and resulting in a measure that captures neither ability nor incentive.

iv. Finally, in relation to Brattle's withholding analysis, so little is said about this that it is not possible to undertake a full assessment of its merits (amounting to three paragraphs: less than a page – to report both methodology and results). However, based on the assumptions and methodologies used in the rest of the paper: which are presumably carried over into the withholding analysis – it is not plausible that this analysis has any analytical power whatsoever.

- Finally in **Section 7** we deal with some other more specific points of difference with the Brattle Group's approach and assumptions.
- As a result Brattle Group's conclusion that GasTerra continues to have market power in the relevant market for flexibility is entirely unreliable.

2 Questions of the NMa Energiekamer

In response to the specific questions raised in the consultation document, GasTerra responds as follows:

1. **Dominance methodology:** GasTerra has serious concerns over the methodology used to assess dominance, both in terms of the definition of the relevant market (Sections 3 and 4), the allocation of sources to GasTerra and its competitors (Section 6.1), and the methodology used in developing market share (6.2), pivotality (6.3) and withholding (6.4) measures of dominance.

2. **Cost assessment:** As discussed in detail in Section 5 of this response, the entire basis for the cost estimation is misguided. What determines the way in which gas flows from different sources from one hour or one week to the next is the *opportunity cost* of providing (or in the case of storage injecting) the gas now rather than at another time. As such it is the market price of gas that should be used to determine the cost of each facility (with the costs differing based on the physical characteristics of the source in question: so that a short duration storage facility will generally have a higher opportunity cost than a long-duration production asset).

3. **Storage prices:** As noted above and in more detail in Section 5 of this response, the entire basis on which storage is valued is incorrect. This relates also to the use of storage prices to assess incentives to use storage. Storage will be sold on the basis of its expected arbitrage value over the period of the sale. However, the opportunity cost of actually using the facility will vary across the year, as the option value associated with supply and injection decisions will vary depending on how full the storage facility is, and how many winter or summer days remain (and therefore the expected price range over this period). The price of the Nuon and Essent facilities at Epe seem to be on the high end, but as the source for this not given, it is difficult to expand on this comment.

4. *Not a question for GasTerra*
5. *Not a question for GasTerra*

6. **Other issues:** These have primarily been dealt with in relation to Questions 1 and 2 above. However, it is worth noting a more general concern that the report contains far too little information on the technical details of the methodologies employed, or the results generated, to make a full assessment of the strengths and weaknesses of the assessment. If further access were granted (e.g. access to the assumed "competitive" price levels that Brattle's model predicts, or to the demand for and supply of flexibility that they calculate on a weekly basis), then it is possible that additional concerns would become apparent.

In the rest of this paper we set out our most important concerns with the Brattle Report in more detail.

3 Geographic market definition

3.1 The relevant market is Northwest Europe

GasTerra first and foremost does not agree with the definition of the geographic market area. GasTerra points out that in 2008 the NMa Energiekamer decided in its decision number 102651/103 (Methodebesluit 2009/2011) that the geographic market is indeed wider than The Netherlands and includes several German gas storages, British and Danish production fields, as well as entry capacity and backhaul. Over the last years, markets in Northwest Europe have integrated substantially, to the extent that an isolated national market no longer can be distinguished. Attesting to this amongst others are the report "The Security of Supply 2010" by Dutch TSO Gastransport Services, and the 2008 Frontier Economics report "Pricing of wholesale gas in the Netherlands", as well as many other internationally acknowledged articles. Another clear illustration of the market integration is in the implicit pricing of flexibility on the gas trading hubs. There is almost complete alignment in the region, in that the NBP and TTF Summer/Q1 spreads are closely correlated.

Brattle claims the transportation constraints on the border imply that the Dutch border defines the limit of the relevant geographic market. This would only be the case if the constraints were indeed restrictive. They are not, as becomes clear from the fact the Dutch and UK prices are almost completely aligned. Thus, the argumentation does not hold, and GasTerra is of the opinion that the Brattle report should consider the entire Northwest European market to determine GasTerra's position.

3.2 Even if a Dutch market is defined, the constraining role of both imports and exports must be recognised

Whilst the report recognizes that flexibility dedicated to export contracts is controlled by the gas buyer outside of the Netherlands, the report takes the case that the majority of the flexibility sold under export contracts cannot be re-imported into the Netherlands at a competetive cost. Therefore the report removes most export flexibility from the supply side of the market. This is incorrect.

The report suggests that using the export flexibility in the Netherlands is not practical because it would be necessary to buy back-haul capacity, which is not firm. Back-haul capacity is indeed not firm, but this does not make it impractical (why would back haul capacity be a service offered by TSO's and endorsed by regulators if it is not practical?). Practice shows that back-haul can be and is being used to re-import gas and flexibility into the Netherlands. The historical physical flows at exit points on the Dutch border (which are large at any given time of the year) show that using substantial back haul can be done reliably the year round. This holds true in particular for the export customers themselves, all of which are active parties in the Netherlands, since they are in an excellent position to predict the physical flows on the back of which re-import is to be done.
Whether or not re-import of flexibility into the Netherlands using back-haul is actually used, is a matter of costs. The report states that export capacity that is not re-imported cannot exert a competitive constraint on GasTerra in the Dutch flexibility market. This is clearly false, in that any market party in the Netherlands planning to hold back flexibility or to raise its prices of flexibility, must reckon with increased re-imports. The report seems to be inconsistent where on the one hand the report is acknowledging that back-haul into the

Netherlands is actually used and on the other hand is denying that back-haul is a force to reckon with.
The point is made in the report that if more flexibility was re-imported into the Netherlands, the export customers would need to find replacement flexibility at some higher price for their domestic markets. The assumptions behind this have no basis in the report. If replacement flexibility would be needed the price may be higher or lower than the price of flexibility in the Netherlands. In most cases no replacement flexibility will be needed, since the export contracts are long term and provide flexibility, which will not always and exclusively be needed for the domestic market of the export customer.

4 Product market definition and measurement

4.1 There is no clear basis on which the gas flexibility market can be segmented

It is worth remembering in considering the market for gas flexibility that what customers actually want is gas (a homogeneous product): but they want more gas in winter than summer, more gas on a weekday than a weekend, more gas in the daytime than the night-time, and so on.

It is certainly true that the market for flexibility is differentiated on the supply side, with certain sources of flexibility having a limited "duration" (i.e. limited time over which gas can be taken at full capacity), relative to others. A source with relatively longer duration (e.g. gas field production) is likely to be particularly important in dealing with increased demand levels in winter relative to summer, while a short-term source like LNG storage can only make a fairly minor contribution by comparison.

Nonetheless, as Brattle also recognise, there are significant substitution possibilities between sources across time (due to customers being willing to substitute one source for another – at least to some extent – within a wider portfolio of flexible supplies). As a result, this is not a reasonable basis for identifying separate markets: rather it is more appropriate to follow the route used by e.g. the UK competition authorities in their investigations of Centrica's acquisition of Rough, and define a single market, but to take account of differentiation on the supply side by looking at different measures of flexibility to capture the capability of different sources to provide additional gas on a short-term or long term basis. The CC concluded that this was the right approach on the basis that:

"All sources of flexibility contribute to some extent to the summer/Q1 [price] differential and there is no firm basis for excluding any sources from our market definition. In assessing the merger's effects, however, we take account of the fact that some sources are much weaker substitutes for Rough than others" (paragraph 2.51).

Brattle fail to follow this approach, or to use an appropriate measure of flexibility to capture this differentiation in their market analysis (as discussed further in the assessment of dominance section below).

4.2 Brattle's segmentation appears to reflect a basic misunderstanding of the SSNIP test

Brattle's proposed approach of simply excluding sources from the market is entirely misguided (indeed, they themselves appear to implicitly accept that this is misguided, in concluding at page 6 of their report that long-term and short-term flexibility products should indeed be included in the relevant market). Moreover, their specific approach (excluding sources whose cost is more than 10% higher than a perfectly competitive benchmark, calculated by Brattle on a weekly basis) appears to be based on a fundamental misunderstanding of the SSNIP test used by competition authorities around the world for the purpose of market definition.

Brattle assert that *"Typically, economists and the EC itself would consider that if one source of flexibility were about 5% to 10% more expensive than another, then the two products would not be substitutes"* (page 14). They go on at section 4.1 to correctly quote the SSNIP test, but then conclude *"Roughly speaking, if one source of flexibility was about 5% to 10% more expensive than another, then the two products would not be substitutes."*

This is *not* the SSNIP test, not even "roughly speaking". The SSNIP test asks about customer responses to a *change* in relative prices, and not to the difference in cost *levels*

(indeed the "I" in "SSNIP" stands for "increase"). See for example the European Commission's guidelines on market definition which states the SSNIP test thus (Market Definition Guidelines, paragraph 17):

> *"The question to be answered is whether the parties' customers would switch to readily available substitutes or to suppliers located elsewhere in response to a hypothetical small (in the range 5 % to 10 %) but permanent relative price increase in the products and areas being considered. If substitution were enough to make the price increase unprofitable because of the resulting loss of sales, additional substitutes and areas are included in the relevant market. This would be done until the set of products and geographical areas is such that small, permanent increases in relative prices would be profitable." (emphasis added)*

This asks whether a 5-10% *increase* in price would be profitable for a monopolist over a hypothetical market: if not, then the market is wider (as this "hypothetical monopolist" would be constrained by alternative suppliers from raising his price).

Take for example the case of a theatre with two ticket classes: seats in the stalls for €40, and seats in the balcony for €30. This absolute difference in starting prices (25-33% depending on whether stalls or balcony seat prices are taken as the base) does not necessarily mean that there is a separate relevant market for seats in the stalls: the question is whether a 5-10% increase in the price of the stalls seats (to €42-44) would be profitable or not, taking account of the number of people who might then switch to the balcony seats (in light of the larger price differential), or not go to the theatre at all. Clearly it is quite possible that a price increase of this type would not be profitable (and therefore the market would not be as narrow as Stalls seats), even given the 25% difference in the price level (i.e. a much larger difference in price levels than Brattle use as a cut-off in this case).

This basic principle can also be seen in European Commission practice. Consider for example electricity generation mergers, where different generation assets have very different marginal production costs (with differences far above 10% for example in relation to nuclear versus fossil-fired generation – and often even between coal and gas). Yet the European Commission still defines single markets for wholesale electricity in which all these generation units compete: taking account of differences in costs directly in the withholding analysis, rather than to exclude any source from the relevant market.[1]

The use of a 10% cut-off in relation to price *levels* is therefore entirely arbitrary, and not based on accepted approaches in competition economics. If Brattle wish to implement the SSNIP test to define the relevant market then this needs to be done properly in relation to changes in relative price, and not simply differences in cost levels.

[1] For an example, see the Commission's decision in EDF/British Energy: http://ec.europa.eu/competition/mergers/cases/decisions/m5224_20081222_20212_en.pdf

5 Cost of flexibility

5.1 The Brattle Group Report uses costs that are not relevant to incentives to use or withhold flexibility from the market

Arguably the most important flaw in Brattle's analysis is their incorrect measures of costs. They take cost measures that seem more suited to calculating investment incentives, and use them to predict short run usage patterns for flexibility sources. This is clearly incorrect, and inconsistent with all the literature on this type of analysis, and with its implementation in past competition cases in the gas flexibility sector (e.g. the 2003 Centrica/Rough case in the UK) and in electricity markets (where supply models are always based on variable costs only: either fuel costs alone, or fuel costs and variable operating costs).

Brattle state that their focus is on whether or not there is dominance in relation to relatively short term (weekly) flexibility. This requires an analysis (as Brattle recognise) of the incentives of GasTerra to withhold flexible gas from the market at any point in time, taking into account the incentives of rivals to respond to any such withholding by increasing gas supply from their own flexible gas sources (thereby undermining any price increase that GasTerra might hope to achieve).

Therefore the key issue is not whether or not to *invest* in a new flexibility asset (where the longer term investment costs used by Brattle might be relevant), but rather how flexibility sources will be used and/or bid into the market once they are already in existence. However, these short term usage/bidding incentives will be based on the opportunity cost of producing/supplying that gas now, rather than at another time.

Given that Brattle appear to be looking at withholding specifically of flexibility (rather than of gas), presumably they assume that the average price of gas remains constant even in the face of such withholding. Therefore implicitly they assume that any reduction in the supply of a production field in winter must be counterbalanced by an increase in summer (reducing the supply of flexibility while maintaining the price of gas), and similarly a withholding strategy for imports or exports would have to involve increased outflows in winter and increased inflows in summer. For storage, this would translate into reduced injection in summer and reduced withdrawals in winter.

The right measure of costs for predicting short term usage incentives is therefore *not* based on some amortised fixed cost of build the facility, but rather a short term/marginal opportunity cost of supplying gas at that point in time and place rather than another. This leads to flawed estimates of costs in relation to every asset. For example:

- In the case of a gas production field, the opportunity cost for a "gas neutral" flexibility withdrawal of the type discussed above would be for the field to produce more in summer and less in winter. It is clear that the cost of this strategy is giving up higher winter prices for that gas, and gaining only lower summer prices in return (i.e. the winter-summer spread of gas prices). For a shorter term withholding strategy (smoothing supplies over the course of a week or month, rather than across the year as a whole), the relevant opportunity cost would be the difference between peak and minimum prices over the relevant period.[2] Based on the discussion of

[2] If instead the scenario proposed is that GasTerra would simply produce less in winter (therefore generating an increase in the price of gas, and not only gas flexibility), then the opportunity cost of selling gas today should be based on the cost of shortening the life of the field: so the opportunity cost of supplying gas in such cases is the long run marginal value (LRMV) of the gas left in the field, taking account on any expected change in production

Groningen at p.25, Brattle appear to have taken no account of these opportunity costs, but rather to have assumed that free flow gas from Groningen should be supplied at any price that will cover the depreciation on a compressor investment. This is likely to be a significant understatement of the true opportunity costs of withholding.

- Specifically in relation to Groningen, it is clear that opportunity costs play a crucial role in the correct positioning of Groningen flexibility on the cost curve, because it is a typical source of seasonal flexibility. Brattle maintains that Groningen flexibility is very cheap, as it has very low costs by defining these as essentially only consisting of operation and maintenance costs. While GasTerra would also contest this on the basis that investment costs do play a more important role than Brattle assumes, the more relevant counter-argument in our view is that Groningen flexibility should be valued against opportunity costs. From this perspective Groningen is actually a quite expensive source of short term flexibility. Given that opportunity costs are the relevant measure for value of flexibility, the distinction between free flow and compression production is also practically irrelevant. From the perspective of opportunity costs it is also clear that there is no difference between Groningen and any other Dutch production field, other than its size.
- Similarly the opportunity cost of using a gas storage facility on a given day or hour is given not only by any physical cost of injection or withdrawal (and indeed, not at all if these costs are not faced by the party nominating the gas delivery amount), but rather by the foregone option value of leaving the gas in store (i.e. giving up the possibility that the gas could instead have been taken on a higher priced day or hour). Therefore using a bottom-up costs approach (as Brattle do for certain sources) is clearly not appropriate. Moreover, while the market value of storage (used by Brattle for other storage facilities), while at least reflecting the expected volatility of wholesale gas prices over the period in question, rather than the costs of building a facility, will still not capture differences in this optionality across different days of the year and for different states of the storage reservoir. As noted below, these "bottom up" and "market based" approaches also give rise to in some cases wildly different cost estimates: illustrating just how inappropriate in particular the "bottom up" based measure is.
- Import flexibility costs appear to be simply assumed to be equal to Dutch storage facility costs (p.31) – and therefore suffer from all the same weaknesses discussed in the previous bullet.
- Back-haul of export flexibility appears to be included only to a very limited extent if at all (at 0.8mcm/hr out of 5.9mcm/hr exported in 2009 – see page 10 – although the tables in Annex 2 include results excluding backhaul, or for domestic flexibility alone – raising questions on whether any back-haul flexibility has been included at all). As noted above, Brattle claim these exports can't swing back as they could not be replaced at acceptable prices. However, we note that many of these exports are into Germany, which can also take flexible gas supply for example from the Norwegian Troll field, coming onshore at Emden. Therefore it is not clear why (particularly on summer days when Groningen is the marginal source of flexible gas supply in the Netherlands) this could not be a relevant cost benchmark for Germany, and may well make it advantageous to ship gas back to the Netherlands, even at low prevailing prices. On higher priced days, again, it is not clear why German storage

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costs and the price of gas, but discounting to an appropriate NPV to take account of the time value of money. In this kind of scenario it may also be necessarily to take account of the tax implications of the strategy (i.e. paying tax now rather than at the end of the life of the field: and taking account of any expected changes in the relevant taxation rate).

facilities for example should not be able to compete with Dutch ones – suggesting there is no reason to treat exports any differently from imports (indeed, transport costs for re-imported exports might well be lower, given that the gas is already at the border).

In general, Brattle appear to have in many (if not all) cases used costs relevant to investment in new flexibility facilities in order to try to asses short term incentives to supply from existing facilities. This will simply lead to incorrect results. However, at p.17 Brattle suggest that they do indeed take account of the fact that they are looking at weekly flexibility, and this is why LNG is cheaper than some gas storage: this needs to be investigated further, to understand exactly what they have done – but based on the information in the annex none of the cost calculations look convincing (again, the main error seems to be that Brattle Group fails to apply the opportunity cost analysis).

5.2 The Brattle Group appears to use the same cost for each flexibility source throughout the year, despite using a weekly analysis

Based on the calculations in Annex I, Brattle appear to use the same cost for each flexibility source throughout the year. As can be seen from the explanation of opportunity costs above, this is clearly not appropriate: and explains the counterintuitive finding that GasTerra is primarily dominant in summer. This result stems from Brattle's assumption that in summer Groningen, which it places at the bottom of the cost curve, will be so much cheaper than any other source that it could increase prices significantly without attracting other sources of gas.

However, this theory clearly does not pass a sense test. In the summer when demand is low and there is ample gas available to meet that demand then similar conditions will prevail in other countries, meaning that if flexibility in the Netherlands is low cost there is likely also easy access to cheap gas flexibility from both imports and re-import of exports, if there were to be even a modest increase in Dutch gas prices. For example, Norwegian gas can also enter the Netherlands (either via Germany or via UK/Belgium), and similarly can replace gas that would otherwise be exported from the Netherlands to Germany or Belgium. Therefore there is no reason to doubt that significant additional volumes of gas would end up in the Netherlands in response to even a small increase in the market price.

Therefore if Brattle wish to assess market shares, pivotality and withholding incentives on a weekly basis (and bearing in mind that their cost assumptions feed into both market shares and pivotality, due to the implementation of the "110% rule") then in order to achieve reliable results they must (a) use the correct costs and (b) allow these costs to vary from week to week. Otherwise sources will be inappropriately excluded from the relevant market, overstating both the share and pivotality of GasTerra.

5.3 The market price (based on the TTF) should be the basis for costs: as it drives incentives to supply the flexibility market

The analysis appears to pay no attention to the TTF, with neither the increasing liquidity of the TTF nor the relevance of TTF prices playing any apparent part in the analysis: apparently on the basis that it does not provide physical flexibility. Although indeed TTF is not a physical source of flexibility, this by no means justifies ignoring TTF altogether, as Brattle does. As a matter of fact, TTF, being the most liquid mainland hub, is crucial to setting the value of gas in different hours, days and times of year – and therefore also in setting the price of

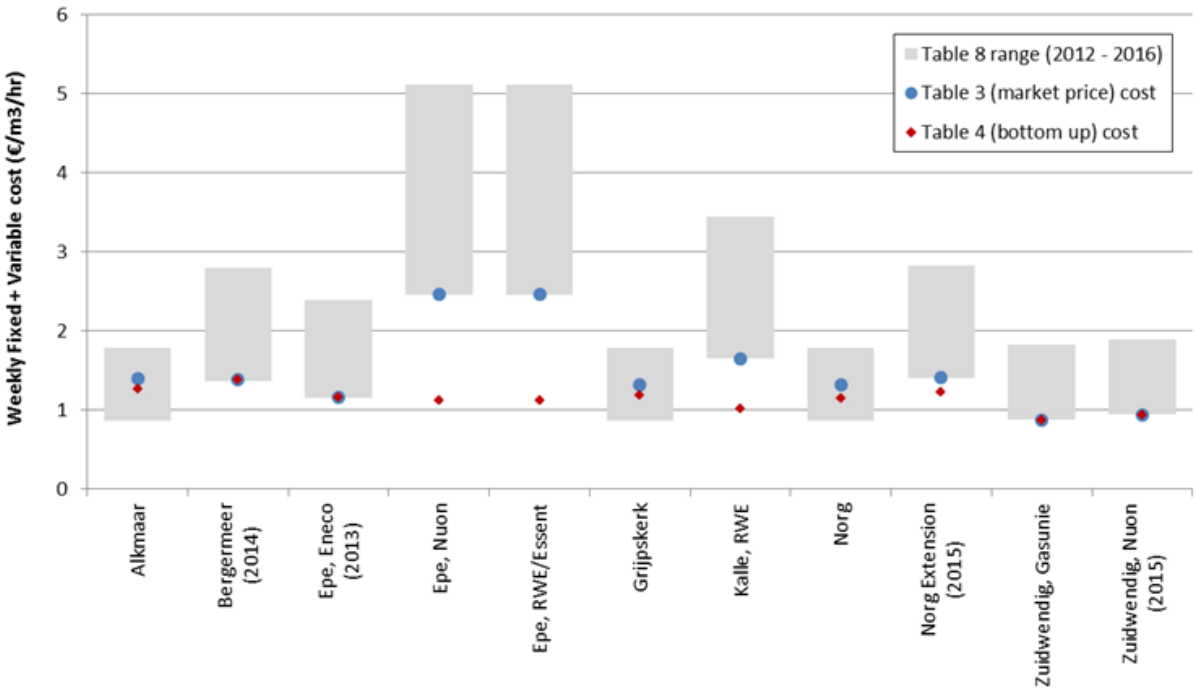
flexibility (i.e. the value of being able to take a m3 of summer gas and turn it into a m3 of winter gas through use of a storage facility, or the choice between producing more gas in summer or winter from a production field). Therefore, it should be an essential element in any discussion about market power.
A flexible product can be accessed on a market like TTF by combining several products, from yearly products up to (for TTF) hourly products. In this way a fully profiled product can be created, given that the on-the-day market also enables balancing deals in the Netherlands. In this way a market party can create a fully flexible product, even though there is no direct access to a specific physical source. TTF, just like any other hub, serves as a virtual platform where flexibility sources can be re-distributed over market parties, just as it serves to redistribute access to commodity sources. Indeed this principle was accepted by the UK Competition Commission in their assessment of the Centrica/Rough merger, where (as noted above) they looked at all sources of seasonal gas flexibility as both influencing and being influenced by the Q1/summer price spread on the NBP (the GB balancing point).
As a matter of fact, and well known to the market and the NMa Energiekamer, GasTerra has indicated early 2011 that it has decided to further stimulate the Dutch gas market. In particular, GasTerra has introduced products that enable customers to put together their own package of gas products according to their own preference (cf. GasTerra's press release of 18.01.2011). Aside from the Virtual Flexibility service, which is somehow included in the Brattle report, it also includes products on short term markets (press release of 30.03.2011) that greatly enhance the opportunities of creating fully profiled products on TTF. The latter Brattle does not take into account.
On the TTF, as on the NBP, the price of flexibility is implicit in the price of the products that can be used to provide it. For example, seasonal flexibility is priced at the difference of summer gas and gas delivered at the first quarter of the ensuing winter (as is explicitly reflected by the Rough indexed price, or the outcome of the Dutch auction of GasTerra seasonal flexibility). GasTerra is of the opinion that on a liquid market such as TTF, the prices of the underlying products are the result of the normal price discovery process as occurs on a liquid market. By buying and selling the underlying product sufficiently far out into the future, any market party can secure its flexibility needs. Because the market place in essence is anonymous, it is no longer possible at any given time to ascertain who has the control over what flexibility. Therefore, the notion of dominance loses its relevance. At the same time, market abuse is quite easily observed, particularly when markets are regionally integrated, through the occurrence of unreasonable prices (more on this below in the discussion of market integration). Finally, TTF and other markets are closely monitored by many parties, rendering price manipulation practically impossible.
As noted above, the value of flexibility at the market is the opportunity cost of flexibility sources. Particularly in the presence of a liquid hub like TTF, or with strong interconnection with other hubs such as NBP and NCG, it is the opportunity cost that define the value of a flexibility source. Given the liquidity of TTF, this concept should play a central role in the analysis of the Dutch flexibility market. Thus, by disregarding TTF in the analysis, Brattle omits a crucial element in the analysis. The result is a flawed reasoning.
As mentioned, all flexibility sources are valued on prices and price differences on TTF, and these define the opportunity costs of a flexibility source. The actual costs will depend on the specifics of the source, such as in the case of a storage the ratio of working volume to withdrawal capacity (and to injection capacity). Parties that control a flexibility source can optimize their profits by trading on TTF. Alternatively they can sell flexible products with a price based on (expected) prices and price differences on TTF. The buyer of a flexible product has the same alternative, TTF, to decide whether the price of the flexible product is right or

not. If flexibility of a source is used for within week flexibility, it can have a loss in value if price differences are higher further on the curve which it can no longer optimally profit from. So, if seasonal flexibility (high ratio working volume : withdrawal capacity) is used for within week flexibility, it has a lost opportunity, since price differences on the curve are highest between seasons. So, flexibility with a higher ratio of working volume to withdrawal capacity have the highest lost opportunity cost when used for short term flexibility.

5.4 Brattle's cost assumptions do not appear to be consistent between Annexes I and II, making it difficult to understand their methodology and assumptions

The above comments relate to the principles of cost calculation for a withholding and/or other type of dominance analysis. However, it is worth noting (even though GasTerra believes these costs to be irrelevant), that there is also a lack of clarity over how costs have been calculated and applied in different parts of the Brattle Group report.
For example, costs reported in Annex I and Annex II to the report appear to be different, as can be seen from the chart below (showing costs from Annex I of the report as points, and cost ranges reported in Annex II of the report as a grey bar). It is unclear why these should be different, and in the interests of transparency and a proper consultation process at the very least Brattle need to explain in what ways the assumptions and methodology differ between the two annexes.

Figure 1: Brattle cost assumptions in Annex I and Annex II



The chart demonstrates clearly the sometimes fundamental differences between storage costs estimated on the basis of market price (which at least incorporates some element of market prices – if not a fully appropriate view of opportunity cost), and bottom-up costs. This is particularly the case for Epe Nuon, Epe RWE/Essent, and Kalle, but also applies to e.g. Norg, the Norg Extension, Alkmaar and Grijpskerk. This is not surprising, but simply reinforces the argument made above that a bottom-up approach is entirely inappropriate for this type of analysis.

For the sake of completeness, it should be noted that the cost estimates shown in the Annexes appear inconsistent with the statement in Brattle Group's report (p.27) that "…the bottom up costs are estimated assuming that similar gas storages have the same cost in €/m3/hr. This means that Grijpskerk, Alkmaar, Bergermeer and Kalle storages all have the same cost as Norg…" [emphasis added]. Referring to table 3, we find Grijpskerk, Alkmaar, and the Norg Extension do show the same fixed costs but Bergermeer, Kalle, and Norg show different costs. This implies that not only the basic approach followed by Brattle Group, but also the way in which the erroneously applied bottom-up approach is implemented in practice.

6 Assessment of Dominance

6.1 It appears that the Brattle report has likely underestimated the extent to which GasTerra has transferred both the control of and price incentives relating to gas flexibility to third parties under contract

GasTerra notes Brattle's acknowledgement of the fact that control over flexibility sources is the relevant issue when determining capacity shares. Having said this, there are still some shortcomings in this regard. The role of export flexibility as GasTerra sees it is clearly an issue, which has been extensively discussed above . A similar point that does not appear in the Brattle report are medium to long term contracts for the Dutch market.
Just as in the case of export, through medium to long term contracts control over flexibility passes from GasTerra to the customer. More fundamentally however, control over flexibility also passes through annual contracts. For the analysis of weekly product markets, GasTerra is not in a position to withhold the flexibility under such contracts from the market.

A third point concerning the control over flexibility is the role of import flexibility in GasTerra's portfolio. Many of the small fields purchase contracts of GasTerra are seller-nominated and most of the small field contracts have a very high load factor up to 100%, with maximum take-off during the whole year. Both types of contract therefore decrease flexibility for GasTerra considerably, as GasTerra needs its other sources to compensate for this, and increase flexibility under control of other parties active in the Dutch market.

Finally, although Brattle includes some new sources of flexibility, it is not complete in doing so. In the review period additional storages will be build in Germany. Some of these are explicitly targeted at the Dutch market, if only partial, such as the 1 bcm storage currently under construction at Jemgum. The companies involved in the construction of the storages actually mention that the connection to the GTS grid provides their customers with an access to the West European gas market (e.g. website VNG: http://www.speicherportal.vng.de/portal/servlet/OpenPortal). Others such as the 2 bcm new storage at Etzel bring new flexibility to the Dutch market in an implicit manner. As for the existing storages, even if one was to ignore the integration towards a single Northwest European market, the existence of import and export contracts in the Netherlands provide a way in which these capacities have an impact in the Netherlands.

6.2 The method for calculating "weekly" flexibility shares appears to be seriously flawed

While the precise details of Brattle's approach to flexibility market shares are unclear, it appears to involve a five-stage process, as follows:

1. Generate a merit-order supply curve for each *year*;
2. Determine the flexibility *demand* for each *week*;
3. Determine the marginal supplier each week, and their cost of supply;
4. Define the relevant market as all suppliers with a cost ≤ 110% of the marginal supply;
5. Calculate market shares of flexibility supply form this relevant market.

This results in 52 separate market shares each year, as the cost of the marginal supplier changes with flexibility demand each week. A summary of these weekly shares are presented by Brattle in figure 6 (p.21) of their report.

The approach, and methods of calculation, appear to suffer from several severe flaws.

Firstly, given that the question is one of **weekly flexibility**, the relevant period over which flexibility supply should be calculated (comparing average supply with maximum capacity) is in any case weekly. I.e. the question is the extent to which different sources can supply more than the typical demand in that week. To the extent that some flexibility services provided under the legislation are forced to balance over a month rather than a week, then a monthly measure could also be relevant. However, an annual or even seasonal measure (which is what the Brattle method appears to produce) is clearly not appropriate to the circumstances. That is, while Brattle only allow their average supply level to vary at most seasonally, in fact it should be allowed to vary week-to-week, in order to capture the ability of sources to turn up *further* from that level. The Brattle measure is neither one nor the other. For example, Brattle's approach appears to result in a significant overestimation of the weekly flexibility capacity of Groningen during the mid-winter period (when output is high, and therefore true weekly ability to turn up further is low, while on Brattle's measure Groningen's ability to "turn up" is assumed to be constant across the year or at best across seasons).

Secondly, as Brattle notes on page 17 of their report, *"… the supply of flexibility also varies constantly over the year"*. However, as noted above in the section on costs, Brattle seems to define the **supply curve on an annual basis or at most a seasonal** (winter/summer) basis when conducting their analysis. There is also no indication that Brattle allow the costs at which supply is made available to vary, even between summer and winter, which is clearly incorrect (see Section C(ii) above, which explains why in fact these costs should be allowed to vary weekly). It is also worth restating here our view that the relevant market used to calculate shares is improperly defined by the '110% rule' (see section B.(ii) above). The correct approach would be to allow flexibility supply to vary by week: both in terms of costs (as discussed in Section C above), and in terms of the "peak less average" measure of supply.

Thirdly, it is not clear how the **'weekly' flexibility demand** calculated by Brattle should be interpreted. Brattle details its approach in footnote 24 (p.19) as maximum demand each week, less seasonal average demand. As noted above, it is in any case unclear what this measure means – combining as it does a weekly peak with a seasonal average. Moreover, if the measure is based on historic flows, then this could presumably even result in negative flexibility measures at shoulder periods of winter and in mid-summer (i.e. in principle the average seasonal demand could be higher than the peak hour demand in a shoulder "winter" week or in a mid "summer" week). This will generate results that – even if they don't in fact go so far as to generate negative flexibility figures – are effectively meaningless (providing a weekly view of a seasonal measure: and one that does not make much sense outside the peak week of the year, at which point it reflects a standard view of seasonal flexibility). At no point would this measure – except by coincidence – reflect a coherent view of short term flexibility of the type that should be the focus of this analysis.

There is also an apparent **inconsistency between the assumptions made on supply and demand**. For example, at page 7 Brattle state that *"for gas storages this definition means that flexibility is approximately equal to the withdrawal capacity of the storage"* – yet this would not be true if the same approach were applied to supply and demand (i.e. if seasonal average supplies were subtracted from peaks, rather than the annual average).

This suggests that there may be fundamental inconsistencies between the supply side and demand side of Brattle's implicit model.
Furthermore, we question how meaningful these measures can be when applied to the 2012-2016 period. Even if new sources are introduced, their pattern of supply still appears to be based on historic supply patterns from existing resources. However, as the supply landscape changes there is no reason to expect the pattern of flows to remain as they were in 2009. Moreover it is not clear what steps, if any, have been taken to ensure that assumptions made on the development of supply and demand between 2009 and 2012 are consistent with one another. As we understand it, Brattle have introduced new sources of supply based on the usage patterns of existing sources – and therefore potentially have assumed that average supply levels increase, while on the other hand assuming flat demand in at least one scenario. Clearly it cannot be assumed both that demand is flat and that average supplies increase: Brattle should explain how they ensure consistency between the demand and supply side of their calculations in these forward looking scenarios.
The analysis on a 52 week basis also serves to highlight the importance of reference to the TTF, given that the analysis implicitly assumes the existence of a market where gas can be contracted on this week-long time scale.
GasTerra can monetize flexibility sources on the time scale of one week by trading on the TTF. Unfortunately, Brattle leaves the TTF entirely out of the equation, so in the framework of Brattle this option is not a solution. If it were, however, the TTF would be a platform where flexibility is sold implicitly: buyers can buy several flat products in such a way that in the end it creates a profiled product. Nowadays, this can in principle be done up to the hourly level.

6.3 Pivotality is not a particularly strong or meaningful indicator of market power, and the adjustment based on costs makes it even less meaningful

Brattle considers both a pivotal supplier index (PSI), and the related residual supplier index (RSI) as an indicator of GasTerra's market power. The RSI considers the proportion of demand that may be met without any contribution by GT. There are several important weaknesses to this approach – both in general and even more strongly in relation to Brattle's implementation in this case:

- Pivotality is not a good measure of incentive to withhold. A pivotal player – while having the ability to withhold – may have no such incentive. A large player with a low cost source of supply may never find it attractive to withhold any of this supply, as it may always be very expensive to withhold this source, and/or the point at which this source sits on the supply curve may be close below other sources of supply (meaning that any restriction of output would result in only a very small price increase, with the primary effect of simply giving up supply to rivals). Therefore Brattle is correct to note (p.4) that a withholding analysis is necessary to understand whether any incentive to withhold exists.
- Moreover, pivotality is not even a particularly good measure of ability to withhold. A non-pivotal player may still have an ability and incentive to withhold gas supplies. A small player, alone not necessary to meet market demand, may still at certain times have both the ability and incentive to withhold output (at low opportunity cost, as the marginal supplier) in order to increase profits on its other supply sources. Therefore Brattle's characterisation of the PSI as a good measure of "ability to raise price" (p.4) is incorrect.

- Therefore pivotality is not a good guide to either ability or incentive to withhold, and should be used at most as a preliminary screening device, and not as a definitive answer on market power or dominance.
- Moreover, Brattle does not include all sources in its pivotality analysis, but only sources that have a cost below 110% of its competitive price calculation. Therefore this is not a standard measure of pivotality, and cannot be compared with standard thresholds used by the FERC in the United States. Effectively this measure is trying to combine a very crude analysis of incentives (in the form of Brattle's flawed cost cut-off) with a pivotality analysis of ability: it is very difficult to know what conclusions should be drawn from a cobbled-together analysis of this type, which (unlike a properly conducted withholding analysis) is not underpinned by any coherent economic model of incentives.
- In relation to Brattle's specific results, we would note that considering the 'overall' market for flexibility, there appears to be ample domestic supply on the basis of Brattle's definitions. Forecast 2012 domestic supply of flexibility is c.14mcm/hr, compared with 2009 domestic flexibility demand of 7.2mcm/hr (see Table 7, Appendix II, of confidential Brattle report, April 2011). Considering all sources of flexibility (regardless of price), 3rd party suppliers are always able to service the entire domestic demand. Without further information on the basis for Brattle's withholding analysis (see below) it is not clear from these pivotality results why a withholding strategy be beneficial to GasTerra, or on what basis Brattle have found that such an incentive exists.

Therefore attempts to characterise either the "sub-market" market shares or the PSI/RSI findings as in any sense more "sophisticated" (p.4) than the basic market shares is incorrect: all these measures have flaws, and in the case of the sub-market and PSI/RSI calculations these flaws are sufficiently serious that the results cannot be relied on.

6.4 Brattle's withholding analysis is barely explained, but the flaws identified above in relation to the measurement and pricing of flexibility make it meaningless

Finally, in relation to Brattle's withholding analysis, so little is said about this that it is not possible to undertake a full assessment of its merits (amounting to three paragraphs: less than a page – to report both methodology and results). However, given the issues raised above in relation to market definition (i.e. rules for inclusion of sources in the market) and cost calculations, it seems clear that the results of this analysis are very unlikely to be accurate.

First, as in relation to the criticism of their market share analysis above, the simple exclusion of certain sources (in particular demand flexibility and the re-import of exports) already undermines the analysis. For a proper analysis the position of these flexibility sources on the supply curve should be identified and included in the analysis.

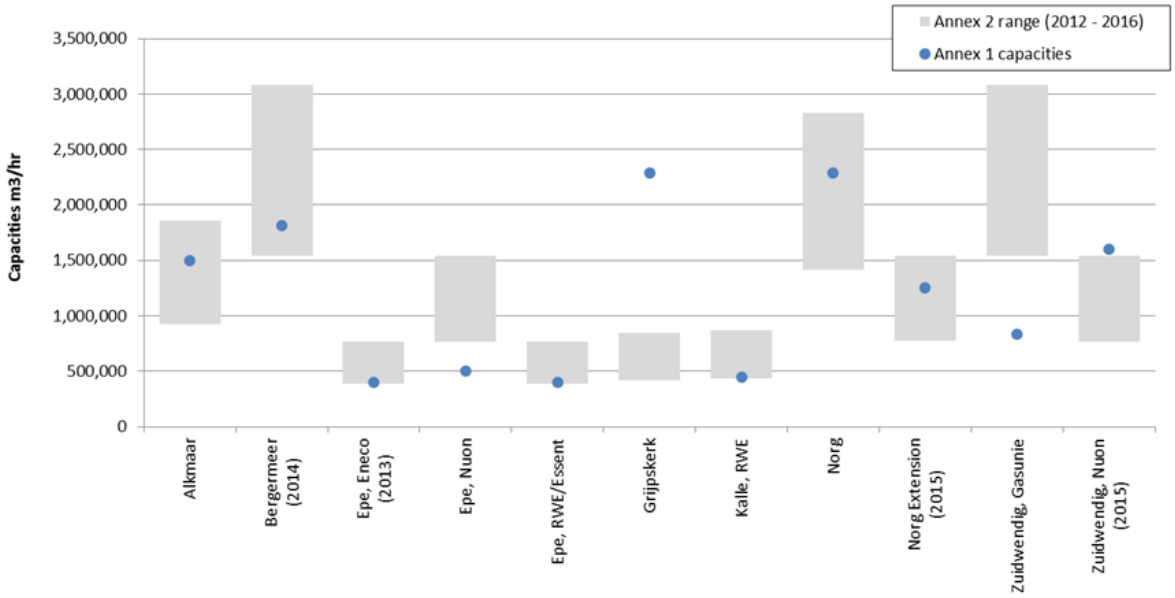
Again as above, the use of fixed costs in this analysis is clearly inappropriate. Even if fixed costs were relevant to the long-run contract prices at which certain flexibility sources are sold, they are not relevant to the short term production decisions that determine whether gas actually flows into or out of the Dutch market on a given day. For these decisions it is clearly a question of whether it makes sense on a given day to deliver gas to the Dutch market taking account of the costs of doing this (i.e. a measure of opportunity cost of supplying the gas to the Dutch market today, rather than at another time or in another

place), relative to the value of that gas in the market on the day (which, given the increasing traded volumes on the TTF, is likely to be best captured by a market based measure). Similarly, as in the case of the market share discussion above, these weaknesses will also undermine the calculation of the competitive price which is a key input into the analysis. Therefore GasTerra does not believe that the withholding analysis, once proper access is given to its assumptions and results, will hold up to examination, and its results cannot be relied on .

6.5 Brattle needs to explain their assumptions on capacity developments

We are also not clear on the reasoning underlying some of the variations in Brattle's assumptions on capacity by source between Annex I and Annex II to their report. The chart below shows the differences in assumptions between the two sections.

Figure 2 – Capacity assumptions in Annex I and Annex II of the Brattle Report



7 Remaining points

Further to the comments regarding the framework of the analysis carried out by Brattle, GasTerra has a few specific comments:

7.1 The analysis hinges on incorrect assumptions regarding the cost of Groningen flexibility

Throughout the analysis, it is assumed that the Groningen flexibility is very low cost. In our view this is not a correct representation of the actual situation. Maintaining Groningen flexibility requires constant investments. However, it is not really relevant, as proper costs measure for Groningen are the opportunity cost, which does not differ from any other Dutch production field.

7.2 The amount of free flow is over-estimated

Brattle assumes that there is still a considerable amount of free flow on Groningen, but at the same time Brattle is not able to substantiate this claim from any public source. We maintain that the available free flow capacity is actually already very limited and that in the short run there will be no free flow capacity left in the system at all.

7.3 Availability of GasTerra's flexibility sources in the summer is limited

According to the report, GasTerra's prime position in the flexibility market is particularly clear in the summer periods [Page 21, a.o.]. Aside from the fact that this hinges on the claim that production flexibility from Groningen is very cheap, which it is not, it furthermore apparently assumes a considerable potential from the storages under GasTerra's control. This is an incorrect interpretation of the possibilities of the storages. During the summer period the storages have to inject at a more or less constant maximum level. This is necessary as the Working Gas Volume has to be available by the start of the send-out season, and due to the relatively limited injection capacity this can only be attained by the constant injection. In this respect, the production storages Norg, Grijpskerk and Alkmaar are truly seasonal storages, contrary to the existing storages of GasTerra's competitors.

The report is also overlooking the fact that most of GasTerra's flexibility is sold on the basis of contracts with a duration of one year (or longer). The relevant customers have control over this flexibility, also in the summer. Withholding the flexibility sold under those contracts in the summer is of course not possible nor an option for GasTerra. Furthermore, the customers are able to respond to any withholding by offering the flexibility they purchased from GasTerra to the market. In this regard, flexibility sold by GasTerra under long term contracts seems to be equally relevant as its flexibility sold under one-year contracts.

7.4 Price assumptions of storage service are incorrect

Brattle claims to assume that all GasTerra storages are priced at the same level as the virtual storage product. We see no reason why Brattle should make such an assumption. As a matter of fact, the assumption is incorrect. At the same time (and in the same paragraph), Brattle states that it assumes storages at Epe to be priced at the bundle price as sold in the market. To the best of our knowledge, the bundles have not been sold at the price offered. Even if they have been sold at the given price, this was at a point in time where the value of (short term) flexibility was considerably higher than at the time of the auction of the virtual storage product.