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IMPLEMENTATION PLAN FOR NEW TRADING ARRANGEMENTS

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IMPLEMENTATION PLAN FOR NEW TRADING ARRANGEMENTS

INTRODUCTION

During the Soviet era, Georgia's power system was integrated with those of Armenia and Azerbaijan in a Transcaucasus network, which in turn was linked to the vast USSR grid Electricity supply in Georgia itself was in the hands of Sakenergo, a vertically integrated, non-commercial government monopoly Since the breakup of the Soviet Union, Georgia has had to rely principally on its hydroelectric production, because a lack of financial resources has severely curtailed the importation of natural gas and mazut as fuel for thermal generating units Moreover, internal political problems with the Abkhazia region, including armed conflict, have threatened the availability of the largest single source of hydropower in the country, the Inguri station, which is located on the river separating Georgia and its Abkhazian province

These political and financial problems contributed to an overall deterioration in the capability of the power system to supply the nation This deterioration was made worse by a lack of maintenance, misuse of equipment, and overloading of the distribution network by households trying to replace cut-off gas supplies with electric heaters and stoves Of the country's original 4 882 MW of installed generating capacity, less than 700 MW were available for service at the beginning of 1996 This compared to an estimated unconstrained annual peak of near 1700 MW, itself reduced dramatically from earlier levels by Georgia's collapsed economy

Parallel with the deterioration of service capability, a critical problem of non-payment developed In early 1996, barely 4% of the amounts billed were being paid by residential customers While industrial users were obliged to pay more regularly, the average rate of payment for all customers at the beginning of 1996 was less than 25%, and only a portion of that was cash The non-payment problem had a devastating impact on the power sectors operating and financial results, in spite of the gradual increase in tariff levels since 1991

This report provides Hagler Bailly's implementation plan for new trading arrangements in the Georgia wholesale power market It describes the reforms in market structure necessary to permits the new trading arrangements, and outlines the steps required to achieve those reforms These recommendations center on the development of a competitive wholesale electricity market

for Georgia As a critical by-product the wholesale market is accompanied by restructuring of the current market to enhance collections and cash flow at all levels of the sector As Georgia achieves these power sector reforms, the resulting wholesale power market will serve to permit growth and enhance efficient operation of the sector, as economic conditions in Georgia and the Caucasus improve

Structural reform of the electric sector must, of course, be planned and implemented in the context of other reform objectives elsewhere identified for Georgia These objectives include

- Establish a market structure that will attract investment to the sector, as distribution and generation assets are made available for privatization
- Improve the efficiency of the power sector on both the demand side and the supply side, through tariff design, privatization, and the introduction of competitive pressures, where appropriate
- Improve financial performance, by increasing collections to levels comparable to the successes achieved in other emerging markets
- Increase public confidence in the electric sector among the management of sector enterprises, policy-makers, and the public

In sum, the fundamental objective of market reform is to create an electric sector characterized by fully commercial, market-oriented operations, to support and sustain Georgia s economic growth

CURRENT MARKET STRUCTURE IN GEORGIA

The Government of Georgia has implemented a number of structural and other reforms to improve the operation of the power sector

- The disaggregation of the former fully-integrated vertical monopoly into generation enterprises (in general, one enterprise per generating facility), an enterprise owning and operating the transmission system, and individual distribution companies (in general, one per municipality)
- Enactment of the Georgian Electricity Law of 1997 which, among other things, established the Georgian National Electric Regulatory Commission, an independent agency with comprehensive authority to regulate the rates, terms and conditions of electric service through a system of licenses and tariffs

- Commencement of the privatization process by GoG's retaining Merrill Lynch as its financial advisor for privatization, and the subsequent issuance by the Ministry of State Property Management of a tender for privatization of Telasi, the distribution company for Tbilisi

The current structure therefore represents a functionally unbundled model, in which generation, transmission, and distribution are handled by separate corporate organizations Rates are currently set by a Presidential Decree, although the Regulatory Commission has commenced rate proceedings and is expected to specify rates that will fully recover costs in late 1998, and continuing into 1999 And, although most enterprises are state-owned,[1] the government has taken the initial steps toward privatizing those assets

The current market structure in Georgia reflects the steps that the government has taken in making the transition from the vertically integrated, monopolized system to a more fully market-oriented configuration Appendix A illustrates the energy flow in the structure of the existing market At present, the Georgian power sector most closely resembles a "single buyer" model, albeit one that is not fully developed A central purchasing authority, Sakenergo, purchases all power at wholesale and transmits it to direct customers and to distribution utilities for ultimate sale to consumers The Georgian structure is not fully developed in that usually, in a single buyer market structure, the single buyer has no responsibility for, or oversight of, technical dispatch Further, with regard to pricing, Georgia's single energy tariff for wholesale and retail electricity sales fails to provide proper incentives to the enterprises in the sector

Although, as discussed above, the Government of Georgia has implemented meaningful reforms in the electric sector, further measures are appropriate to remedy the chronic problems that hobble the sector These include

- Collections rates that have stagnated at levels well below amounts required to restore the financial viability of the sector's enterprises
- Lack of sufficient internal financial controls to ensure proper disposition of cash flow and safeguarding of assets
- Tariffs that remain significantly below cost recovery levels, causing deterioration of capital assets
- Salaries that, even when paid, are inadequate
- Deteriorated assets due to inadequate maintenance
- Insufficient commercial orientation of the sector

[1] GoG sold some hydropower projects to private investors during 1996

- Unclear and arbitrary financial settlement procedures

These problems are, of course, interrelated Insufficient collections combined with below full cost recovery tariff levels jeopardize the sector's ability to provide adequate levels of maintenance and investment Insufficient and unpaid salaries for employees create disincentives to perform critical maintenance, and incentives to bypass internal financial controls Lack of clear financial settlement procedures leads to situations in which, even if collections were improved, not all parties would benefit equally, particularly the generation enterprises Any market reform recommendations should address all of these interrelated problems

ALTERNATIVE MARKET STRUCTURES

An electricity market is comprised of a number of characteristics including the structure of the sector (e g , vertically integrated, horizontally integrated, functionally separated), the type of ownership (e g , public, private, mixed), pricing principles (e g , cost-based, market price, value of service based) extent of open access to the electricity networks, the extent to which consumers can select their supplier and the type of regulation used (e g , direct government oversight, independent regulation, so-called contract plans) The market structure in-and-of-itself does not *de facto* determine the structure of the other components For instance, there can be a vertically integrated industry with a variety of different types of pricing and differing methods of regulation and ownership Each alternative may have its advantages and disadvantages In order to determine the optimal structure for Georgia, it is necessary to examine each of these components and assess the optimal "mix" that best meets the reform objectives noted

Internationally, there are numerous ways in which countries have organized their power sectors There are the traditional vertically integrated utilities, such as seen in some parts of the U S (although admittedly waning) and France There are functionally unbundled markets, in which generation can be (or must be) bid into a power pool, such as in the U K , Chile, and Ukraine There are markets dominated by bilateral contracts (Norway) in which consumers are free to choose the supplier of their choice or, as is more customary, mixed markets in which pooling arrangements exist along with bilateral contract opportunities for buyers and sellers (Australia, New Zealand, New England and California) There is a single buyer model (such as seen in Hungary and Poland) where a central buyer purchases all wholesale power under contract with generation enterprises and then in turn resells the power to the distribution utilities and in some instances, large consumers

Generally, the single buyer model has the potential to retard economic efficiency Simply put, in a single buyer market, there is both a monopoly and a monopsony Even if there are multiple generation enterprises, there is only one buyer of electricity, even if there are multiple distribution utilities, there is only one seller Given this obvious shortcoming in the single buyer

market structure, the model has often been criticized by reviewers and not recommended for adoption Other models, making greater use of competition, have been promoted instead [2]

In many countries, there is a growing trend towards more open and competitive power markets through the use of a bid-based pool In this model, generation enterprises compete to provide power to the pool (and in some cases directly to consumers) The pooling and bid-based approach is considered more economically efficient in that it creates a greater likelihood of competition between generation enterprises Those enterprises bidding too high run the risk of not being dispatched and thus not receiving revenue As the supply of electricity becomes more constrained, due to higher load levels or generating units being off line, the price of electricity rises in tandem because more expensive units are generating electricity in order to meet the load Over time, as the supply and demand balance becomes more constrained, the higher prices seen in the spot market encourage new participants to enter the market to provide additional needed capacity Use of a bid-based pool creates incentives for those most cost-effective new units to be added as capacity

[2] This is obviously an oversimplification of the single buyer model Ultimately, economic efficiency will be driven by pricing (i e , does the pricing structure promote efficiency?) and the extent to which competitive principles are promoted For instance, periodic transparent all-source bidding can be an effective way to encourage generation competition even in a single buyer setting However, it is clear that a more effective way to ensure economic efficiency is to create a market setting with numerous buyers and sellers rather than having a single buyer in place

RECOMMENDED MARKET STRUCTURE FOR GEORGIA

Hagler Bailly's recommendations as to the appropriate market structure for Georgia are reflected in a series of position papers appended to this report They are

Position Paper No	Subject-Matter
1	Obligation to Supply
2	Obligation to Connect
3	Wholesale Market Members
4	The Inter-relationship Between Regulatory, Technical, and Commercial Standards
5	Pricing Methodology Transition Plan

These position papers form an integral part of this report Hagler Bailly has had these documents translated and presented them to counterparts in the Government of Georgia and the electric sector, to promote and facilitate discussion of market reform

IMPLEMENTATION OF RECOMMENDATIONS

We propose the following steps to implement the market reform proposals reflected in the position papers

Complete the Restructuring of Sakenergo

Sakenergo currently serves two different functions it operates and maintains the transmission grid, and it dispatches power and energy on a daily basis We propose that these two functions be separated, so that in future, as the new market takes shape and commences operation, either or both of these functions might be performed on a contract basis

Formulate Market Rules Principles

Hagler Bailly proposes that a task force be assembled to commence discussing the market restructuring recommendations, with the goal of formulating market rules principles that will govern future development of the market The working group might plausibly consist of one representative from the electric sector (Sakenergo being the logical candidate, due to its central function in the sector and its institutional knowledge), one from the government (the Ministry of Fuel and Energy being a logical candidate), and a representative from the Electric Commission, due to its expertise and the continuing oversight role that the Commission is expected to play over time, as the market develops

Implement the Governance Structure

We expect that the market rules principles will, at least to some extent, reflect the recommendations set forth in the position papers, including the recommendation that the market members select an Executive Committee (or similar body) At some point after formulation of the principles, therefore, the Executive Committee should be selected and convene, to perform the following functions

- Assign working committees The Executive Committee should assign committees to perform the work necessary for the market effectively to function, including, in particular a committee to prepare the detailed market rules that will govern the market once it commences operation, and a committee to prepare the grid code, setting forth the technical specifications for electric service and operations of the market and its members

- Determine the legal status of the market The Executive Committee should determine what sort of legal entity the market should be under Georgia law, taking into consideration tax implications, its ability to contract for services, the prerequisites for opening and maintaining a bank account, and so on

- Analyze the Electricity Law Certain features of Hagler Bailly's recommendations may be inconsistent with the Electricity Law, as for example the elimination of the central buyer/reseller of electricity (a function that the Electricity Law assigns to the Dispatch Licensee) The Executive Committee should analyze the Electricity Law to determine whether amendments are necessary or appropriate to accommodate the new market structure

CONCLUSION

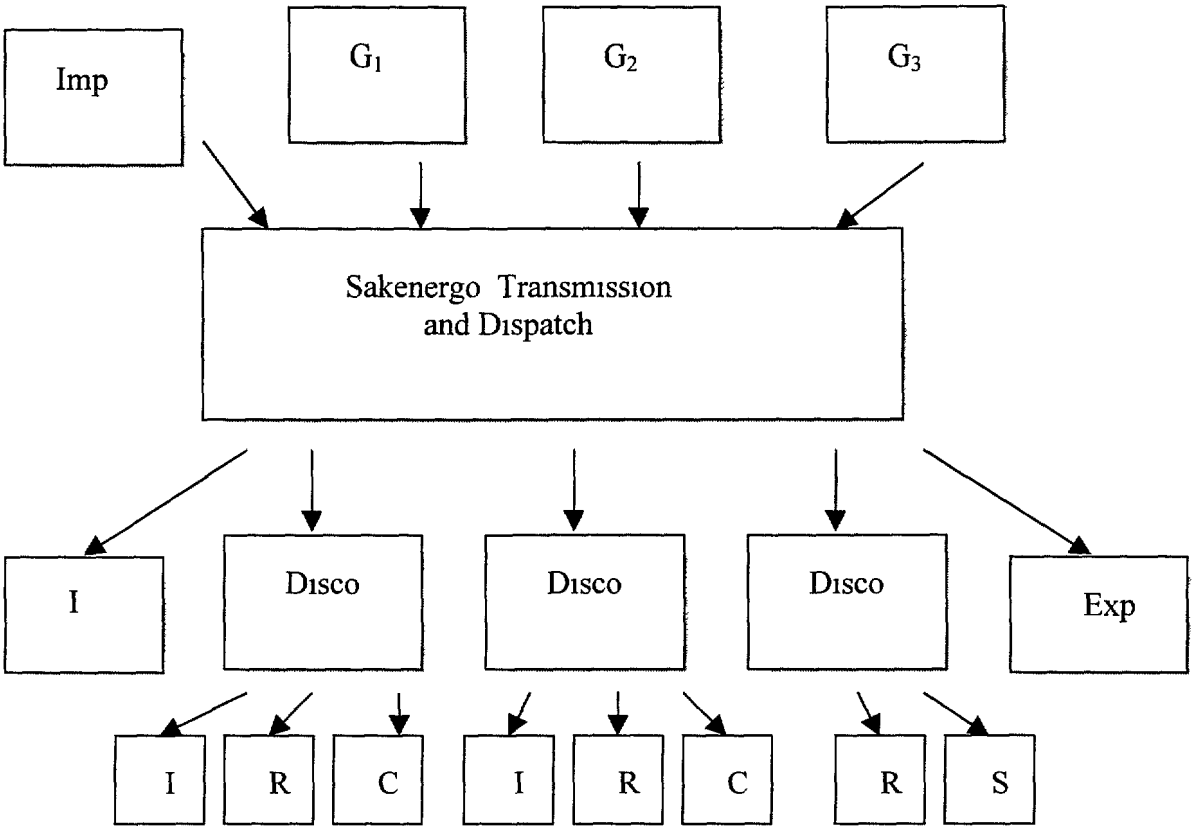
Georgia has taken several steps to reorganize its electric sector It has conducted an aggressive restructuring of Sakenergo, the former state-owned vertical monopoly, into enterprises separated along functional lines Enactment of the Electricity Law and creation of the National Electric Commission has provided for the institutional change necessary to oversee the transition to a market-oriented sector The Government's selection of a financial advisor for privatization and its statements of willingness to commence privatizing electric sector assets signals a willingness to capture the advantages offered by private-sector investment and ownership

The recommendations stated in this plan are intended to represent the next major phase of the power sector restructuring process With the structural changes here suggested, along with the new institutions to be developed, the sector will be well-equipped to sustain improvement and financial recovery

APPENDIX A

STRUCTURE OF EXISTING MARKET

ENERGY FLOWS IN STRUCTURE OF EXISTING MARKET (DECEMBER 1997)



Imp	Imports
G_1 G_2 G_3	Generators (only 3 shown) Includes large and small hydropower stations and Gardabani Thermal Station
I	Large Industrial customer Sakenergo serves some of these directly
Disco	Distribution and retail supply enterprises, only 3 of approximately 70 shown Some, but not all Discos serve Large Industrial Customers
R	Residential customer
C	Commercial customer
Exp	Exports

APPENDIX B

POSITION PAPER NO. 1: OBLIGATION TO SUPPLY

GEORGIAN POWER SECTOR

MARKET RULES POSITION PAPER NO. 1:
OBLIGATION TO SUPPLY

This position paper will define the concept of "obligation to supply" as it pertains to the operation of the future Georgian wholesale electricity market This paper represents a preliminary step in the effort to define the terms and concepts upon which the Georgian Wholesale Electricity Market Rules will be based The obligation to supply is briefly discussed in the Georgian Electricity Law of 1997, but this important responsibility must be stated in greater detail for the purposes of creating a sound set of market rules to govern the operation of the wholesale electricity sector

The obligation to supply on the wholesale market refers to the responsibility to provide wholesale electricity consumers with adequate capacity and/or electricity relative to their anticipated needs To meet this obligation, the responsible party (or parties) must weigh the available supply options and their costs against the needs of the wholesale consumers Typical options may include the construction of new generating assets, the increase of foreign electricity imports, the mandating of demand side management and energy efficiency programs, or any combination of these and other investment options

In a vertically integrated market, the obligation to supply is generally the responsibility of the integrated utility since the utility has monopoly over the its regional market The integrated utility must make investment decisions for new supply options for the entire market based on the estimated costs and potential benefits of each investment alternative The analysis of investment options to determine the most economically efficient is usually conducted according to a least cost planning approach

However, in a competitive wholesale market the wholesale electricity consumers (i e , distribution companies and direct industrial customers) are responsible for meeting their own future supply needs, and the needs of their franchised customers, through contracts with domestic or foreign power producers, or through demand side management and other efficiency initiatives If increased supply is contracted from power producers, the power producers must then perform

their own least cost estimates of how best to meet the supply requirements of their contracts Thus, the obligation to supply is transferred from a central institution to the individual wholesale consumers and power producers within the wholesale market

The language in Clause 33 and 33a of the 1997 Georgian Electricity law appears to place the burden of securing future electricity supply on the Dispatch Licensee Specifically the clause states that,

> (33) According to the License Conditions the Dispatch Licensee shall, for the duration of the License (a) Plan for and secure adequate rights to electricity supplies, including rights to electricity supplies from foreign Individual or Legal Persons, and transmission services to satisfy the needs of Distribution Licensees and Direct Consumers at least in principle, *provided*, that if any Distribution Licensee or Direct Consumer has contracted directly with one or more Generation Licensees or other foreign or domestic Legal Persons to meet part or all of its electricity supply requirements and/or the Transmission Licensee for transmission capacity, the Dispatch Licensee shall not be responsible for obtaining back-up or stand-by electricity supplies or transmission capacity unless the Distribution Licensee or Direct Consumer has paid the appropriate Commission approved rates for such services,

However, according to Clause 34 of the Georgian Electricity Law, the Distribution Licensee is also responsible for securing long term electricity supply Clause 34 and 34b of the Georgian Electricity Law state

> (34) According to the License Conditions, each Distribution Licensee shall for the duration of the License (b) Obtain rights to sufficient transmission capacity from the Transmission Licensee and/or the Dispatch Licensee, and also from Generation Licensees other foreign or domestic Legal Persons, and the Dispatch Licensee

This appears to give both the Dispatch Licensee and the Distribution Licensee the responsibility to secure long term supply, creating a clear conflict of responsibility It is recommended that the obligation to supply rest solely with the Distribution Licensees for several reasons

The responsibility for long term system planning is at odds with a Dispatch Licensee's short term functional perspective A dispatch entity's primary responsibility is to carry out the function of balancing current system load with supply to ensure system stability This is an objective activity which is carried out from a decidedly short term perspective Long term system planning and supply is an entirely separate functional responsibility Placing the responsibility for securing long term system supply on the Dispatch Licensee is inconsistent with the core concept and function of electricity dispatch

In addition, the Dispatch Licensee also lacks the capital structure or guarantees to effect long term investment decisions The Dispatch Licensee may, as a neutral party, be in a position to collect and disseminate information on future supply conditions, but no more so than any other third party Thus, the Dispatch Licensee will not be able to secure the necessary financing for

power development projects even if it increases its functional responsibilities to include securing long term supply The obligation to supply would only work under the assumption that the Dispatch Licensee act as a central purchasing agent for all electricity bought and sold in Georgia, with the necessary capital and organizational structure However, the creation of a single buyer entity in the Georgian wholesale electricity market runs counter to the goal of creating a competitive market Because the industry is unbundling by functional area to promote greater competition and development according to the principles of market economics, it is only appropriate to adopt an interpretation of the obligation to supply which supports such a market model

In a competitive wholesale market the obligation to supply should rest with the Distribution Licensees as stated in Clause 34b, either explicitly or implicitly Explicit requirements would resemble the US style obligation to supply which is only appropriate as long as the Distribution Licensee is a monopoly retailer (i e , as long as the retail customers have no choice with regards to their supplier) Such requirements would compel the Distribution Licensee to fully plan for and meet all of its expected future wholesale electricity needs Implicit requirements would flow from the commercial decisions made by the Distribution Licensee in a competitive market place The Distribution Licensee would make the most appropriate supply decisions based upon its response to costs, the perception of future costs and the value assigned to the loss of energy supply An implicit requirement is less heavy-handed than explicit requirements and also allows for the possibility of greater competition for customers among Distribution Licensees, two goals which are also compatible with the creation of a competitive wholesale electricity market

The Distribution Licensee's obligation to supply highlights the dual function of the Distribution Licensee as both a distribution wires company and an electricity retailer As an electricity retailer with captive customers within its franchise territory, the Distribution Licensee has the obligation to meet the needs of its customers and make the appropriate supply plans to meet their needs

In the Market Design for Georgia, it will be assumed that any obligation to supply is implicit and carried out by the Distribution Licensees The Dispatch Licensee will not have any obligation to plan and augment the system, except for the planning and augmentation of the dispatch center The responsibilities of the Dispatch Licensee will be limited to the short term balancing of load with supply within the transmission system The responsibility to plan and augment the system will be carried out by the transmission licensee, with input from all the wholesale market members through the governance structure of the wholesale electricity market

The Georgian Electricity Law also states that the Transmission Licensee has the obligation to provide adequate high voltage transmission capacity to wholesale customers Clause 32 3 of the Georgian Electricity Law states

> (32/3) When a new transmission facility is required in the Transmission Grid the Transmission Licensee shall apply for a modification to its License proposing the new transmission facility If after notice and hearing pursuant to the rules promulgated by the

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> Commission, the Commission determines that the new facility is required, and further determines that the proposed route for the facility as may be amended at or following the hearing will reasonably minimize adverse impacts on the area concerned, is consistent with the State Policy concerning the proposed route as expressed to the Commission during the proceeding and complies with the requirements of the Law, the Commission shall issue to the Transmission Licensee a modified Transmission License that includes the new transmission facility and authorizes its construction on the approved route

The Electricity Law clearly states that once new transmission facilities are needed, the Transmission Licensee must obtain the approval of the regulatory commission to amend its license and construct the facilities However the Law does not specify where the decision to construct new facilities originates This decision could originate with the Transmission Licensee or with the Market Members governance body The former option adheres to general industry practices However, in the latter case, placing the decision to construct new transmission facilities in the hands of the Market Members would grant the Market Members greater control over the actual wholesale market It is recommended that at least during the transition period, the decision to construct new transmission facilities rest with the Transmission Licensee If the Market Members feel that the Transmission Licensee and its investment plan is not in the best interest of the wholesale market, then the Market Members governance body will be able to bring such to the attention of the regulatory commission

GEORGIAN POWER SECTOR

MARKET RULES POSITION PAPER NO. 2:
OBLIGATION TO CONNECT

This position paper will define the concept of "obligation to connect" as it pertains to the operation of the future Georgian wholesale electricity market This paper represents a preliminary step in the effort to define the terms and concepts upon which the Wholesale Market Rules will be based The obligation to connect is discussed in the Georgian Electricity Law of 1997, but the interpretation of this important responsibility must be clear for the purposes of creating a sound set of market rules to govern the operation of the wholesale electricity sector

The obligation to connect refers to the responsibility of the Transmission Licensee and the Distribution Licensee to provide wholesale and retail electricity consumers, respectively, with the appropriate connections to the electricity grid network to meet their needs The Transmission Licensee's obligation to connect is codified in the Georgian Electricity Law under Clause 32 6 a which states

> (32 6) According to the License Conditions the Transmission Licensee shall for the duration of the License (a) Develop and maintain the Transmission Grid in a manner adequate to support the needs of Generation Licensees, Distribution Licensees and Direct Consumers

The Transmission Licensee has the obligation to connect all wholesale electricity customers and generators to the high voltage electricity grid in a manner which will support their transmission needs If the connection of a particular wholesale customer to the grid will require substantial upgrades to the grid then the Transmission Licensee has the right to impose the appropriate charges, with regulatory commission approval, upon the customer The manner and cases in which charges may be levied must be determined in the permanent Transmission License The technical specifications and standards governing the obligation to connect on the part of the Transmission Licensee are included in the Georgian transmission code

The Distribution Licensee's obligation to connect is codified in the Georgian Electricity Law under Clause 34 3 a which states

> (34/3) According to the License Conditions each Distribution Licensee shall for the duration of the License (a) Extend distribution services to consumers consistent with eligibility criteria established by the Commission and with the Licensee s investment program

As stated in the Electricity Law, Distribution Licensees have the obligation to connect all retail customers that meet predetermined technical standards to their respective grids If the connection of a particular customers will require substantial upgrades to the existing grid, then the Distribution Licensee has the right to impose the appropriate fees, with regulatory commission approval, upon the consumer The manner and cases in which charges may be levied must be determined in the permanent Distribution Licenses The technical specifications and standards governing the obligation to connect on the part of the Distribution Licensee are included in the Georgian distribution code

The obligation to connect a consumer to the high or low voltage electricity grids does not necessarily entail the obligation to provide the wholesale or retail consumer with power regardless of the situation This particular point highlights the dual function of the Distribution Licensee as both a wires company and an electricity retailer As a wires company the Distribution Licensee has the obligation to connect all customers to the distribution grid However, as an electricity retailer the Distribution Licensee may also have the obligation to provide the electrical supply required by the customers The role of the Distribution Licensee as an electricity retailer will be covered in separate documents (i e , Licenses, Market Rules chapters, Decrees, etc)

The Transmission Licensee does not face the same obligations as the Distribution Licensees since it is strictly a wires company The wholesale electricity Market Members are the actual electricity wholesalers These Market Members control the way in which the wholesale market is operated through a governance structure and, in turn, determine the conditions governing wholesale supply service in the system, including high voltage transmission The Transmission Licensee is vested with the responsibility by the Market Members for connecting wholesale customers and generators and maintaining the high voltage grid with the approval of the regulatory commission

GEORGIAN POWER SECTOR

MARKET RULES POSITION PAPER NO. 3:
WHOLESALE MARKET MEMBERS

This position paper will describe the basic structure of the recommended Georgian wholesale electricity market, identify the participants in that market and describe the basic inter-relationships between these participants The concepts and inter-relationships outlined in this position paper will be explicitly defined in the forthcoming Market Rules documents that will govern commercial practices within the Georgian wholesale electricity market

Exhibits 1 and 2 provide in schematic form the primary participants in the proposed power market structure, and the electricity payment and information flows between and among these entities

WHOLESALE ELECTRICITY MARKET

The Georgian wholesale electricity market is envisioned to be one where the Market Members will be able to enter into a variety of commercial and financial arrangements This includes contracts of various types and duration, joint ventures where allowed, short term trading, and other similar commercial arrangements At the core of these commercial arrangements is a wholesale market pool created through a multi-lateral agreement between Market Members, the Georgian Electricity Market Agreement The Market Members include all wholesale market entities with commercial contracts for electricity supply, electricity retailing or direct consumption These entities comprise all the Generator Licensees, the Distribution Licensees, the Direct Consumers, the Import/Export traders and any other trader or power marketing entities

Market Members can choose to sell or purchase electricity either through their own individually negotiated contracts or through the wholesale market pool With regard to electricity purchased through individual contracts, the contracts will specify the price, quantity, and payment terms as negotiated between the contracting parties There will be no regulatory review or approval of

individual contracts For electricity purchased through the wholesale market pool, the Market Members must abide by the terms and conditions established in the Market Rules and agreed to under the Georgian Electricity Market Agreement (GEMA) The regulator will review and approve the wholesale tariffs embodied in the GEMA

GOVERNANCE STRUCTURE

The multi-lateral agreement, GEMA, binds the Market Members together through the establishment of a governance structure and determines the commercial arrangements through an initial set of operating and pricing rules known as the Market Rules The governance structure defines the framework within which decisions regarding the sale and purchases of electricity are made Governance encompasses the processes and procedures for admission to the wholesale market, decision making or voting rights of each of the members, making or changing the rules, surveillance and compliance of the rules by the members and others, identification and resolution of disputes between members and the administration of the wholesale market

The first and most fundamental element of the governance structure is the process by which parties are bound to the GEMA Electricity, as opposed to other commodities, is produced and transmitted through an interconnected system In an interconnected electrical system the actions of an individual generator or consumer can have a positive or negative impact on other generators or consumers connected to the transmission system Transmission losses, for example, are not determined just by the actions of two parties to a bilateral contract but are determined by the actions of all the generators and consumers and the configuration of the transmission system at any moment in time Likewise, all connected parties benefit from the presence of the transmission system and the system security services such as reactive support, frequency control, black start capability and others Problems arise if parties who benefit from services are not bound to adhere to the rules that give rise to those services Connected parties, even if they do not participate in the wholesale market, will need to pay for the transmission and system security services they use

As a result of the interconnected nature of the wholesale electricity market it is reasonable to require as a license condition that all interconnected parties are bound by the GEMA It is recommended that all Generation Licensees, Distribution Licensee and other Consumers that are connected to the transmission system and that are above a minimum size must sign on to the GEMA at least to the extent of providing information, meeting technical standards and taking on payment and liability responsibilities with respect to transmission and system security services

Governance, as stated above, is the framework for decision making One of the largest areas of decision making is the development, implementation and on-going administration of the Market Rules Through the governance structure the Market Members are responsible for agreeing to the initial Market Rules and subsequent changes To facilitate the development and implementation

processes a focused endeavor is required It is recommended that an Executive Committee be selected to lead that effort The Executive Committee would be chosen for both their skills and experience as well as their representational position within the electric industry The Executive Committee provides a central body to coordinate and oversee the work required to fully develop and implement Market Rules

MARKET RULES

If the governance structure is the decision making framework, then the Market Rules are the commercial and operating terms of the GEMA Market Rules incorporate the processes and procedures for scheduling and dispatching electricity, determining the price paid to generators and the price paid by wholesale consumers for electricity, preparing invoices, collecting and disbursing funds and disseminating information to the members Market Rules also delineate the treatment of the other services proposed to be provided through the wholesale market such as transmission services and system security services

SCHEDULING AND DISPATCH

Scheduling and dispatching of electricity is currently the responsibility of the Dispatch Licensee and it is envisioned to remain their responsibility under the Market Rules The Market Rules, however, should be designed to add transparency to the scheduling and dispatch processes Market members will have responsibility for providing information to the Dispatcher regarding their generating capabilities and their load curtailment capabilities It is important to recognize the communication and informational technology available to the Market Members when designing the information flows between the Dispatcher and the Market Members

The Dispatcher is responsible for issuing instructions to the generating facilities in accordance with the decision making authority outlined in the Market Rules Market Members should have an obligation to follow the instructions received from the Dispatcher After the fact, the Market Members could dispute an instruction issued by the Dispatcher in which case the Dispatcher would need to provide an explanation of their actions One of the ways changes to the Market Rules will be identified is through this process of after the fact disputing of dispatch instructions

PRICING

It is proposed that the price of electricity in the wholesale market pool initially should be set through an administered wholesale tariff approved by the GERNC The aim is to develop a simple, robust method of allocating costs of the various generating technologies to the wholesale

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customers A more complete discussion of price determination and the transition to a more market based pricing methodology will be presented in a separate paper The proposed price determination methodology is much simpler than advancing immediately into a wholesale bidding system, and more practicable for the short run given the lack of generation in the country and the technological limitations within the electricity sector However, the goal of the Market Rules work is to design a single framework for the wholesale market that will allow it to grow and expand in complexity, facilitating the market's move into competitive generation bidding and other areas as the demand for these options increases in the future

With regard to transmission services, it is proposed that a contractual structure be established between the GEMA and the Transmission Licensee for the Transmission Licensee to provide transmission capability to the Market Members This contractual arrangement would consolidate the billing and market collection activities for both wholesale market electricity and transmission services While the Transmission Licensee could enact individual contracts with each Market Member, such a contractual structure would fragment the billing and collection processes Operational efficiencies are gained by combining the billing and collection procedures for all common services The transmission tariff, reviewed and approved by the GERNC, will form the basis for payment for transmission services Market Members will be billed for Transmission services by the Settlement Manager and the Market Funds Manager will collect the funds and disburse them to the Transmission Licensee The details of the proposed transmission tariff will be presented in the separate price determination paper mentioned above

There are a number of services that are required by the Dispatcher to ensure system stability These include reserves, reactive support, frequency control, and black start capability Traditionally the costs for these services have been bundled in with the cost of electricity Separating these services from the cost of electricity adds transparency and enhances the possibility of alternative sources for the provision of these services While the proposed initial wholesale price determination does not separately identify these services, it is clearly a goal of future price determination methodologies

The Market Members will engage a number of Service Providers to operate the wholesale market, to determine the wholesale market transactions, and to collect and disburse funds related to those wholesale market transactions Service Providers include the Scheduler/Dispatcher, the Settlement Manager, and the Market Funds Manager The Market Rules will delineate the operational and decision making responsibilities of each of the Service Providers

The Service Providers will be in a position to monitor the operation of the wholesale market and to alert the Market Members when modifications appear to be warranted While these Service Providers perform a valuable monitoring function, they themselves are not responsible for modifying the GEMA or the Market Rules The Market Members retain responsibility for reviewing the Service Provider's recommendations and modifying the GEMA or the Market Rules

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MARKET MEMBERS

Generation Licensee

It is recognized that Generation has the potential to be the most competitive area within the electricity market The wholesale market structure will be influenced by the structural design chosen for the Generation sector As the structural design of the Generation sector evolves, the market rules will likewise need to evolve Optimal market rules would limit the opportunity for the abuse of market power, ensure least cost generation through economic dispatch and provide incentives for generation to reduce costs and increase operational efficiencies

There are some basic inter-relationships between the Generation sector and the other sectors of the wholesale market that will remain constant regardless of the structure of Generation

- Generation Licensees will be responsible to provide information to the Dispatcher with regard to generating quantity, future availability and associated costs for each generating unit or hydro based system The Dispatcher will issue dispatch instructions to the Generation Licensees for the generating units under their control and the Generation Licensee will be obliged to follow those dispatch instructions The frequency and detail of the information flow between Generation Licensees and the Dispatcher will be specified in the Market Rules

- Generation Licensees will be responsible to provide metering information from each of their generating units or hydro based systems to the Settlements Manager They will also need to provide information concerning their individual contracts that are outside the wholesale market pool to the Settlement Manager such that the Settlement Manager can determine the amount of electricity the Generation Licensee sold through the wholesale market pool Prior to invoicing, the Generation Licensee will be responsible for verifying with the Settlement Manager the payments that will be due to them for that settlement period including any offsets owed by them for Service Provider fees

- Generation Licensees will receive payment for wholesale market pool transactions and any separately identified system services from the Market Funds Manager

- Generation Licensees will be responsible for invoicing and receiving payment for any individual direct contract from the contracting party

Distribution Licensee, Direct Consumers

Within Georgia there are 66 municipal distribution companies, not including Abkhazia and Ossettia There have been a number of proposals to group these distribution companies in order to facilitate commercial functioning, attract investment and allow for appropriate regulation of

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the distribution sector Distribution Licensees, as currently formed, are responsible for both the distribution network (the wire business) and the retailing of electricity (the supply business) Optimal market rules would lessen the effect of price volatility, and provide adequate information on which to base commercial decisions such as consumption, contracting and new investment decisions

There are some basic inter-relationships between the distribution sector and the other sectors of the wholesale market that will remain constant regardless of the number of Distribution Licensees

- Distribution Licensees and Direct Consumers will be responsible to provide information regarding load projections and demand side curtailment schemes to the Dispatcher Initially the Dispatcher may develop a load forecast that is not totally dependent on the information provided from the Distribution Licensee but rather incorporates the information received

- Distribution Licensees and Direct Consumers will be responsible for providing metering information to the Settlement Manager They will also need to provide information concerning their individual contracts that are outside the wholesale market pool to the Settlement Manager such that the Settlement Manager can determine the amount of electricity the Distribution Licensee or Direct Consumer purchased through the wholesale market pool Prior to invoicing, the Distribution Licensee or Direct Consumer will be responsible for verifying with the Settlement Manager the payments that will be owed from them for that settlement period including any payments owed by them for Service Provider fees

- Distribution Licensees and Direct consumer will pay the Market Funds Manager for wholesale market pool transactions, separately identified system services, transmission services contracted from the Transmission Licensee and Service Provider fees

- Distribution Licensees and Direct Consumers will pay the contracting party for any individual contract transactions

Import/Export Traders

The Georgian power system interconnects with Turkey, Russia, Azerbaijan and Armenia Small amounts of energy are currently being traded and it is possible that imports could increase as commercial relations are established between these countries Absent a regional wholesale market, it is very likely that the price determination methodology for each country will vary Imports into the Georgian system are equivalent to another Generation source and likewise, exports out of the Georgian system are equivalent to another Direct Consumer It is not practical

or recommended that the foreign trading entities become Market Members and be bound by the rules and conditions of the GEMA However, the imports and exports are clearly part of the interconnected system and will be receiving benefits from that interconnection

In order to fairly treat imports and exports within the Georgian wholesale market it is recommended that a Trader position be created Traders must be registered as Georgian entities and will be responsible for trading imports and/or exports within the wholesale market I It is recommended that for the sake of transparency the Trader category should be independent of the other Market Members Similarly, to avoid a conflict of interest, the Trader category should be independent of the Service Providers The Dispatcher will facilitate imports and exports, however, it would be inappropriate for the Dispatcher to negotiate contract terms or take on the other financial responsibilities involved in the import and export of electricity

As registered Georgian entities, all electricity Traders would be Market Members and bound by the terms and conditions of the GEMA and the applicable licenses Like other Market Members, the Import/Export Traders would be free to enter into individual contracts with other parties within Georgia as well as participate in the wholesale market pool

The financial structure of the Import/Export Trader category will need to be examined as the wholesale market transitions from an administered price to a market determined price

SERVICE PROVIDERS

The category of Service Providers includes the entities that facilitate the operation of the wholesale electricity market, such as the Scheduler/Dispatcher, the Settlement Manager and the Market Funds Manager

Dispatcher

To the extent possible the proposed responsibilities for the Dispatch function will be designed to allow the development of a market that ultimately is able to determine both short term operations and long term investments while assessing the trade off between reliability and cost This means that as a general principle the Market Rules will allow Market Members to make their own commercial judgments and business decision and that the Dispatcher's role in making decision on behalf of the Market Members will be minimized

The Dispatcher is responsible for managing the moment to moment balancing of supply and demand while ensuring that system security is maintained The Dispatcher can be viewed as "making" the wholesale market as it is the Dispatcher who will determine the generating units that operate and the wholesale customers that are served The Dispatcher also has decision making responsibility over events within a time period other than real-time During the transition period of the wholesale electricity market the Dispatcher may need to have greater

responsibilities out farther in time to ensure system security and reliability Notwithstanding the need for system security these additional responsibilities should be viewed as a transition feature The Dispatcher will be required to make his decision making process transparent and to maximize the information flow to Market Members, thus permitting them to begin to establish commercial judgment processes

Settlement Manager

After the fact, the Settlement Manager is responsible for the settlement of wholesale market transactions This involves the collection and verification of metering information, the determination of a wholesale market pool price and the production of invoices for the Market Members Additionally the Settlement Manager is responsible for the invoicing of system security services, when those services are un-bundled and priced separately from electricity supply, and for the invoicing of transmission services provided by the Transmission Licensee

The Settlement Manager determines, based on the pricing formula developed in the Market Rules, the price for wholesale market pool transactions Initially it is proposed that the price for wholesale market transactions be an administered price based on the cost of service from each generating source Over time with the introduction of a competitive generating bidding system the task of price determination will increase in complexity

In support of the Settlement Manager's invoicing role, the Settlement Manager is responsible for developing and maintaining a Metering Standard that will outline the design, installation and operational standards for meters, meter reading procedures and meter database administration The Transmission Licensee is responsible for installing and maintaining the meters at the entry and exit points on the transmission system and the Distribution Licensee is responsible for installing and maintaining meters at the interface points to their distribution network

Specific functions of the Settlement Manager are

- Collects and verifies metering data from Market Members and the Transmission Licensee
- Determine total amount of electricity supplied from and to each Market Member
- Determine transmission losses and assign those losses to the appropriate Distribution Licensee, Direct Consumer and/or Trader
- Determine the wholesale market pool transactions for each Market Member by subtracting the individual contract amounts taking account of transmission losses
- Determine price paid to and price paid by each Market Member for wholesale market pool transactions

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- Receive information from Dispatcher regarding system security services provided in billing period
- Prepare and submit to Market Members an invoice detailing wholesale market pool transactions, system security payments or charges and transmission service payments
- Provide invoice information to the Market Funds Manager

Market Funds Manager

The Market Funds Manager is responsible for the collection and the disbursement of funds related to the wholesale market activities including transmission The Market Funds Manager will not collect or disburse funds related to the individual contracts between wholesale market parties

Non-payment or partial payment of an invoice by a Market Member will prevent the Market Funds Manager from making a full disbursement The Market Rules will detail the procedures that the Market Funds Manager is to follow in the event of non-payment or partial payment The Market Members, rather than the Market Funds Manager, will be liable under the terms of the Market Members Agreement for any payment default by another Market Member

Specific functions of the Market Funds Manager are

- Receive invoice information regarding wholesale market pool transactions, system security services and transmission services from Settlements Manager
- Receive information regarding Service Provider fees from the Dispatcher and Settlement Manager
- Collect funds from Distribution Licensees, Direct Consumers and the Export Traders for wholesale market pool transactions, system security services, transmission services and Service Provider fees
- Disburse funds to Generator Licensees and the Import Traders for wholesale market pool transactions and system security service provision less any Service Provider fees
- Disburse funds to the Dispatcher, Settlement Manager and Market Funds Manager for services provided to the Market Members

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REGULATORY ENTITIES

Regulatory entities include the Georgian Electricity Regulatory National Commission (GERNC), the Ministry of Energy and the Standards Laboratory These bodies regulate the commercial and technical aspects of the wholesale electricity market

The wholesale electricity tariffs for sales and purchases through the wholesale market are embodied in the GEMA GERNC will need to approve the initial agreement and all subsequent modifications The Market Members retain primary responsibility for monitoring the operation of the wholesale market and the Market Members' and Service Providers' compliance with the rules Market members are also responsible for initiating additions or changes to the governance structure or the market rules In line with a light-handed regulatory regime and a competitive wholesale electricity market, GERNC will be appraised by the Service Providers on behalf of the Market Members of key operational and commercial aspects of the wholesale market such as collections It is recommended that the GERNC be able to recommend modifications to the GEMA but not have the authority to order specific modifications to the agreement

As the structure of the wholesale market is clarified and the Market Rules are developed attention should be paid to the specific License requirements for Generation, Distribution and Dispatch licensees A requirement that those parties must be members of the GEMA will need to be added as a license condition A new license may also need to be developed to account for the requirements placed on the Import/Export Trader category

GEORGIAN POWER SECTOR

MARKET RULES POSITION PAPER NO. 4: THE INTER-RELATIONSHIP BETWEEN REGULATORY, TECHNICAL, AND COMMERCIAL STANDARDS

As part of the series of preliminary position papers laying the foundation for the Georgian Market Rules, this paper will discuss the basic inter-relationships between, and the development of, the regulatory, technical, and commercial standards which will govern the transactions and operations of the new Georgian wholesale electricity market The standards established under these three areas are mutually dependent upon each other and, therefore, must be crafted so that they function in harmony This is not a simple task since there are existing technical and legal constraints determining how much certain aspect of the wholesale market can be changed Keeping these limitations in mind, this paper proposes a strategy for achieving the major goals of the Market Rules task, while ensuring that the regulatory, technical, and commercial standards will function together at the conclusion of the process

Before describing the approach to be employed in the development of the Market Rules, it is necessary to provide a brief description of the role each area of standards plays in the wholesale market The technical standards, contained within the grid code, control the operation of the grid network The technical standards specify the quality of supply, i e , the frequency and voltage levels, the connection requirements, the operational metering and communication standards, and the coordination of maintenance Existing operational procedures will need to be reviewed and re-written where necessary and new procedures will need to be developed such that the technical standards balance with the market framework The regulatory standards specify and enforce the licensing requirements for all the wholesale market members and provide checks and balances over the entire system by establishing reporting and other monitoring requirements Georgia has already adopted a progressive regulatory legal framework which should work well to support the development of a competitive wholesale electricity market Finally, the commercial standards govern the manner and process of conducting electricity sales, settlements, and payments It is in this final area, commercial standards, where the bulk of the changes will need to be made to create a viable wholesale electricity market

The market rules process will primarily focus on developing a set of commercial standards that will shape the process for conducting electricity transactions, creating the actual market and market procedures The commercial standards are the heart of the wholesale market since they define the actual market framework, determine the amount and level of competition, establish the number of market members, institute governance procedures, and create a process for the settlement of disputes

The goals of the market rules task are to 1) create a viable, competitive, and economically efficient wholesale electricity market that will 2) accommodate direct contracts, but 3) maintain the unified structure of the system and 4) promote future investment in the power system In order to achieve these goals it is necessary to begin the process by first defining the commercial standards and then adjust the technical and regulatory standards to support the commercial framework of the market The creation of the commercial standards must, of course, account for the physical, technical and legal realities of the country, but the development of the commercial framework for the market should not be dictated by these existing conditions

The market rules work over the next few months will develop an initial set of commercial standards for the wholesale market and a transition plan for advancing the market design as the technical and commercial capability of the market members advances Once these initial standards have been developed and approved, the corresponding changes to the regulatory and technical standards will be identified and addressed

GEORGIAN POWER SECTOR

MARKET RULES POSITION PAPER NO. 5·
PRICING METHODOLOGY TRANSITION PLAN

This position paper will describe the initial wholesale market price determination methodology that is recommended to work in conjunction with the establishment of a multi-party agreement between market participants This paper will further outline the transitional steps to move to a more competitive wholesale electricity market, focusing on the changes in the price determination methodology Discussion of the multi-party agreement is contained in position paper #3, Wholesale Market Members

One goal of the electricity market reform is to create a wholesale electricity market that allows investment and consumption decisions to be determined through the commercial, competitive interaction of producers and consumers For this goal to be realised the price of electricity should be allowed to change in response to the changes in the supply and demand situation Benefits are gained in two ways, through more efficient consumption decisions and through better investment decisions By allowing the price to change, the wholesale market signals the value of electricity relative to other sources of energy as well as the relative value of electricity consumption at various times of the day or times during the year Changing prices also signal the value and potential profitability of producing additional electricity at various times

Traditionally, the price of electricity has been regulated on a cost of service plus rate of return basis to protect the interests of the captive end users from possible unregulated monopolistic pricing abuse When prices are fixed for a period of time to protect the end user those prices failed to signal the relative value, scarcity or marginal cost of producing and consuming electricity Such a pricing methodology fails to provide strong incentives for efficiency in the supply of electricity and encourages inappropriate consumption during times of scarcity

So why are we recommending a regulated cost of service plus rate of return pricing methodology as the initial phase of the wholesale market in Georgia?

In some countries the wholesale market establishes hourly, or even half-hourly prices based on marginal cost offerings by electricity suppliers Settlements and billing are also

calculated on a corresponding hourly or half-hourly basis These are sophisticated market models which determine optimal prices with detailed precision They require the existence of many market-based concepts and institutions as well as a stable financial system and an advanced level of operations, technology and communications Given the lack of a market-based economic tradition in Georgia, the rudimentary managerial, technical, information, and communication systems in the existing power sector enterprises, and the payments and related financial problems in the electricity supply industry, a sudden leap to a sophisticated, technology laden wholesale market model is not feasible For this reason a gradual transition to a market-based wholesale pool is recommended

In order to successfully develop a competitive wholesale electricity market based on free market principles, the current wholesale market should evolve through several steps, or phases, of development The initial phase of the wholesale market development process is designed to educate the wholesale market members in basic commercial practices such as contracting, marketing, corporate control, fiscal control and accountability, and cost-based as well as competitive pricing At the same time, the initial phases of the market will work to ensure sufficient and reliable cash flow to wholesale market members to stabilise the financial conditions within the industry Revenue stability will place wholesale market members in the position to procure and install the necessary technology (communications, computers, hourly meters) to move towards a more sophisticated market model

PHASE I REGULATED COST OF SERVICE PRICE METHODOLOGY

Phase I presumes the prior establishment of a multi-party agreement between the market participants and the implementation of a rudimentary wholesale pool, neither of which currently exist in Georgia It will be essential to develop a well understood and transparent wholesale settlement and collection process prior to the beginning of Phase I Existing metering, communications and dispatch systems, while sub-optimal, could be used in the early stage of Phase I

Wholesale Suppliers will include

- Generation licensees, and
- Import Trader licensees, which represent the Georgian interface for foreign sellers

Wholesale Suppliers will receive compensation for available capacity and actual electricity production System security services, also known as ancillary services, will not be unbundled from capacity and energy and separately compensated Rather, the cost of providing system security services will be factored into the overall cost of service calculation for each generating facility

Available capacity will be defined as the demonstrated capability of the generating facility to produce electricity absent a shortage of fuel, or in the case of the hydro plants, water The available capacity will be recorded, by the generating plant personnel, on an hourly basis A monthly average available capacity will be determined from the average of all the hourly capacity values and the rolling average of the preceding eleven months The available capacity payment will provide an incentive for a Wholesale Supplier to maintain its generating facilities, albeit not as strong an incentive as will be available in later price phases Each generating facility or, in the case of small hydro, generating group will receive a payment for electricity that reflects the specific rate of return on assets for that facility or group Import Traders will receive a payment that reflects the capacity payment terms of their contract with the foreign entity

Actual electricity production will either be metered at the transmission entry point or will reflect the production amount less the amount of electricity used by the generating facility for its own purposes, i e , station service Each generating facility or, in the case of small hydro, generating group will receive a payment for electricity that reflects the specific cost of service for that facility or group times the actual production in the month Import Traders will receive a payment for electricity that is based on the contractual energy rate times the metered amount of electricity received at the Georgian interface

The settlement for available capacity and actual production will be on a monthly basis The Wholesale Supplier will be responsible for providing information to the Settlement Manager regarding the Monthly Available Capacity and daily meter readings for the electricity produced in that month

Wholesale Customers will include

- Customers, usually large industrial facilities, who are directly connected the high voltage grid and do not receive electricity from Distribution Licensees,
- Distribution licensees, including enterprises with local government ownership, joint stock companies with private ownership, and joint stock companies with a mixture of local government and private ownership, and
- Export Trader licensees, which will represent the Georgian interface for foreign buyers

Wholesale Customers who purchase capacity and energy from the pool during the month will be billed, by the Settlements Manager, for their purchases plus an allocated amount of the total energy losses for the month The amount of energy purchased from the pool will be the metered consumption for that Wholesale Customer less the energy loss adjusted amount of electricity purchased under a direct contract

For Phase I, it will be assumed that a Wholesale Customer's obligation to supply will be fulfilled though the purchase of a pro-rata share of the total Monthly Available Capacity A Wholesale Customer's charges for its share of the total Monthly Available Capacity will be based on the ratio of that Wholesale Customer's yearly peak usage versus the non-coincident yearly peak usage of all Wholesale Customers

Charges for electricity consumed during a month will be based on the total pool cost of electricity supply for that month divided by the total electricity sold to the wholesale pool, effectively a monthly pool price expressed as $/kWh The monthly pool price will be multiplied by the Wholesale Customer's actual metered consumption less an adjustment for the amount of electricity purchased under direct contracts plus an allocation of the energy losses Energy losses are the difference between the total metered amount of electricity produced and the metered amount of electricity consumed

In addition to the charges for capacity and energy, a Wholesale Customer will also pay for transmission service as established in the transmission tariff and for pool services as established in the Market Members Agreement The pool services fee will cover the cost of providing scheduling, dispatch, settlement and collection services to the Wholesale Customers

The incentive for Wholesale Customers and Wholesale Suppliers to enter into direct contracts during this phase will be influence by the structure of the retail tariff adopted during this phase If the retail tariff allows for a full pass through of capacity and energy purchase costs there will be little to no incentive for parties to contract outside the pool If, however, the retail tariff sets a price cap on capacity and energy purchase costs there will be some incentive for Wholesale Customers to contract with Wholesale Suppliers whose production costs are lower than the average pool price Wholesale Suppliers should be economically indifferent to selling their production under direct contract or selling their production to the pool

Currently, the GERNC has placed a limit on the amount of electricity that can be sold through direct contracts to between 10% and 20% depending on the yearly level of production of an individual Generation licensee During Phase I when the monthly pool price is a regulated average price, these limits will prevent low cost Generators from being captured by a particular Wholesale Customer and thus driving the average pool price up for all other Wholesale Customers It is recommended that the direct contract limits remain in place until the energy sector is ready to move to Phase II of the wholesale pricing path

SETTLEMENT AND BILLING PROCEDURES

At the end of each month the Settlement Manager will collect information from Wholesale Suppliers and Wholesale Customers to aid in the preparation of the bills Wholesale Suppliers will provide their Monthly Available Capacity amount and their total metered production for each generating facility Wholesale Suppliers will also provide their per unit cost of production ($/kWh) that is within the bands established by the GERNC Wholesale customers will provide the Settlement Manager with their total monthly metered consumption Both Wholesale Suppliers and Wholesale Customers will provide information regarding the amount of electricity purchased under a direct contract during the month

The Settlement Manager will calculate

- the Monthly Available Capacity payments based on the information supplied by Wholesale Suppliers and the rate established by the GERNC,
- the Monthly Available Capacity charges based on the total Monthly Available Capacity payments and Wholesale Customer's historic peak usage versus the historic non-coincidental peak usage of all the Wholesale Customers
- the monthly wholesale pool price from the production and cost information supplied by all the Wholesale Suppliers,
- the total energy losses for the month by reference to the production and consumption information supplied by Wholesale Suppliers and Wholesale Customers,
- the energy loss adjusted amount of electricity each Wholesale Customer purchased under a direct contract during the month, and
- the energy loss adjusted amount of electricity each Wholesale Customer purchased from the pool during the month

The Settlement Manager will produce a bill for each Wholesale Customer that will detail the charges for capacity, electricity, transmission services and pool services Appendix 1 provides a simple illustration of the settlement procedure during Phase I

Although the Settlement Manager is responsible for determining the billing and payments for each wholesale market participant, it is recommended that a separate Market Funds Manager be responsible for receiving payments from the Wholesale Customers and disbursing payments to the Wholesale Suppliers

REGULATION

In order to mitigate the possibility of rate shock to the end use customers as the result of introducing market reform, it is recommended that the initial wholesale pool price determination methodology embodied in the Market Members Agreement follow a cost-based model which will be approved and regulated by GERNC As a license requirement at the start of Phase I of the wholesale market, Wholesale Suppliers will be required to submit the cost of service data for each of their units, or contracts in the case of Import Traders, to GERNC

GERNC will use this data to establish the initial cost of service tariffs for each generation unit or contract The tariff methodology will establish a band within which the individual generation tariff can fluctuate as a means of accounting for changes in fuel and other variable costs without continuous regulatory intervention If the cost of service exceeds the parameters of the tariff band, then the Wholesale Supplier can request a rate increase from the GERNC The Wholesale Supplier will be required to resubmit its cost of service data and to prove just cause for the requested increase

A regulated cost of service tariff will be established for each generating facility or contract above 10 MW For small hydro stations in the Georgian wholesale market, a group cost of service tariff will be established based on the costs of a select number of representative stations This group cost of service tariff will then be applied to all small hydro Generators However, if a hydro station believes that it should receive a different tariff it can request a rate review and submit the appropriate cost data to GERNC that will serve to justify a separate tariff

NEXT PHASE

The cost of service approach to wholesale pool pricing is recommended during Phase I to ensure that all Wholesale Suppliers initially have the funds to cover their costs of operation as well as their cost of capital In addition, by establishing a robust cost based methodology the Wholesale Suppliers will be encouraged to begin implementing real cost accounting standards within their businesses This will enable the Wholesale Suppliers to gain a better understanding of their actual business costs, a critical step for entering Phase II in which Wholesale Suppliers will offer their units according to marginal cost calculations

Wholesale Customers will also be developing skills to support the movement to a more open market Power purchase costs from the wholesale pool will vary each month and the Distribution Licensees will need to develop tools and techniques that allow them to forecast those variations and develop appropriate retail tariffs

Before the wholesale market is able to move to Phase II, it is recommended that the industry operate under the Phase I conditions for a period of time (2-3 years) to allow participants to adjust to the new market concepts and procedures and to build up the technological capabilities needed to progress to the next step This will require significant investments in hourly metering, communications, computers, and other management information systems During this period the low payment levels and other financial problems plaguing the industry must be successfully resolved in order to make the move to a more commercial market feasible It is recommended that market performance targets be set specifying collections levels and other key benchmarks that must be met before the transition to Phase II can begin However, the market must not be allowed to stall during Phase I

Once the market has implemented the proper technological requirements (i e , communications and metering) and certain market performance benchmarks have been achieved, the wholesale market will transition to Phase II - implementation of a wholesale spot market

PHASE II ADMINISTERED PRICE METHODOLOGY

In Phase II, the wholesale pricing methodology departs from the fully regulated wholesale market of Phase I, and introduces more information in the price signal In Phase I the prices seen by the Wholesale Customers were an average rather than a marginal price and there was no information contained in the price that would indicate to the customer the relative value of electricity at any point in time In Phase II the concept of marginal pricing will be introduced to provide consumption signals to the Wholesale Customers Allowing the price to vary in response to the supply and demand situation will create an incentive for Wholesale Customers and Wholesale Suppliers to develop financial instruments to manage the risk of these price variations Providing Wholesale Consumers with such signals is one of the main reasons for establishing a spot market

Wholesale Suppliers will continue to include the same market participants as in Phase I

Wholesale Suppliers will receive compensation for available capacity and actual energy production As in Phase I, the cost of system security services will continue to be bundled in with the cost of energy and not compensated for separately

Available Capacity will be determined as in Phase I, i e , as a twelve month rolling average of the hourly available capacity of a generating facility The difference in Phase II will be that the amount of payment received will be based on the marginal cost of capacity for the system rather than each individual generating facility's specific asset cost basis

The marginal cost of capacity will be an administered value set each year by the GERNC Marginal cost of capacity is defined as the carrying costs for a new increment of generation, which is usually the carrying cost of a gas-fired peaking unit Associated with the marginal cost of capacity will be an assessment of the capacity requirement for the Georgian system The capacity requirement will act as a modulator on the marginal cost of capacity To the extent that the total installed capacity is less than the assessed capacity requirement, the administered marginal cost of capacity will effectively be increased Likewise if the installed capacity exceeds the assessed capacity requirement the administered marginal cost of capacity will effectively be decreased The administered marginal cost of capacity will signal the profitability of new investment in production

Actual electricity production will still reflect metered production less station service as in Phase I Settlement quality hourly metering will be required either at the transmission entry point or at the generating facility Every Wholesale Supplier that is supplying electricity to the wholesale pool within an hour will receive the same calculated wholesale pool price for each unit of electricity supplied to the wholesale pool in that hour

In advance of real-time operations, the Wholesale Suppliers will inform the Dispatcher of their offer to supply electricity The offer will consist of the amount of electricity available to be supplied to the wholesale pool and the price of that electricity In Phase II, the price offers will be constrained to the demonstrated cost of energy production for each Wholesale Supplier The wholesale pool price will be determined from the cost based offer of the marginal supplier within an hour

It could be argued that there is no need to constrain the price offers since in a fully competitive market suppliers will be driven to offer short run marginal costs Georgia, with its limited number of generating facilities and the divergent costs of those facilities, may lack the characteristics necessary for a competitive market during Phase II However, it is still of benefit to introduce a pricing system that varies with supply and demand conditions albeit in a constrained form This constraint will be most evident during times of energy shortages when the wholesale pool price is not allowed to raise to the level necessary to clear the market

Wholesale Customers will include the same parties as in Phase I Wholesale Customers who purchase capacity and energy from the pool will have the amount of their pool purchases calculated in a manner similar to that in Phase I

As in Phase I it will be assumed that a Wholesale Customer's obligation to supply will be fulfilled though its purchase of a pro-rata share of the total Monthly Administered Capacity A wholesale Customer's charges for its share of total Monthly Administered Capacity will be based on the ratio of that Wholesale Customer's yearly peak usage versus the non-coincident yearly peak usage of all Wholesale Customers

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Charges for electricity consumed during a month will be based on the summation of the charges for each hour within that month For each hour, the calculated pool price will be multiplied by the Wholesale Customer's actual metered consumption adjusted for the amount purchased under a direct contract for that hour plus an allocation of the energy losses incurred in that hour Energy losses are the difference between the total metered amount of electricity produced and the metered amount of electricity consumed

The two major differences for Wholesale Customers, under Phase II, is that they will see a marginal cost rather than an average cost for all their pool energy purchases and the time period will shrink from a month to an hour thus creating more variation in average wholesale pool purchase costs amongst Wholesale Customers

In addition to the charges for capacity and energy, a Wholesale Customer will also pay for transmission service as established in the transmission tariff and for pool services as established in the Market Members Agreement The pool services fee will cover the cost of providing scheduling, dispatch, settlement and collection services to the Wholesale Customers

Whilst in theory, the total amount of payments levied over a year under the Phase I pricing methodology could be equal to the total amount of payments levied for the same period under the Phase II pricing methodology, the cash flow implications for the two pricing regimes will create an much stronger incentive for contracts or other financial instruments In other wholesale markets that have moved from an average cost of service methodology to a marginal pricing methodology, "transition" contracts have been prepared, in consultation with the participants, to add stability to the cash flows and reduce the impact of the price volatility Transition contracts often take the form of financial "contract for differences" or hedges against the pool price It is recommended that a set of transition contracts be prepared Such contracts should be structured to gradually expire over a period of time (3 - 5 years)

SETTLEMENT AND BILLING PROCEDURES

The settlement and billing function will be more data intensive and complex in Phase II than in Phase I Changing from a monthly calculation of average pool price to an hourly calculation will dramatically increase the amount of data that must be retrieved, processed and then stored On the supply side, determining the amount of funds that should be disbursed to each of the Wholesale Suppliers will require referencing both the hourly pool price as well as the hourly production information In Phase I the disbursements to Wholesale Suppliers could be calculated without reference to the monthly pool price since all payments were specific to a particular supplier

During each month the Settlement Manager will collect information from the Wholesale Suppliers and Wholesale Customers to aid in the preparation of the bills Although the settlement period has shorten from a month to an hour, it is recommended that the billing period remain a month Changing the billing period and/or the billing lag (the time from when the bill is rendered until the bill is due and payable) will impact the cash flow position of the wholesale market participants and not necessarily contribute any benefits to the wholesale market To ease the burden of validating and processing the data, however, the Settlement Manger may request that information be submitted on a weekly or even daily basis rather than receiving all the data at the end of the month

Wholesale Suppliers will continue to provide their Monthly Available Capacity amount and the hourly metered production for each generating facility Wholesale Customers will provide the Settlement Manager with their hourly metered consumption for the month Both Wholesale Suppliers and Wholesale Customers will provide information regarding the hourly amount of electricity purchased under a direct contract during the month

As opposed to Phase I, in Phase II the Dispatcher will play a vital role in the price determination process The Dispatcher will provide the Settlement Manager the hourly marginal cost that is based on the offers previously received form the Wholesale Suppliers and the actual dispatch of facilities during an hour

The Settlement Manager will calculate

- the individual Monthly Administered Capacity payments based on the available capacity information supplied by each Wholesale Supplier and the administered marginal cost of capacity rate established by the GERNC,
- the individual Monthly Administered Capacity charges based on the total Monthly Administered Capacity payments and the Wholesale Customer's historic peak usage versus the historic non-coincidental peak usage of all Wholesale Customers,
- the amount of electricity each Wholesale Supplier sold to the pool in each hour based on the metered production information less the amount of electricity sold under a direct contract for the relevant hour,
- the total energy losses for each hour by reference to the production and consumption information supplied by Wholesale Suppliers and Wholesale Customers,
- the energy loss adjusted amount of electricity each Wholesale Customer purchased under a direct contract during each hour,

- the energy loss adjusted amount of electricity each Wholesale Customer purchased from the pool during each hour based on the metered consumption less the adjusted amount of electricity purchased under a direct contract plus an allocation of the total hourly energy losses,

- the monthly wholesale pool energy payment to each Wholesale Supplier based on the summation of the hourly pool prices supplied by the Dispatcher and adjusted production information for the relevant hour from each Wholesale Supplier, and

- the monthly wholesale pool energy charges to each Wholesale Customer based on the summation of the hourly wholesale pool charges The hourly wholesale pool charge will be the Wholesale Customer's pro-rata share of the total hourly wholesale pool energy payment

The Settlement Manager will produce a bill for each Wholesale Customer that will detail the charges for capacity, electricity, transmission services and pool services Appendix 2 provides a simple illustration of the settlement procedure for an hour

As in Phase I, it is recommended that a separate Market Funds Manager be responsible for receiving payments from the Wholesale Customers and disbursing payments to the Wholesale Suppliers

REGULATION

In Phase I the GERNC concentrated on developing a cost of service price, both capacity and energy, for each specific Wholesale Supplier One of the purposes of Phase I was to afford the GERNC an opportunity to gain detail knowledge of the cost structure and basis of each Wholesale Supplier The emphasis shifts in Phase II from developing a cost of service price for each Wholesale Supplier to monitoring and auditing the cost offers submitted by the Wholesale Suppliers to the Dispatcher The Wholesale Suppliers will be responsible for developing appropriate cost based offers for the supply of electricity to the wholesale pool The GERNC will act as a check agent to ensure that the offer are reasonable and can be demonstrated to be cost based

In addition to the monitoring of wholesale supplier offers, the GERNC will need to begin to monitor the level and volatility of the wholesale price

With regards to capacity costs, the GERNC will take on the role of a central planner through the establishment of the Administered Marginal Cost of Capacity and the Assessed Capacity Requirement To develop these values the GERNC will need to focus on the

market as a whole as oppose to focus on each specific generating facility as was the case during Phase I It is recommended that the GERNC develop a consultative process with the wholesale market participants whereby there is involvement of the market participants in the determination of the system capacity requirement

As mentioned above, it is recommended that financial hedge contracts be developed to manage the potential volatility of the pool price As opposed to direct contracts where the Electricity Law gives the GERNC the responsibility to regulate price and terms, the GERNC has no jurisdiction over financial hedge contracts It is anticipated that during Phase II direct contracts may be re-cast as financial hedges in which case the GERNC will no longer regulate the price and terms of those contracts

NEXT PHASE

The transition from Phase I to Phase II occurred when the electricity power sector exhibited the signs of a robust, commercially stable market by meeting a number of proscribed benchmarks Collection targets had to be met, technology and training had to be acquired and systems needed to be developed The transition from Phase II to Phase III will occur when the structure rather than the systems of the electricity market exhibits the signs of being able to support an open, competitive market The structure of the electricity market in Georgia will limit what the market rules and the GERNC can accomplish with regards to a competitive wholesale market Prior to implementing Phase III, the ownership, size and diversity of the generation portion of the power sector will need to be carefully examined to insure that no group or individual Wholesale Supplier is able to exercise undue market power

PHASE III OPEN COMPETITIVE PRICE METHODOLOGY

Phase III extends the concept of marginal pricing and creates a price clearing market In a price clearing market information about scarcity is sent through the prices In times of shortage the price will be allowed to rise to market clearing levels so that the amount that consumers want to buy and the amount the producers want to sell match Similarly in times of plenty the price will be allowed to fall

The advantage of having a market that clears on price include

- a rationing mechanism which can be linked to the desired efficiency criteria,
- a rationing mechanism that is transparent and simple,

- prices which efficiently direct resources among different sectors of the economy without compulsion, and
- prices which transmit information continuously and smoothly

The disadvantages of having a price clearing market relate to

- how quickly prices can adjust to reflect new states of demand, supply and knowledge,
- the extent to which market power distorts the signal that prices are meant to convey,
- the size of the transaction costs involved in establishing a price

The benefits which can be gained from a price clearing market, in terms of improved signals for investment and consumption, will be maximised only if prices are allowed to respond to changes in supply and demand conditions

Wholesale Suppliers will continue to include the same market participants as in Phase I and Phase II

Wholesale Suppliers will receive compensation for actual energy production and for system security services they provide to the wholesale pool Wholesale Supplier will not receive a separate fixed payment as in Phase I and Phase II

As in Phase I, actual electricity production will still reflect metered production less station service and settlement quality hourly metering will be required either at the transmission entry point or at the generating facility As in Phase II, every Wholesale Supplier that is supplying electricity to the wholesale pool within an hour will receive the same calculated wholesale pool price for each unit of electricity supplied to the wholesale pool in that hour

In advance of real-time operations, the Wholesale Suppliers will inform the Dispatcher of their offer to supply electricity The offer will consist of the amount of electricity available to be supplied to the wholesale pool and the price of that electricity In Phase III, as opposed to the constraint imposed in Phase II, the price offers will be unconstrained and need not be the cost of energy production for each Wholesale Supplier This means that during times of energy shortages Wholesale Supplier will raise their prices to reflect the increased value of electricity and likewise during times of energy surpluses the Wholesale Suppliers will lower their prices to reflect the lower value of electricity production at that time The wholesale pool price will be determined from the value based offer of the marginal supplier within an hour

In addition to receiving compensation for actual production the Wholesale Suppliers who provide system security services to the wholesale pool, such as spinning reserve, stand-by reserve or reactive support, will receive separate compensation for those products The costs of those services will not form part of the wholesale pool price but will be charged to the Wholesale Customer as a separate charge

Wholesale Customers will include the same parties as in Phase I and Phase II Wholesale Customers who purchase energy from the pool will have the amount of their pool purchases calculated in a manner similar to that in Phase II

Charges for electricity consumed during a month will be based on the summation of the charges for each hour within that month For each hour, the calculated pool price will be multiplied by the Wholesale Customer's actual metered consumption adjusted for the amount purchased under a direct contract for that hour plus an allocation of the energy losses incurred in that hour Energy losses are the difference between the total metered amount of electricity produced and the metered amount of electricity consumed

In addition to the charges for energy, a Wholesale Customer will also pay for system security charges incurred by the wholesale pool, transmission service as established in the transmission tariff and for pool services as established in the Market Members Agreement The pool services fee will cover the cost of providing scheduling, dispatch, settlement and collection services to the Wholesale Customers

The major difference for Wholesale Suppliers and Wholesale Customers, under Phase III, is that wholesale pool prices will no longer may capped during times of energy shortages

Moving from a quantity clearing market to a price clearing market will involve fundamental changes in the price risks faced by the Wholesale Suppliers and the Wholesale Customers as there will no longer be centralised administration of capacity and wholesale pool prices will not be held at the cost of service and thus could rise or fall beyond that level

Wholesale Customers will likely wish to develop hedging contracts with Wholesale suppliers to substantially cover their expected consumption Thus hedge contracts will determine the major portion of monetary flows for sales and purchases in the wholesale pool Although the non-contracted purchases within the wholesale pool may determine only a small fraction of the monetary flows between Wholesale Suppliers and Wholesale Customers, this does not make the wholesale market any less important or its price signals any weaker The wholesale pool price will determine the price expectations against which future hedge contracts will be written, and provide strong incentives for incremental supply or load management when demand threatens to exceed supply

If wholesale pool prices rise to high levels, a fully hedged Wholesale Supplier will face strong incentives to produce beyond their contracted amount, and a fully hedged Wholesale Customer will face strong incentives to reduce demand and sell their contracted but unused energy into the wholesale pool In short, the wholesale pool will provide opportunities for those parties who have the technical capability and commercial interest to operate in the market on a day to day basis, while the hedge contract market will provide the means by which Wholesale Suppliers and Wholesale Customers can protect their cash flows

SETTLEMENT AND BILLING PROCEDURES

The settlement process will be similar to that used in Phase II except there will no longer be a fixed payment aspect to the process The Settlement Manager will calculate

- the amount of electricity each Wholesale Supplier sold to the pool in each hour based on the metered production information less the amount of electricity sold under a direct contract for the relevant hour,
- the total energy losses for each hour by reference to the production and consumption information supplied by Wholesale Suppliers and Wholesale Customers,
- the energy loss adjusted amount of electricity each Wholesale Customer purchased under a direct contract during each hour,
- the energy loss adjusted amount of electricity each Wholesale Customer purchased from the pool during each hour based on the metered consumption less the adjusted amount of electricity purchased under a direct contract plus an allocation of the total hourly energy losses,
- the monthly wholesale pool energy payment to each Wholesale Supplier based on the summation of the hourly pool prices supplied by the Dispatcher and adjusted production information for the relevant hour from each Wholesale Supplier, and
- the monthly wholesale pool energy charges to each Wholesale Customer based on the summation of the hourly wholesale pool charges The hourly wholesale pool charge will be the Wholesale Customer's pro-rata share of the total hourly wholesale pool energy payment

REGULATION

The market monitoring role for GERNC that began in Phase II will continue and expand in Phase III GERNC will monitor the performance of the wholesale market to ensure the market is delivering competitive prices and there is no abuse of market power by individual Wholesale Suppliers While changes to the market rules will undoubtedly be necessary to correct minor market aberrations, serious and continual price distortions in the wholesale market will suggest that the underlying structure of the industry needs to be reformed It will be GERNC's responsibility to alert the Government of Georgia to any structural deficiencies in the wholesale market

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APPENDIX C

POSITION PAPER NO. 2: OBLIGATION TO CONNECT

GEORGIAN POWER SECTOR

MARKET RULES POSITION PAPER NO. 2:
OBLIGATION TO CONNECT

This position paper will define the concept of "obligation to connect" as it pertains to the operation of the future Georgian wholesale electricity market This paper represents a preliminary step in the effort to define the terms and concepts upon which the Wholesale Market Rules will be based The obligation to connect is discussed in the Georgian Electricity Law of 1997, but the interpretation of this important responsibility must be clear for the purposes of creating a sound set of market rules to govern the operation of the wholesale electricity sector

The obligation to connect refers to the responsibility of the Transmission Licensee and the Distribution Licensee to provide wholesale and retail electricity consumers, respectively, with the appropriate connections to the electricity grid network to meet their needs The Transmission Licensee's obligation to connect is codified in the Georgian Electricity Law under Clause 32 6 a which states

> (32 6) According to the License Conditions, the Transmission Licensee shall, for the duration of the License (a) Develop and maintain the Transmission Grid in a manner adequate to support the needs of Generation Licensees, Distribution Licensees, and Direct Consumers

The Transmission Licensee has the obligation to connect all wholesale electricity customers and generators to the high voltage electricity grid in a manner which will support their transmission needs If the connection of a particular wholesale customer to the grid will require substantial upgrades to the grid, then the Transmission Licensee has the right to impose the appropriate charges, with regulatory commission approval, upon the customer The manner and cases in which charges may be levied must be determined in the permanent Transmission License The technical specifications and standards governing the obligation to connect on the part of the Transmission Licensee are included in the Georgian transmission code

The Distribution Licensee's obligation to connect is codified in the Georgian Electricity Law under Clause 34 3 a which states

> (34/3) According to the License Conditions each Distribution Licensee shall, for the duration of the License (a) Extend distribution services to consumers consistent with eligibility criteria established by the Commission and with the Licensee s investment program

As stated in the Electricity Law, Distribution Licensees have the obligation to connect all retail customers that meet predetermined technical standards to their respective grids If the connection of a particular customers will require substantial upgrades to the existing grid, then the Distribution Licensee has the right to impose the appropriate fees, with regulatory commission approval, upon the consumer The manner and cases in which charges may be levied must be determined in the permanent Distribution Licenses The technical specifications and standards governing the obligation to connect on the part of the Distribution Licensee are included in the Georgian distribution code

The obligation to connect a consumer to the high or low voltage electricity grids does not necessarily entail the obligation to provide the wholesale or retail consumer with power regardless of the situation This particular point highlights the dual function of the Distribution Licensee as both a wires company and an electricity retailer As a wires company the Distribution Licensee has the obligation to connect all customers to the distribution grid However, as an electricity retailer the Distribution Licensee may also have the obligation to provide the electrical supply required by the customers The role of the Distribution Licensee as an electricity retailer will be covered in separate documents (i e , Licenses, Market Rules chapters, Decrees, etc)

The Transmission Licensee does not face the same obligations as the Distribution Licensees since it is strictly a wires company The wholesale electricity Market Members are the actual electricity wholesalers These Market Members control the way in which the wholesale market is operated through a governance structure and, in turn, determine the conditions governing wholesale supply service in the system, including high voltage transmission The Transmission Licensee is vested with the responsibility by the Market Members for connecting wholesale customers and generators and maintaining the high voltage grid with the approval of the regulatory commission

APPENDIX D

POSITION PAPER NO. 3: WHOLESALE MARKET MEMBERS

GEORGIAN POWER SECTOR

MARKET RULES POSITION PAPER NO. 3:
WHOLESALE MARKET MEMBERS

This position paper will describe the basic structure of the recommended Georgian wholesale electricity market, identify the participants in that market and describe the basic inter-relationships between these participants The concepts and inter-relationships outlined in this position paper will be explicitly defined in the forthcoming Market Rules documents that will govern commercial practices within the Georgian wholesale electricity market

Exhibits 1 and 2 provide in schematic form the primary participants in the proposed power market structure, and the electricity payment and information flows between and among these entities

WHOLESALE ELECTRICITY MARKET

The Georgian wholesale electricity market is envisioned to be one where the Market Members will be able to enter into a variety of commercial and financial arrangements This includes contracts of various types and duration, joint ventures where allowed, short term trading, and other similar commercial arrangements At the core of these commercial arrangements is a wholesale market pool created through a multi-lateral agreement between Market Members, the Georgian Electricity Market Agreement The Market Members include all wholesale market entities with commercial contracts for electricity supply, electricity retailing or direct consumption These entities comprise all the Generator Licensees, the Distribution Licensees, the Direct Consumers, the Import/Export traders and any other trader or power marketing entities

Market Members can choose to sell or purchase electricity either through their own individually negotiated contracts or through the wholesale market pool With regard to electricity purchased through individual contracts, the contracts will specify the price, quantity, and payment terms as negotiated between the contracting parties There will be no regulatory review or approval of

individual contracts For electricity purchased through the wholesale market pool, the Market Members must abide by the terms and conditions established in the Market Rules and agreed to under the Georgian Electricity Market Agreement (GEMA) The regulator will review and approve the wholesale tariffs embodied in the GEMA

GOVERNANCE STRUCTURE

The multi-lateral agreement, GEMA, binds the Market Members together through the establishment of a governance structure and determines the commercial arrangements through an initial set of operating and pricing rules known as the Market Rules The governance structure defines the framework within which decisions regarding the sale and purchases of electricity are made Governance encompasses the processes and procedures for admission to the wholesale market, decision making or voting rights of each of the members, making or changing the rules, surveillance and compliance of the rules by the members and others, identification and resolution of disputes between members and the administration of the wholesale market

The first and most fundamental element of the governance structure is the process by which parties are bound to the GEMA Electricity, as opposed to other commodities, is produced and transmitted through an interconnected system In an interconnected electrical system the actions of an individual generator or consumer can have a positive or negative impact on other generators or consumers connected to the transmission system Transmission losses, for example, are not determined just by the actions of two parties to a bilateral contract but are determined by the actions of all the generators and consumers and the configuration of the transmission system at any moment in time Likewise, all connected parties benefit from the presence of the transmission system and the system security services such as reactive support, frequency control, black start capability and others Problems arise if parties who benefit from services are not bound to adhere to the rules that give rise to those services Connected parties, even if they do not participate in the wholesale market, will need to pay for the transmission and system security services they use

As a result of the interconnected nature of the wholesale electricity market it is reasonable to require as a license condition that all interconnected parties are bound by the GEMA It is recommended that all Generation Licensees, Distribution Licensee and other Consumers that are connected to the transmission system and that are above a minimum size must sign on to the GEMA at least to the extent of providing information, meeting technical standards and taking on payment and liability responsibilities with respect to transmission and system security services

Governance, as stated above, is the framework for decision making One of the largest areas of decision making is the development, implementation and on-going administration of the Market Rules Through the governance structure the Market Members are responsible for agreeing to the initial Market Rules and subsequent changes To facilitate the development and implementation

processes a focused endeavor is required It is recommended that an Executive Committee be selected to lead that effort The Executive Committee would be chosen for both their skills and experience as well as their representational position within the electric industry The Executive Committee provides a central body to coordinate and oversee the work required to fully develop and implement Market Rules

MARKET RULES

If the governance structure is the decision making framework, then the Market Rules are the commercial and operating terms of the GEMA Market Rules incorporate the processes and procedures for scheduling and dispatching electricity, determining the price paid to generators and the price paid by wholesale consumers for electricity, preparing invoices, collecting and disbursing funds and disseminating information to the members Market Rules also delineate the treatment of the other services proposed to be provided through the wholesale market such as transmission services and system security services

SCHEDULING AND DISPATCH

Scheduling and dispatching of electricity is currently the responsibility of the Dispatch Licensee and it is envisioned to remain their responsibility under the Market Rules The Market Rules, however, should be designed to add transparency to the scheduling and dispatch processes Market members will have responsibility for providing information to the Dispatcher regarding their generating capabilities and their load curtailment capabilities It is important to recognize the communication and informational technology available to the Market Members when designing the information flows between the Dispatcher and the Market Members

The Dispatcher is responsible for issuing instructions to the generating facilities in accordance with the decision making authority outlined in the Market Rules Market Members should have an obligation to follow the instructions received from the Dispatcher After the fact, the Market Members could dispute an instruction issued by the Dispatcher in which case the Dispatcher would need to provide an explanation of their actions One of the ways changes to the Market Rules will be identified is through this process of after the fact disputing of dispatch instructions

PRICING

It is proposed that the price of electricity in the wholesale market pool initially should be set through an administered wholesale tariff approved by the GERNC The aim is to develop a simple robust method of allocating costs of the various generating technologies to the wholesale

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customers A more complete discussion of price determination and the transition to a more market based pricing methodology will be presented in a separate paper The proposed price determination methodology is much simpler than advancing immediately into a wholesale bidding system, and more practicable for the short run given the lack of generation in the country and the technological limitations within the electricity sector However, the goal of the Market Rules work is to design a single framework for the wholesale market that will allow it to grow and expand in complexity, facilitating the market's move into competitive generation bidding and other areas as the demand for these options increases in the future

With regard to transmission services, it is proposed that a contractual structure be established between the GEMA and the Transmission Licensee for the Transmission Licensee to provide transmission capability to the Market Members This contractual arrangement would consolidate the billing and market collection activities for both wholesale market electricity and transmission services While the Transmission Licensee could enact individual contracts with each Market Member, such a contractual structure would fragment the billing and collection processes Operational efficiencies are gained by combining the billing and collection procedures for all common services The transmission tariff, reviewed and approved by the GERNC, will form the basis for payment for transmission services Market Members will be billed for Transmission services by the Settlement Manager and the Market Funds Manager will collect the funds and disburse them to the Transmission Licensee The details of the proposed transmission tariff will be presented in the separate price determination paper mentioned above

There are a number of services that are required by the Dispatcher to ensure system stability These include reserves, reactive support, frequency control, and black start capability Traditionally the costs for these services have been bundled in with the cost of electricity Separating these services from the cost of electricity adds transparency and enhances the possibility of alternative sources for the provision of these services While the proposed initial wholesale price determination does not separately identify these services, it is clearly a goal of future price determination methodologies

The Market Members will engage a number of Service Providers to operate the wholesale market, to determine the wholesale market transactions, and to collect and disburse funds related to those wholesale market transactions Service Providers include the Scheduler/Dispatcher, the Settlement Manager, and the Market Funds Manager The Market Rules will delineate the operational and decision making responsibilities of each of the Service Providers

The Service Providers will be in a position to monitor the operation of the wholesale market and to alert the Market Members when modifications appear to be warranted While these Service Providers perform a valuable monitoring function, they themselves are not responsible for modifying the GEMA or the Market Rules The Market Members retain responsibility for reviewing the Service Provider's recommendations and modifying the GEMA or the Market Rules

MARKET MEMBERS

Generation Licensee

It is recognized that Generation has the potential to be the most competitive area within the electricity market The wholesale market structure will be influenced by the structural design chosen for the Generation sector As the structural design of the Generation sector evolves, the market rules will likewise need to evolve Optimal market rules would limit the opportunity for the abuse of market power, ensure least cost generation through economic dispatch and provide incentives for generation to reduce costs and increase operational efficiencies

There are some basic inter-relationships between the Generation sector and the other sectors of the wholesale market that will remain constant regardless of the structure of Generation

- Generation Licensees will be responsible to provide information to the Dispatcher with regard to generating quantity, future availability and associated costs for each generating unit or hydro based system The Dispatcher will issue dispatch instructions to the Generation Licensees for the generating units under their control and the Generation Licensee will be obliged to follow those dispatch instructions The frequency and detail of the information flow between Generation Licensees and the Dispatcher will be specified in the Market Rules

- Generation Licensees will be responsible to provide metering information from each of their generating units or hydro based systems to the Settlements Manager They will also need to provide information concerning their individual contracts that are outside the wholesale market pool to the Settlement Manager such that the Settlement Manager can determine the amount of electricity the Generation Licensee sold through the wholesale market pool Prior to invoicing, the Generation Licensee will be responsible for verifying with the Settlement Manager the payments that will be due to them for that settlement period including any offsets owed by them for Service Provider fees

- Generation Licensees will receive payment for wholesale market pool transactions and any separately identified system services from the Market Funds Manager

- Generation Licensees will be responsible for invoicing and receiving payment for any individual direct contract from the contracting party

Distribution Licensee, Direct Consumers

Within Georgia there are 66 municipal distribution companies, not including Abkhazia and Ossettia There have been a number of proposals to group these distribution companies in order to facilitate commercial functioning, attract investment and allow for appropriate regulation of

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the distribution sector Distribution Licensees, as currently formed, are responsible for both the distribution network (the wire business) and the retailing of electricity (the supply business) Optimal market rules would lessen the effect of price volatility, and provide adequate information on which to base commercial decisions such as consumption, contracting and new investment decisions

There are some basic inter-relationships between the distribution sector and the other sectors of the wholesale market that will remain constant regardless of the number of Distribution Licensees

- Distribution Licensees and Direct Consumers will be responsible to provide information regarding load projections and demand side curtailment schemes to the Dispatcher Initially the Dispatcher may develop a load forecast that is not totally dependent on the information provided from the Distribution Licensee but rather incorporates the information received

- Distribution Licensees and Direct Consumers will be responsible for providing metering information to the Settlement Manager They will also need to provide information concerning their individual contracts that are outside the wholesale market pool to the Settlement Manager such that the Settlement Manager can determine the amount of electricity the Distribution Licensee or Direct Consumer purchased through the wholesale market pool Prior to invoicing, the Distribution Licensee or Direct Consumer will be responsible for verifying with the Settlement Manager the payments that will be owed from them for that settlement period including any payments owed by them for Service Provider fees

- Distribution Licensees and Direct consumer will pay the Market Funds Manager for wholesale market pool transactions, separately identified system services, transmission services contracted from the Transmission Licensee and Service Provider fees

- Distribution Licensees and Direct Consumers will pay the contracting party for any individual contract transactions

Import/Export Traders

The Georgian power system interconnects with Turkey, Russia, Azerbaijan and Armenia Small amounts of energy are currently being traded and it is possible that imports could increase as commercial relations are established between these countries Absent a regional wholesale market, it is very likely that the price determination methodology for each country will vary Imports into the Georgian system are equivalent to another Generation source and likewise, exports out of the Georgian system are equivalent to another Direct Consumer It is not practical

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or recommended that the foreign trading entities become Market Members and be bound by the rules and conditions of the GEMA However, the imports and exports are clearly part of the interconnected system and will be receiving benefits from that interconnection

In order to fairly treat imports and exports within the Georgian wholesale market it is recommended that a Trader position be created Traders must be registered as Georgian entities and will be responsible for trading imports and/or exports within the wholesale market I It is recommended that for the sake of transparency the Trader category should be independent of the other Market Members Similarly, to avoid a conflict of interest, the Trader category should be independent of the Service Providers The Dispatcher will facilitate imports and exports, however, it would be inappropriate for the Dispatcher to negotiate contract terms or take on the other financial responsibilities involved in the import and export of electricity

As registered Georgian entities, all electricity Traders would be Market Members and bound by the terms and conditions of the GEMA and the applicable licenses Like other Market Members, the Import/Export Traders would be free to enter into individual contracts with other parties within Georgia as well as participate in the wholesale market pool

The financial structure of the Import/Export Trader category will need to be examined as the wholesale market transitions from an administered price to a market determined price

SERVICE PROVIDERS

The category of Service Providers includes the entities that facilitate the operation of the wholesale electricity market, such as the Scheduler/Dispatcher, the Settlement Manager and the Market Funds Manager

Dispatcher

To the extent possible the proposed responsibilities for the Dispatch function will be designed to allow the development of a market that ultimately is able to determine both short term operations and long term investments while assessing the trade off between reliability and cost This means that as a general principle the Market Rules will allow Market Members to make their own commercial judgments and business decision and that the Dispatcher's role in making decision on behalf of the Market Members will be minimized

The Dispatcher is responsible for managing the moment to moment balancing of supply and demand while ensuring that system security is maintained The Dispatcher can be viewed as "making" the wholesale market as it is the Dispatcher who will determine the generating units that operate and the wholesale customers that are served The Dispatcher also has decision making responsibility over events within a time period other than real-time During the transition period of the wholesale electricity market the Dispatcher may need to have greater

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responsibilities out farther in time to ensure system security and reliability Notwithstanding the need for system security these additional responsibilities should be viewed as a transition feature The Dispatcher will be required to make his decision making process transparent and to maximize the information flow to Market Members, thus permitting them to begin to establish commercial judgment processes

Settlement Manager

After the fact, the Settlement Manager is responsible for the settlement of wholesale market transactions This involves the collection and verification of metering information, the determination of a wholesale market pool price and the production of invoices for the Market Members Additionally the Settlement Manager is responsible for the invoicing of system security services, when those services are un-bundled and priced separately from electricity supply, and for the invoicing of transmission services provided by the Transmission Licensee

The Settlement Manager determines, based on the pricing formula developed in the Market Rules, the price for wholesale market pool transactions Initially it is proposed that the price for wholesale market transactions be an administered price based on the cost of service from each generating source Over time with the introduction of a competitive generating bidding system the task of price determination will increase in complexity

In support of the Settlement Manager's invoicing role, the Settlement Manager is responsible for developing and maintaining a Metering Standard that will outline the design, installation and operational standards for meters, meter reading procedures and meter database administration The Transmission Licensee is responsible for installing and maintaining the meters at the entry and exit points on the transmission system and the Distribution Licensee is responsible for installing and maintaining meters at the interface points to their distribution network

Specific functions of the Settlement Manager are

- Collects and verifies metering data from Market Members and the Transmission Licensee
- Determine total amount of electricity supplied from and to each Market Member
- Determine transmission losses and assign those losses to the appropriate Distribution Licensee, Direct Consumer and/or Trader
- Determine the wholesale market pool transactions for each Market Member by subtracting the individual contract amounts taking account of transmission losses
- Determine price paid to and price paid by each Market Member for wholesale market pool transactions

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- Receive information from Dispatcher regarding system security services provided in billing period
- Prepare and submit to Market Members an invoice detailing wholesale market pool transactions, system security payments or charges and transmission service payments
- Provide invoice information to the Market Funds Manager

Market Funds Manager

The Market Funds Manager is responsible for the collection and the disbursement of funds related to the wholesale market activities including transmission The Market Funds Manager will not collect or disburse funds related to the individual contracts between wholesale market parties

Non-payment or partial payment of an invoice by a Market Member will prevent the Market Funds Manager from making a full disbursement The Market Rules will detail the procedures that the Market Funds Manager is to follow in the event of non-payment or partial payment The Market Members, rather than the Market Funds Manager, will be liable under the terms of the Market Members Agreement for any payment default by another Market Member

Specific functions of the Market Funds Manager are

- Receive invoice information regarding wholesale market pool transactions, system security services and transmission services from Settlements Manager
- Receive information regarding Service Provider fees from the Dispatcher and Settlement Manager
- Collect funds from Distribution Licensees, Direct Consumers and the Export Traders for wholesale market pool transactions, system security services, transmission services and Service Provider fees
- Disburse funds to Generator Licensees and the Import Traders for wholesale market pool transactions and system security service provision less any Service Provider fees
- Disburse funds to the Dispatcher, Settlement Manager, and Market Funds Manager for services provided to the Market Members

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REGULATORY ENTITIES

Regulatory entities include the Georgian Electricity Regulatory National Commission (GERNC), the Ministry of Energy and the Standards Laboratory These bodies regulate the commercial and technical aspects of the wholesale electricity market

The wholesale electricity tariffs for sales and purchases through the wholesale market are embodied in the GEMA GERNC will need to approve the initial agreement and all subsequent modifications The Market Members retain primary responsibility for monitoring the operation of the wholesale market and the Market Members' and Service Providers' compliance with the rules Market members are also responsible for initiating additions or changes to the governance structure or the market rules In line with a light-handed regulatory regime and a competitive wholesale electricity market, GERNC will be appraised by the Service Providers on behalf of the Market Members of key operational and commercial aspects of the wholesale market such as collections It is recommended that the GERNC be able to recommend modifications to the GEMA but not have the authority to order specific modifications to the agreement

As the structure of the wholesale market is clarified and the Market Rules are developed attention should be paid to the specific License requirements for Generation, Distribution and Dispatch licensees A requirement that those parties must be members of the GEMA will need to be added as a license condition A new license may also need to be developed to account for the requirements placed on the Import/Export Trader category

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APPENDIX E

POSITION PAPER NO. 4: THE INTER-RELATIONSHIP BETWEEN REGULATORY, TECHNICAL, AND COMMERCIAL STANDARDS

GEORGIAN POWER SECTOR

MARKET RULES POSITION PAPER NO. 4: THE INTER-RELATIONSHIP BETWEEN REGULATORY, TECHNICAL, AND COMMERCIAL STANDARDS

As part of the series of preliminary position papers laying the foundation for the Georgian Market Rules, this paper will discuss the basic inter-relationships between, and the development of, the regulatory, technical, and commercial standards which will govern the transactions and operations of the new Georgian wholesale electricity market The standards established under these three areas are mutually dependent upon each other and, therefore, must be crafted so that they function in harmony This is not a simple task since there are existing technical and legal constraints determining how much certain aspect of the wholesale market can be changed Keeping these limitations in mind, this paper proposes a strategy for achieving the major goals of the Market Rules task, while ensuring that the regulatory, technical, and commercial standards will function together at the conclusion of the process

Before describing the approach to be employed in the development of the Market Rules, it is necessary to provide a brief description of the role each area of standards plays in the wholesale market The technical standards, contained within the grid code, control the operation of the grid network The technical standards specify the quality of supply, i e , the frequency and voltage levels, the connection requirements, the operational metering and communication standards, and the coordination of maintenance Existing operational procedures will need to be reviewed and re-written where necessary and new procedures will need to be developed such that the technical standards balance with the market framework The regulatory standards specify and enforce the licensing requirements for all the wholesale market members and provide checks and balances over the entire system by establishing reporting and other monitoring requirements Georgia has already adopted a progressive regulatory legal framework which should work well to support the development of a competitive wholesale electricity market Finally, the commercial standards govern the manner and process of conducting electricity sales, settlements, and payments It is in this final area, commercial standards, where the bulk of the changes will need to be made to create a viable wholesale electricity market

The market rules process will primarily focus on developing a set of commercial standards that will shape the process for conducting electricity transactions, creating the actual market and market procedures The commercial standards are the heart of the wholesale market since they define the actual market framework, determine the amount and level of competition, establish the number of market members, institute governance procedures, and create a process for the settlement of disputes

The goals of the market rules task are to 1) create a viable, competitive, and economically efficient wholesale electricity market that will 2) accommodate direct contracts, but 3) maintain the unified structure of the system and 4) promote future investment in the power system In order to achieve these goals it is necessary to begin the process by first defining the commercial standards and then adjust the technical and regulatory standards to support the commercial framework of the market The creation of the commercial standards must, of course, account for the physical, technical and legal realities of the country, but the development of the commercial framework for the market should not be dictated by these existing conditions

The market rules work over the next few months will develop an initial set of commercial standards for the wholesale market and a transition plan for advancing the market design as the technical and commercial capability of the market members advances Once these initial standards have been developed and approved, the corresponding changes to the regulatory and technical standards will be identified and addressed

APPENDIX F

POSITION PAPER NO. 5: PRICING METHODOLOGY TRANSITION PLAN

GEORGIAN POWER SECTOR

MARKET RULES POSITION PAPER NO. 5:
PRICING METHODOLOGY TRANSITION PLAN

This position paper will describe the initial wholesale market price determination methodology that is recommended to work in conjunction with the establishment of a multi-party agreement between market participants This paper will further outline the transitional steps to move to a more competitive wholesale electricity market, focusing on the changes in the price determination methodology Discussion of the multi-party agreement is contained in position paper #3, Wholesale Market Members

One goal of the electricity market reform is to create a wholesale electricity market that allows investment and consumption decisions to be determined through the commercial, competitive interaction of producers and consumers For this goal to be realised the price of electricity should be allowed to change in response to the changes in the supply and demand situation Benefits are gained in two ways, through more efficient consumption decisions and through better investment decisions By allowing the price to change, the wholesale market signals the value of electricity relative to other sources of energy as well as the relative value of electricity consumption at various times of the day or times during the year Changing prices also signal the value and potential profitability of producing additional electricity at various times

Traditionally, the price of electricity has been regulated on a cost of service plus rate of return basis to protect the interests of the captive end users from possible unregulated monopolistic pricing abuse When prices are fixed for a period of time to protect the end user those prices failed to signal the relative value, scarcity or marginal cost of producing and consuming electricity Such a pricing methodology fails to provide strong incentives for efficiency in the supply of electricity and encourages inappropriate consumption during times of scarcity

So why are we recommending a regulated cost of service plus rate of return pricing methodology as the initial phase of the wholesale market in Georgia?

In some countries the wholesale market establishes hourly, or even half-hourly prices based on marginal cost offerings by electricity suppliers Settlements and billing are also

calculated on a corresponding hourly or half-hourly basis These are sophisticated market models which determine optimal prices with detailed precision They require the existence of many market-based concepts and institutions as well as a stable financial system and an advanced level of operations, technology and communications Given the lack of a market-based economic tradition in Georgia, the rudimentary managerial, technical, information, and communication systems in the existing power sector enterprises, and the payments and related financial problems in the electricity supply industry, a sudden leap to a sophisticated, technology laden wholesale market model is not feasible For this reason a gradual transition to a market-based wholesale pool is recommended

In order to successfully develop a competitive wholesale electricity market based on free market principles, the current wholesale market should evolve through several steps, or phases, of development The initial phase of the wholesale market development process is designed to educate the wholesale market members in basic commercial practices such as contracting, marketing, corporate control, fiscal control and accountability, and cost-based as well as competitive pricing At the same time, the initial phases of the market will work to ensure sufficient and reliable cash flow to wholesale market members to stabilise the financial conditions within the industry Revenue stability will place wholesale market members in the position to procure and install the necessary technology (communications, computers, hourly meters) to move towards a more sophisticated market model

PHASE I REGULATED COST OF SERVICE PRICE METHODOLOGY

Phase I presumes the prior establishment of a multi-party agreement between the market participants and the implementation of a rudimentary wholesale pool, neither of which currently exist in Georgia It will be essential to develop a well understood and transparent wholesale settlement and collection process prior to the beginning of Phase I Existing metering, communications and dispatch systems, while sub-optimal, could be used in the early stage of Phase I

Wholesale Suppliers will include

- Generation licensees, and
- Import Trader licensees, which represent the Georgian interface for foreign sellers

Wholesale Suppliers will receive compensation for available capacity and actual electricity production System security services, also known as ancillary services, will not be unbundled from capacity and energy and separately compensated Rather, the cost of providing system security services will be factored into the overall cost of service calculation for each generating facility

Available capacity will be defined as the demonstrated capability of the generating facility to produce electricity absent a shortage of fuel, or in the case of the hydro plants, water The available capacity will be recorded, by the generating plant personnel, on an hourly basis A monthly average available capacity will be determined from the average of all the hourly capacity values and the rolling average of the preceding eleven months The available capacity payment will provide an incentive for a Wholesale Supplier to maintain its generating facilities, albeit not as strong an incentive as will be available in later price phases Each generating facility or, in the case of small hydro, generating group will receive a payment for electricity that reflects the specific rate of return on assets for that facility or group Import Traders will receive a payment that reflects the capacity payment terms of their contract with the foreign entity

Actual electricity production will either be metered at the transmission entry point or will reflect the production amount less the amount of electricity used by the generating facility for its own purposes, i e , station service Each generating facility or, in the case of small hydro, generating group will receive a payment for electricity that reflects the specific cost of service for that facility or group times the actual production in the month Import Traders will receive a payment for electricity that is based on the contractual energy rate times the metered amount of electricity received at the Georgian interface

The settlement for available capacity and actual production will be on a monthly basis The Wholesale Supplier will be responsible for providing information to the Settlement Manager regarding the Monthly Available Capacity and daily meter readings for the electricity produced in that month

Wholesale Customers will include

- Customers, usually large industrial facilities, who are directly connected the high voltage grid and do not receive electricity from Distribution Licensees,
- Distribution licensees, including enterprises with local government ownership, joint stock companies with private ownership, and joint stock companies with a mixture of local government and private ownership, and
- Export Trader licensees, which will represent the Georgian interface for foreign buyers

Wholesale Customers who purchase capacity and energy from the pool during the month will be billed, by the Settlements Manager, for their purchases plus an allocated amount of the total energy losses for the month The amount of energy purchased from the pool will be the metered consumption for that Wholesale Customer less the energy loss adjusted amount of electricity purchased under a direct contract

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For Phase I, it will be assumed that a Wholesale Customer's obligation to supply will be fulfilled though the purchase of a pro-rata share of the total Monthly Available Capacity A Wholesale Customer's charges for its share of the total Monthly Available Capacity will be based on the ratio of that Wholesale Customer's yearly peak usage versus the non-coincident yearly peak usage of all Wholesale Customers

Charges for electricity consumed during a month will be based on the total pool cost of electricity supply for that month divided by the total electricity sold to the wholesale pool, effectively a monthly pool price expressed as $/kWh The monthly pool price will be multiplied by the Wholesale Customer's actual metered consumption less an adjustment for the amount of electricity purchased under direct contracts plus an allocation of the energy losses Energy losses are the difference between the total metered amount of electricity produced and the metered amount of electricity consumed

In addition to the charges for capacity and energy, a Wholesale Customer will also pay for transmission service as established in the transmission tariff and for pool services as established in the Market Members Agreement The pool services fee will cover the cost of providing scheduling, dispatch, settlement and collection services to the Wholesale Customers

The incentive for Wholesale Customers and Wholesale Suppliers to enter into direct contracts during this phase will be influence by the structure of the retail tariff adopted during this phase If the retail tariff allows for a full pass through of capacity and energy purchase costs there will be little to no incentive for parties to contract outside the pool If, however, the retail tariff sets a price cap on capacity and energy purchase costs there will be some incentive for Wholesale Customers to contract with Wholesale Suppliers whose production costs are lower than the average pool price Wholesale Suppliers should be economically indifferent to selling their production under direct contract or selling their production to the pool

Currently, the GERNC has placed a limit on the amount of electricity that can be sold through direct contracts to between 10% and 20% depending on the yearly level of production of an individual Generation licensee During Phase I when the monthly pool price is a regulated average price, these limits will prevent low cost Generators from being captured by a particular Wholesale Customer and thus driving the average pool price up for all other Wholesale Customers It is recommended that the direct contract limits remain in place until the energy sector is ready to move to Phase II of the wholesale pricing path

SETTLEMENT AND BILLING PROCEDURES

At the end of each month the Settlement Manager will collect information from Wholesale Suppliers and Wholesale Customers to aid in the preparation of the bills Wholesale Suppliers will provide their Monthly Available Capacity amount and their total metered production for each generating facility Wholesale Suppliers will also provide their per unit cost of production ($/kWh) that is within the bands established by the GERNC Wholesale customers will provide the Settlement Manager with their total monthly metered consumption Both Wholesale Suppliers and Wholesale Customers will provide information regarding the amount of electricity purchased under a direct contract during the month

The Settlement Manager will calculate

- the Monthly Available Capacity payments based on the information supplied by Wholesale Suppliers and the rate established by the GERNC,
- the Monthly Available Capacity charges based on the total Monthly Available Capacity payments and Wholesale Customer's historic peak usage versus the historic non-coincidental peak usage of all the Wholesale Customers
- the monthly wholesale pool price from the production and cost information supplied by all the Wholesale Suppliers,
- the total energy losses for the month by reference to the production and consumption information supplied by Wholesale Suppliers and Wholesale Customers,
- the energy loss adjusted amount of electricity each Wholesale Customer purchased under a direct contract during the month, and
- the energy loss adjusted amount of electricity each Wholesale Customer purchased from the pool during the month

The Settlement Manager will produce a bill for each Wholesale Customer that will detail the charges for capacity, electricity, transmission services and pool services Appendix 1 provides a simple illustration of the settlement procedure during Phase I

Although the Settlement Manager is responsible for determining the billing and payments for each wholesale market participant, it is recommended that a separate Market Funds Manager be responsible for receiving payments from the Wholesale Customers and disbursing payments to the Wholesale Suppliers

REGULATION

In order to mitigate the possibility of rate shock to the end use customers as the result of introducing market reform, it is recommended that the initial wholesale pool price determination methodology embodied in the Market Members Agreement follow a cost-based model which will be approved and regulated by GERNC As a license requirement at the start of Phase I of the wholesale market, Wholesale Suppliers will be required to submit the cost of service data for each of their units, or contracts in the case of Import Traders, to GERNC

GERNC will use this data to establish the initial cost of service tariffs for each generation unit or contract The tariff methodology will establish a band within which the individual generation tariff can fluctuate as a means of accounting for changes in fuel and other variable costs without continuous regulatory intervention If the cost of service exceeds the parameters of the tariff band, then the Wholesale Supplier can request a rate increase from the GERNC The Wholesale Supplier will be required to resubmit its cost of service data and to prove just cause for the requested increase

A regulated cost of service tariff will be established for each generating facility or contract above 10 MW For small hydro stations in the Georgian wholesale market, a group cost of service tariff will be established based on the costs of a select number of representative stations This group cost of service tariff will then be applied to all small hydro Generators However, if a hydro station believes that it should receive a different tariff it can request a rate review and submit the appropriate cost data to GERNC that will serve to justify a separate tariff

NEXT PHASE

The cost of service approach to wholesale pool pricing is recommended during Phase I to ensure that all Wholesale Suppliers initially have the funds to cover their costs of operation as well as their cost of capital In addition, by establishing a robust cost based methodology the Wholesale Suppliers will be encouraged to begin implementing real cost accounting standards within their businesses This will enable the Wholesale Suppliers to gain a better understanding of their actual business costs, a critical step for entering Phase II in which Wholesale Suppliers will offer their units according to marginal cost calculations

Wholesale Customers will also be developing skills to support the movement to a more open market Power purchase costs from the wholesale pool will vary each month and the Distribution Licensees will need to develop tools and techniques that allow them to forecast those variations and develop appropriate retail tariffs

Before the wholesale market is able to move to Phase II, it is recommended that the industry operate under the Phase I conditions for a period of time (2-3 years) to allow participants to adjust to the new market concepts and procedures and to build up the technological capabilities needed to progress to the next step This will require significant investments in hourly metering, communications, computers, and other management information systems During this period the low payment levels and other financial problems plaguing the industry must be successfully resolved in order to make the move to a more commercial market feasible It is recommended that market performance targets be set specifying collections levels and other key benchmarks that must be met before the transition to Phase II can begin However, the market must not be allowed to stall during Phase I

Once the market has implemented the proper technological requirements (i e , communications and metering) and certain market performance benchmarks have been achieved, the wholesale market will transition to Phase II - implementation of a wholesale spot market

PHASE II ADMINISTERED PRICE METHODOLOGY

In Phase II, the wholesale pricing methodology departs from the fully regulated wholesale market of Phase I, and introduces more information in the price signal In Phase I the prices seen by the Wholesale Customers were an average rather than a marginal price and there was no information contained in the price that would indicate to the customer the relative value of electricity at any point in time In Phase II the concept of marginal pricing will be introduced to provide consumption signals to the Wholesale Customers Allowing the price to vary in response to the supply and demand situation will create an incentive for Wholesale Customers and Wholesale Suppliers to develop financial instruments to manage the risk of these price variations Providing Wholesale Consumers with such signals is one of the main reasons for establishing a spot market

Wholesale Suppliers will continue to include the same market participants as in Phase I

Wholesale Suppliers will receive compensation for available capacity and actual energy production As in Phase I, the cost of system security services will continue to be bundled in with the cost of energy and not compensated for separately

Available Capacity will be determined as in Phase I, i e , as a twelve month rolling average of the hourly available capacity of a generating facility The difference in Phase II will be that the amount of payment received will be based on the marginal cost of capacity for the system rather than each individual generating facility's specific asset cost basis

The marginal cost of capacity will be an administered value set each year by the GERNC Marginal cost of capacity is defined as the carrying costs for a new increment of generation, which is usually the carrying cost of a gas-fired peaking unit Associated with the marginal cost of capacity will be an assessment of the capacity requirement for the Georgian system The capacity requirement will act as a modulator on the marginal cost of capacity To the extent that the total installed capacity is less than the assessed capacity requirement, the administered marginal cost of capacity will effectively be increased Likewise if the installed capacity exceeds the assessed capacity requirement the administered marginal cost of capacity will effectively be decreased The administered marginal cost of capacity will signal the profitability of new investment in production

Actual electricity production will still reflect metered production less station service as in Phase I Settlement quality hourly metering will be required either at the transmission entry point or at the generating facility Every Wholesale Supplier that is supplying electricity to the wholesale pool within an hour will receive the same calculated wholesale pool price for each unit of electricity supplied to the wholesale pool in that hour

In advance of real-time operations, the Wholesale Suppliers will inform the Dispatcher of their offer to supply electricity The offer will consist of the amount of electricity available to be supplied to the wholesale pool and the price of that electricity In Phase II, the price offers will be constrained to the demonstrated cost of energy production for each Wholesale Supplier The wholesale pool price will be determined from the cost based offer of the marginal supplier within an hour

It could be argued that there is no need to constrain the price offers since in a fully competitive market suppliers will be driven to offer short run marginal costs Georgia, with its limited number of generating facilities and the divergent costs of those facilities, may lack the characteristics necessary for a competitive market during Phase II However, it is still of benefit to introduce a pricing system that varies with supply and demand conditions albeit in a constrained form This constraint will be most evident during times of energy shortages when the wholesale pool price is not allowed to raise to the level necessary to clear the market

Wholesale Customers will include the same parties as in Phase I Wholesale Customers who purchase capacity and energy from the pool will have the amount of their pool purchases calculated in a manner similar to that in Phase I

As in Phase I it will be assumed that a Wholesale Customer's obligation to supply will be fulfilled though its purchase of a pro-rata share of the total Monthly Administered Capacity A wholesale Customer's charges for its share of total Monthly Administered Capacity will be based on the ratio of that Wholesale Customer's yearly peak usage versus the non-coincident yearly peak usage of all Wholesale Customers

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Charges for electricity consumed during a month will be based on the summation of the charges for each hour within that month For each hour, the calculated pool price will be multiplied by the Wholesale Customer's actual metered consumption adjusted for the amount purchased under a direct contract for that hour plus an allocation of the energy losses incurred in that hour Energy losses are the difference between the total metered amount of electricity produced and the metered amount of electricity consumed

The two major differences for Wholesale Customers, under Phase II, is that they will see a marginal cost rather than an average cost for all their pool energy purchases and the time period will shrink from a month to an hour thus creating more variation in average wholesale pool purchase costs amongst Wholesale Customers

In addition to the charges for capacity and energy, a Wholesale Customer will also pay for transmission service as established in the transmission tariff and for pool services as established in the Market Members Agreement The pool services fee will cover the cost of providing scheduling, dispatch, settlement and collection services to the Wholesale Customers

Whilst in theory, the total amount of payments levied over a year under the Phase I pricing methodology could be equal to the total amount of payments levied for the same period under the Phase II pricing methodology, the cash flow implications for the two pricing regimes will create an much stronger incentive for contracts or other financial instruments In other wholesale markets that have moved from an average cost of service methodology to a marginal pricing methodology, "transition" contracts have been prepared, in consultation with the participants, to add stability to the cash flows and reduce the impact of the price volatility Transition contracts often take the form of financial "contract for differences" or hedges against the pool price It is recommended that a set of transition contracts be prepared Such contracts should be structured to gradually expire over a period of time (3 - 5 years)

SETTLEMENT AND BILLING PROCEDURES

The settlement and billing function will be more data intensive and complex in Phase II than in Phase I Changing from a monthly calculation of average pool price to an hourly calculation will dramatically increase the amount of data that must be retrieved, processed and then stored On the supply side, determining the amount of funds that should be disbursed to each of the Wholesale Suppliers will require referencing both the hourly pool price as well as the hourly production information In Phase I the disbursements to Wholesale Suppliers could be calculated without reference to the monthly pool price since all payments were specific to a particular supplier

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During each month the Settlement Manager will collect information from the Wholesale Suppliers and Wholesale Customers to aid in the preparation of the bills Although the settlement period has shorten from a month to an hour, it is recommended that the billing period remain a month Changing the billing period and/or the billing lag (the time from when the bill is rendered until the bill is due and payable) will impact the cash flow position of the wholesale market participants and not necessarily contribute any benefits to the wholesale market To ease the burden of validating and processing the data, however, the Settlement Manger may request that information be submitted on a weekly or even daily basis rather than receiving all the data at the end of the month

Wholesale Suppliers will continue to provide their Monthly Available Capacity amount and the hourly metered production for each generating facility Wholesale Customers will provide the Settlement Manager with their hourly metered consumption for the month Both Wholesale Suppliers and Wholesale Customers will provide information regarding the hourly amount of electricity purchased under a direct contract during the month

As opposed to Phase I, in Phase II the Dispatcher will play a vital role in the price determination process The Dispatcher will provide the Settlement Manager the hourly marginal cost that is based on the offers previously received form the Wholesale Suppliers and the actual dispatch of facilities during an hour

The Settlement Manager will calculate

- the individual Monthly Administered Capacity payments based on the available capacity information supplied by each Wholesale Supplier and the administered marginal cost of capacity rate established by the GERNC,
- the individual Monthly Administered Capacity charges based on the total Monthly Administered Capacity payments and the Wholesale Customer's historic peak usage versus the historic non-coincidental peak usage of all Wholesale Customers,
- the amount of electricity each Wholesale Supplier sold to the pool in each hour based on the metered production information less the amount of electricity sold under a direct contract for the relevant hour
- the total energy losses for each hour by reference to the production and consumption information supplied by Wholesale Suppliers and Wholesale Customers,
- the energy loss adjusted amount of electricity each Wholesale Customer purchased under a direct contract during each hour,

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- the energy loss adjusted amount of electricity each Wholesale Customer purchased from the pool during each hour based on the metered consumption less the adjusted amount of electricity purchased under a direct contract plus an allocation of the total hourly energy losses,

- the monthly wholesale pool energy payment to each Wholesale Supplier based on the summation of the hourly pool prices supplied by the Dispatcher and adjusted production information for the relevant hour from each Wholesale Supplier, and

- the monthly wholesale pool energy charges to each Wholesale Customer based on the summation of the hourly wholesale pool charges The hourly wholesale pool charge will be the Wholesale Customer's pro-rata share of the total hourly wholesale pool energy payment

The Settlement Manager will produce a bill for each Wholesale Customer that will detail the charges for capacity, electricity, transmission services and pool services Appendix 2 provides a simple illustration of the settlement procedure for an hour

As in Phase I, it is recommended that a separate Market Funds Manager be responsible for receiving payments from the Wholesale Customers and disbursing payments to the Wholesale Suppliers

REGULATION

In Phase I the GERNC concentrated on developing a cost of service price, both capacity and energy, for each specific Wholesale Supplier One of the purposes of Phase I was to afford the GERNC an opportunity to gain detail knowledge of the cost structure and basis of each Wholesale Supplier The emphasis shifts in Phase II from developing a cost of service price for each Wholesale Supplier to monitoring and auditing the cost offers submitted by the Wholesale Suppliers to the Dispatcher The Wholesale Suppliers will be responsible for developing appropriate cost based offers for the supply of electricity to the wholesale pool The GERNC will act as a check agent to ensure that the offer are reasonable and can be demonstrated to be cost based

In addition to the monitoring of wholesale supplier offers, the GERNC will need to begin to monitor the level and volatility of the wholesale price

With regards to capacity costs, the GERNC will take on the role of a central planner through the establishment of the Administered Marginal Cost of Capacity and the Assessed Capacity Requirement To develop these values the GERNC will need to focus on the

market as a whole as oppose to focus on each specific generating facility as was the case during Phase I It is recommended that the GERNC develop a consultative process with the wholesale market participants whereby there is involvement of the market participants in the determination of the system capacity requirement

As mentioned above, it is recommended that financial hedge contracts be developed to manage the potential volatility of the pool price As opposed to direct contracts where the Electricity Law gives the GERNC the responsibility to regulate price and terms, the GERNC has no jurisdiction over financial hedge contracts It is anticipated that during Phase II direct contracts may be re-cast as financial hedges in which case the GERNC will no longer regulate the price and terms of those contracts

NEXT PHASE

The transition from Phase I to Phase II occurred when the electricity power sector exhibited the signs of a robust, commercially stable market by meeting a number of proscribed benchmarks Collection targets had to be met, technology and training had to be acquired and systems needed to be developed The transition from Phase II to Phase III will occur when the structure rather than the systems of the electricity market exhibits the signs of being able to support an open, competitive market The structure of the electricity market in Georgia will limit what the market rules and the GERNC can accomplish with regards to a competitive wholesale market Prior to implementing Phase III, the ownership, size and diversity of the generation portion of the power sector will need to be carefully examined to insure that no group or individual Wholesale Supplier is able to exercise undue market power

PHASE III OPEN COMPETITIVE PRICE METHODOLOGY

Phase III extends the concept of marginal pricing and creates a price clearing market In a price clearing market information about scarcity is sent through the prices In times of shortage the price will be allowed to rise to market clearing levels so that the amount that consumers want to buy and the amount the producers want to sell match Similarly in times of plenty the price will be allowed to fall

The advantage of having a market that clears on price include

- a rationing mechanism which can be linked to the desired efficiency criteria,
- a rationing mechanism that is transparent and simple,

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- prices which efficiently direct resources among different sectors of the economy without compulsion, and
- prices which transmit information continuously and smoothly

The disadvantages of having a price clearing market relate to

- how quickly prices can adjust to reflect new states of demand, supply and knowledge,
- the extent to which market power distorts the signal that prices are meant to convey,
- the size of the transaction costs involved in establishing a price

The benefits which can be gained from a price clearing market, in terms of improved signals for investment and consumption, will be maximised only if prices are allowed to respond to changes in supply and demand conditions

Wholesale Suppliers will continue to include the same market participants as in Phase I and Phase II

Wholesale Suppliers will receive compensation for actual energy production and for system security services they provide to the wholesale pool Wholesale Supplier will not receive a separate fixed payment as in Phase I and Phase II

As in Phase I, actual electricity production will still reflect metered production less station service and settlement quality hourly metering will be required either at the transmission entry point or at the generating facility As in Phase II, every Wholesale Supplier that is supplying electricity to the wholesale pool within an hour will receive the same calculated wholesale pool price for each unit of electricity supplied to the wholesale pool in that hour

In advance of real-time operations, the Wholesale Suppliers will inform the Dispatcher of their offer to supply electricity The offer will consist of the amount of electricity available to be supplied to the wholesale pool and the price of that electricity In Phase III, as opposed to the constraint imposed in Phase II, the price offers will be unconstrained and need not be the cost of energy production for each Wholesale Supplier This means that during times of energy shortages Wholesale Supplier will raise their prices to reflect the increased value of electricity and likewise during times of energy surpluses the Wholesale Suppliers will lower their prices to reflect the lower value of electricity production at that time The wholesale pool price will be determined from the value based offer of the marginal supplier within an hour

In addition to receiving compensation for actual production the Wholesale Suppliers who provide system security services to the wholesale pool, such as spinning reserve, stand-by reserve or reactive support, will receive separate compensation for those products The costs of those services will not form part of the wholesale pool price but will be charged to the Wholesale Customer as a separate charge

Wholesale Customers will include the same parties as in Phase I and Phase II Wholesale Customers who purchase energy from the pool will have the amount of their pool purchases calculated in a manner similar to that in Phase II

Charges for electricity consumed during a month will be based on the summation of the charges for each hour within that month For each hour, the calculated pool price will be multiplied by the Wholesale Customer's actual metered consumption adjusted for the amount purchased under a direct contract for that hour plus an allocation of the energy losses incurred in that hour Energy losses are the difference between the total metered amount of electricity produced and the metered amount of electricity consumed

In addition to the charges for energy, a Wholesale Customer will also pay for system security charges incurred by the wholesale pool, transmission service as established in the transmission tariff and for pool services as established in the Market Members Agreement The pool services fee will cover the cost of providing scheduling, dispatch, settlement and collection services to the Wholesale Customers

The major difference for Wholesale Suppliers and Wholesale Customers, under Phase III, is that wholesale pool prices will no longer may capped during times of energy shortages

Moving from a quantity clearing market to a price clearing market will involve fundamental changes in the price risks faced by the Wholesale Suppliers and the Wholesale Customers as there will no longer be centralised administration of capacity and wholesale pool prices will not be held at the cost of service and thus could rise or fall beyond that level

Wholesale Customers will likely wish to develop hedging contracts with Wholesale suppliers to substantially cover their expected consumption Thus hedge contracts will determine the major portion of monetary flows for sales and purchases in the wholesale pool Although the non-contracted purchases within the wholesale pool may determine only a small fraction of the monetary flows between Wholesale Suppliers and Wholesale Customers, this does not make the wholesale market any less important or its price signals any weaker The wholesale pool price will determine the price expectations against which future hedge contracts will be written, and provide strong incentives for incremental supply or load management when demand threatens to exceed supply

If wholesale pool prices rise to high levels, a fully hedged Wholesale Supplier will face strong incentives to produce beyond their contracted amount, and a fully hedged Wholesale Customer will face strong incentives to reduce demand and sell their contracted but unused energy into the wholesale pool In short, the wholesale pool will provide opportunities for those parties who have the technical capability and commercial interest to operate in the market on a day to day basis while the hedge contract market will provide the means by which Wholesale Suppliers and Wholesale Customers can protect their cash flows

SETTLEMENT AND BILLING PROCEDURES

The settlement process will be similar to that used in Phase II except there will no longer be a fixed payment aspect to the process The Settlement Manager will calculate

- the amount of electricity each Wholesale Supplier sold to the pool in each hour based on the metered production information less the amount of electricity sold under a direct contract for the relevant hour,
- the total energy losses for each hour by reference to the production and consumption information supplied by Wholesale Suppliers and Wholesale Customers,
- the energy loss adjusted amount of electricity each Wholesale Customer purchased under a direct contract during each hour,
- the energy loss adjusted amount of electricity each Wholesale Customer purchased from the pool during each hour based on the metered consumption less the adjusted amount of electricity purchased under a direct contract plus an allocation of the total hourly energy losses,
- the monthly wholesale pool energy payment to each Wholesale Supplier based on the summation of the hourly pool prices supplied by the Dispatcher and adjusted production information for the relevant hour from each Wholesale Supplier, and
- the monthly wholesale pool energy charges to each Wholesale Customer based on the summation of the hourly wholesale pool charges The hourly wholesale pool charge will be the Wholesale Customer's pro-rata share of the total hourly wholesale pool energy payment

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REGULATION

The market monitoring role for GERNC that began in Phase II will continue and expand in Phase III GERNC will monitor the performance of the wholesale market to ensure the market is delivering competitive prices and there is no abuse of market power by individual Wholesale Suppliers While changes to the market rules will undoubtedly be necessary to correct minor market aberrations, serious and continual price distortions in the wholesale market will suggest that the underlying structure of the industry needs to be reformed It will be GERNC's responsibility to alert the Government of Georgia to any structural deficiencies in the wholesale market