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GEORGIAN ELECTRICITY ROAD MAP (2015-2020)

WHITE PAPER FOR THE GOVERNMENT OF GEORGIA

USAID GOVERNING FOR GROWTH (G4G) IN GEORGIA

13 April 2016

This publication was produced for review by the United States Agency for International Development. It was prepared by Deloitte Consulting LLP. The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

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DATA

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ACRONYMS

AMR	Automatic Meter System
AWT	Average Weight Time
BM	Balancing Market
BRP	Balancing Responsible Parties
BSP	Balancing Settlement Price
CBETA	Cross Border Electricity Trading Agreement
CFD	Contract for Difference
CH	Clearing House
CP	Costumers Protection
DAM	Day-Ahead Market
DAP	Day-Ahead Planning
DAS	Day-Ahead Schedule
DISCO	Distribution Companies
DNO	Distribution Network Operator
DSO	Distribution System Operator
EFET	European Federation of Energy Traders
EMRA	Energy Market Regulatory Authority of Turkey
EPIAS	Turkish Market Operator
ESCO	Electricity System Commercial Operator
ETM	Electricity Trading Mechanism
EU	European Union
FDI	Foreign Direct Investment
FIT	Feed in Tariff
FYNDP	Five Year Network Development Plan
G4G	Governing for Growth in Georgia
GEMM 2015	Georgian Electricity Market Model of 2015
GNERC	Georgian National Energy and Water Supply Regulatory Commission
GoG	Government of Georgia
GSE	Georgian State Electrosystem
GSP	Grid Supply Point
GWh	Gigawatt Hour
HIPP	Hydropower Investment Promotion Project
HPEP	Hydro Power and Energy Planning Project
HPP	Hydro Power Plant
IFI	International Financial Institution
IOA	Interconnection Operations Agreement
ISB	Independent Supply Business
kV	Kilovolt
kW	Kilowatt
MCH	Market Clearing House
MO	Market Operator
MoE	Ministry of Energy of Georgia
MoLHSA	Ministry of Labour, Health and Social Affairs of Georgia
MP	Market Player
MR	Market Rule

MW	Megawatt
MWh	Megawatt Hour
NARUC	National Association of Regulatory Utility Commissioners
NBG	National Bank of Georgia
OTC	Over-The-Counter
PMUM	Electricity Market Operator in Turkey
PPA	Power Purchase Agreement
PPD	Public Private Dialog
PSB	Public Supply Business
PSO	Public Service Obligation
PX	Power Exchange
RE	Renewable Energy
RES	Renewable Energy Source
SOLR	Supplier of Last Resort
TPP	Thermal Power Plant
TSO	Transmission System Operator
TYNDP	Ten Year Network Development Plan
UK	United Kingdom
USAID	United States Agency for International Development
USoA	Uniform System of Accounts
WB	World Bank
WG	Working Group

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1. INTRODUCTION

Hydropower resources are the largest of Georgia’s natural endowments and their further expansion requires a simultaneous domestic and export-oriented project development focus with merchant power plants, without sovereign and corporate guarantees. This is because the Georgian electricity market has a balanced mix of low-cost hydro and thermal power plants and the new power plants will have to locate multiple markets inside and outside of Georgia for selling their energy output year around. Hydropower development is also an economic growth driver for Foreign Direct Investment (FDI) and job creation. New hydropower plants will improve energy security and independence and enhance geographical diversification of energy sources. Regional export direction is towards the west, Turkey and Southeast Europe. This region is already operating on competitive electricity market basis with their respective standards for trading electricity and new cross-border trade of electricity by Georgian entities requires adaptation of these trading standards.

Therefore, United States Agency for International Development (USAID) decided to propose an Electricity Trading Mechanism (ETM) that will facilitate FDIs with non-recourse project financing from International Financial Institutions (IFIs), according to competitive electricity market principles in line with European Union (EU) energy directives.

In order to implement the ETM, certain changes in the Georgian electricity market model to allow competitive electricity trading and therefore the Georgian Electricity Market Model of 2015 (GEMM) was created.

The GEMM is a strategy which when implemented will enable Georgian Market Players (MPs) to trade electricity cross border into the regional competitive power markets and at the same time provide long-term cost effective electricity to domestic costumers; it is consistent with regional competitive power markets, carrying necessary minimal technical and legal requirements to benefit from the energy trade.

GEMM 2015 provides details of the required legal and regulatory reforms and sufficient institutional capacity building in the Georgian Government and its electricity sector-related agencies to implement a competitive electricity market in Georgia and provide the required enabling environment for competitive domestic and cross border trading.

The ETM is a product of GEMM 2015 and represents the move from a monthly balancing market model to an hourly balancing and competitive electricity trading-based market model.

GEMM 2015 was adopted by the Ministry of Energy (MoE) as a core strategy for energy sector development. The MoE and USAID jointly signed a memorandum in January 2013 on GEMM 2015 implementation. And GEMM 2015 is included in the Georgia Economic and Social Strategy known as Strategy 2020.

By signing the EU Association Agreement, Georgia committed itself to undertake actions to move towards EU’s competitive market principles and approximate its legislation with EU directives. In July 2014 the Government of Georgia (GoG) approved the government action plan (2014-2018) which includes the following components of GEMM 2015:

Actions to be Undertaken by Georgia	Responsible Entity
Adoption of the Electricity Grid Codes	GNERC
Adoption of standards term and conditions for various services	GNERC
Adoption of tariff methodology based on best EU practices	GNERC
Adoption of the USoA	GNERC
Normative losses, adoption of rules of calculation	GNERC
Development of electricity market	MoE
Development of coordinated instructions for emergency situation	MoE
Development of electricity trading platform	GSE

Note: *GSE – Georgian State Electrosystem*
GNERC – Georgian National Energy and Water Supply Regulatory Commission
USoA – Uniform System of Accounts

Retail electricity costs are increasing with growing electricity demand requiring new, market-priced energy. In addition, new government-guaranteed electricity sector commitments must be paid (debt on new infrastructure, Power Purchase Agreements (PPAs)) and government subsidies should be removed from tariffs, at least for the non-vulnerable customers. Artificial control over prices will

discourage investors from entering the domestic market which, in the long run, will cause increased imports of electricity and/or generation fueled by imported fossil fuels.

Several factors must be considered while opening the retail electricity market:

- Protection of vulnerable residential consumers and consumers that may become vulnerable if their electricity bills are significantly increased (taking into consideration other increased utility bills for natural gas and water as a result of new investments and reforms in these sectors).
- Support to vulnerable energy-intensive commercial and industrial customers, especially those that depend on exporting their goods in the competitive global market.
- Market opening requires the unbundling of the electricity distribution companies and the introduction of domestic competitive traders, suppliers and brokers.
- The non-residential customers entering the competitive electricity market can be aided through government-supported energy efficiency programs to help reduce the average cost of production of goods and services.
- All generators should enter the competitive electricity market, albeit, some older generators will have increasing availability to join over time while new power plants will enter immediately.

The ETM provides the minimum requirements to harmonize Georgia's electricity sector to facilitate migration to a market oriented electricity sector, and allows for multiple privately-owned Hydro Power Plants (HPPs) to trade into the hourly settlement market in Turkey. Access to the competitive electricity market for HPPs connected to the distribution systems are currently greatly disadvantaged compared to larger HPPs connected to the transmission network, an inequity which must be addressed. Responsibility for market rules must be transferred to Georgian National Energy and Water Supply Regulatory Commission (GNERC).

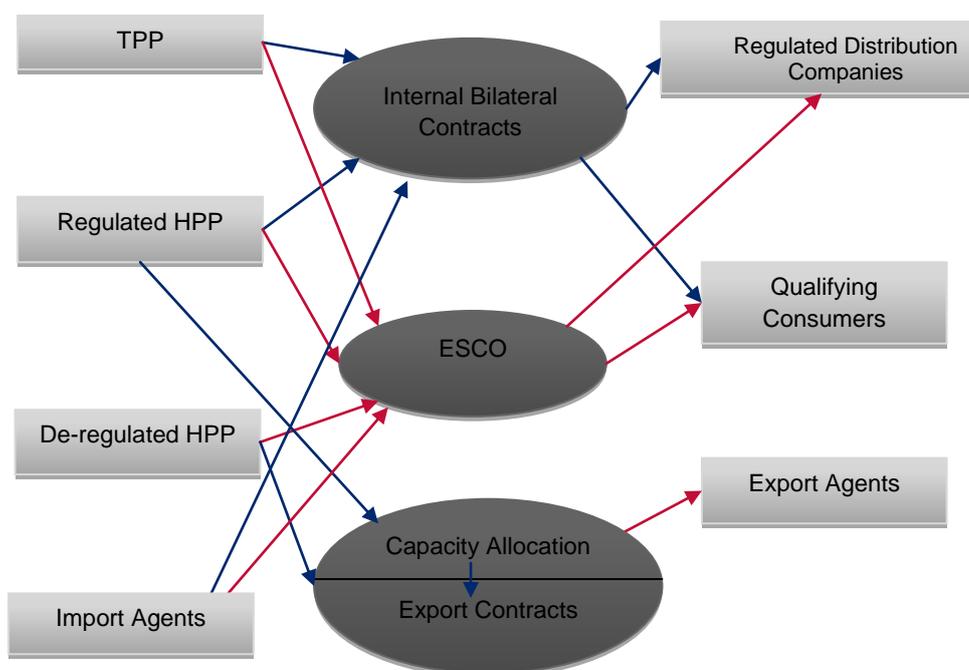
The ETM will:

- Allow more competition, increased appetite for investors/developers and in the long run put downward pressure on end-user prices.
- Provide clear price signals both for investors/developers as well for consumers.
- Provide risk mitigation tools to allow MPs to operate on the market more efficiently.

2. EXISTING ELECTRICITY MARKET IN GEORGIA

The market is based on bilateral contracts between the Generators, the three distribution companies and the very few eligible electricity customers. Tariffs are set for all power stations except those below 13 MW installed capacity. Wholesale buyers and small HPP built since 2008 have the ability to create their own 'basket' of contracts from the available sources to suit their own needs at de-regulated prices.

Figure 1: Existing Market Structure



Note: *TPP* - Thermal Power Plant
ESCO - Electricity System Commercial Operator
HPP - Hydro Power Plant

In the figure above, the blue arrows designate direct (bilateral) contracts; the red arrows designate balancing transactions.

The Direct Contracts specify a price, a delivery period and a tolerance on delivery, for example, a contract may be for 50 GWh +/- 20% for delivery between 1st June and 31st August. The contracts are not profiled and not firm. Georgian State Electrosystem (GSE) dispatches according to recognized operational practice, taking account of demand, reservoir levels, state of Thermal Power Plants (TPPs), import contracts etc. At the end of each settlement period, Electricity System Commercial Operator (ESCO) calculates the flows between the contracted parties and notifies them of their payment obligations. Any electricity which has been dispatched outside of contract tolerance is deemed ex-post as balancing electricity and is settled by ESCO.

Most of the wholesale electricity generation is sold to distribution companies and large industrial consumers through bilateral contracts at fixed or capped regulated tariffs. The remainder is defined as balancing energy, managed by ESCO and priced depending on the generation mix used to supply the electricity. The balancing electricity covers the difference between contracted and consumed electricity and is priced at the average weighted price from the tariffs.

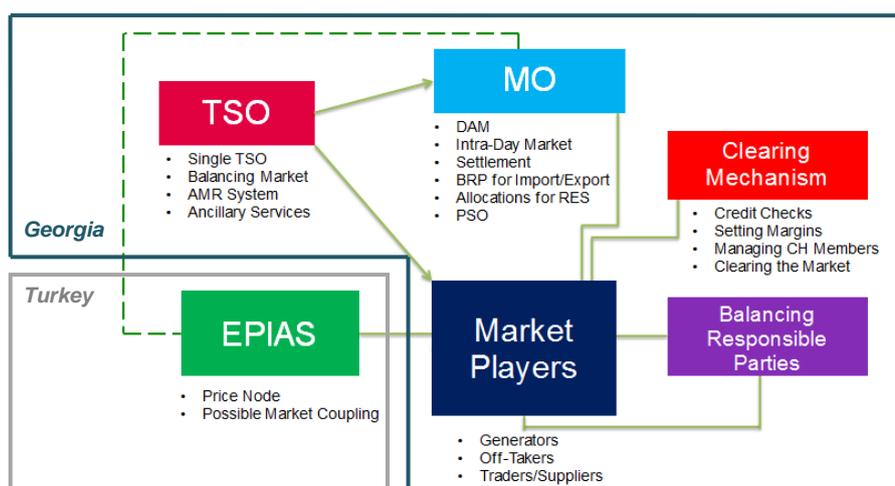
3. FUTURE POWER MARKET (2020)

In order to have a well-functioning, sustainable market, additional recommendations are provided below:

- Energy prices should not be politicized and should be driven by the competitive electricity market, not by regulations and subsidies from the State Budget. Public awareness campaign could be conducted to introduce the public to opportunities and challenges stemming from electricity market reform.
- The electricity market should move from central dispatching to a self-dispatching concept, allocating responsibilities to MPs, without sacrificing system security and stability.
- Competitive electricity traders should be introduced to the market.
- Ancillary services should be procured through the market.
- Unbundling of distribution companies into network operators and customer suppliers is an essential step towards a competitive market and concomitant benefits to end consumers.
- GoG should develop a vulnerable customer protection strategy for support during the transition from price-regulated to the fully competitive electricity market.
- GoG should gradually abolish direct or indirect subsidies and develop a coordinated plan as how to allocate extra state revenues generated from gas transit fees.
- Market Rules and Grid Codes should be under the same regulatory body.

MPs, private sector, local banks, IFIs and all other relevant stakeholders should be involved in development of the electricity market. Successful operation of the competitive electricity market will require a market structure with specific roles and responsibilities for each of the key stakeholders shown in Figure 2 below.

Figure 2: Proposed Market Structure



Note: AMR – Automatic Meter System
 DAM – Day Ahead Market
 RES – Renewable Energy Source
 EPIAS – Turkish Market Operator

PSO – Public Service Obligation
 BRP – Balance Responsible Parties
 CH – Clearing House

The design objective is to create the systems, procedures and capabilities that will enable the migration from the sector structure to a model that has a clear route to full implementation of the Energy Community Acquis *in a manner that permits the risks to be controlled for participants in terms of trading risk and for retail customers in terms of impact on tariffs*. The design must be capable of full compatibility with the provisions of the Acquis on Energy (derogations may apply short/medium term to permit evolution) and must be capable of delivering protection to non-eligible customers in the short to medium term:

- The model must provide for commercially unrestricted 3rd Party access to transmission network for qualified organizations.
- Distribution and supply must be legally unbundled to allow unrestricted 3rd Party Access to the distribution network.
- The concept of full customer choice in the long term must be supported.

4. TRANSITIONAL MARKET DESIGN STAGES

The objectives of the market are achieved through a phased implementation strategy comprising of five stages. The first and most critical stage re-organizes the existing structure into a hybrid pool/bilateral form (frequently referred to as the 'Partial Pool'), defines the roles and responsibilities in the market and prepares the market rules and other necessary documents and agreement pro-formas, establishes the systems, procedures and interfaces and procures, configures and tests the relevant software tools.

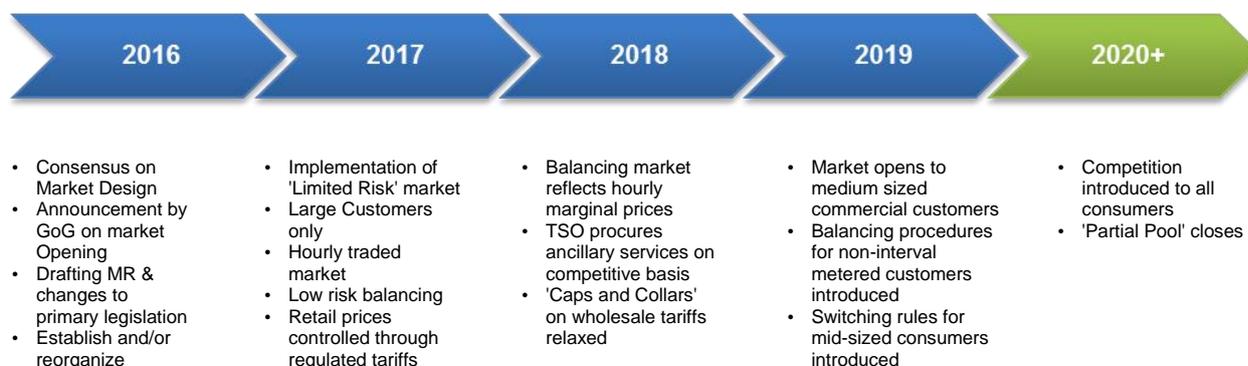
Until the market fully opens, the design envisages a hybrid model with two parallel markets: a centrally dispatched segment with regulated price controls serving the vulnerable consumers (the Partial Pool) while allowing competition on an initially small but growing competitive segment.

- Stage 1 is a simplified and low risk form of the market and should result in little or no impact upon tariffs in the regulated sector.
- Stages 2 through 4 introduce new products and trading tools and increasingly push risk (and opportunity) out to the participants where it belongs. Household tariffs will still depend upon supplies from tariff priced generation and will therefore remain controlled. Stage 5 is the roll out to households.

Ultimately, the electricity sector should be fully open to competition with only the network businesses subject to tariff regulation because of their monopolistic character. However, until that point is reached:

- A proportion of generation will be reserved to supply the non-eligible customers at regulated wholesale tariffs.
- No leakage of generation at regulated tariffs into the competitive segment should be permitted; regulated and competitive segments must be segregated and appropriate procedures put in place to manage physical flows between the two markets.

Figure 3: ETM Implementation Plan



Note: GoG – Government of Georgia
MR - Market Rules

PREPARATORY STAGE (2016)

In preparation for Stage 1, several large and complicated tasks have to be addressed, including:

- Consultation committees to debate the detail of design have to be formed.
- Any necessary changes in the Law on Electricity and Natural Gas and any other affected primary legislation must be drafted and passed.
- A new set of market rules must be drafted and agreed covering all aspects of the competitive and regulated market, including balancing rules, settlement rules, financial guarantees, dispute resolution, switching rules, obligations of public and independent suppliers, etc.
- New institutions have to be created and new licenses drafted.
- Transitional rules for the implementation of the various stages must be drafted.

- The existing distribution companies must be unbundled into supply and distribution network businesses (Distribution System Operator (DSO)); legal unbundling will be necessary under the Acquis.
- The unbundled supply businesses turn into the Public Supply Businesses (PSB) responsible for servicing non-eligible customers in their geographical territory. Any generation assets must reside in the supply business, as the Acquis on energy does not permit control of generation to lie with the same organization as the DSO.
- Tariffs for the DSO and Public Supplier must be unbundled and applied.
- Independent Supply Businesses (ISB) must be created to service the eligible customers that are not Direct Customers.
- Existing Direct contracts between Generators and DSOs must be terminated. Sales to and purchases from the Partial Pool will be governed by the market rules, with the PSBs being the buyers.
- Existing contracts between Generators and Direct Customers must be either discarded or novated into a new form that will reflect hourly profiles with firm commitment.
- Market support tools including of supporting spot and Over-The-Counter (OTC) trading include a power exchange and clearing functions able to guarantee the settlement of trades must be established.
- Software functional specifications must be prepared and the software procured, installed and configured.
- Significant training of participants and service organizations has to be undertaken.
- Public awareness issues should be addressed.

It is proposed that the competitive segment should consist of Direct Customers plus 6/10 kV upwards customers - approx. 50% of non-residential sector, but a small number of customers. The vast majority of customers will remain in the regulated market at this stage. During this phase, thought should be given to regulatory measures to encourage liquidity in the market, for example by requiring generators to reserve some proportion of their output for a Power Exchange (PX).

STAGE 1 – PARTIAL POOL, BI-LATERAL CONTRACTING AND DAY AHEAD TRADING (2017)

As noted above, to maintain tariffs in the regulated market, it will be necessary to reserve some portion of low cost generation to serve the non-eligible customers. This may be achieved by allocating a specific power plant to the regulated segment, a percentage of available capacity from the power plant or a mixture of the two.

Electricity provided to the non-eligible customers would be priced at the capped tariffs set by GNERC, using the standard tariff mechanisms currently in use. All of the generation required to service the regulated market would be dispatched under the control of the TSO.

The competitive segment would be able to strike their own contracts between generator and load, bilaterally, through newly formed independent supply organizations operating on their own behalf or acting as brokers, or through a power exchange. It is important that this sector does not gain access to tariff-priced generation, as this would create distortions in the market. However, it is clear that under some circumstances electricity will flow between the two markets; the settlement for such flows will be managed by the market operator.

MANAGING MARKET DISTORTIONS

The underlying concept of splitting the market into regulated and competitive segments is to introduce competition into those sectors able to manage the risks while controlling prices for small consumers through the application of tariffs. However, there are some costs which should be allocated evenly over all consumers.

Abkhazia:

Supplies to Abkhazia are outside of the control of the electricity sector. Current legislation requires that supply to Abkhazia is allocated to Enguri/Vardnili HPPs. This causes some distortions in the market:

- The low cost Enguri/Vardnili supplied to Abkhazia is removed from the available capacity resulting in an increase in the average weighted tariff.
- Enguri/Vardnili HPPs are obliged to return energy to the partial pool to compensate for times when there was insufficient capacity in the cascade.

There would be financial losses created by the price difference in the timing of under and over use of Enguri electricity production by Abkhazia and resulting financial losses should be covered by either by budget or all other retail customers.

Imports, Thermal Power Plant generation and Take or Pay contracts:

It is clear that a certain level of relatively expensive electricity is required to make up the electricity balance. For technical reasons, it is necessary to run these supply sources as baseload.

The dispatch of such electricity is deleterious to the market for two reasons:

- Currently, when baseload TPP or imports are in the generation mix, Average Weighted Tariff (AWT) at peak time is lower than off-peak time because of the increased inclusion of low cost HPPs, which is the opposite signal the TSO would want to send to the market.
- It would be very difficult to sell the expensive electricity in the competitive market so there is risk that too much would remain in the regulated segment which would impact on prices.

Currently, for the benefit of the whole system, the TSO seeks to optimize the deployment of HPPs and TPPs based on their forecasts and the overarching requirement to ensure system security. As the whole system benefits from this approach, it seems reasonable that in the period before the market is fully deregulated, the whole system should contribute to the unavoidable costs incurred by the system.

It is therefore recommended that this remains the case and until the market reaches a further stage of maturity, the TSO continues to optimize deployment of TPP and imports and the cost is spread evenly over all consumers.

While in principle this approach is equitable, it is far from easy to implement in practice. In the competitive market particularly, it would be difficult to encourage ISBs or Direct Customers to include appropriate volumes of expensive power in their portfolios, which would result in either an expensive and unattractive Day Ahead Market or a reversion to the balancing mechanism, neither of which would instill confidence or liquidity in the system.

For this reason, it is proposed that a solution akin to that of the Feed in Tariff (FIT) mechanism used in many EU countries is proposed. In that system, suppliers of renewable energy are granted a FIT commensurate with the requirement to deliver appropriate returns to investors. The Renewable Energy (RE) plant then offers electricity to the market at prices necessary to be dispatched, and the difference between the strike price and the FIT is covered by a Contract for Difference (CFD) with the relevant licensed supplier. The supplier recovers the cost through a fund financed by a levy on the retail customers they supply.

While the circumstances are not identical in Georgia, the concept may be adopted. For example, providers of electricity may offer electricity at a 'market' price with a bandwidth of minimum offer price in the mid to upper range of the regulated HPP price to encourage buying, and price assigned to consumption in the regulated market. To compensate for the lost revenue through billing, the Market Operator would, through an arrangement similar to a CFD, pay for the lost revenue. The payments would be financed by an inclusion of a cost element in the Market Operator (MO) fees collected from Wholesale buyers, PSBs and ISBs depending on their consumption.

Note that there will be an incentive for the TPP plant to sell more than the minimum required to ensure system security. For this reason, there would be a cap on the volume permitted on the TTP subsidized tariff established by the TSO for each period.

This solution implies the early configuration of the market is limited to sales and purchases at HPP prices only.

The 'Partial Pool' (so named because it does not include all generation in Georgia) is the section of the wholesale electricity market designed to provide electricity to supply businesses that serve the regulated customers in Georgia.

Capacity from Enguri/Vardnili and other generators which has not been contracted in the competitive market is available to the TSO, which dispatches generation according to least cost principles, taking

into account regulated tariff caps and prudent reservoir management. In the interests of security of supply, the TSO will plan and dispatch TPPs and will coordinate with the MO to secure imports of electricity when necessary.

To maintain reasonable price parity between household and commercial tariffs, it will be necessary for the regulated pool to include the same proportion of high cost electricity in their generation mix as the proportions of regulated and commercial demand.

In the regulated market, the new PSB will be responsible for all sales of electricity to non-eligible customers. As a local monopoly, tariffs and service quality obligations will be under the control of GNERC. Public Suppliers are provided electricity out of the regulated pool, which is intrinsically self-balancing. However, the PSB will have responsibility for providing annual, monthly and daily consumption forecasts to the TSO to enable accurate planning in the system. In later stages of the market, the PSB will have balancing responsibility, complete with incentives and penalties.

The PSB will pay the MO for electricity and will recover the costs from non-eligible customers at the tariff for the customer classes set by GNERC. The MO in turn pays the generators for their metered injections. It is likely that the PSBs will be subsidiaries of the existing distribution companies.

Introduction of Day Ahead Scheduling (DAS) and Day-Ahead Planning (DAP) - PSBs will submit their DASs for approval and contracted volumes as notification to GSE/ESCO. In December 2014, Georgia GSE introduced DAS software which allows MPs to submit their hourly nominations for the next day.

THE COMPETITIVE MARKET

It is proposed that the competitive segment at Stage 1 includes all customers who are supplied at 6/10 kV or above. This represents 50% of non-residential sector and 40% of current DSO demand. All customers of this type must have interval meters installed capable of recording hourly consumption volumes and at least 45 days of data storage.

Direct Customers may contract directly with generators for their supply, but those connected to the distribution network will require an intermediary to manage the relationship with the Distribution Network Operator (DNO) and to accept responsibility for balancing. To accommodate this, the design envisages the establishment of an Independent Supply Businesses, who will have the ability to establish contracts with generators and customers, will take part in trade on the Day Ahead market, and will have balancing responsibility assigned by the TSO. It is likely that the initial ISBs will be subsidiaries of the existing distribution companies; however over time new ISBs may appear, for example as sellers to aggregate supplies of small HPPs, or as buying organizations representing commercial groups.

The Market Operator will have the role of registrar of all of the contracts at these voltage levels and will have the responsibility to inform the TSO of aggregate position of all of the participants with balancing responsibility for each Grid Supply Point (GSP). The relevant DSO will also be informed of the current aggregate position of ISB brokered contracts using their network. A common database for contract registration would make the process automated and easy to register and access. Reports on a daily, weekly and monthly basis can be created.

Standard contracts greatly simplify market operations and allow for automation of the process instead of human intervention (which should always be limited). It is envisaged that there will be a 'master agreement' established between each buyer and seller based on an approved template, which will establish the commercial obligations between them, thus enabling a relatively simple schedule to be agreed for each contract which defines the amount and time of supply. The contracts will be firm and will be hourly profiled.

The contracts that will be available will include:

- Bilateral contracts struck between Generators and Direct Customers for their specific requirements.
- Bilateral generators and ISBs.
- Anonymous PX-managed Day-Ahead contracts.

BALANCING

The counterparties to the TSO in the balancing regime are the Direct Customers who are connected to the Transmission Network, and the ISBs who manage the eligible customers who are connected to

the distribution networks. The electricity balance is measured at the interface between the transmission network and the Direct Customer or the transmission network and the relevant distribution network. The interface is often referred to as the Grid Supply Point (GSP). Within the GSP there may be customers of several different ISBs, and the contribution of each one to the net imbalance must be calculated. This is facilitated at Stage 1 by requiring all eligible customers to have interval metering installed. Via contract notifications provided by the MO, the TSO will be aware of the contracted net position for each GSP.

The TSO is the party responsible for the safe operation of the system, and it is the TSO who must maintain the instantaneous balances. This is usually managed by raising or lowering the amount of electricity injected in the system, although demand side techniques are increasingly popular. It is very much in the interest of the TSO to encourage the accuracy of the forecasts of the participants, which is achieved by passing of the financial risk of being out of balance to the participants. Generally, the prices for balancing electricity are unpredictable and participants wish to tune their positions to be as close as possible to the actual consumption or delivery. As the TSO is the counterparty in all Balancing Market (BM) transactions, the TSO is normally responsible for managing the Balancing Market.

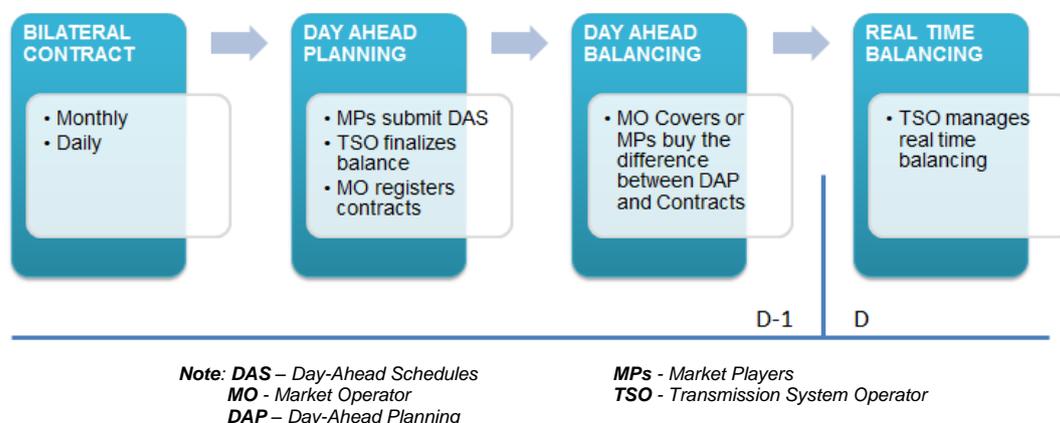
However, in Stage 1 of the market, risk is intended to be minimized. To achieve this, it is proposed that there will be no market for balancing electricity. Instead financial settlement may be managed within the regulated market by the MO as follows:

- If an ISB or Direct Customer takes more electricity than contracted in any hour, the excess will be charged at the *daily average pool price plus an uplift calculated to discourage MPs from reverting to the balancing mechanism for their supply*; if less is taken it will be compensated at average pool price.
- If a generator produces less than his contracted position in the competitive segment, then difference between contracted and actual production will be charged at daily average pool price.
- If, as usually will be the case, the generator injects more than the net contracted position he will be paid at the regulated tariff.

Note that the ISB is responsible for settling the imbalances for its customers. The ISB must make its own contractual relationship with its customers to recover the costs, which may be established by the records from the interval meters installed on their premises.

“Shadow prices” for balancing energy should be calculated and published for every hour, based on the highest cost of energy in each day. While this may not be an entirely accurate representation of true balancing prices, the mechanism should provide participants with a “soft landing” to appreciate the risks and encourage accuracy.

Figure 4: GEMM – Phase I Daily Trading Day Ahead Process



In summary, the first stage of the markets includes:

1. The introduction of hourly trading and balancing, including hourly scheduling in the regulated market.
2. All bilateral contracts will move from daily energy volumes to hourly volumes.
3. Hourly Day Ahead Market will be introduced with bids and offers with settlement and clearing mechanism through a power exchange.
4. Hourly Balancing Mechanism will be introduced at tariffs from the regulated market.
5. Large consumers with the aid of energy traders and brokers will enter the competitive market for most or all of their electricity needs.
6. Effective clearing entity should be introduced, which will fill some very important gaps in the entire trading process – i.e. collateralization, margin requirements and riskless settlement mechanism. In general it should be an entity recognized as a financial institution by its nature. One of the functions of the clearing entity should include provision of information to the PX regarding transaction limits of market members.

By introducing new clearing entity to the electricity market, clearly defined operational and legally sound relationships should be established between clearing entity, power exchange and transmission system operator. Further outcomes should be:

- MPs will take responsibilities for their DAP.
- MPs will improve forecasting skills.
- Balancing entities will receive additional income.
- Instead of monthly balancing price, there will be Hourly Energy Price and Hourly Balancing Price.

STAGE 2 – RISK TRANSFERS TO THE COMPETITIVE SEGMENT (2018)

In Stage 1, there was little real incentive for accurate forecasting and tuning of real time contract positions, because the cost of balancing electricity was unlikely to deviate far from the norm. Now in Stage 2 it is proposed that the 'soft' prices used in Stage 1 are abandoned, and the Balancing Market becomes subject to a market approach managed by the TSO.

Based upon the net position of the contracts in the regulated market and the forecast of demand from the regulated segment, the TSO will conduct an auction with bids and offers for each hour in which:

- Generators offer to increase injections, customers (ISBs and Direct Consumers) offer to decrease load.
- Generators will bid to decrease injections, customers will bid to increase load.

From the offers and bids, the TSO will calculate a Balancing Settlement Price (BSP) based on the Accepted bids/offers as appropriate. The value of the BSP should be the marginal price from the auction. Participants who are short on their contracts (deliver less or consume more) will pay the BSP, those who are long will be paid by the BSP.

It may also be prudent to consider some incentive for the PSBs to improve accuracy of forecasting, because it is the small commercial and household sectors which are much more likely to cause imbalance than the relatively predictable large consumers. As the market continues to open more, balancing risk will pass from the PSBs to the ISBs.

ANCILLARY SERVICES

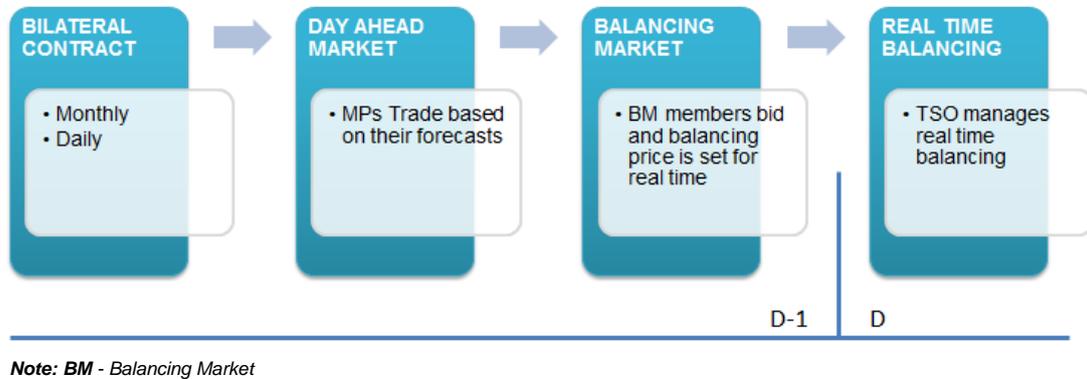
It is possible at the Stage 2 to release some other ancillary services to market competition. In terms of reserves, while Enguri/Vardnili may be capable of proving for much of the requirement, reserves must also be available in the event of, for example, a transmission outage preventing the evacuation of electricity on the 500 kV Imereti or Kartli lines. Voltage support must also be in reasonable proximity to the likely source of voltage instability.

Both of these services may be procured competitively at this stage through a procurement method managed by the TSO.

In summary, Stage 2 increases risk in the market thus encouraging prudent behavior and improving demand forecasting accuracy:

- 1) The balancing market will move to competitive bids and offers and will be priced at the marginal price of electricity for each hour in the trading day.
- 2) The TSO will start to procure ancillary services competitively and will have a tariff element to cover the cost.

Figure 5: Hourly Trading – 2018-2019GEMM – Phase I Daily Trading Day-Ahead Process



STAGE 3: INITIAL RETAIL MARKET OPENING (2019)

This stage represents a significant development in market implementation, when the emphasis moves to encompass organizations at the lower voltage levels, and whose consumption does not warrant interval metering. It is recommended that once development is finished, the next tranche of commercial and industrial should be moved into the competitive market. Some research would be necessary to establish the threshold, but perhaps in the 40 MWh annual consumption, or a maximum demand of 10 kW.

REQUIRED CHANGES

The major changes are:

- In the management of customer switching – information flows between supply organizations, relationships between ISBs and DSOs, bad debt management, quality targets for the switching process, etc.
- In the administration of the balancing market, because it will no longer be possible to directly measure the actual position of the ISBs. To accommodate the changes, new rules must be introduced.
- The establishment of the rules for the suppliers of last resort.

BALANCING NON-INTERVAL METERED SUPPLY

In Georgia, the majority of non-hourly meters are read every month thus avoiding many of the issues caused by timing differences, and so reasonably accurate estimates of total consumption per GSP per supplier should be available. However, there will be no record of the hourly consumption, which is the proposed unit for balancing.

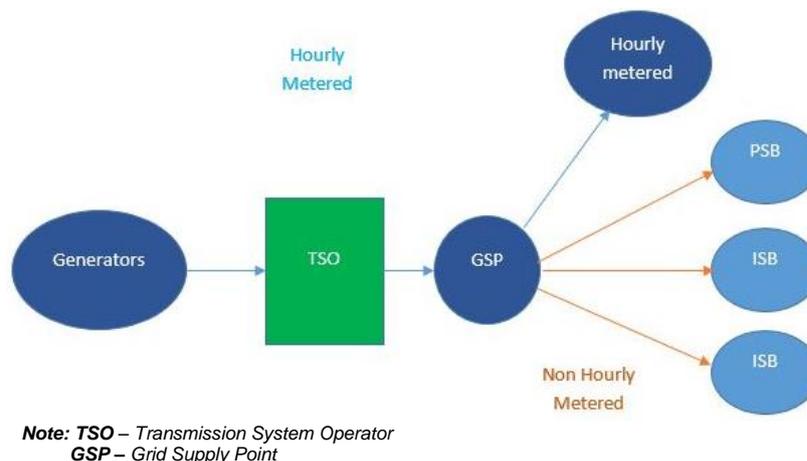
To address this issue, it will be necessary to define a series of classes of customers who have a similar profile of consumption. Some research will be necessary to identify the divisions between the classes, but typically they will represent different types of industrial and commercial enterprise, educational establishments etc., and one or two classifications of household customer. For example, in the United Kingdom (UK) representative classes are:

- Households unrestricted.
- Households on time of use tariffs.
- Commerce unrestricted.
- Commerce with time of use tariffs.
- Commerce with a load factor between 20% and 30%.
- Commerce with a load factor between 30% and 40%.
- Commerce with a load factor greater than 40%.

Each of these classes are assigned a load profile which typifies their consumption pattern. Then, by knowing the total consumption for each class on a grid supply point from the ISB and PSB records, the load profile for each class is applied to establish the hourly load for each ISB and the PSB connected to the GSP. For each ISB, the load from their interval metered customers for each GSP is added and the final hourly load is calculated.

From there, the contracted amounts are compared with the actuals and imbalances calculated.

Figure 6: Balancing Relationships at Grid Supply Points



From the simplified explanation above, it is clear that significant systems development will be necessary to manage the market, and some sampling required to establish typical profiles in the customer classes.

ELECTRICITY DERIVATIVES MARKET

Some 60% of demand should now be served by the competitive market, but it remains small in terms of customers. There is a strong probability that liquidity remains low and a large proportion of the trade in electricity is through bilateral agreements at commercially confidential prices.

To improve liquidity and price risk hedging, it may now be appropriate to introduce derivatives trading; forwards, futures, CFDs, etc. This should improve liquidity and stabilize the reference price in the DAM, thus encouraging more transaction and reducing bi-lateral volume.

STAGE 4: ROLL OUT TO HOUSEHOLDS

Once all of the stages above are well established in the market, the move to full choice may now be considered. This will entail all of the complexity of designing customer switching rules and systems, competition in tariffs, managing debt transfers, managing vulnerable and delinquent customers, etc. This is also the point at which any protection from the rigors of the marketplace will be taken away from customers as the state relinquishes control of the sector. There are many social consequences that must be considered and addressed before this step is taken, and it is out of the scope of this document.

However, once the market has progressed to Stage 3 and can manage the mechanics of competition, the possibility for customer choice exists. To move forward, areas that will require significant analysis, planning and implementation include:

- Infrastructure development: Metering, IT, Communications, Websites.
- Tariff reform - to encourage non-vulnerable customers to enter market; Protection of vulnerable residential customers.
- Legislative development/reform.
- Eligibility and registration of traders.
- Establishing balancing groups and balancing responsible parties.
- Establishing a clearing mechanism.

5. INTERNATIONAL ELECTRICITY TRADING

ELECTRICITY EXCHANGE OR PX NODE WITH TURKEY (2018)

One of the most important risk management tools for MPs that have signed bi-lateral agreements is the energy exchange that allows for adjusting the position of the trader (too much or too little energy for the settlement period) and eliminates balancing penalties.

The Turkish electricity market is designed to operate on a zonal basis similar to the developed European markets. Therefore, it may be hard to define a real node for Georgian electricity on the Turkish side. Instead of a real locational node, a virtual node (like a different price zone) may be defined in order to enable the Georgian HPPs sell energy into the Turkish competitive power market. In this mechanism, the Turkish market operator (EPIAS) can define the Georgian price zone as a virtual node; single points where the electricity sales offer are injected into the Turkish price zone.

The software infrastructure of EPIAS will be able to define the Georgian PX Node as a separate price zone. However, the legal framework in Turkey does not allow participation of foreign entities in the market. EPIAS cannot take the counterparty risk of the Georgian participants. The EPIAS must ensure financial security of the market and itself. Possible legal arrangements can be established to allow Georgian traders into the market. An example may be for Georgian exporters to establish Turkish affiliate companies or contract with a Turkish counterparty to trade on the PX. An alternative to aggregating the sales offers of Georgian generators in the PX node, an EPIAS to MO agreement that allocates counterparty risk might be another approach.

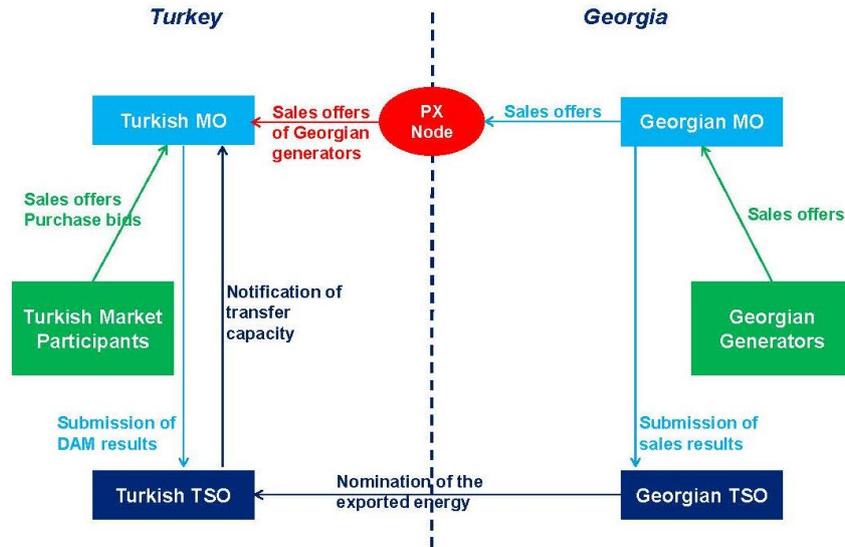
The best possible approach, although, would be the establishment of Clearing House for cross border trade between Georgia and Turkey.

In principle, the Clearing House might be an existing bank or commodities house, or it could be newly established special purpose entity (For example, Georgian Stock Exchange can establish a subsidiary to be a clearinghouse). Anyone who has appropriate provision to act as a clearinghouse could enter the market – equity adequacy, proper corporate governance, established risk management procedures and processes, proper IT equipped and some other mandatory requirements are typical requirements to be entitled as a clearinghouse. This provision could be the product of a competitive tendering process and operate under a clear set of rules that are transparent to clients and clearing house members. Clearinghouses in other countries sometimes provide services to only one exchange; others serve a group of exchanges. What is important for cross-border trading is that a Georgian clearinghouse should be recognized as eligible clearing member for international Central Counterparties if Georgian electricity has to be traded cross border.

In future Georgia should structure its energy products according to established practices on Power exchanges:

- Spot Markets.
- Derivatives;
 - With physical delivery obligations.
 - With Financial delivery obligations.

Figure 7: Pricing Zone on EPIAS Power Exchange – Clearing



*Note: PX – Power Exchange
MO – Market Operator
TSO – Transmission System Operator*

CROSS BORDER HARMONIZATION (2018)

In order to establish competitive trading between Turkish and Georgian Power Markets, the following actions need to be taken:

- Bring consensus for the Market Clearing House (MCH) development amongst the MoE, GSE, ESCO and the Georgian Stock Exchange.
- Invite Takasbank and EPIAS for possible cooperation and suggestions.
- Prepare required legislative framework, mandates for market clearing, registration-licensing and regulation.
- Establish a parallel process with the World Bank (WB) and GoG stakeholders for IT infrastructure-hardware and software with available WB loan.
- Ensure that GoG stakeholders are leading the process, with required G4G technical assistance.
- Changes in Cross Border Electricity Trading Agreement (CBETA) and the Interconnection Operations Agreement (IOA) to allow simultaneous bidirectional trade, daily capacity allocation and price zone trading.
- MO to MO agreement needs to be developed and signed.
- New customs /tax regulations in Georgia must be developed to allow bidirectional, simultaneous trading.
- MoE, GSE, MO and GNERC should continue working closely with Turkish counterparties to harmonize technical and commercial regulations for cross border electricity trading.

Figure 8: Next Steps



*Note: CBETA – Cross Border Electricity Trading Agreement
MCH - Market Clearing House*

In the medium term, following the start of an operational balancing market in Georgia with at least hourly settlement periods and introduction of a day-ahead market (centralized electricity spot market where “next day delivery” hourly products are traded), an implicit auction is recommended as a possible efficient trading method.

It is highly recommended to implement implicit auctions for cross border trade. Implicit auctions do not require having a capacity allocation right and guarantees the optimal utilization of transmission capacity. By conducting implicit auctions, exporters avoid the unclear decision of whether transmission capacity should be purchased first and then the energy should be sold second, or vice versa. With an implicit auction methodology, all qualified participants become capable of trading in the market mechanism. However, prior to implementation of an implicit auction mechanism, Georgia must have an hourly designed market mechanism, and should also have the corresponding collateral mechanism.

DEVELOPMENT OF CLEARING MECHANISM

Competitive markets assume that all entities are creditworthy and will pay for all debts on a timely basis. The clearing mechanism is the process that guarantees both aspects.

The daily activities of the MCH include: reporting (monitoring), clearing, funds administration, margin calls, real-time surveillance, information dissemination and to ensure that all trades are settled in accordance with market rules, even if a buyer or seller becomes insolvent prior to settlement. Along with the daily activities, the MCH performs periodical administration related to: membership, funds, reporting, dispute resolution, ex-post operations monitoring, and management of instructions and notices. Figure 9 shows the explicit functions of the MCH described by the “Three Lines of Defense” in its organizational structure.

Figure 9: Three Lines of Defense



Steps that should be completed for this mechanism to become operational:

- Establishment of a Georgian MO (or determination of a responsible central body);
- Preparation of MO-MO trading agreement that covers the details of the mechanism and responsibilities of the both parties;
- Definition of operational procedures for Georgian generators (submission of offers, daily planning and scheduling, collateral liabilities, payments, etc.);
- Updating the necessary regulations (balancing and settlement, collaterals, daily payments, etc.) corresponding to the defined operational procedures;
- Development (or purchasing, leasing, etc.) of the software that will be used for offer submission by MPs in Georgia;
- Enhancing the coordination between the MO and TSO in Georgia, and TSO's of both countries.

6. ELECTRICITY MARKET DEVELOPMENT ACTION PLAN

No	Activity Description	Responsible Party	Actions	Deadline	Technical Assistance
2016					
1	Establish Market Development Working Group (WG)	GNERC	WG Creation	2016	
2	Develop and adopt the objectives and scope of work for the Market Development WG.	GNERC	Approved objectives and action plan for the WG.	2016	Draft by G4G
3	G4G, at the request of the MoE, developed electricity market simulation software to analyze impacts of various market reforms and to develop a recommendation for market transition based on the results of the simulation analysis.	MoE, GSE, GNERC	Decision-makers actively participate in analyzing parallel market results	2016	G4G is running the software and producing results of the simulations into presentation format
4	There is general consensus within the electricity sector that reforms and restructuring toward a competitive market is not only inevitable, but also beneficial for Georgia. But a detailed and adopted Electricity Market Roadmap has been elusive which has resulted in a slowdown in the needed reforms and restructuring. Approval of the road map within this document should be finalized by the decision makers, adopted, and implemented with dedicated personnel and a Champion with decision-making powers.	GNERC and MoE	Support the WG in finalizing the roadmap and approve it.	2016	Public Private Dialogue (PPD) events by G4G
5	Large consumers will be expected to enter the competitive electricity market in the near term. In order to prepare them for market pricing of electricity (without the infusion of low-cost hydropower reserved for the domestic market), GNERC must develop a plan for raising the tariffs of non-residential consumers, of highlighting the cost of purchasing power on the customer bills, of institutionalizing marginal block tariff in all customer tariffs and preparing large consumers for upcoming tariff increase, a transitional tariff plan is needed.	GNERC	Adopt transitional retail tariff plan	2016	
6	Modify and Adopt the Primary Legislation for Daily Trading and bi-lateral contract market, establishing licenses for electricity traders, to move responsibility for adopting market rules to GNERC and requires GNERC to develop specific electricity regulations and requires unbundling of discos to at least legal unbundling.	MoE and Parliament, Energy Community	Modify and adopt the necessary primary legislation	2016	
7	The MO today has a long process (11-15 days) to process the monthly settlement for about 50 MPs. The market is moving toward daily and then hourly market, with perhaps 4-5 times the number of MPs. Fine-tuning of the settlement process is mandatory.	ESCO	Design, develop and test software for a daily settlement system	2016	G4G to provide software development
8	Detailed Open Access Rules need to be developed. Open access rules provide details on the opening of the retail market including: <ul style="list-style-type: none"> • Network wheeling (access) tariffs – revenue cap regulation. • Definition of an eligible customer. • Customer request to enter the competitive market. 	GNERC	Develop and adopt Open Access Rules	2016	USAID/The National Association of Regulatory Utility Commissioners (NARUC) to provide international best practice on open access rules

№	Activity Description	Responsible Party	Actions	Deadline	Technical Assistance
	<ul style="list-style-type: none"> Allocation of generator capacity to competitive market and partial pool. 				
9	The Distribution Code provides the technical operation rules for the DSO(s) for operating the networks for a competitive electricity market. The Distribution Code must reflect the opening of the retail market and include, among many other issues, procedures for electricity loss allocation between regulated customers and customers on the competitive market.	GNERC	Update and adopt the Distribution Code	2016	
10	The Energy Strategy is under development. The MoE needs to update and adopt the National Energy Strategy in line with the approved Electricity Market Roadmap. It should be a functional document accompanied by an implementation plan and clearly assigned responsibilities. Direction chosen by strategy needs to be clearly justified and communicate with stakeholders.	MoE	Update and approve the National Energy Strategy	2016	G4G can host PPD events for the energy strategy
11	The opening up of the retail market to competition and the reflection of marginal pricing in retail tariffs will require a review of the protection process for identifying and supporting vulnerable electricity consumers. Proper legislation must be developed, both primary and secondary, to protect vulnerable customer during the introduction of competition in the electricity market.	Ministry of Labor, Health and Social Affairs of Georgia (MoLHSA), MoE and GNERC	Develop and agree on a plan to develop primary and secondary legislation	2016	
12	Competitive power markets will result in difference between scheduled energy transactions and actual transactions. To the extent that the differences result in TSO orders to increase or decrease generation or demand, then compensation must be provided by those creating the imbalance. The Balancing and Settlement Rules will provide the process for charging and paying for imbalance services.	GNERC	Review, update and adopt the Balancing and Settlement Rules	2016	G4G can support updating the draft balancing rules developed under Hydro Power and Energy Planning Project (HPEP).
13	Customer switching rules provide protection for all parties during the period when a retail consumer decides to leave one retail supplier and signs a contract with another retail supplier.	GNERC	Review, update and adopt the draft Customer Switching Rules	2016	USAID/NARUC can provide the draft customer switching rules
14	The Supplier of Last Resort (SOLR) defines the procedures when a retail supplier defaults (goes bankrupt, leaves Georgia suddenly, etc.). The SOLR defined who will be the back-up supplier, payments, how long the SOLR will supply the consumers and so forth.	GNERC	Review, update and adopt the draft SOLR Rules	2016	USAID/NARUC can provide the draft SOLR rules
15	Transparent, fair and consistent accounting and regulatory reporting by the network owners and the corresponding operators will ensure that the basis for network tariffs is reasonable and that the network operators are funding investments in accordance with their approved network investment plans.	GNERC	Adopt the USoA for transmission and distribution network owners and operators (TSO and DSOs)	2016	G4G can hold PPD events
16	The introduction of energy traders will greatly enhance competition.	GNERC	Develop and adopt	2016	G4G can provide template

№	Activity Description	Responsible Party	Actions	Deadline	Technical Assistance
	<p>Privately-owned brokers and traders have limited transactions in Georgia, even for energy import and export. Traders and brokers will push for more competition and drive energy prices down. Initially traders should be licensed to protect consumers from inexperienced traders or fraudulent activities.</p> <p>At the earliest stages of competition in the market, it is best to establish discipline in how MPs will interact with each other. This requires that all MPs, including traders, are licensed. GNERC can determine later if enough self-discipline exists in the market to relieve energy traders from formal GNERC licensing requirements.</p>		template license for electricity traders		licenses from other countries
17	Market regulations for the competitive market need to be seamlessly created and adopted. There cannot be differences in approaches in two different market regulations. Competitive market rules must provide specific details such as algorithms that prescribe a transparent and non-discriminatory basis for electricity trading and settlement.	Distribution Companies (DISCOs) and GNERC	Develop and adopt the initial competitive market rules	2016	
18	<p>Just as investors of large generators are interested in ensuring the transmission network will support evacuation of the generator output, generators connected to the distribution company have the same concern and consumers have a similar concern that they will be able to off-take electricity in volumes required for their needs. Typical industry standards are for DSOs to provide five year network development plans as opposed to the 10 year plans developed by TSOs.</p>	GNERC	Develop a guideline for 5-year distribution network plans	2016	The initial 10-year transmission network plan provides a starting point for the Five Year Network Development Plan (FYNDP) for DISCOs. G4G can provide the guidelines developed under HPEP for creating the Ten Year Network Development Plan (TYNDP).
19	The Transmission Grid Code provides a basis for developing ancillary services for the electricity market. The primary energy legislation required GSE to provide a proposal for ancillary services market by June 2015. The concepts developed in the Grid Code and by GSE need to be formalized into detailed rules.	GSE and GNERC	Develop and adopt ancillary services rules	2016	
20	Georgian HPPs do not have access to a PX at this time. Having access to the Turkish PX, at least a node at the border between Georgia and Turkey, would provide some level of risk mitigation related to volume levels from day to day and hour to hour. At this point, the Georgian HPPs could create a registered company in Turkey and try to manage its transactions using long-term transmission capacity, a rather expensive for of risk mitigation.	ESCO, MoE and GNERC	With EPIAS/PMUM, establish plan for a PX node with Turkish power market	2016	
2017					
21	The accuracy and reliability of the metering, communications and metering database management systems is extremely important for a competitive electricity market. Minimal intervention by human	GSE, GNERC	Develop a plan to upgrade the market metering and communications system	2017	WB loan is available to support the evaluation and develop a plan

№	Activity Description	Responsible Party	Actions	Deadline	Technical Assistance
	hands should be allowed in any part of the flow of information. Redundant systems must be a part of the installations to ensure data is always available on almost real-time basis. These systems should be evaluated by an independent consultant and recommendations by the consultant should be followed in accordance with good international practices.				
22	Once the specifics of the market are adopted in the road map, the market can be opened as full bi-lateral contract market with specific energy and capacity requirements that are balanced each day or a partial pool market with a bi-lateral contracts just for competitive trading (again with specific energy and capacity transactions scheduled the day before).	GSE, ESCO	Initiate daily trading market	2017	
23	The existing market in Georgia is devoid of the concept of electricity balancing groups and Balancing Responsible Parties (BRPs) because the number of MPs (about 50) was manageable. With the introduction of large consumers, more HPPs coming online and the introduction of domestic electricity traders, the process of balancing payments for all contracts becomes unmanageable for the TSO. Large generators and regulated retail suppliers typically become balancing responsible parties for several MPs.	GNERC, Disco's and large generators	Design, develop and implement balancing group and BRP rules	2017	
24	In order to run an orderly daily and hourly electricity market through software packages, standard terms and conditions must be applied to all Power Purchase Agreements (PPAs). USAID HIPP developed a standard PPA for cross border trading with Turkey, but no such standard PPA exist for domestic trading.	GNERC or Association of Market Players	Approve the standard PPA	2017	G4G can provide European Federation of Energy Traders (EFET) examples. The cross border template developed by Hydropower Investment Promotion Project (HIPP) can be a good starting basis.
25	Surveillance is the real-time oversight of the market which is the responsibility of the TSO, MO and DSOs. Regular reporting should come from each on the results of the surveillance. Market monitoring is the regular assessment of the competitive energy markets to ensure that market power, fixed pricing/collusion, violating market regulations and other market abuses are identified, sanctioned and eliminated. Regulator must have the right to suspend and remove a license if violations are persistent. Competitive markets open up the possibility of unintended consequences, such as market abuse, fixed pricing schemes, by-passing of regulations, and other similar market defeating activities. It is the responsibility of the energy regulator to ensure that such activities don't exist in the market by adopting and implementing market monitoring procedures.	GNERC	Review, update and adopt the draft Market Monitoring Procedures	2017	G4G can provide the draft market monitoring rules developed under HIPP.
26	Customers in the competitive market must comply with specific rules	GNERC	Develop and adopt	2017	G4G can provide international

No	Activity Description	Responsible Party	Actions	Deadline	Technical Assistance
	for connection, including metering and communications equipment, payments for shallow and perhaps deep network costs, payment for disconnection and re-connection of the metering point and so forth.		Connection Procedures		best practices on such issues.
27	New entities join the electricity market and markets become increasingly competitive, the risk of default greatly increases. In fact, some economists measure the effectiveness of competition in a market by the number of MP defaults each year. Therefore it is not uncommon or bad that defaults exist, but the market will fail if proper procedures for covering the risk of defaults are not in place.	National Bank of Georgia (NBG), Georgian Stock Exchange, and GNERC	Develop and adopt electricity market clearing rules	2017	
28	Retail market opening requires that competition is not hampered by the incumbent retail supplier, who in turn, manages the distribution system. The primary legislation must provide for unbundling of the distribution systems.	MoE	Modify and Adopt the Primary Legislation	2017	
29	The rules for the ancillary services market, developed by the TSO and approved by GNERC will require extensive level of software in order to manage all the transactions within an hourly settlement period.	GSE (TSO)	Design develop and test ancillary services market software	2017	
30	The electronic connection between the wholesale and retail markets is through the customer account database. This database will contain all information on each retail consumer on an ongoing basis. Access to the database will be limited to the suppliers of the customer. Regulated energy supplier that are affiliated with the distribution company will only have access to price regulated customers and may not have access to the personnel, computer system and buildings of the DSO, except as specified in the market rules.	GNERC with the DISCOs	Design, develop and test initial customer account database to include the largest electricity users.	2017	
31	Harmonization of the Georgian and Turkish power market will require one or more cross border agreements to be modified or developed.	MoE (Georgia) and MoE (Turkey)	Modify and Adopt the Primary Legislation	2017	
2018					
32	As the electricity market moves from a monthly settlement to a daily and hourly market, calculations of market positions and the need for increasing margins would be unworkable using a manual process. Software will be needed to manage all the clearing for 1000's of transactions each day in the Georgian market.	Georgian Stock Exchange	Develop software for clearing and settlement	2018	
33	Regulated retail suppliers should be restricted to providing power to consumers that have not elected to enter the competitive electricity market. Transitional plan could include: 1. Accounting (USoA). 2. Management/Functional. 3. Legal.	MoE/GNERC/ GSE	Approve a plan to unbundle the TSO from transmission network service	2018	

No	Activity Description	Responsible Party	Actions	Deadline	Technical Assistance
4. Ownership.					
34	A domestic PX will be very beneficial for MPs for mitigating risk related to volume and it will help establish a market price by hour for Georgia. The PX can also provide additional risk mitigations services later, once the DAM is operational.	ESCO (MO)	Design, develop, and test PX software	2018	
35	The Primary Legislation should be modified to allow for licensing and operation of the PX, competitive pricing of ancillary services.	MoE/Parliament	Modify and adopt the primary legislation	2018	
36	Customers should be protected by fraudulent activity in the energy sector. The Law on Costumers Protection (CP) should cover the rights of energy consumers. In particular, energy trader promotion rules (interaction with consumers/consumer protection) must be clear and enforced. Utilities must break out energy sales as a separate item on the bill, for which traders will compete.	GoG	Revision of Customer Protection legislation and implementation of system for protection of electricity consumers	2018	
37	The initial operation of the ancillary services market will require a period of testing and then real time operation can begin once the systems are fully functional and the relevant MPs understand how to bid into the market.	GSE	Initiate the operation of the ancillary services market	2018	
38	Harmonization of transmission grid codes	GSE and GNERC, TEIAS and EMRA	Modify Grid Code	2018	
39	Harmonization of market regulation	GSE and GNERC	Modify Market Rules	2018	
40	Agreement on clearing rules	Georgian Stock Exchange, TAKAS Bank, GNERC, EMRA, NBG	Develop Clearing Rules	2018	
41	The introduction of electricity market derivatives will most likely require a change in the capital market legislation.	Georgian Stock Exchange, NBG	Modify and Adopt the Primary Legislation	2018	
2019					
42	The initiation of the derivatives market will require software for market purchases and sales.	Georgian Stock Exchange	Design, develop and test software	2019	
43	Marketing of the initial stage of derivatives market to potential clients.	Georgian Stock Exchange	Develop and implement the marketing program	2019	
44	The derivatives market should commence with a test period where MPs can enter their bids and offers to ensure both the systems and the MPs are ready for real trading.	Georgian Stock Exchange	Operate the test program	2019	
45	The introduction of all consumers into the competitive retail market will require changes in the structure of the electricity sector, including the elimination of the regulated retail suppliers.	MoE	Modify and Adopt Primary Legislation	2019	
2020					
46	The introduction of opening the market to Georgia's largest consumers will require a well-planned public awareness program. GNERC will need to design, develop and implement the plan far in	GNERC	Develop and start implementing public awareness program for	2020	

№	Activity Description	Responsible Party	Actions	Deadline	Technical Assistance
	advance of market opening day.		market opening		
47	Design, develop and implement a Public Awareness Program to introduce and educate the retail consumers on the upcoming market opening.	GNERC	PA program adopted and implemented	2020	
48	After the adoption of the primary legislation allowing increasing market opening to 100%, then all relevant secondary legislation will require updating.	GNERC	Update and revision of all appropriate regulations	2020	
49	Review and update as needed the primary and secondary legislation relating to protection of vulnerable electricity users.	MoLHSA, MoE, GNERC	Update legislation as needed	2020	
50		DSOs	Expansion of the customer account database	2020	
51		DSOs	Development of typical customer load shapes	2020	
52		GNERC	Retail market is opened to all consumers	2020	

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