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WHITE PAPER ON ELECTRICITY BILATERAL TRADING

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8 May 2020

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DATA

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ACRONYMS

CDS	Credit Default Swaps
CfD	Contracts for Difference
DA	Day Ahead
DAM	Day-Ahead Market
EU	European Union
GEE	Georgian Energy Exchange
GSE	Georgian State Electrosystem
kV	Kilovolt
kWh	Kilowatt Hour
MWh	Megawatt
OTC	Over-The-Counter
TSO	Transmission System Operator

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1. BILATERAL TRADING IN THE ELECTRICITY MARKET

Georgia has opted to adopt the European Union (EU) approach to the electricity sector, which aims to implement competitive markets in both generation and supply, and in the long term to provide all retail customers to choose from suppliers of electricity. Many countries in the EU now have mature wholesale and retail markets with sophisticated regulatory authorities protecting retail customers from anti-competitive practices and providing a safety net ensuring continuation of supply in the event of corporate failures, thus allowing customers to easily switch between suppliers. As electricity is homogenous, suppliers cannot market the quality of the product, and therefore they adopt service strategies to attract customers into their portfolio, for example sell gas and electricity on a single bill at a discount, offering discounts for paying in advance for their electricity, providing time of day tariffs where smart meters are installed etc. Many businesses have grown around the gas and electricity sector, offering to find the best deals for retail consumers, and take commissions on the sale.

The market relies upon an active and vigorous wholesale electricity markets which provide opportunity for producers, suppliers and re-sellers to optimize their sales and purchases and thus improve their offer to the retail market.

2. MARKET MECHANISMS

The production and consumption of electricity are policed by the various codes and market rules that ensure a level playing field for all participants. Unlike all other commodities, electricity must be consumed in the instant that it is manufactured. This results in trading mechanisms that are more complex than for those commodities that may be stored and delivered more or less at leisure.

The participants in the markets are

- Generators;
- Transmission System Operators;
- Suppliers;
- Large Consumers;
- Resellers;
- Brokers;
- Speculative Traders.

The Transmission operators are required to provide an unbiased service to the system, ideally by being entirely independent from the upstream and downstream participants. The Transmission System Operator (TSO) manages the Transmission network, and requires adherence to the market rules to ensure delivery of electricity to the distribution networks and transmission connected customers.

Trading requires that the delivery of an agreed volume of electrical energy is produced and consumed by the trading parties during a specific hour, half hour or 15 minute interval depending on the jurisdiction. In reality, the trade is tripartite – the producer agrees to inject electricity into the system, the consumer agrees to extract the electricity and, at the wholesale level, the TSO facilitates the injection and extraction of said electricity. The TSO is required to ensure that the injections and extractions are close to identical.

Several different market mechanisms exist to facilitate accurate forecasting, pricing and delivery of electricity, with increasing granularity towards real time.

In the UK, more than 80% of bilateral trades are conducted bilaterally between two parties. ‘Over-The-Counter’ (OTC) is used to define a trade that is not executed on one of the trading platforms that establishes anonymous transactions.

The Balancing Mechanism

The Balancing Mechanism is the system in which the inevitable miss-matches that remain after all of the markets have closed, in which the TSO accepts bids and offers to deploy resources to ensure the safe running of the system. The cost of providing those reserves are passed back to market members at a price derived from the closed auction held just before real time. Balancing market prices are highly volatile and are subject to severe price spikes, albeit on relatively small volumes.

The Intraday Market

The intraday auction is a continuous open action that seeks to match buyers and sellers of electricity, with the intention of further tuning their position. Buyers and sellers post their bids and offers for each of the timeslots in the day ahead, and are continuously matched. The intra-day market closes at Gate Closure, a period (1 hour in the UK) to permit the TSO to arrange the real time dispatch.

The Day Ahead Market

A closed auction held on the day before real time in which participants make bids to buy and offers to sell based on their own portfolio of electricity. The purpose of this is to allow participants to adjust their existing position match their current forecast, and to provide a reference price for wholesale electricity.

The Bilateral Market (also known as the OTC or Forwards market)

The Bilateral market is a physical market in which a bilateral arrangement will result in an injection of electricity into the network and an extraction of electricity from the network. Bilateral trades may be struck at any time up to ‘Gate Closure’. In the EU, Gate Closure may be no later than 1 hour before real time – individual jurisdictions may require a longer gap between Gate Closure and real time.

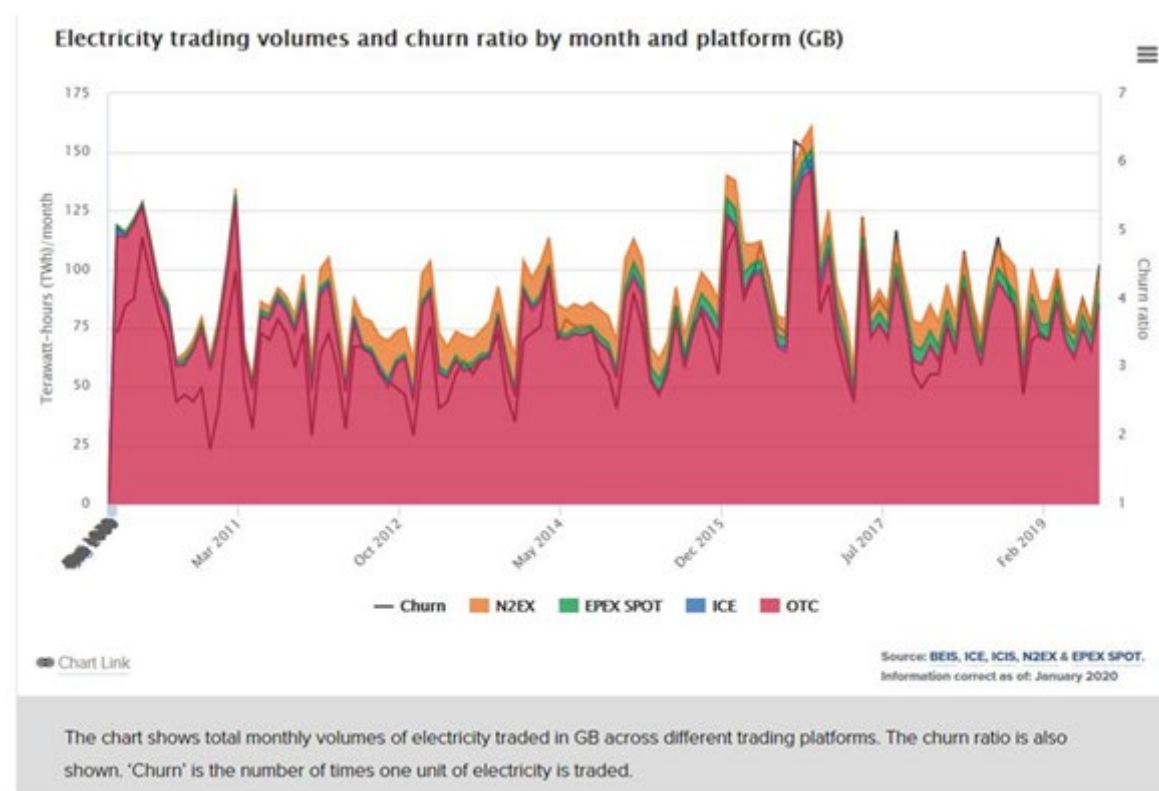
The vast majority of electricity is traded bilaterally. Bilateral trades may be agreed by two parties directly or through private networks such as those of electricity brokers. During these trading

sessions, buyers and sellers establish contracts which approximate their intentions in real time. The contracts are not standardized.

The bulk of OTC arrangements are the buying and selling of baseload, and often occur between organisations that are owned by a common parent, which may involve no financial settlement between them. Regardless, counterparties in OTC transactions have no mandate to publicise the prices paid for the purchase and are therefore not helpful in price discovery.

At Gate Closure, participants must confirm to the TSO of their injections and extractions to inform the Balancing Mechanism of the required actions.

Figure 1: UK Electricity Trading Volumes

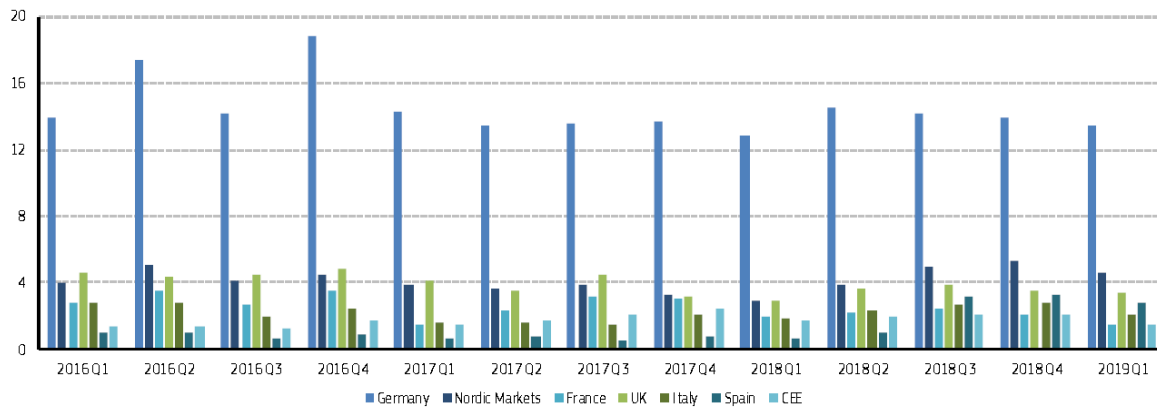


The Futures Market, also referred to as 'Organized' markets

The Futures markets run on trading platforms which match bids and offers anonymously between participants where the price and volume match. Traders may be Physical – the trade will result in an injection of electricity from the seller and an extraction of electricity by the buyer; or Non Physical – trading Megawatt (MWh) by buying low and selling high before delivery. Both Physical and Non Physical participants will trade in derivatives such as Contracts for Difference (CfD) or Credit Default Swaps (CDS) either for hedging purposes or to speculate to generate income.

Physical Traders in the market buy and sell some distance into the future, thus locking in prices against price risk. They may tune their positions closer to real time by selling and buying positions established earlier. The Non Physical traders seek to make a profit out of variations in price over a time; in a simple example a trader may buy a block of electricity at a price for delivery in future with the expectation of re-selling that electricity at a higher prices before real time – thus closing their position. Non Physical traders are important to the market in that they are a source of churn. A high rate of churn is an indicator of liquidity in a market, and high liquidity leads to low spreads and hence representative pricing.

Figure 1: Churn Rates in the EU Electricity Market



Source: Quarterly Report on EU Electricity Markets Q1 2019; DG for Energy

The chart shows the churn rates vary between reselling each MWh between 3 and 13 times for the mentioned countries. The larger the market, the higher the churn rate.

There are many other products that may be transacted in a Futures market. Contracts for Difference, a non-physical product, enable traders to lock in a price for a block of electricity for future delivery. The buyer of the CfD expects the price at the time of delivery to be higher at delivery and to be paid the difference and the seller take the opposite stance. CfDs require a reference price, in which value between the counterparties will alternate as the underlying asset varies in price. These instruments are 'marked to market' every day, in which the closing price of the underlying asset is compared against the bargain, and the 'loser' in the day compensates the 'winner'. This is relatively simple with normal assets which will have a base price at end of each day – for example, the price of a barrel of oil at close of day. Clearly, this does not work in continuous trading in 24 or 28 hour slices. The EU exchanges generally use an index based on the average price in the 24 hours of day ahead trading. Georgia may choose to delay the implementation of CfD trading until there is a reasonable history of day ahead trading to provide some comfort in the stability of the Day Ahead (DA) price.

Credit Default Swaps provide an instrument for traders in the market to protect themselves against payment default. The seller of the CDS agrees to compensate the trader in the event of default in payment from the trader's counterparty at a price that compensates seller of the CDS for the risk, thus insuring the trader against risk of default. Credit insurance companies may enter the energy market providing credit insurance policies which may be hedged through CDS instruments.

Options trading are arrangements in which a buyer has the option but not the obligation to buy electricity for future delivery at a price agreed by the seller. If on the day of delivery, the prices are higher than the strike price the buyer will exercise the option, if not the option will lapse and the buyer will buy at the market price. The buyer pays a premium to the seller for the Option. Options may themselves be re-sold in the market.

Large Customers connected the transmission grid generally purchase most of their electricity OTC with counterparties with whom they have already established long term relationships, either with generators or with resellers who may buy from several different sources – small hydro, aggregated wind plant etc. as well as from spare capacity from large generators. The Large Customers will seek to avoid balancing market costs through the DA and Intraday markets but are less apparent on the Futures market. There is no reason for them to avoid Futures, but in mature markets they will tend to have long established relationships brokers, who will trade on their behalf and thus reduce transaction costs by having small trading desks. In Georgia, that may not be the case.

3. POLICY CONSIDERATIONS

The underlying objective of the structural reform of the energy sector in Georgia is to improve the efficiency and transparency of the sector by a migration to a fully competitive sector where all customers have the benefit of choosing from a range of electricity suppliers according to their requirements, based on the premise that free competition delivers the best value.

The strategy is intended to be implemented in stages with competition being implemented in 5 stage between now and January 2027 by which time all but households and small business will be free to choose supplier. The introduction of competition in the domestic and small business sector will be appraised during the reform process.

At the initial stage, those customers connected at 35 -110 Kilovolt (kV) and consuming no less than 0.4 million Kilowatt Hour (kWh) monthly will join the market, followed by the 6 – 10kV customers, consuming no less than 1 million kWh monthly and all 35-110 kV customers. It is reasonable to suppose (or insist if necessary) to ensure those customers have hourly metering and recording facilities, and the ability to electronically inform the TSO of their consumption.

Preparations also need to be made to provide for the opening of the third tranche of the market which will have many customers that will not have hourly meters. An exercise to establish typical consumption profiles need to be carried out to enable the receipt of electricity to be apportioned in hourly slices to the suppliers to establish their balancing obligation to the TSO.

In relative terms, Georgia has a small electricity sector, and until 2026 a small number of trading customers, so liquidity will be an issue.

Policy Suggestions to encourage new suppliers in the de-regulated sector:

- (i) There are currently 2 distribution companies in Georgia, who fulfil the supply activity in addition to managing the distribution networks. It would be difficult to penetrate the supplier duopoly unless the networks and supply functions are unbundled from the management of the distribution networks and some requirements introduced to increase the contestability of new entrants, for example, by requiring the incumbents to offload some of their captive customers.
- (ii) Introduce a market maker into the sector, perhaps the Wholesale Public Service Organization since they already have a mandate to sell or buy electricity. The Market maker would offer to sell at some value higher than the median and to buy at some point lower, bringing liquidity to the market. In the early days an average clearing price from the Day-Ahead Market (DAM) may provide a benchmark.
- (iii) Similarly, the two large supply business could be required to provide market making.
- (iv) Encourage non-physical traders into the futures market – re-trading is a key support to market activity and will support hedging strategies.
- (v) To support new entrants, it may be helpful to insist that large generators are required to dedicate some of their output to new supply side entrants through the OTC market.
- (vi) Collateral requirements are likely to be high in the organized markets, and OTC sale to new entrants may require substantial deposits. The Government may consider some collateral support to new entrants.
- (vii) The absence of a futures market with long dated, standardized products providing hedging tools would act as a deterrent to new and existing suppliers; expediting the implementation of such a market may be helpful.
- (viii) In terms of Governance, European commodity markets insist that all market members are companies – individuals are not permitted to trade. They do not require licenses, but are regulated by the regulator where the platform is based, for example the EEX, located in Leipzig is governed by the German Exchange Act (which is compatible with REMIT). The Georgian Energy Exchange (GEE) might consider that approach and forgo a license for the exchange.
- (ix) In terms of the exchange, it is unlikely for there to be sufficient demand to support more than one Energy Futures market in Georgia, at least until the whole of the market, including households, are entitled to choose supplier. It seems sensible for the GEE to procure and manage the Futures exchange, because:

- a. the expertise to specify and implement the precise requirements of market functionality between the prompt and futures markets are coherent;
- b. there is a reporting and coordinating requirement to ensure the TSO are fully informed of market activity.

Another candidate is Georgian State Electrosystem (GSE)– they have experience in stock markets, and they have experience in the clearing functions.

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