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COMPARATIVE ANALYSIS OF THE DEVELOPED CONCEPTS FOR THE NEW ELECTRICITY MARKET IN GEORGIA

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DATA

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ACRONYMS

BM	Balancing Mechanism
BRP	Balancing Responsible Parties
CfD	Contract for Difference
DAM	Day Ahead Market
DSO	Distribution System Operator
ESCO	Electricity Market Operator
ETM	Electricity Trading Mechanism
GNERC	Georgian National Energy and Water Supply Regulatory Commission
GoG	Government of Georgia
GWh	Gigawatt Hour
IDM	Intraday Market
MO	Market Operator
MoESD	Ministry of Economy and Sustainable Development of Georgia
MP	Market Player
NP	Nord Pool
PPA	Power Purchase Agreement
PSO	Public Service Obligation
TSO	Transmission System Operator
USAID	United States Agency for International Development
WG	Working Group
WP	White Paper

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BACKGROUND

USAID projects have been actively supporting the Government of Georgia (GoG) in reform making process. Working Groups (WG) on Electricity and Gas Market Development were established to develop and support the implementation of Action Plans for necessary activities and results. USAID Energy Program has provided numerous recommendations for a smooth transition to the target market model and has identified a list of transitional issues that remain challenging in need of a solution.

USAID Energy Program published a White Paper on Market Concept Design of Georgia¹ (hereinafter – USAID Energy Program WP) in July 2018.

Almost at the same time, Nord Pool released own version of the concept² on reforming the Georgian market (hereinafter – NP Concept) with fundamental differences from USAID Energy Program WP mostly regarding the Electricity Trade Mechanisms.

On December 2018 the Ministry of Economy and Sustainable Development of Georgia (MoESD) approved the Concept Design for Georgian Electricity Market³ (hereinafter – MoESD Concept).

The objectives of this report are:

- to identify Georgian Electricity Market Concept Design approved by the MoESD and White Paper on Electricity Market Concept Design, developed by USAID Energy Program;
- to show the fundamental differences with Nord Pool approach;
- to make an analysis of the Transitional Plan outlined in the approved market concept design, recommendations and next steps.

¹ White Paper on Market Concept Design of Georgia, July 10, 2018, USAID Energy Program, Deloitte Consulting LLP.

² (1) Electricity Market Concept Design and (2) Electricity Market Concept Design for Georgia. Transitional Measures, Nord Pool Consulting, June 2018

³The Concept Design for the Georgian Electricity Market approved by MoESD at December 2018.

MOESD CONCEPT AND USAID ENERGY PROGRAM WP IDENTITY AND DIFFERENCES FROM NP CONCEPT

MARKET STRUCTURE

The proposed wholesale market structure is identical in all three documents including NP Concept. Market Participants and institutions are:

- Generators;
- Eligible consumers;
- Traders;
- Suppliers including Universal Supplier;
- Wholesale Public Service Entity;
- Balancing Service Provider;
- Balancing Responsible Party;
- Transmission System Operator (TSO);
- Distribution System Operator (DSO);
- Market Operator (MO).

Chapter 4 of the MoESD Concept defines the roles assigned to the MoESD, however it should be extended according to the draft Law on Energy (December 2018).

Table 1: MO Responsibility

MoESD Concept	USAID Energy Program WP
<ul style="list-style-type: none"> • Establish and operate Day-Ahead Market (DAM) and Intraday Market (IDM) of electricity markets in line with the Law and the Electricity Market Rules; • Register and keep records on electricity market participants; • Publish and exchange information required for unhindered organisation of the Market and performance of electricity activities; • Receive orders (bids and offers for buying and selling power) from Balancing Responsible Parties (BRPs) for DAM and IDM; and • Maintain and update a trading calendar. 	<ul style="list-style-type: none"> ▪ Prepare Revisions to Market Rules; ▪ Registration of Electricity Generation Facility; ▪ Revision of Market Organization, Propose Improvement Measures; ▪ Recommendations on Balancing Rules Within Network Code; ▪ Recommendations on Cross-Border Capacity and Congestion Management; ▪ Surveillance of Trading Facility; ▪ Reporting to Georgian National Energy and Water Supply Regulatory Commission (GNERC) on Infringement of Rules; ▪ Organize DAM and IDM; ▪ Possibility of Stock Exchange in Derivatives; ▪ Justify Fee Structure; ▪ Annual Operational and Financial Plan; ▪ Contracts Registration and Database; ▪ Daily Scheduling of Contracts; ▪ Informing TSO of Daily Schedules; ▪ Market Players (MPs) Database; ▪ Data Publishing Required to Support Market Activity; ▪ Settlement system; ▪ Cyber Security / Data Security; ▪ Dispute Resolution.

ELECTRICITY TRADE MECHANISM

There is a fundamental difference between the Nord Pool approach and two approaches by the MoESD and USAID Energy Program in regard to Electricity Trade Mechanism (ETM).

Electricity Trade Mechanisms proposed in USAID Energy Program WP and the MoESD Concept are identical and include:

- *Contractual trade – (1) Regulated segment and (2) Bilateral physical contracts at free negotiated prices;*

- DAM;
- IDM;
- Balancing Market (BM).

Moreover, USAID Energy Program WP contains some details of the tools for the implementation of trade segments.

Table 2: Contractual Trade

MoESD Concept	USAID Energy Program WP	NP Concept
Regulated segment		
<p><u>Article 10.</u> The first and the second stages initially envisage the reorganization of the existing structure into a form of market to allow the co-existence of the deregulated and regulated sectors. As an interim measure, it will be necessary to use state-owned generation to serve non-eligible customers through a defined group of plants to the regulated segment. In the regulated segment, electricity provided to the non-eligible customers would be priced at the capped tariffs set by GNERC</p>	<p>As a transparent mechanism for allocating the generation to wholesale buyers, the concept of Partial Pool is proposed. The Partial Pool concept assumes the allocation of any share of generation of selected generators between consumers in proportion of consumption taking into account the priorities of each consumer during the allocation of each generators (structure can be different for hours, seasons). Prices cannot be higher than the capped tariffs set by GNERC Optimal structure of Partial Pool must be determined based on simulations and appropriate Rules should be created.</p>	<p>Elimination of regulated segment</p>
Bilateral physical contracts		
<p>For any period including domestic market, export / import</p>	<p>For any period including domestic market, export / import</p>	<p>For export / import only</p>

The presence of a regulated sector allows the protection of end-users in particular vulnerable ones and the reduction of the volume of Public Service Obligations (PSO).

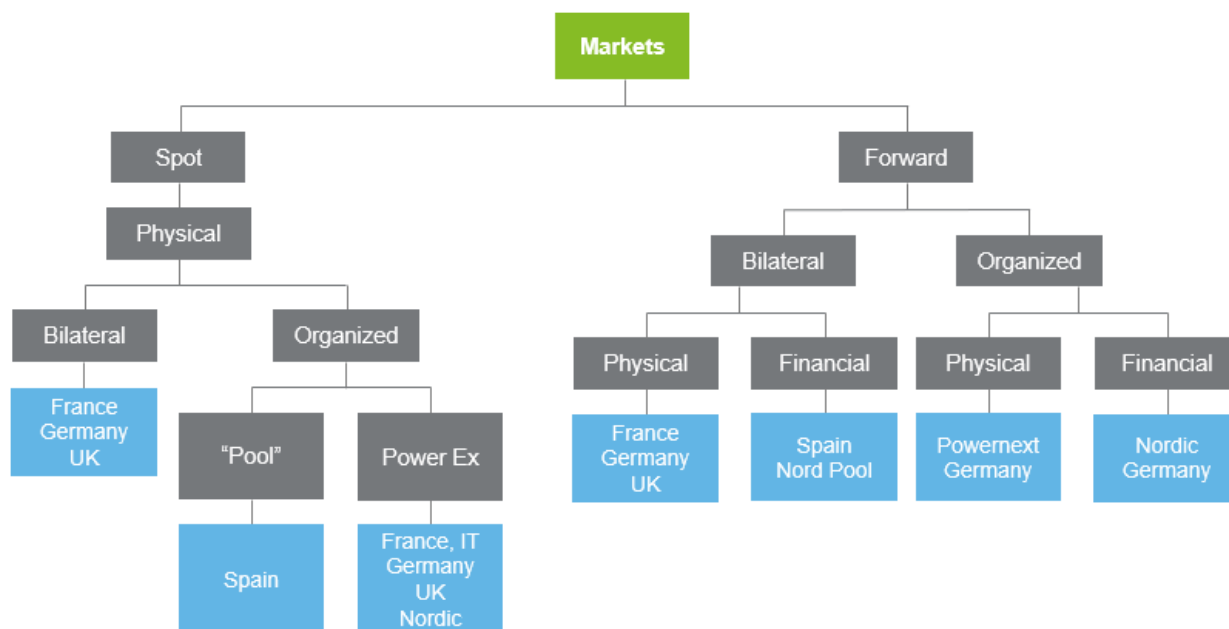
Bilateral physical contracts in the domestic market allow participants to improve their functioning. The existence of such contracts also permits to reduce the volume of PSO in case of making a decision on refusal of payment obligations according to PPA on contracted volume.

The proposal to abandon contract trading in the domestic market (almost 100% DAM) is most likely determined by an attempt to simply introduce the principles of NP market without taking into account the specifics of Georgia, in particular:

- *lack of effective generation surplus (net deficit in Georgia is 920 GWh in 2018);*
- *free flow to Abkhazia;*
- *a large number of signed Power Purchase Agreements (PPAs) with generators and privileged consumers.*

At the same time, contract trading is used in many European countries (Fig. 1).

Figure1: ETMs



Source. *Power Market and Trading, Juan J Alba, 2006*

Moreover, in many countries, the transition to organized markets takes years. Thus, Australia has been increasing the organized market volume at 20% every two years, Turkey began DAM implementation in 2011 and reached a volume of 41.6% by 2016.

The MoESD retains the contractual trade and, in particular, the regulated segment in order to avoid a shock price increase for end users. Moreover, the concept does not define a period of complete refusal.

Day Ahead Market

In accordance with the MoESD Concept and USAID Energy Program WP, the residues of generation/consumption (uncovered by contracts) are traded on DAM while the NP Concept suggests covering practically 100% volume of consumption on domestic DAM (except import transactions).

The MoESD Concept and NP Concept imply the marginal or market clearing price on DAM. The Same proposal is in USAID Energy Program WP, but in addition the analysis of “pay as bid” principle is proposed.

The main justification is the application of the principle of marginal cost bidding (Article 3, MoESD Concept), however, to use it, real competition is needed, which means that it is necessary to have an effective generation surplus (absent in Georgia for most of the year). In this regard, it is ambiguous that e.g. Enguri HPP will order the minimum price given that it always gets into the power system balance.

That is why USAID Energy Program WP proposes to conduct a comparative analysis of pricing for DAM taking into account the specifics of Georgia with an objective of making a final decision for the first transitional phase.

Marginal or Market Clearing Pricing creates more incentives for generators to increase efficiency, but at the same time has more impact on price growth.

Intraday Market

As a part of Organized Market, the IDM allows to increase the planning accuracy and minimize participation on Balancing Market.

The implementation of the IDM is planned:

- *in 2022 in accordance with MoESD Concept;*
- *even in 2020 in accordance with NP Concept.*

In USAID Energy Program WP the implementation time is not defined, given that for IDM actual operation, it is necessary to have a perfect metering system that functions in real time. Given the current situation, it is a problem especially for consumers who buy electricity from many nodes. IDM can be implemented only after this.

Balancing Market

Balancing Market is a tool of MP's or BRP's personal responsibility that is absent in the current market (Electricity Market Operator (ESCO) determines balancing average price based on sum of deviations and trade through ESCO and all consumers pay regardless of deviation or non-deviation).

Both in the MoESD Concept and USAID Energy Program WP market of deviations is proposed to be considered as Balancing Market on which Balancing Service Providers function by using ramp up / ramp down regulation (are awarded when performing dispatcher order) and MPs or BRPs, who deviate on its own initiative, are penalized based on imbalance service regulation.

Hourly deviations are defined as the actual capacity minus the sum of the contracts and the volume of trade in DAM. Obviously, for this all contracts must be firm, which is clearly spelled out in the USAID Energy Program WP and apparently adopted in the MoESD Concept.

The NP Concept doesn't provide details of the mechanisms of the Balancing Market, most likely this will be done later by their partners (Blueberries, Siemens).

Public Service Obligation

In accordance to the Article 4 (point 6) of the MoESD Concept the tasks of the PSO implementing entity may include, but not be limited to:

- Management of the existing PPAs, Renewable Energy Sources and agreements of privileged producers;
- Promotion of renewable energy resources;
- Encouragement of energy produced from state-owned and state-administered generation entities;
- Administering the wholesale supply for Universal (Retail) Supply obligations.

The volume of PSO is determined based on Contract for Difference principle (USAID Energy Program WP).

The volume of PSO is actually covered by the end-user tariff and given the really large volume in Georgia this can lead to a significant increase in the tariff.

So, the special tools are needed to minimize the PSO volume.

For example, by using Partial Pool concept, proposed in USAID Energy Program WP, it's possible to cover costs of Abkhazia's flow through other wholesale consumers. As mentioned above, minimization is possible at the expense of special rules, that will allow the exemption from performing the obligations under PPA in case of such participant concludes a bilateral physical contract (for the contracted amount).

Keeping the regulated segment in the MoESD Concept also allows alleviating the financial burden on end-users.

As additional tools, the "pay as bid" pricing on DAM as well as the restriction of prices of offer / bids can be considered at the first stage of the reform.

The NP Concept implies coverage of Contract for Difference (CfD) volumes only through PSO.

TRANSITIONAL AND ACTION PLANS

The Transitional Plan was developed within USAID Energy Program based on draft Law on Energy dated March 2018, according to which a completely new market had to be introduced from January 1, 2019.

Considering the delay in the approval of the updated Law (dated on December 2018) and the Concept, as well as agreement on a later transition to a new market, this plan should be revised that will allow carrying out more prepared transition.

The MoESD Concept provides activities to be implemented yearly. However, there is a need for certain additions for example, it is necessary to create transparent rules for the functioning of the regulated trading segment, Metering Rules, rules for consumer exit to the wholesale market, etc.

The document contains a list of tasks to be implemented with a breakdown by years with no intermediate models of a new market (the models are present in the USAID Energy Program WP). It seems that practically a new market is scheduled to be implemented from 2021. However, this brings in contradiction since the new draft law commits the introduction of support scheme for vulnerable population without which GNERC is unlikely to agree on transition.

It is important to note that both the MoESD Concept and USAID Energy Program WP pay special attention to carrying out simulations based on real data in view of specifications characterizing for Georgian Power System, which will help to adjust the approaches and create the regulations.

Summarizing the above, it is necessary to determine the intermediate models of the functioning of the new market and draw up a detailed Action Plan specifying the tasks, deadlines (not for years) and responsible organizations.

For this to happen, new entities need to be created in a possible shortest time, especially the Market Operator, which will bear the main burden of creating regulations and conducting simulations. Options for creating MO are given in USAID Energy Program WP.

All this is important in terms of commitments on market opening too.

The target market model must be agreed upon by the engaged stakeholders. This will aid to successfully open the market compared to the current situation when consumers are forced to enter the market with a lot of uncertainties. The consumers must have the choice to enter the competitive market voluntarily on the basis of clear rules for its functioning.

CONCLUSIONS AND RECOMMENDATIONS

1. The concepts presented in the “Concept Design for the Georgian Electricity Market” (MoESD) and in “White Paper on Market Concept Design of Georgia” (USAID Energy Program) are almost identical.
2. At the same time, there are fundamental differences in the approaches of MoESD / USAID Energy Program and Nord Pool (the main disadvantages of Nord Pool Concept on transitional phases are shown in Annex 1).
3. The terms of reform (even with prolongation) are quite short and require the immediate phased development and implementation of appropriate mechanisms and regulations.
4. It is urgent to create a MO, whose initial task will be to create regulatory documents that will form the basis for the creation of Target Market Rules.
5. To ensure a smooth transition to the Target Market and regulations development, the new market model without financial obligations for MPs in parallel with existing one must be launched (software is ready).
6. Lack of work experience on hourly markets requires the commencement of the capacity building for market players as soon as possible. This process should be phased and operate on permanent basis.
7. USAID Energy Program can provide support to all main stakeholders as well as Working Group on the development of trade mechanisms and regulations.

ANNEX 1. MAIN ADVANTAGES OF MOESD / USAID ENERGY PROGRAM CONCEPTS WITH NORD POOL APPROACHES

N	Trade segments	MoESD Concept and USAID Energy Program WP	NP Concept	MoESD and USAID Energy Program advantages
1	Regulated generation allocation	<ul style="list-style-type: none"> • Preserved • Partial Pool Concept (in USAID Energy Program WP) 	Fully eliminated	<ul style="list-style-type: none"> • Decrease of PSO volume and growth rate of end-user tariff
2	Bilateral Physical contracts	Domestic market and Export / Import	Export / Import only	<ul style="list-style-type: none"> • Decrease of PSO volume and growth rate of end-user tariff • More freedom for Market Participants
3	DAM	<ul style="list-style-type: none"> • VDAM1 • Marginal / Market clearing price • Pay as Bid principle (in addition in UEP WP) 	<ul style="list-style-type: none"> • VDAM2 > VDAM1 • Marginal / Market clearing price 	<ul style="list-style-type: none"> • Average generation price for consumers (regulated segment + DAM) is less • More potential for cross-border trade • The possibility of analyzing the use of option that lead to a decrease of price on DAM (the reference to the theoretical possibility of using the marginal cost bidding principle is unjustified due to the lack of effective generation surplus)
4	IDM	<ul style="list-style-type: none"> • In 2022 (MoESD) • As metering readiness to operate in real-time (USAID Energy Program) 	In 2020	More realistic deadlines
5	BM	<ul style="list-style-type: none"> • Marginal price • Weighted average price (in addition in USAID Energy Program WP) 	Marginal price only	The possibility to decrease price on BM if needed during initial stage of transformation
6	CfD	VCfD1	VCfD2 > VCfD1	<p>Lower volume due to:</p> <ul style="list-style-type: none"> • Keeping regulated segment, e.g. for Abkhazia, Universal Supplier, • bilateral contracts allows to decrease volume for generators with PPAs • possibility of using pay as bid principle on DAM and weighted average price on BM
7	Coverage of CfD	Multi-optional approach (USAID Energy Program) including Public Service Obligation PSO1	Public Service Obligations only PSO2 > PSO1	Minimization of the financial burden on end-users

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