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# Argus White Paper: Are transactional indexes appropriate for European gas and electricity markets?

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## Executive Summary

The European Commission's proposal for a Regulation on Energy Market Integrity and Transparency (REMIT) foresees the reporting by market participants of all transactional data relating to Europe's wholesale electricity and natural gas markets to the Agency for the Cooperation of Energy Regulators (ACER) for the purposes of market oversight, and the detection and prevention of market abuse. Additionally under REMIT's provisions, national regulatory authorities will be able to access the data collected by ACER.

There have been suggestions that this transactional data could also be used by regulatory authorities to create and publish transaction-based aggregate price indexes. These indexes may in turn be used as a price reference for long-term supply contracts and/or in retail business.

Argus' long experience of developing price transparency tools for different physical energy markets indicates that there are major inherent risks in taking this route. Alternative methods of assessing prices in EU gas and electricity markets already exist, and offer a better template for the creation of appropriate price benchmarks.

## Price benchmarks for physical over-the-counter (OTC) gas and electricity

### 1. The importance of price benchmarks

Price benchmarks have a widely accepted role in making physical energy markets, including those for natural gas and electricity, more transparent. Argus has 40 years' experience of developing and applying a variety of methodologies to independently identify prices that best reflect prevailing market value.

Argus published prices are used extensively where a reliable and independent daily price reference for spot physical energy markets is required. These robust and independent price assessments are used by governments as an independent tax reference price, and by market participants in price formulas for long-term supply contracts, for portfolio mark-to-market purposes, as the underlying index for energy derivatives, for operational scheduling, as well as for a wide range of analysis purposes including capital investment planning.

#### In Europe, principal uses of Argus price assessments include:

- **Petroleum products** — Argus European gasoline Rotterdam barge assessment is the principal gasoline price reference for Europe's wholesale gasoline markets. It is the underlying index for an active European gasoline swaps market
- **LPG** — Argus provides the main benchmark price in Europe
- **Natural gas** — Argus is a leading provider of natural gas price assessments used for gas contract pricing in the UK and northwest Europe
- **Electricity** — Argus provides UK and mainland European mark-to-market values
- **Coal** — Argus is the leading provider of price indexation for physical and derivative markets in Europe (API 2)

This position is constantly evolving as price reporting agencies (PRAs) continue to compete and innovate in the provision of price benchmarking services.

Argus is one of a number of PRAs that provide energy market price transparency. Platts, Argus and Icis (including Icis-Heren) are the three global providers of benchmark prices across the energy sector. Global news agencies such as Thomson Reuters and Bloomberg also compete in this space. There are many other sector or regional specialists, including OMR (Germany, Austria and Switzerland), APPI (Asia), RIM (Asia) and OPIS (US). And of course energy and commodity exchanges publish settlement prices which may be used as price benchmarks, while brokers publish end-of-day bid-offer ranges.

## 2. Exchanges vs physical OTC

Regulations governing trade in energy commodities, financial instruments and derivatives are currently under review within the EU, and indeed worldwide. Some proposals would force a majority of derivatives trade onto formal exchanges or similar electronic platforms. Other aspects of proposals seek to require compulsory central clearing for all eligible derivatives. In some jurisdictions (but notably not in the US), physical forwards contracts — widely traded in European wholesale electricity and gas markets — may be captured by new derivatives regulations.

Exchanges offering contracts in electricity and natural gas provide an important service to market participants in terms of reduced credit risk, anonymity and transparency of pricing. However, this comes at a cost both financially and in terms of available liquidity, which is why a vibrant physical over-the-counter (OTC) market is always present in successful energy commodity markets. OTC transactions may not be subject to margin calls nor always require the posting of collateral by the buyer or seller. This makes them more flexible, and often cheaper, at the cost of higher credit exposure. Some OTC markets have developed position netting-off provisions and emerging regulations may require most OTC trade to centrally clear. Because liquidity is often much higher and bid-offer spreads tighter in OTC energy markets compared with exchanges, market participants often prefer to transact in the OTC market. Larger-volume transactions can often be concluded OTC which could not be executed on an exchange for lack of liquidity. Energy market participants therefore typically use a combination of OTC and exchange trading (where exchange-traded contracts are available) to manage their physical supply portfolios and hedge price risk.

**Figure 1 Volumes of electricity traded in the EU's main markets in 2009** *TWh*

	Brokered OTC		Exchange		Total traded volumes
	Forward	Spot	Futures/forwards derivatives	Spot	
Germany	4,109.9	38.2	257.0	135.0	4,540.0
Nordic	1,100.0	0.0	1,195.9	185.5	2,581.4
UK	1,020.8	9.9	0.0	12.6	1,073.4
France	500.7	11.7	28.0	52.6	593.0
The Netherlands	205.8	2.3	34.0	29.1	271.2
Spain	168.1	1.5	0.0	201.0	370.6
Czech Rep.	82.6	1.1	24.3	3.0	111.0
Italy	72.0	0.0	0.0	213.0	285.0
Belgium	71.1	0.4	8.4	10.1	90.0
Hungary	38.7	0.4	3.5	0.0	42.6
Poland	31.3	0.0	0.0	2.8	34.1
Romania	6.9	0.0	11.5	6.3	24.7
<b>Total traded volumes</b>	<b>7,407.8</b>	<b>95.6</b>	<b>1,562.6</b>	<b>951.0</b>	<b>10,017.0</b>
<b>Total in %</b>	<b>74.0</b>	<b>1.0</b>	<b>15.6</b>	<b>9.5</b>	<b>100.0</b>

Data Sources: Argus Media Ltd, GME, EEX, APX, PXE, Polpx, Opcom Table: EU Commission Impact Assessment (SEC (2010) 1510 final) accompanying REMIT  
According to market participants an additional 10% of standard transactions are conducted purely bilaterally without engaging any intermediaries.

EU markets for electricity and natural gas are still relatively new. The UK's NBP natural gas market is one of the oldest, and began trading in 1996 (earlier trade was on the basis of specific physical locations). Several exchanges offer contracts for various national and regional markets, but it is notable that in nearly all of them, OTC volumes are many times larger than the volumes trading on the comparable exchange contracts (*see figure 1*). For example, OTC traded volumes in the UK natural gas market at NBP, the second most liquid natural gas hub in the world, are two to three times larger than those traded on the Ice Futures exchange. The one exception is Nord Pool, whose electricity contracts cover Scandinavia, including Norway, where OTC volumes and exchange volumes are roughly equal.

This disparity in traded volumes means that specific price benchmarks based on OTC trading activity are critical in providing price transparency in the wholesale EU electricity and natural gas markets.

### 3. Methodology and transparency

Argus' primary daily activity is the independent identification and publication of prevailing prices in physical energy spot and forwards markets around the world. Argus journalists report the energy markets on a daily basis, assessing spot and physical forward trade during that day and using this information for price discovery. The company's highly trained market reporters identify prevailing prices, including benchmarks and differential prices for each market covered. The precise methodological approach for identifying prices varies according to the market, reflecting the uniqueness of each physical energy commodity and each geographic market. The methodologies employed by Argus are detailed and transparent. They are freely and publicly available online at [www.argusmedia.com/methodology](http://www.argusmedia.com/methodology).

On a daily basis, Argus gathers information from a wide range of market participants and sources representing all segments of the energy markets. Argus receives its information from multiple sources, including transactional data supplied from the back offices of energy companies, as well as from market surveys conducted over the telephone, by instant message and by email. The information flow from companies to Argus is voluntary but robust. Argus' internal procedures ensure that information received is verified and any discrepancies are highlighted and reconciled.

The independent publication of robust and reliable price assessments is a full-time enterprise that is provided by PRAs. This is a complex task as daily physical trade in energy markets can be highly diverse. Argus brings transparency to what would otherwise be a collection of bilateral deals with companies aware only of the transactions in which they were involved. By disseminating information, PRAs level the playing field between market participants. This allows smaller market participants, which might otherwise have difficulty in obtaining robust daily price information representing the full marketplace, to compete.

## Problems with transactional indexes

### 1. Gaps in the curve and systemic risk

Two different approaches to price assessment may be considered appropriate for OTC electricity and gas markets in the EU: indexes based on aggregated transactional data, and moment-in-time intelligent assessments.

Transactional indexes have certain advantages in that they are based on actual trade. They are

particularly suitable in markets that exhibit a high degree of standardisation and high liquidity. Transactional indexes have grave disadvantages in markets that regularly have low or zero liquidity, for example in emerging markets, or along the length of a forward curve.

When there are no deals, a transactional index would be of necessity blank. So a data series comprised purely of transactions will give incomplete and misleading price signals to the market. This is more common than might be assumed. For example in the UK electricity market for 12 April 2011, Argus assessed 53 base and peak-load contracts, of which only 19 registered any concluded transactions. Argus assessed 44 natural gas contracts at the UK's NBP, of which 15 saw concluded trades.

These gaps are quite typical across Europe's gas and electricity markets and throughout the entire year (see figures 2, 3, 4 and 5).

As an example of the significance of these gaps, on 12 April 2011, the summer 2014 gas contract traded at the NBP, the first reported transaction for the period in exactly one week (since 5 April). Using these two trades, we can understand the risk imposed on the market if it were to rely only on transactional price reporting.

The summer 2014 trade on 5 April was done in a standard-sized 25,000 therm deal at 70.5p/th. In real money, that gas was worth £3,225,375. In the absence of a PRA-provided daily closing price — using a robust intelligent assessment methodology — it would have been impossible for the buyer and seller to value that gas until the market traded again.

In this case, the next trade came a week later, at 68.25p/th, valuing the gas traded on 5 April at £3,122,438.

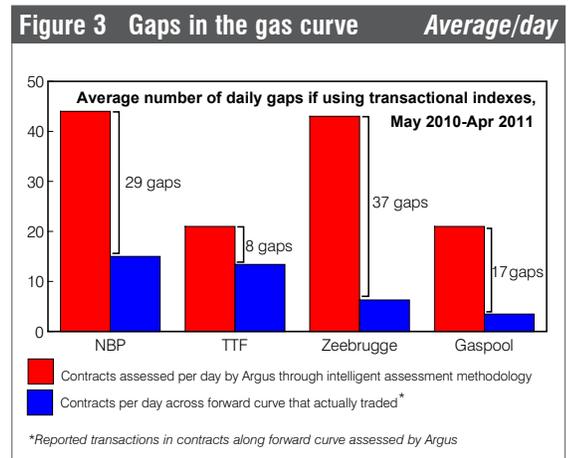
Effectively, not having a closing price for the contract each day exposed the buyer and seller to an unquantified risk at the time, and which in this case we now know amounted to nearly £103,000. PRAs allow firms to quantify their risk daily by providing intelligent moment-in-time price assessments, even for illiquid forward contracts.

If only transactional indexes were to be used, trading portfolios would not be marked to market correctly. Counterparty risk would be miscalculated and mismanaged, introducing systemic risk to the trade of energy commodities. Markets may well become confused and disorderly.

**Figure 2 European gas markets: Gaps in the curve, May 2010-Apr 2011**

	NBP	TTF	Zeebrugge	Gaspool	Total
Average number of contracts assessed per day by Argus through intelligent assessment methodology	44	21	43	21	129
Average number of contracts per day along forward curve that actually traded*	15.0	13.4	6.3	3.5	38.2
<b>Average number of data gaps per day along forward curve if using transactional indexes</b>	<b>29.0</b>	<b>7.6</b>	<b>36.7</b>	<b>17.5</b>	<b>90.8</b>
<b>Average daily missing percentage of forward curve from transactional indexes</b>	<b>66%</b>	<b>36%</b>	<b>85%</b>	<b>83%</b>	<b>70%</b>

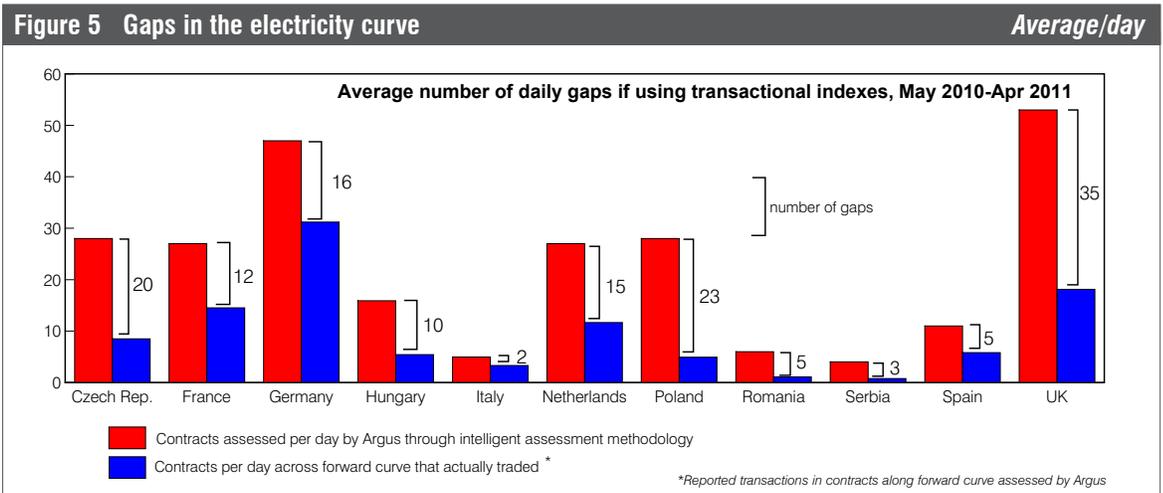
\*Reported transactions in contracts along forward curve assessed by Argus



**Figure 4 European power markets: Intelligent assessments vs. transactional indexes, May 2010-Apr 2011**

	Czech Rep.	France	Germany	Hungary	Italy	Netherlands	Poland	Romania	Serbia	Spain	UK	Total
Average number of contracts assessed per day by Argus through intelligent assessment methodology	28.0	27.0	47.0	15.9	5.0	27.0	28.0	6.0	4.0	11.0	53.0	251.8
Average number of contracts per day along forward curve that actually traded*	8.5	14.5	31.2	5.4	3.3	11.7	4.9	1.1	0.8	5.8	18.1	105.3
<b>Average number of data gaps per day along forward curve if using transactional indexes</b>	<b>19.5</b>	<b>12.5</b>	<b>15.8</b>	<b>10.5</b>	<b>1.7</b>	<b>15.3</b>	<b>23.1</b>	<b>4.9</b>	<b>3.3</b>	<b>5.2</b>	<b>34.9</b>	<b>146.6</b>
<b>Average daily missing percentage of forward curve from transactional indexes</b>	<b>70%</b>	<b>46%</b>	<b>34%</b>	<b>66%</b>	<b>33%</b>	<b>57%</b>	<b>82%</b>	<b>82%</b>	<b>81%</b>	<b>47%</b>	<b>66%</b>	<b>58%</b>

*\*Reported transactions in contracts along forward curve assessed by Argus*



## 2. Different pricing structures in the same market

Transactional-based methodologies make the assumption that the transactions will all be concluded using the same type of pricing construction — such as a fixed price, for example €50/MWh. But markets evolve and in many energy markets pricing occurs under different pricing constructions — such as fixed price and price differentials to a price reference, for example “€50/MWh” and “€2/MWh over the prevailing first month NCG price as published in Argus”. It is impossible to combine the types of price constructions into a single transactional average. Therefore transactional indexes can exclude large parts of the market.

The US experience with using transactional indexes for gas and power provides another cautionary tale. After a false reporting scandal which sent several traders to jail, US gas and power regulator the Federal Energy Regulatory Commission (FERC) issued a policy statement in 2003 that set guidelines on how to construct transactional-based indexes. But an unintended consequence was that transparency was severely affected when market participants stopped reporting trades to PRAs for fear of being penalised over inadvertent errors. FERC had to issue several clarifications and a “safe harbour” protection to ease these fears. Mandatory price reporting on a daily basis has always been ruled out in the US, as it is considered too burdensome for smaller participants.

The US regulator recently reported that transactional-based gas indexes are underpinned by a relatively small amount of gas volume — an insight it gleaned from a new requirement for gas market participants to report volumes, but not price, annually. Transactions done referencing the index but not contributing to its calculation accounted for 70pc of reported US spot gas volumes in 2009. A further 8pc of volumes was deals referencing Nymex futures contracts, leaving fixed price transactions accounting for just 22pc of spot market volume. Partly as a result, market participants in US gas markets invariably continue to use independent intelligent-assessment values for daily mark-to-market purposes of contracts along the forward curve. Daily transactional-based indexes in US gas markets continue to contain widespread gaps along the forward curve.

These examples underline two important lessons: firstly, that simple transactional averages cannot necessarily be relied upon to generate robust price indexes; and secondly, that regulatory changes may have unintended consequences.

### **3. Breakdown of relationships between markets**

Indexes based on transactions have no logical relationship to one another. This is a major problem for time spreads and locational differentials. For example, if contract months along the forward curve have a linear relationship whereby each month is €1/MWh lower than the preceding month, then this will not be properly represented in indexes derived from averaged transactional data. For any day, the transactional index for each contract month will be set independently, based on the price of transactions concluded that day for each contract month. This means that the relationship between the monthly periods will be lost. Similarly, locational relationships will be lost if transactional indexes are calculated independently for each location. For if one location or hub is valued at €2/MWh higher than another location then this will not be accurately represented in indexes derived from averaged transactional data.

If transactions are used to identify market prices, then the number of transactions is critical to the representative nature of the price. If only one or two transactions occur in a contract, the transactional index price for that contract could be vulnerable to deliberate distortion — for example where a market participant has leveraged a greater volume of derivative contracts based on the transactional index than is spot traded to set the transactional index.

Transactional indexes do not represent the appropriate time value of the market. This may be a major problem in hedging. Transactional averages by their very nature lag the marginal price. This puts large volume traders with better access to the market in a position to trade the difference between the marginal price (the direction the average is heading) and the current average. This phenomenon is known in equity markets as “stale price arbitrage”.

### **4. Strengthening the position of incumbents**

There are two further significant problems with transactional indexes in markets with low liquidity.

Firstly, the market participant that trades the greatest volume will have the greatest influence on the final index price. In a market that is assessed using a moment-in-time methodology, all market participants have an equal opportunity to buy or sell at the marginal price. This creates a more level playing field, and encourages liquidity. Pricing from transactional data is a perfectly acceptable price reference in markets with high liquidity, but it does carry the implicit risk that large companies that are incumbents and that trade extensively will make a greater contribution to the establishment of the market price than smaller companies. Smaller companies can only compete on equal terms with larger companies in the setting of a market price at the margin.

Secondly, when there are only one or two transactions in a given market on a given day, there is the risk of leverage, whereby a single deal can significantly skew the resulting index. Argus typically employs intelligent assessment methodologies in such markets, to minimise the risk of leverage.

It is worth noting that a migration of trade from the physical OTC markets to exchanges would not resolve any of the four transactional-index difficulties discussed above. Exchange settlement prices and similar indexes based on exchange trading still suffer from these four technical problems, particularly in low liquidity situations.

### Problems with endorsing a single methodology

It is important that regulators avoid either explicitly or implicitly endorsing a single methodological approach to price discovery. PRAs operate in a competitive market, ensuring not only that costs are reasonable, but also that there is a constant spur to innovation.

Any official sanction of the use of one particular methodology carries with it the risk that market structures will be not be sufficiently flexible to allow for the full evolution of an open competitive single European market. The “officially sanctioned” approach could become a strait-jacket, preventing timely development of new price benchmarks and indexes.

For example in oil markets, even an apparently “standard” refined product category such as diesel is complicated by variations in quality, quantity, location and timing that all have an effect on price. PRAs take these diverse inputs and produce normalised reference price assessments for clearly labelled product categories. The technical parameters for these normalised reference prices have to be constantly adjusted as the market evolves. As an illustration, Argus has recently changed various technical specifications of its price benchmarks for the European gasoline market, in light of the new requirements for a gasoline that reflects bio-ethanol blending mandates that have been introduced on a European basis.

Despite their relative level of standardisation, similar issues could affect Europe’s electricity and gas markets in the future, for example in relation to standard contract volumes, or credit terms, or the definition of peak hours, or the start and finish of the trading day, or any number of other trading parameters. For these reasons, regulators should not explicitly or implicitly sanction the use of transactional data for anything other than market oversight, and should encourage freedom of choice in the use of robust and reliable price indexation.

### Conclusion

Argus has 40 years’ experience of assessing prices in both liquid and illiquid physical energy markets around the world. Based on this experience, it is clear that transaction-based indexes have their place in markets with high volumes of standardised trading, but are beset by problems when employed in markets that regularly have limited or zero liquidity.

Most EU electricity and gas markets are less than 10 years old, and all are still developing, both in terms of trading volumes, liquidity and the number of market participants. The gas market began in the UK in 1995 and the power market in 1999. Both markets initially used price references that were generated from transactions (such as *The Heren Index* in gas), but over time both markets have moved to the use of independent price references that are based on buy-sell ranges with supportive depth of market.

None of the discussion above is meant to discredit the concept of transactional-based pricing. Argus identifies prevailing price levels using transaction-based methodologies in many markets — where we consider this approach to be reliable. But in our view this approach is not right for all markets — in particular Europe’s electricity and gas wholesale markets. And where we do apply a transactional-based methodology, we do so with a professional and well-resourced operational base and within a competitive environment, so that the market is free to choose whether it wishes to employ such a methodology.

**This last point is the key:** competition in the provision of robust and reliable price transparency. PRAs operate in a competitive market, ensuring not only that costs are reasonable, but also that there is a constant spur to innovation. This competitive market model is the best guarantee that all stakeholders, including consumers, will be able to trust the prices identified in the wholesale electricity and gas markets in the future.

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