

Competition and Monopoly in Internal Energy Markets

The paper aims to present the main principles of implementing market competition and monopoly regulation in internal energy markets of a country and particularly in the electric power sector. The study discusses the experience of developed countries, the main principles of the European Union energy legislation and the current Georgian electric power sector specifics in this relation. The paper is not a comprehensive research of these topics, though it attempts to emphasize some significant factors that need to be addressed in the context of Georgia's integration with the European Union.

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Introduction

Adequate energy resources, sustainable energy infrastructure and robust energy markets are among the most important prerequisites for a successful functioning of a society. Energy supply is as important for economic and social development as the supply of prime use commodities. Therefore, an important function and responsibility of the state to provide short term and long term energy security for the whole country, as well as for each individual consumer, at affordable prices and standard quality, while sustaining social and economic conditions and with a minimal impact on the environment.

Historically, different states, during different periods have used distinct regulatory systems for the energy sector; this has varied from full government control to maximal liberalization. However, irrespective of a competitive or regulated monopolistic market or energy asset ownership, sustainable energy supply has always remained an important responsibility of governments.

Network and Non-Network Energy

Energy carriers can be divided into distinct types of network and non-network energy forms. Coal, oil¹, crude oil products, wood and liquid gas are non-network energy commodities that are transported by regular transport.

Non-network energy carriers are ordinary market commodities and can be supplied in the conditions of a free competitive market. The prices for such energy carriers, including oil products, are mainly set by the global market, but are also influenced by international and local transportation.

In contrast to non-network energies, electricity and natural gas can be transported and distributed only via an appropriate infrastructure - electric grids and gas pipelines. Network energy trade requires specific conditions. The facilities for transportation and distribution, as well as technical parameters (voltage, frequency, pressure and so forth) and supply regimes, become essential for transmission and distribution of electricity and natural gas.

A competitive market is generally recognized as an extremely effective mechanism for quality improvement and cost reduction of product supply (including energy supply). Therefore, even in case of network energy, special measures are taken in order to introduce competition into the markets.

Below the network energy markets are discussed based on the examples of EU countries (France, Germany) and Georgia. The main focus is made on electricity market as a more complicated system that requires more sophisticated control and regulatory environment.

Power System

The main characteristic of electricity as a product, is that its production and consumption occur simultaneously through a very complicated highly-technological process.² Production and consumption of electric energy consists of: electricity generation by power plants, transmitting the generated electrical energy through a high-voltage network, distributing it through a low-voltage network and finally, supplying it to the consumers for their personal or production usage.

Electricity generated by hydro and thermal power plants in Georgia is supplied through the high-voltage transformers to the high-voltage (500-220kV³) transmission lines that transmit the energy to long distances. Then, in transmission substations voltage is lowered to 110-35 kV to supply to distribution network where it is further reduced to 6-10kV and is supplied to

¹ Oil is only partially transported in large amounts through main pipelines and as a rule, is not considered as a network infra structure

² It is possible to transform electric energy into other kind of energy and consume it only after the transformation. However, this is very rarely done in practice.

³kV – Voltage unit. kV=1000 Volt

small groups of consumers and to industries. In the distribution transformers, the voltage is reduced to an acceptable level of 220-380kV and reaches all kinds of retail customers.

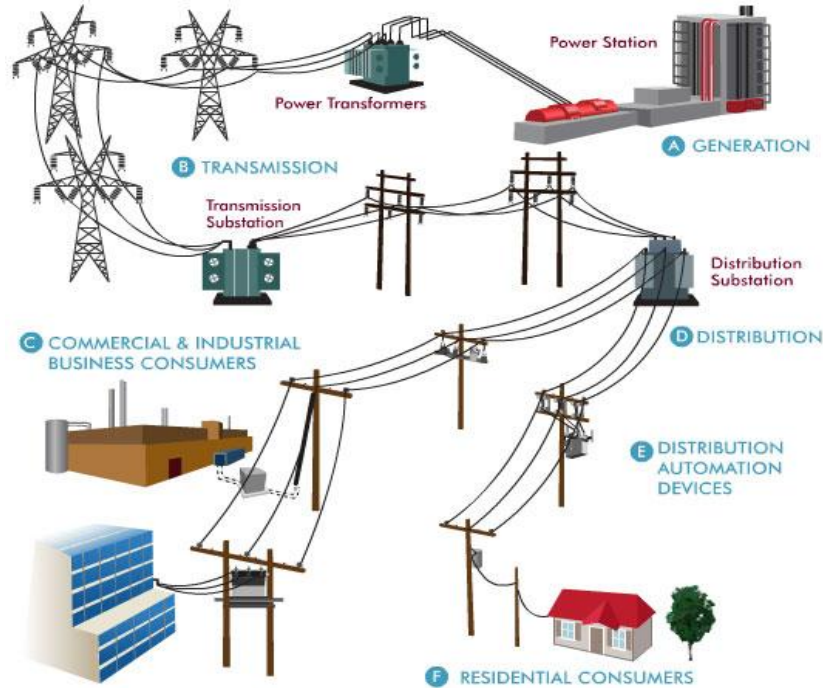


Fig. 1 Electrical Energy System Scheme⁴

The power system is an interconnected complicated system subordinated to the united control by a Dispatcher. All generators in the system are synchronized and rotate at the same speed. The system operator that executes System Control service has to keep continuous balance between the electrical energy supply and demand and keep the united, standard frequency in the system (50 or 60 Hz), keep standard voltage levels, on the grid and to maintain the stability during failures and outages of system components. The System Operator as an organizational unit can be an independent entity (Independent System Operator - ISO) or a structural unit (Transmission System Operator - TSO) of the distribution system operator.

Transmission system operator (TSO) operates the high-voltage transmission network. Its functions are - high-voltage transmission line and substation operation and maintenance, repairs, network development and expansion, implementing innovative technologies in order to cover the future loads and transfer electricity from generation centers to consumption centers without failure and with minimal loss. Additionally, a transmission operator may perform the functions of an electricity market operator.

For the distribution system operator (DSO) as for the TSO the main function is to manage the network technically and to distribute the received electricity further to costumers. However, the distribution operator operates a low-voltage distribution network. Often (including Georgia) the distribution operator also performs the functions of a retail seller. However, in general retail activity is considered to be a separate business.

⁴ Picture source http://www.bravoprojects.co.in/power_solutions.php

Electricity suppliers in many western countries, including European countries, buy electricity on a wholesale market and then sell it on a retail market. The main functions of the supply companies are relations with producers and consumers, managing and evaluating risks, metering the consumption and billing the consumers accordingly. However, sometimes meter reading is conducted by an independent company.⁵

Natural Monopolies and Competitive Markets in the Electricity Sector

Therefore, functioning of the power system is comprised of the following basic activities: energy generation, transmission/dispatch, distribution and supply. The system where all four activities are performed by one (private or public) company is called a vertically integrated system. “Sakenergo” represented such a vertically integrated company in Soviet times in Georgia.

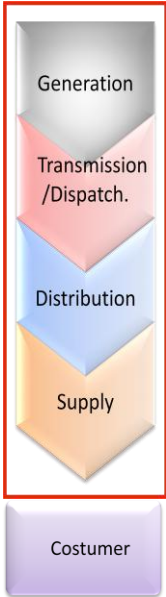


Fig 2. Vertically integrated organizational structure

Until the end of the 20th century, power systems were mainly under public administration. Governments took the responsibility for reliability and quality of the electricity service. They assured the system reliability and development by making needed investments and performing all the necessary functions. Later on, the process of privatization and introducing the competitive markets for system optimization began. Irrespective to introduction of competitive markets, governments still bear the responsibility for product supply its reliability, quality and price in the short term, as well as in the long run and they use various mechanisms for planning and regulating the system.

⁵Chris Harris – Electricity Market, pp.:87

Historically, electrical energy systems started functioning in the conditions of a competitive market, while generator companies built their own transmission networks and competed with each other to attract the costumers. Despite the fact that a competitive market is universally considered as the best instrument for increasing efficiency, this approach did not prove to be successful. For instance, between 1887 and 1893⁶, twenty-four central station power companies were established within Chicago alone. With overlapping distribution lines, competition for customers was fierce and costs were high. The experience proved that such competition was unjustified both commercially and practically. In 1898, the same year the government replaced an ineffective competitive market by acquiring a monopoly. Later, vertically integrated companies became an industry standard for the given period.

Gradually, along with network technology development, the possibility of electricity transmission to longer distances created conditions for competition between generators. This enabled regulation of power systems and formation of wholesale markets. Though the transition and distribution subsystems are naturally monopolies, because the constructing parallel systems is neither technically reasonable nor economically feasible. Free market prices and quality-based competition makes the generation and supply providers improve their technologies and improve services, thus increasing social gain.

In order to form a competitive market, the network infrastructure needs to be functioning independently, so that it can guarantee equal conditions of network access to all generators and costumers. Additionally, it is essential that customers have a free and diverse choice of suppliers. For this concrete reason, active energy sector liberalization began in the western world (mostly USA and European countries) in the end of the 20th, which in particular meant:

- Reduction of the state role, in ownership, command and control, elimination of prescriptive solutions and cross subsidies in power sector.
- Creation and enhancement of competition by deregulation, vertical de-integration (unbundling), horizontal de-integration (divestment) and regulated third party access.
- Increase in consumer choice and their participation in short and long term demand management, as well as growing responsibility to secure their own energy.

The Experience of European countries showed that deregulation did not necessarily mean simplification – on the contrary refined regulation is needed for competitive market, than in the case of a vertical regulated monopoly⁷.

Horizontal unbundling of vertically integrated companies is the most important part of forming a competitive market. It ensures the separation of competitive and monopolistic activities, puts market actors (generators or suppliers) in equal conditions so that none of them have advantages, firstly because of network ownership and secondly, to stimulate the operators to make additional investments and develop the networks further. Power system unbundling in competitive and natural sectors is shown below:

⁶“Power System Economics, Designing Markets for Electricity”, Steven Stoft,2002, pp.6

⁷“Power System Economics, Designing Markets for Electricity”, Steven Stoft, 2002

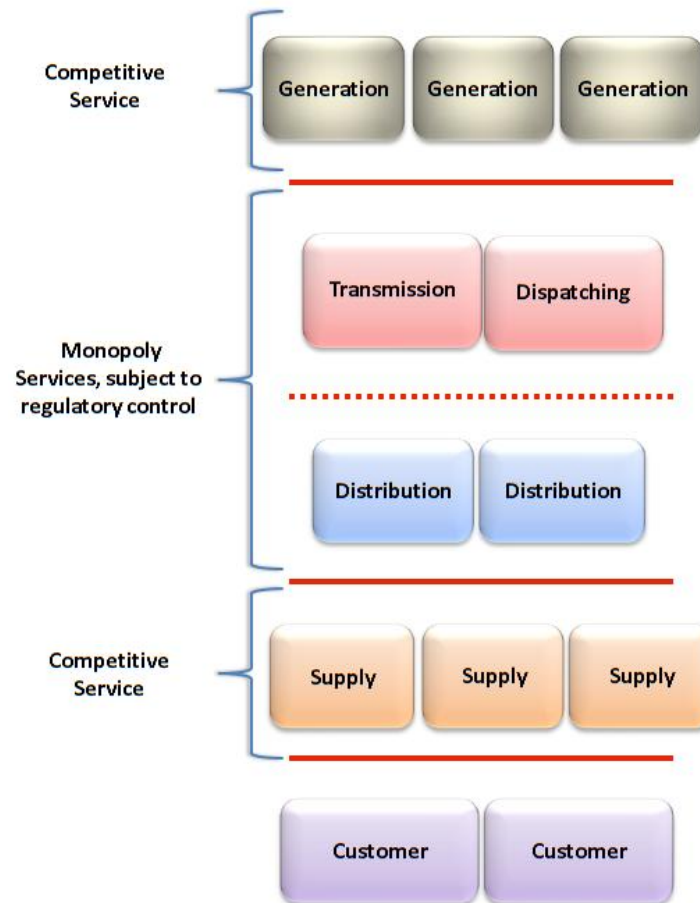


Fig. 3 Natural Monopolies and Competitive Markets in the Electricity Sector

Gradual unbundling and implementation of competitive market relations is a necessary condition for meeting the requirements of EU energy directives and regulations.⁸

In particular, several levels of unbundling are considered:⁹

- Accounting unbundling - Separation of accounts for the transmission/distribution and other activities of a company.
- Management unbundling - Management of the network business must be separate from the management of the remainder of the company.
- Legal unbundling - A separate legal undertaking is created in which all the activities of the network company are carried out. Experience has proven, that a legally separate company will tend to act more independently, than one in which only management unbundling takes place.

⁸<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:1997:027:0020:0029:EN:PDF> – 1 directive package

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2003:176:0037:0037:EN:PDF> – 2nd directive package

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:211:0055:0093:EN:PDF> – 3rd directive package

⁹<http://www.euractiv.com/energy/eu-electricity-market-liberalisation/article-169597>

- Ownership unbundling- Clear ownership unbundling between transmission system and any supply undertaking. The vertically integrated company is required to sell its network so that it is controlled by shareholders not active in the generation, production and sale of electricity or gas.

In case of unbundling, the prices are defined by different mechanisms on different supply stages. In the generation and supply sector the mechanism for setting prices is a competitive market, while in transmission/dispatching and distribution sectors prices are set through regulation.

The benefit of horizontal unbundling was justified by the experience of European countries, clearly showing that unbundled company consumer prices have historically increased less, compared to vertically integrated companies.¹⁰

European Electric Energy Market Liberalization

European countries started to liberalize energy markets intensively in 1997¹¹. Germany, Great Britain and the Scandinavian countries were the first ones to start the process, while France, Greece, Ireland, Italy and Portugal have kept vertically integrated companies for a very long time. By the year 2002, 80% of energy markets in Europe were open for competition. A crucial moment in the European liberalization of electricity markets came with the February 1997 adoption of the EU Electricity Directive 96/92, which compelled all EU member states to begin progressive deregulation of their electricity sectors. Generation would be deregulated first, allowing for free competition and new entrants, while transmission and distribution would remain regulated via price caps by regulatory bodies.

The European Commission has prepared three packages of directives in which the second and the third packages are most important. The main differences are given in the table below. The table shows how the directives about the separation become stricter gradually.

	2 nd Package (2003)	3 rd Package (2009)
To obtain the permission to start construction of new facility in Energy Market	Authorization, Tender	Authorization
To separate the transmission network from production and supply sectors	Accounting; Management; Legal;	Ownership; Independent System Operator; Independent Transmission Operator;
To separate the distribution network from production and supply sectors	Accounting; Management; Legal;	Obligatory legal separation in case of more than 100 000 costumers
The Regulatory body	Independent from Energy	Independent as from energy

¹⁰<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52007PC0528:EN:NOT>

¹¹ „Deregulating Electricity Markets: The French Case” INSEAD, 2004

	Industry sector	industry sector, as well as the government
To allow the third party in the network	Obligatory	Obligatory

It is worth mentioning, that the third package of directives does not call for separation of ownership for distribution companies. It also offers alternative ways of unbundling to the transmission companies (ownership separation; independent system operator, independent transmission operator).

Moreover, apart from the separation of ownership, in some cases it is recommended to introduce regulatory mechanisms that could remove possible nonmarket activity.

It is noteworthy, that countries have different approaches in electricity market liberalization. This is the reason for the difficulties that occur in the implementation of directives in some of them. In addition, in particular cases, based on local specifics, some exceptions are allowed for several countries. For instance, the exceptions concerned Cyprus and Malta because of the small and isolated electricity systems.¹²

In order to illustrate the Energy sector restructuring, we can present the cases of Germany and France, the countries with the biggest energy markets in Europe.

Germany

Germany is the leading country in Europe with its consumption share (19%). Its annual consumption reaches 547 TWh¹³. In 2002 up to 520¹⁴ electricity Production Companies were functioning in Germany, among which there were four biggest producers that generate 70% of the whole production.

Prior to deregulation Germany had a three-level supply structure:

- *eight supra-regional interconnected companies that produced 81 % of the total electricity production*
- *about 80 regional supply companies that produced 7 % of the total*
- *some 900 municipal supply companies (12 % of electricity production)*

Market opening led to strong price competition that revealed excess capacity in electricity production and forced market players to involve both in the rationalization and restructuring programs. This led to a strong concentration process in the German market and profound structural change, which included 30 mergers (involving 80 companies) and 100 cooperation ventures (including 500 companies). The significant part about this process was that when the large companies merged to retain a competitive position, the smaller companies began to cooperate and act jointly in order to gain market power. The utilities that were owned by the municipality were privatized. Finally four companies (E.ON, RWE, EnBW, Vattenfall Europe).were created, from eight large energy supply companies.

Due to Electricity market liberalization the previous activities were divided into: production/generation, wholesale and retail, transmission and distribution. All this in favor of creating new markets.

In Germany, electricity markets include wholesale as well as retail trade. The wholesale market is for electricity producer and supplier companies and big industrial customers. As for retail markets, supplier companies sell the

¹² It is notable that according to Europe's decision Nabucco pipeline is free from tariff regulations and third party access for 25 years.

¹³ http://www.nationmaster.com/graph/ene_ele_con-energy-electricity-consumption

¹⁴ Integrating Electricity Markets through Wholesale Markets: EURELECTRIC Road Map to a Pan-European Market / 2005

electricity purchased on the wholesale market. Wholesale trade takes place through bilateral direct contracts (OTC - over the counter), as well as through financial derivatives.

In Germany, the retail electricity markets have been functioning since 1998. However, electricity consumers (100%) were granted the right of a free choice only from 2005 and in France from 2007.¹⁵ The main electricity consumers in Germany are the power intensive industries; aluminum, chemistry and paper. Germany has the best quality of supply in Europe (only 15 min/year outage).

During the first 2-3 years after electricity market liberalization, the prices were actually decreasing (5 % for everyday products, 30% for industrial products). However, since 2002 prices began to increase again, which was caused by changing amortized technologies with new ones and an increase in taxes.

Germany is the leader in EU directive implementation. The management and legal separation of network monopolies is actively taking place. Although, there remain couple companies that own network assets and supply the product apart from generation objects. These are RWE¹⁶, E.ON¹⁷, Vattenfall Europe¹⁸. The situation is complicated also by the fact that companies based on the gentlemen's agreement do not interfere in each other's businesses that limits the competition in some sense.

France

The French government clearly positioned itself as an opponent of the liberalization process of the EU electricity market and it argued its point on a number of grounds. For one, liberalization in other markets had not always been clearly successful in lowering prices or guaranteeing supply. In addition, energy is a strategically important sector for the country. It was believed that monopoly favors the society interests more than a competitive market does. Serving places that are far away from each other can be unfavorable, and therefore it is better to serve them through a monopoly, since a competitive market is unable to do the same. The thrust of this argument was that utilities were a natural monopoly because of the high economies of scale associated with the industry. These imply maximum efficiency at monopoly level. The choice for a monopoly structure reinforced the need however, for state ownership because of the risk of market power abuse should the electricity company be privatized. Market inefficiencies in energy would thus be minimized by having a monopolist that would consider public interest as its first priority, and not abuse its dominant market position. Prices and price volatility would both remain low because the monopolist would only take "fair" profit and prices would not reflect short-term market changes.

The largest share of electricity generation in France comes from nuclear stations of the company Electricity De France (EDF). Nuclear stations made France the most energetically independent country in Europe. In addition, the prices were the lowest here for a consumed unit of electricity. Together with advantages, this system had disadvantages too. Nuclear stations always carry the danger of nuclear catastrophes and are characterized by a short amortization period (30 years).

France had two regulatory bodies, the government and the Electricity Regulation Commission (CRE) created in March 2000. The government applied the energy policy, defined public service responsibilities and ensured their proper implementation. The regulator recommended electricity tariffs to the Minister of Energy who would approve them and ensure that the tariffs cover the full cost of supply. The CRE monitored fair and transparent user access to the public electricity transmission and distribution networks and it had the power to impose penalties. Despite the protectionist politics that France is implementing, in year 2002, the independent Transmission Management Network – RTE was formed. RTE is regulated by the regulatory commission and provides the whole country with the electricity. EDF has only generation objects in its ownership. In France, the market share of EDF

¹⁵<http://www.leonardo-energy.org/training-module-electricity-market-regulation-session-2>

¹⁶<http://www.rwe.com/web/cms/en/179662/rwe/responsibility/>

¹⁷<http://www.eon.com/en/corporate/2033.jsp>

¹⁸<http://www.vattenfall.com/en/our-business.htm>

was 93.8% by 2001 and in order to implement competition EDF started to reduce its share and began to invest in the neighbor countries. Today EDF has 85% of the electricity sector in France, 16% in Great Britain and 15% in Italy.¹⁹

Notably, despite intensive liberalization, the retail market in Europe is still in its development stage.²⁰ 57% of the households still pay the regulated tariffs. This creates a major obstacle for competitive market development. National European wholesale markets are mostly comprised of local energy companies.

In the conditions of an effective competitive market, different prices created for the peak, off-peak, night and seasonal rates maximally closely reflect the actual cost of electricity supply at each period of time, and through different components of the system give signals about market actors and for optimizing their performance as needed.

Several different markets function simultaneously in developed electricity systems, these are:

1. Energy
2. Capacity
3. Ancillary services
4. Derivatives

The Market for ancillary services guarantees that system operator to procure additional services such as: frequency regulation, reactive power supply, black start of the system, etc.

Time wise the markets are divided into futures' (future long run) market, spot markets (a day ahead, during the day or in real time) ex-post markets (post factum). This kind of separation serves to balance trade differences.

In order to develop the competition and increase the reliability of supply one of the main trends of the European energy policy is to create the internal energy market. The united European market assures the connection of different country generators and suppliers and the free flow of energy across the borders, thereby increasing production efficiency in transmission and distribution sectors and providing the high-level of energy security.

By establishing European Energy Community EU seeks to extend the principles of the European energy market, promote competition and increase the level of energy security in EU and non-EU countries. Georgia holds the status of an observer in this organization.

Regulation of electricity markets

In deregulated markets, the role of the government is reduced to planning and long term energy policy development, as well as creation of appropriate regulatory mechanisms (the independent regulatory agencies). It should be noted that the liberalization of electricity markets does not imply reducing the role of the regulator. On the contrary, the area and the importance of its responsibilities are expanding. Regulation is needed to prevent the abuse of monopoly power, discrimination of market participants, and unjustified price increases by

¹⁹EDF group, reference document 2010 pp.44

²⁰EU Energy Markets in Gas and Electricity – State of Play of Implementation and Transposition, 2010.

naturally monopolistic network industries. The Regulator is responsible for ensuring fair competition and elimination of market abuse.

The main functions of the regulator are:

i. Price control. The regulator sets the tariffs for network operators. It considers their operational and capital expenditures and balances the interests of the customer and the licensee, so that it does not unreasonably increase the cost on one hand, and on the other hand for it to provide the possibility for developing the network and assuring long-term reliability of supply.

ii. Product and service quality control. The regulator monitors the quality and reliability of electricity or natural gas supply. For example, a stable power supply indicators are SAIDI (The **System Average Interruption Duration Index (SAIDI)** is commonly used as a reliability indicator by electric power utilities. SAIDI is the average outage duration for each customer served) and SAIFI (The **System Average Interruption Frequency Index (SAIFI)** is the average number of interruptions that a customer would experience). The number of complaints to the quality of the service and their content is also a service quality indicator.

iii. Ensuring market functioning and the elimination of non-market activity. The Regulator monitors the effective functioning of electricity competitive markets and responds appropriately if non-market behavior is noticed.

iv. Third Party Access. The regulator obligates electricity transmission and distribution network operators to allow for different generation units to supply electricity generated by their customers through the network on non-discriminatory terms.

v. Licensing. The regulator shall issue a license for search of energy resources and the subsequent power production, the transmission, distribution and supply to final customers. It also provides for the safety of market participants, environmental protection requirements and further necessary investments, etc.

Regulation is effective if it costs less than the economic benefit it delivers.

The Electricity Sector in Georgia

It is worthwhile to consider the structure of the Georgian power system in comparison to the EU systems and electricity market structures, with respect to sector's unbundling and the possibility for competitive market functioning.

Georgia is a country rich with hydro resources and the largest share (93% in 2010) of power generation comes from hydroelectric power plants. Currently the country has 20 large and 27 small hydroelectric power stations²¹. Out of the hydropower plants the largest Enguri/Vardnili cascade is state owned, five belong to "Energo - Pro Georgia" - and two are owned by "Inter - RAO EES", with the rest owned by other private owners. In addition, to hydropower plants there are three thermal power plants functioning as well, including "Mtkvari Energy" owned by to "Inter - Rao EES," Tbilisresi owned by Georgian Industrial Group and "G-Power" owned gas turbine plant.

²¹<http://www.menr.gov.ge/4379>

There are other companies having the major generation plants and consumer industries under their ownership: E.g. "Georgian Water and Power" owns Jinali HPP, "Georgian Manganese" owns Vartsikhe HPPs, and the largest power consumers (FeroAlloy Factory, Chiaturmanganum); The Georgian Industrial Group (GIG) owns both large generation (Tbilsresi) and various consumption production industrial enterprises.

There are more than a dozen companies that produce or are starting new constructions of a small hydro power sector, and are therefore considered as potential stakeholders.

There are three electricity transmission companies operating in Georgia: Ltd "Georgian State Electrosystem" (GSE), JSC "Sakrusenergo" and LLC. "Energotrans".

The Georgian State Electrosystem Ltd. (GSE) was established in 2002 by merging JSC Electrogradatsema and Electrodispetcherizatsia Ltd. It carries out the following activities:²²

- Electricity transmission on Georgia's territory through the high voltage network (35/110/220 kV);
- Electricity dispatch and control of Georgian power system to ensure overall system reliability and proper operation of 500/330/220/110/35 kV transmission facilities under a normal operational mode, as well as in emergencies.

JSC "Sakrusenergo"²³ was founded on May 27, 1996, based on a joint decision of the Georgian and Russian governments. As of today, 50% of the company shares belong to the Enterprise Management Agency of Georgia and the other 50% - to JSC Federal Power Grid Company - the Russian RAO UES. Its main function is the transmission of electricity through 500 kV transmission lines and service for interconnected lines with neighboring countries (except Armenia), and technical services.

"ENERGOTRANS" Ltd. was established in 2002. Full 100 % of the company share is under state ownership. Since 2009 "Georgian State Electrosystem" Ltd (GSE) became a partner of "ENERGOTRANS" Ltd. It owns 500kV power transmission lines "Tbilsresi-South Georgia-Zestafoni", involving 859 towers and crossing 9 regions on the entire territory of Georgia. Electricity is distributed by three distribution companies in Georgia: Energo-Pro Georgia Ltd., JSC Telasi and "Kakheti Energy Distribution Company Ltd."²⁴

JSC "Energy - Pro Georgia" is the largest distribution company that owns high (110 kV), medium (35-10 kV) and low (6-0,4 kV) voltage networks on the whole territory of Georgia except Tbilisi and the Kakheti region.²⁵ Apart from the distribution sector, the company owns eight hydroelectric power stations (Rioni, Gumati cascade, Shaori, Dzevrula, Atsi, Lajanuri, Satskhenisi, Chitakhevi HPPs) with the total installed capacity of more than 414 megawatts -

²² www.gse.com.ge

²³ www.srenergo.ge

²⁴ www.minenergy.gov.ge

²⁵ www.energo-pro.ge

which is more than 26% of total country capacities. Energo-Pro Georgia provides 2,150 billion kWh of electric energy a year to its 850 000 consumers.

Electricity sales by the company make up 25% of the total electricity consumption in the country. It is noteworthy that distribution network was privatized in a single package with generation assets. Energo –Pro provides also electricity transit service and customer technical service. In addition it is working on the development of its own transmission line to Turkey.

JSC "Telasi" is the second largest distribution company on the Georgian electricity market. It owns high (110 kV), medium (35-10 kV) and low (6-0,4 kV) voltage networks in Tbilisi and its surrounding areas.²⁶ JSC "Telasi" supplies about 2 billion kWh per year to its 416 500 customers. Since 2003 the owner of 75% "Telasi" stocks is Inter RAO EES a subsidiary of Russian United Energy Systems. Along the distribution network of "Telasi" Inter RAO EES owns also the generation facilities: Mtkvari Energy a thermal power plant with 300 MW installed capacity and the Khrami -1 and Khrami 2 HPPs. Under the MoU signed with the government Telasi is provided with stable long term tariff in return for obligation to build new Khrami 3/4 HPPs.

JSC „Kakheti Energy Distribution,²⁷" is a distribution company operating in the Kakheti region, which was established on the basis of JSC "Sinatle" in April, 2003. Kakheti Energy Distribution company provides 200 GWh of electric energy annually to its 117 058 consumers.

All three distribution companies along with distribution are also suppliers of electricity; i.e. they buy electricity and sell it to the customer. Independent suppliers are practically not participating in the market.

Energy Sector Governance

The main governing entity in Georgian energy sector is the Ministry of Energy and Natural Resources, which supervises state-owned enterprises and has regulatory authority functions. The main functions of the ministry are:²⁸

- ✓ Develop short, medium and long-term energy strategies and priorities;
- ✓ Promote investments in the energy sector;
- ✓ Ensure optimal management of the privatization process;
- ✓ Create legislative and normative bases in the sector;
- ✓ Coordinate the process of electricity and natural gas production, transmission, dispatch, distribution, import, export and final consumption;
- ✓ Promote scientific - research and educational programs in the energy sector;
- ✓ Determine an energy security strategy;
- ✓ Promote expansion of energy production, use of renewable energy resources, and supporting energy efficient technologies.

²⁶ www.telasi.ge

²⁷ <http://www.menr.gov.ge>

²⁸ <http://www.menr.gov.ge>

The Georgian National Energy and Water Supply Regulatory Commission (GNEWRC) is the main regulatory body, which according to the law should be independent from other government bodies, entities and organizations.

The main functions of GNEWRC are:

- Setting tariffs for power generation, transmission, dispatch, distribution, transit, import and consumption, Electricity System Commercial Operator services, capacity reserves, as well as new customer network connection fees;
- Licensing and control of compliance with license terms of market participants;
- Setting and approval of Energy and water supply and usage rules, tariffs and tariff methodologies;
- Conflict resolution among Market participants;
- Coordination of the certification process;
- Setting the conditions of services provided by Licensee, importer, exporter, supplier.

Power plants in Georgia are subject to different tariff regulation according to size and ownership:

- Power generation tariffs are fixed for Enguri and Vardnili HPPs;
- Tariff caps are defined for other power plants, including gas fired ones;
- Small power plants with the capacity below 13 MW and newly built power plants (built after 2004) are free from to tariff regulation;

Along with energy tariff thermal power plants are entitled to capacity reserve payments while hydro plants do not have capacity reserve margins. Such a tariff structure seems to be unique for Georgia and is much different from other countries pursuing the model of competitive energy market.

According to the market rules in Georgia, energy licensees conclude short-term (1 year) or long-term (5 year) power purchase agreements between consumers and producers. The balance of un-contracted energy is traded by Electricity System Commercial Operator (ESCO).

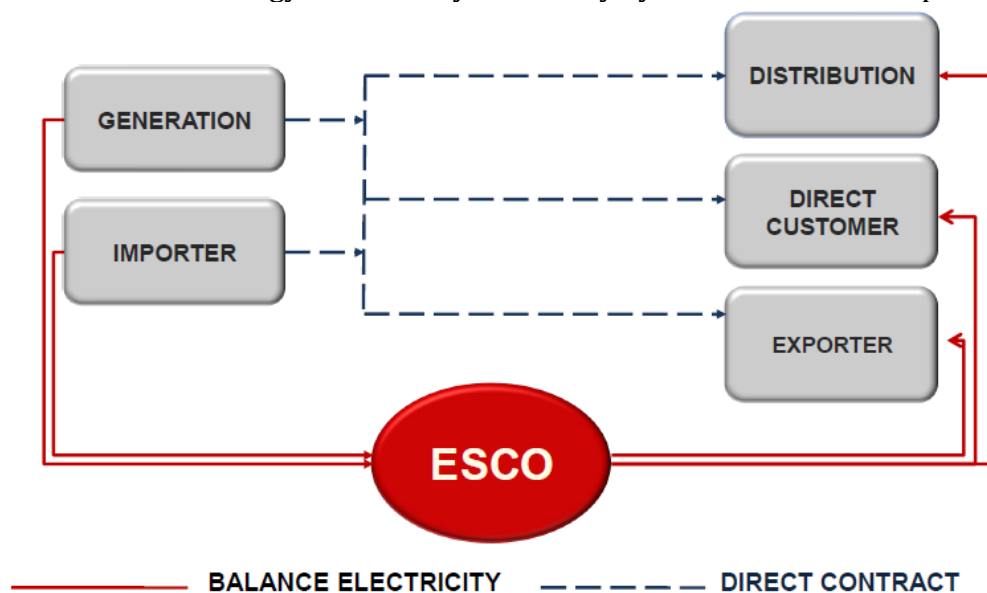


Fig 4. Electricity trade model²⁹

²⁹ <http://www.menr.gov.ge/4367>

ESCO³⁰ started functioning in September 1, 2006.

The functions of ESCO are as follows:

- The Purchase and sale of un-contracted leftover “balancing” Electric Power (capacity);
- Trade with Guaranteed reserve Capacity;
- Determination of the actual amount of electricity sold and purchased and/or received;
- Inspection of the meters used in wholesale trade;

The greatest share of electricity is sold via direct bilateral contracts. The balance energy traded by ESCO 12-15% of total electricity and the settlement period is one month.

The eligible consumers (consuming more than 7GWh/a) have the right of wholesale power purchase. By 2017, this limit will be decreased to 1 kWh but implementation mechanisms will be needed in order to enable the free consumer choice in practice.

The Horizontal division of the Georgian energy system is the following:

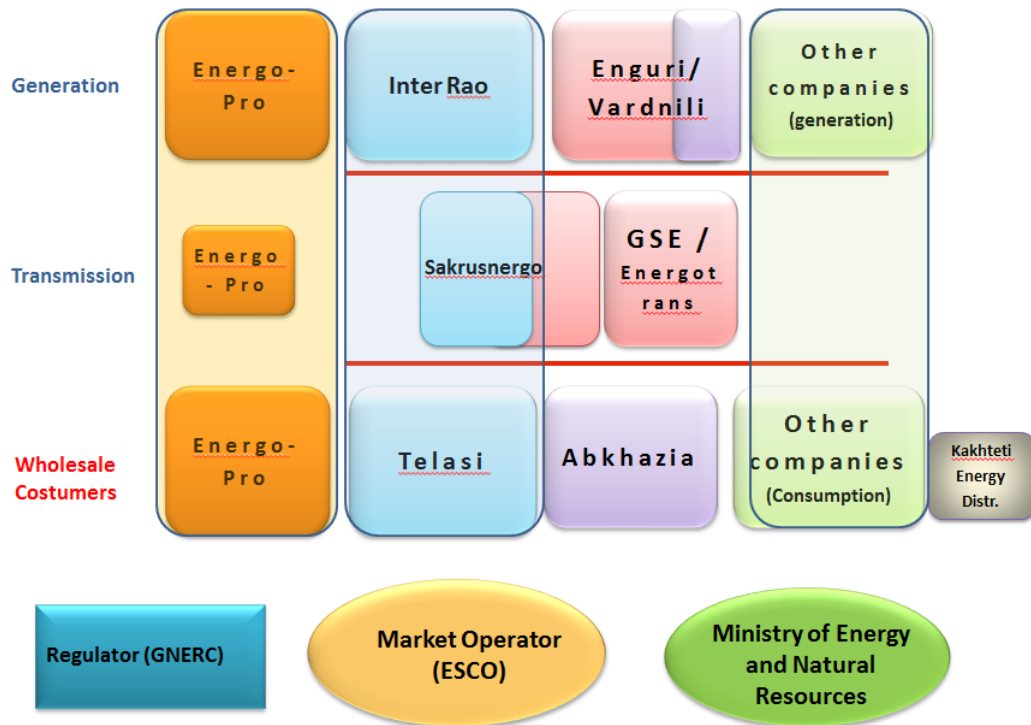


Fig. 5 Georgian Electricity Market

The same color shows united ownership or the same enterprise. Since there is no formal requirement

One can see, that the power system is divided into several, partially vertically integrated segments (Energo-Pro (orange), RAO-UES (blue), State (red), Abkhazia (purple), major generator/consumer companies (green)). The generation and supply/distribution or generation and consumption businesses have same owners, or

³⁰www.esco.ge

are united within a single company. Since the bilateral power purchase agreements are the main form of electricity trade, one can expect with that the buyers procure electricity mostly from own generation sources. In addition, the electricity from Enguri and the expensive electricity from thermal power plants, as well as system reserve obligations, are distributed based on the principles that need further clarification.

This segmented structure of the Georgian power market significantly differs from the Western and namely European market models and has very narrow (if any) niche for competition. This non-competitive structure has been formed through the MoUs between government and investors, where generation and distribution assets were offered in one privatization package. The situation is further complicated by the fact that these long term memoranda also, fix long term fixed tariffs that are being later approved by GNERC, in difference with the accepted principles of regulation.

Further liberalization of the Georgian power market and bringing it in closer compliance with the European energy legislation, will require addressing significant challenges of:

- Unbundling of some form of the existing energy system structure;
- Deregulation in the generation sector and development of the wholesale market;
- Bringing GNERC and the Ministry functions in compliance with the EU standards and market models;
- Development of a retail market and practical implementation of third party access;
- Creating competition between uneven market players (Enguri1300 MW and 1-2 MW of small hydropower stations);
- Assure a common development strategy for the tripartite transmission operator etc.

This tasks have to be accomplished with the account of other specific conditions of the Georgian power sector operations:

- The major difference of the competitive environment in summer and winter, due to hydropower excess in summer and shortage in winter;
- Georgian power system dependence on external markets, due to seasonal imbalance of supply and demand;
- The special status of the major generating source - Enguri cascade and a major consumption center in Abkhazia, due to the occupation of Georgian territory.

A thorough consideration of these and other relevant circumstances will be needed, in order to turn the harmonization with the EU energy legislation into practical reality. Along with being a major step towards EU integration, this will also be the premise for successful electricity trade with Turkey. An in-depth research will be needed for development of an optimal road map for further market reforms, which is far beyond the scope of this article.

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WEG 2012, January