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SOME CONSIDERATIONS IN RESPECT TO CUSTOMER-CENTRIC DEMAND RESPONSE MARKET DESIGN

Abstract:

For already of the past decade, the Georgia's electricity sector has been engaged in a complex process to bring increased competition to the business of electric generation, sales, and service delivery. But initial legislative and regulatory efforts to promote competition have focused on the supply side of the market: creating trading floors for energy and capacity sales, removing barriers to independent generators and marketers, and promoting open and non-discriminatory access to the transmission grid. It is assumed by many that robust competition among a variety of suppliers would be sufficient to ensure reasonable electricity rates and service options to customers. But the principal lesson learned from New England's, French, Germany, Austria and other power systems and markets is that competition among electricity suppliers alone (without an active demand response) is not enough to create efficiently competitive electricity markets.

Demand response provides a fair reward to consumers for demand flexibility without compensation of suppliers and relies on available technical solutions. But customers benefit alone is not enough to make demand response to participate in balancing market. Suppliers could also gain by making use of demand response, if they chose to do so.

Thus, the purpose of Our study is twofold: to show that robust competition among a variety of suppliers without an active demand response is not enough to create efficiently competitive electricity markets, and to test the hypothesis that "Only under the fully liberalized customer-centric demand response electricity market with "Aggregators" on place Georgia's domestic customers can reap the benefits from their "demand response" behavior in the form of reduced energy bills without the need of compensating suppliers".

In order to test our hypothesis, empirical analyses have been applied. Based exclusively on secondary data obtained from various sources, We have made the modification to the Georgian Electricity Market Model (GEMM2015) developed by Deloitte Consulting in collaboration with Pierce Atwood Attorneys LLC in 2012. Our considerations are based mainly on the cost-benefit analysis commissioned by Regulatory Assistance Project (RAP) aiming to prove that all customers benefit from explicit demand response, not just those customers who reduce their demand.

Thus, instead of paying to generators that sell energy in the balancing market a "market-clearing price" (in the event of "over-scheduling") or compensating generators to reduce generation (in the event of "under-scheduling"), it would be more reasonable to deploy responsive demand for balancing purposes.

Keywords:

Keywords: Demand response market design, explicit demand, implicit demand, peak demand, demand flexibility, energy policy, aggregator.

JEL Classification: D47, M31, Q41

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Introduction

For already of the past decade, the Georgia's electricity sector has been engaged in a complex process to bring increased competition to the business of electric generation, sales, and service delivery. The objectives of electric industry restructuring have been to harness the forces of competition to increase the efficiency of the electric system, to reduce costs, and to improve the services and choices offered to consumers.

For the purpose to meet the MENR's (The Georgian Ministry of Energy & Natural Resources) commitment to design and implement the minimum modifications (compliant with EU competitive market principles and harmonized with the Turkish power market rules and procedures) to the Georgian power market design to enable Georgian HPPs to sell their electricity output in the Turkish power market (and, eventually, other regional markets) with a Electricity Trading Mechanism (ETM) that properly allocates risks among market players and provides dependable cross-border transmission capacity rights, Deloitte Consulting in collaboration with Pierce Atwood Attorneys LLC prepared Georgian Electricity Market Model (GEMM 2015) in 2012.

The initial objective in developing Georgian Electricity Market Model (GEMM 2015) and Electricity Trading Mechanism (ETM) was to enable sellers to sell the electricity produced from renewable sources in Turkey and the EU, including access to European buyers who were mandated to purchase renewable energy. Among other objectives the proposed market design and electricity trading mechanism were developed for the purpose to guarantee market access for the new entities not already in Georgia's electricity market such as: Independent Power Producers (IPP) (new proposed power projects that did not satisfy RG¹ requirements and are above 13 MW would fall into the IPP category); Traders (including export and import activities); Consolidator (provides electricity marketing and trading services to small-and medium-sized generators); and Eligible Customers (customers that have the right to choose their supplier).

It was also envisaged that under GEMM, bilateral contracts between the various participants of the electricity market be established and non-regulated electricity market along with the regulated one is created in order to provide full third party access when the market is fully opened in 2017. But issues related to contractual obligations between the entities presently operating in the Georgian electricity sector, have not been considered. At the same time, prior to implementing GEMM and ETM the Grid Code (Metering, Communications, IT, System Protection Equipment) and Market Operating Rules (Balancing Rules, Clearing Rules, Imbalance Service) needed to be developed and approved by the Georgian National Electricity & Water Services Regulatory Commission (GNEWRC).

¹ Regulated Generators- being those existing HPPs in Georgia that have seasonal storage (Enguri, Vardnili, Krhami-1, Krhami-2, Dzevrula, Shaori, and Zhinvali).

Although the proposed GEMM and ETM are flexible to meet imbalances occurred due to the constant electricity load fluctuations, they don't consider participation of demand side resources for covering any shortfalls in demand that the schedules do not meet. The purpose of presented paper is twofold: to show that robust competition among a variety of suppliers without an active demand response is not enough to create efficiently competitive electricity markets, and to test the hypothesis that "Only under the fully liberalized customer-centric demand response electricity market with "Aggregators" on place Georgia's domestic customers can reap the benefits from their "demand response" behavior in the form of reduced energy bills without the need of compensating suppliers".

Review of Literature

Europe's new energy project promises to put a focus on consumer interests. As the European Commission ponders the design of a new and interconnected energy market for Europe, it needs to make sure that this market benefits consumers, while not disadvantaging suppliers. Philip Baker, senior advisor at the Regulatory Assistance Project (RAP), in his article - "Delivering the Benefits of Customer Participation in the Energy Market"- explains how this can be achieved without the need to compensate suppliers for the energy bought in front but not sold-on. (Baker, 2016). New research commissioned by the Regulatory Assistance Project (RAP) finds that demand flexibility can save many billions of euros in electricity costs. As the European Commission is pondering the design of a new and interconnected energy market for Europe, it needs to make sure these benefits are realised, writes Philip Baker. Brussels should resist calls to "compensate" energy suppliers for perceived losses as a result of demand response arrangements. (Baker, <http://energypost.eu/demand-response-can-drastically-lower-energy-bills-suppliers-dont-get-compensated>, 2016) Thus, the analysis commissioned by RAP to more fully understand the potential benefits of customers managing their electricity consumption, demonstrates that all power customers benefit from increased consumer market participation and that, while varying from year to year, the potential benefits are considerable. (Baker, *Benefiting Customers while Compensating Suppliers: Getting Supplier Compensation Right*, 2016) Even modest reductions in demand can avoid the need to run high-marginal-cost generation or other more costly measures, reducing market clearing prices. This allows suppliers to make significant savings when buying energy for their customers, and one would expect that most of these savings will make their way to customers through competitive or, where necessary, regulatory pressure. The point to note here is that *all* customers benefit from cost-competitive demand response, not just those customers who reduce their demand. It is a genuine societal benefit in the form of lower wholesale and retail energy prices and avoidance of uneconomic investment. (Baker, <http://www.raponline.org/blog/proposed-electricity-directive-step-right-direction-customers-demand-response/>, 2017)

Along with RAP analysis, our study is based on the reports of Georgia's Electricity System Commercial Operator (ESCO), EURELECTRIC, Federal Energy Regulatory Commission (FERC) and Deloitte Consulting.

The Methodology

Our hypothesis is following: "Only under the fully liberalized customer-centric demand response electricity market with "Aggregators" on place Georgia's domestic customers can reap the benefits from their "demand response" behavior in the form of reduced energy bills without the need of compensating suppliers". In order to test our hypothesis, empirical analyses have been applied. Based exclusively on secondary data obtained from various sources mentioned above, We have made the modification to the Georgian Electricity Market Model (GEMM2015) developed by Deloitte Consulting in collaboration with Pierce Atwood Attorneys LLC in 2012. Our considerations are based mainly on the cost-benefit analysis commissioned by Regulatory Assistance Project (RAP) aiming to prove that *all* customers benefit from explicit demand response, not just those customers who reduce their demand. It is a genuine societal benefit in the form of lower wholesale and retail energy prices and avoidance of both uneconomic investments in costly generation and losses for suppliers. In the scenarios investigated by RAP, the savings seen by suppliers in the form of reduced wholesale market costs exceed the likely reduction in revenues by a factor of at least 10 and as high as 70, providing more than enough headroom for suppliers to recover any lost income by this means.(Baker, Benefiting Customers while Compensating Suppliers: Getting Supplier Compensation Right, 2016)

Analysis and Findings

Under GEMM 2015 initial legislative and regulatory efforts to promote competition have focused on the supply side of the market: creating trading floors for energy and capacity sales, removing barriers to independent generators and marketers, and promoting open and non-discriminatory access to the transmission grid. It is assumed by many that robust competition among a variety of suppliers would be sufficient to ensure reasonable electricity rates and service options to customers. But the principal lesson learned from New England's, French, Germany, Austria and other power systems and markets is that competition among electricity suppliers alone (without an active demand response) is not enough to create efficiently competitive electricity markets.

Demand side participation assumes increased involvement of consumers who choose to take part in it for a reward. As a consumer-driven and market-based mechanism successfully implemented in many other economic sectors in EU (for example, peak and off-peak pricing in telecommunications, transport or holiday businesses), demand response is an integral part of both wholesale and consumer-centric retail markets in the

energy sector. It provides a fair reward to consumers for demand flexibility and relies on available technical solutions.

Europe's new energy project promises to put a focus on consumer interests, yet what this new market would look like in practice is often poorly understood. As the European Commission ponders the design of a new and interconnected energy market for Europe, it needs to make sure this market benefits consumers, while not disadvantaging suppliers. (Baker, *Delivering the Benefits of Customer Participation in The Energy Market*, 2016).

Issues related to Georgia's association to the EUs Energy Community and implementation of requirements in the energy sector under the "EU-Georgia Association Agreement", were in focus at a conference held in Tbilisi on November 11, 2015. Georgia's strive to become the part of European Energy Union requires harmonization of Georgia's Electricity Market Model and ETM with those of European. In this respect, *Explicit Demand Response*² should become an integral part of Georgia's energy policy if considering a variety of financial and operational benefits that it offers to electricity customers, load-serving entities (whether integrated utilities or competitive retail providers) and grid operators. But for this purpose the entity so called "Aggregator" should be established (not considered by GEMM2015) for "bundling up" the demand flexibility of many smaller customers to deliver valuable services to the market at scale. By managing electricity consumption customers can, either directly or through a third-party aggregator, participate in the market and benefit from lower power costs. However, these consumer benefits could be jeopardized by the treatment of "supplier compensation" because when customers, or third-party aggregators operating on their behalf, modify their consumption to offer services to the market, suppliers cannot generally bill customers for energy they don't consume and therefore, an individual supplier may appear to face a loss. This apparent loss of income has resulted in demands by suppliers to be compensated, either by negotiated agreement with the customer or his third-party aggregator, or as determined by a nationally administered arrangement as is the case in France³ (Baker, *Delivering the Benefits of Customer Participation in The Energy Market*, 2016).

The rather tenuous reasoning behind claim of suppliers to be compensated is that they have purchased energy from generators in anticipation of customers' needs. When they find that customers don't use the energy, they appear to face a loss. By contrast the

² where aggregators enable small commercial and domestic consumers to directly participate in the wholesale power market

³ In France this is already current practice: there suppliers are compensated for the loss of revenue resulting from demand response by a nationally administered arrangement.

customers make money from their “demand response” behavior: they lower their consumption and can sell this “negative consumption” on in the balancing market.

In the united electric energy system of Georgia the trade with electric power is performed through the Direct Contracts or through the Electricity System Commercial Operator (ESCO) that balances the difference between the actual and scheduled consumption embedded in Direct Contracts. The balancing energy is provided by the regulated hydropower plants (“Enguri” Ltd and “Vardnili Hydro Power Cascades) along with the seasonal and de-regulated ones, thermal power-stations (“Mtkvari Energetika” Ltd, “Georgia’s International Energy Corporation” Ltd, and “Ge Power” Ltd)⁴, and imported energy. (ESCO, 2016)

Under the proposed GEMM, responsibility for balancing the system is placed on the Market Participants. To the extent that a Market Participant fails to address an imbalance through its own purchases, the Transmission Service Operator (TSO) will be required to make the electrical purchases necessary to ensure that Georgia’s power system remains in balance. (Deloitte Consulting in collaboration with Pierce Atwood Attorneys LLC, 2012)

Unfortunately, all these arrangements considered by GEMM, are not enough for addressing network constraints generally, and particularly, peak demand. Happily, a unique opportunity exists to promote competitive innovation in delivering consumer energy services and monetizing the value of demand-side flexibility. If the full potential of the demand side is to be realized, the flexibility of smaller industrial and commercial loads, and specifically the residential sector, will need to be “aggregated” by entities capable of acting on consumers’ demand to deliver energy services at a scale that is useful to system operators and/or Balance Responsible Parties (BRPs). (Philip Baker, 2015).

In order to more fully understand the potential benefits of customers managing their electricity consumption, Regulatory Assistance Project (RAP) commissioned an analysis of the impact of demand response on the French, German-Austrian, and Nordic day-ahead markets. The analysis demonstrates that all power customers benefit from increased consumer market participation and that, while varying from year to year, the potential benefits are considerable. This is illustrated in Figure 1 which shows the predicted reduction in the French, German-Austrian, and Nordic day-ahead market costs due to the application of demand response. Depending on the level of demand response assumed (how much and for how many hours), the cost to suppliers in sourcing energy for their customers could be reduced by as much as €1600 million across the three markets. Assuming sufficiently competitive retail markets and/or adequate regulatory oversight, these savings should be passed through to customers in the form of lower

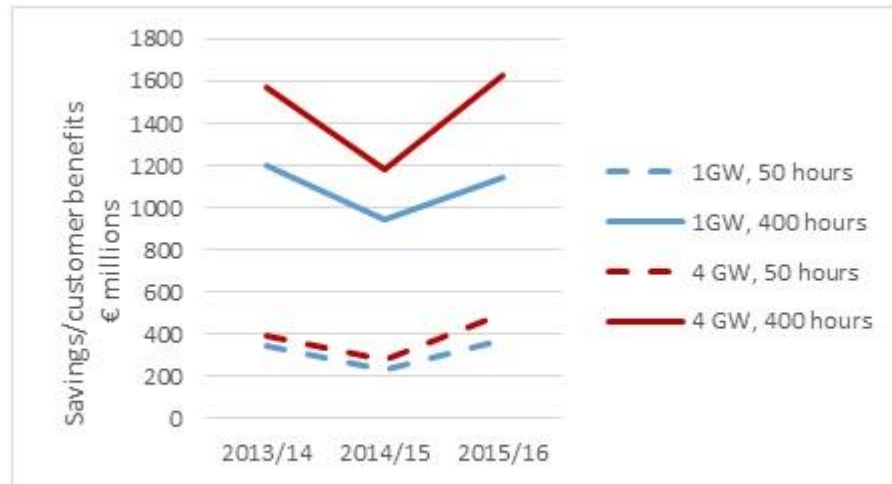
⁴ In January of 2016 year thermal power-stations share in energy balance were respectively 59.3%, 32%, and 8.7%.

retail prices. (Baker, <http://energypost.eu/demand-response-can-drastically-lower-energy-bills-suppliers-dont-get-compensated>, 2016) But customers benefit alone is not enough to make demand response to participate in balancing market. Suppliers could also gain by making use of demand response, if they chose to do so.

In France, since 2014, some 80 to 87 percent of all demand response has been taken up by compensation payments. The revenue remaining for consumers or demand aggregators averaged some €7/MWh, insufficient to meet operational let alone capital costs. If suppliers need to be compensated, an alternative way needs to be found. An obvious solution would be that suppliers retain some of savings associated with reduced day-ahead wholesale market prices rather than passing all of those savings through to customers in the form of lower retail prices. This solution becomes even more obvious when one considers that the costs incurred by suppliers are only a tiny fraction of their overall savings. In fact, in the scenarios investigated by RAP, the savings seen by suppliers in the form of reduced wholesale market costs exceed the likely reduction in revenues by a factor of at least 10 and as high as 70, providing more than enough headroom for suppliers to recover any lost income by this means.(Baker, *Benefiting Customers while Compensating Suppliers: Getting Supplier Compensation Right*, 2016). In designing well-functioning, competitive retail markets to the benefit of customers, the principles should be the same as for any other market; in particular, to the customer, buying electricity and electricity services should 'look' like any other purchase⁵. Today consumers are more educated and informed than ever and they have the tools to verify suppliers' claims and seek out superior alternatives. Customers tend to be value-

⁵ The only exceptions relate to the specific features of electricity, such as the fact that it is intangible, the need to protect those for whom a short-term loss of electricity supply would be potentially life-threatening (e.g. reliance on kidney dialysis machine), and the need to ensure universal supply for residential (household) customers. Electricity is, however, not the only essential good, and provisions to ensure citizens can afford essential goods are part of wider economic and social welfare policy.

Figure 1. Reduction in Day-Ahead Market Revenues/Potential Customer Benefits Associated with Demand Flexibility (French, German/Austrian & Nordic Markets)



Source: <http://energypost.eu/demand-response-can-drastically-lower-energy-bills-suppliers-dont-get-compensated>

maximisers, within the bounds of search costs and limited knowledge, mobility, and income. They can opt among many suppliers and services wherever retail supply companies can freely enter the market to meet customers' differing expectations and compete on a level playing field.

To ensure the successful development of demand-side participation customers have to be at the very core of demand response markets with smart meters. This will only be possible under the following conditions:

1. Suppliers should remain customers' main point of contact for all (major) processes. This will simplify and clarify market processes for customers and therefore ease their engagement and active participation in markets – even with the increased complexity of the future 'smart energy system';
2. Demand response markets need to be supported by an appropriate regulatory framework. In most member states, the regulatory framework rewards Distribution Service Operators (DSOs) for following business-as-usual and provides little to no economic incentives to invest in innovative solutions such as smart meters, supervision and monitoring devices, and network automation. Policymakers should address this issue to ensure that incentives for smart grids exist and that demand side participation solutions can take off;
3. Customers will need to have confidence in demand response markets, which includes adequate data protection. It should always be clear to customers who have access to their data and what is done with it. At the same time, a market

framework needs to be developed which allows innovation and makes full use of technological potential to offer products that are attractive to customers;

4. Finally, new market models also mean that new contractual agreements will have to be established between suppliers and Distribution System Operators (DSOs) to ensure that the mutual interests of both market players and system operators are satisfied (concerning, for instance, grid security, congestion management, and management of the supply portfolio).(EURELECTRIC, 2011)

Customers can easily be involved in the electricity market if the purchases in this market are similar to those they are accustomed to in other retail markets. For instance, a customer buying goods via the Internet can choose the delivery service they are willing to pay for but have no interaction with the transportation company; delivery is both arranged and billed by the retailer. Similarly, 'a customer-centric model with the supplier as the major point of contact', implies that most services are handled by the supplier. Such services include: billing, moving in/out, supplier switching and questions about consumption and so forth. In the mentioned model of electricity market the customer virtually has just one counterpart for major matters: the supplier. Network-related issues such as interruptions, metering devices, quality of supply, new connections, and compensation for failing to meet specified standards of supply will remain the responsibility of DSOs.

In a well-functioning retail electricity market, customers actively choose their supplier. This means that customers have confidence in the market and are not afraid of switching: they know they will not be cut off when changing supplier and will receive the right bill. In this respect, clear and transparent contract terms must be in place allowing customers to make an informed choice. GNEWRC can choose between two different market models for supplier switching, which can be found equally across the EU. In the first model, the DSO simply registers the new supplier contacted by the customer, and then notifies the old supplier of the switch (NL, NO, SE, IT, ES, FR, DK, GR). In the second model, the DSO has to check with the old supplier that the switching is correct, e.g. does not imply a breach of contract. The DSO then sends either a positive or a negative supplier switching message to the new supplier (FI, DE, CZ, HU, AT, UK).

We adhere more to the first model where the customer is responsible for contract breach fees and bad debt is a suppliers' risk. In the second model, by contrast, the switching process is subject to evaluation and can be blocked, under certain conditions, by the old supplier.

As mentioned above, demand response markets need to be supported by an appropriate regulatory framework to remove barriers impeding aggregators directly participate in the wholesale electricity market without the need of obtaining permission from the customer's supplier and compensating the supplier for lost income. We advocate using *explicit demand response* where aggregators enable small commercial and domestic consumers

to participate directly in the wholesale market by flexing their demand without compensation of incumbent suppliers as it is case in some Member States (e.g., Great Britain)⁶. The matter is that suppliers are accustomed of benefiting from selling energy bought in front at a peak price as a response to the signals of balancing market operator to covering any shortfalls in demand that the schedules do not meet. If allowing customers to respond to the signals of the same balance market operator to reduce the energy consumption in peak hours either individually or through aggregators, the peak no longer occurs in the market.

However, incumbent suppliers continue to seek compensation from aggregators, maintaining that energy the incumbents buy up front is transferred to aggregators free of charge who then profit by selling it on, leaving suppliers unable to bill customers for unused energy. This is in fact not the case as explained by senior advisor at RAP Mr. Ph. Baker. Although it is true that suppliers cannot bill for unused energy, in providing downward demand response aggregators simply reduce the amount of energy consumed and, therefore, generated. Energy is not sold on; it is neither consumed nor generated. (Baker, Unleashing Demand Response with Effective Supplier Compensation, 2017).

One more argument for supporting the opinion not to compensate suppliers for energy that is neither consumed nor generated is the case where customers simply reduce consumption in response to price signals delivered through a time-of-use or dynamic tariff (price-based or implicit demand response) and doing so are not required to compensate the supplier for loss of revenue. Respectively, requiring aggregators to compensate suppliers for lost revenue essentially amounts to the same thing.

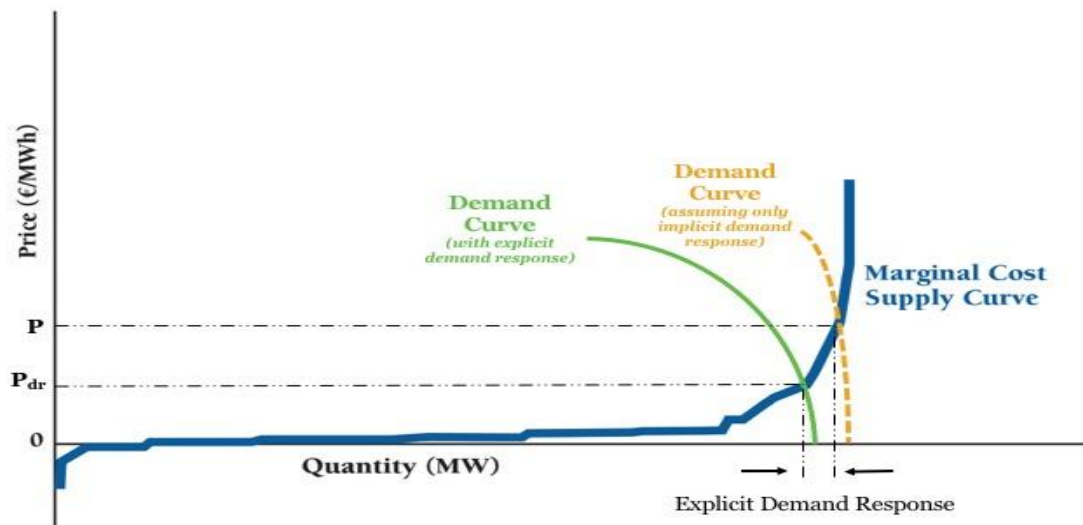
Thus by allowing energy supplier's customers to reduce their demand, aggregators help them to avoid expensive generation costs that occurs during peak hours. When the aggregator offers this product to the wholesale energy market, it removes the need to generate an equivalent amount of energy. As no more energy can be generated than is consumed, the aggregator's product reduces the amount of energy generated and, hence, market costs. No energy is transferred; it is simply not used.

Figure 2 demonstrates that even modest reductions in demand can avoid the need to run high-marginal-cost generation or other more costly measures, reducing market clearing prices. This allows suppliers to make significant savings when buying energy for their customers, and one would expect that most of these savings will make their way to customers through competitive or, where necessary, regulatory pressure. The point to note here is that *all* customers benefit from cost-competitive demand response, not just those customers who reduce their demand. It is a genuine societal benefit in the form of lower wholesale and retail energy prices and avoidance of uneconomic

⁶ France has an administered arrangement that removes the need for negotiation.

investment. (Baker, <http://www.raonline.org/blog/proposed-electricity-directive-step-right-direction-customers-demand-response/>, 2017).

Figure 2. Explicit Demand Response Reduces Wholesale Electricity Prices



Source: <http://www.raonline.org/blog/proposed-electricity-directive-step-right-direction-customers-demand-response/>

As the potential for demand response is significant and the savings likely exceed associated costs by a considerable amount, we should be doing everything we can to tear down barriers and open markets to this customer-centric resource. Article 17 of the European Commission's proposed Electricity Directive is a positive step in this direction and should be widely supported. It ends the requirement for an aggregator to obtain permission to operate on a consumer's demand or to compensate the consumer's supplier (other than in some imbalance-related "exceptional circumstances"). (Baker, Aggregators Help Customers to Reduce Demand, Avoid Expensive Generation Costs, 2017)

Order 745 of the Federal Energy Regulatory Commission (FERC) in the U.S. requires wholesale market operators to pay the same wholesale price to providers of demand response as is paid to generators—essentially the same situation as exists in European markets today. No discount or supplier compensation is applied.

Barriers of different complexities and different types (legislative, technical, economic and etc.) exist in Georgia to successful deployment of this vital resource. The first and the most important is the development of the Network Code on Electrical Balancing (NCEB) along with the other suite of Network Codes considered by GEMM 2015. The primary objective of NCEB will be to facilitate the participation of Demand Side Resources (DSR) and aggregation in the balancing markets. The development of the NCEB therefore represents a unique opportunity to embed DSR in Georgia's wholesale market,

maximizing its contribution to delivering the benefits to Georgian citizens and achieving decarbonisation through the cost-effective integration of renewable resources.

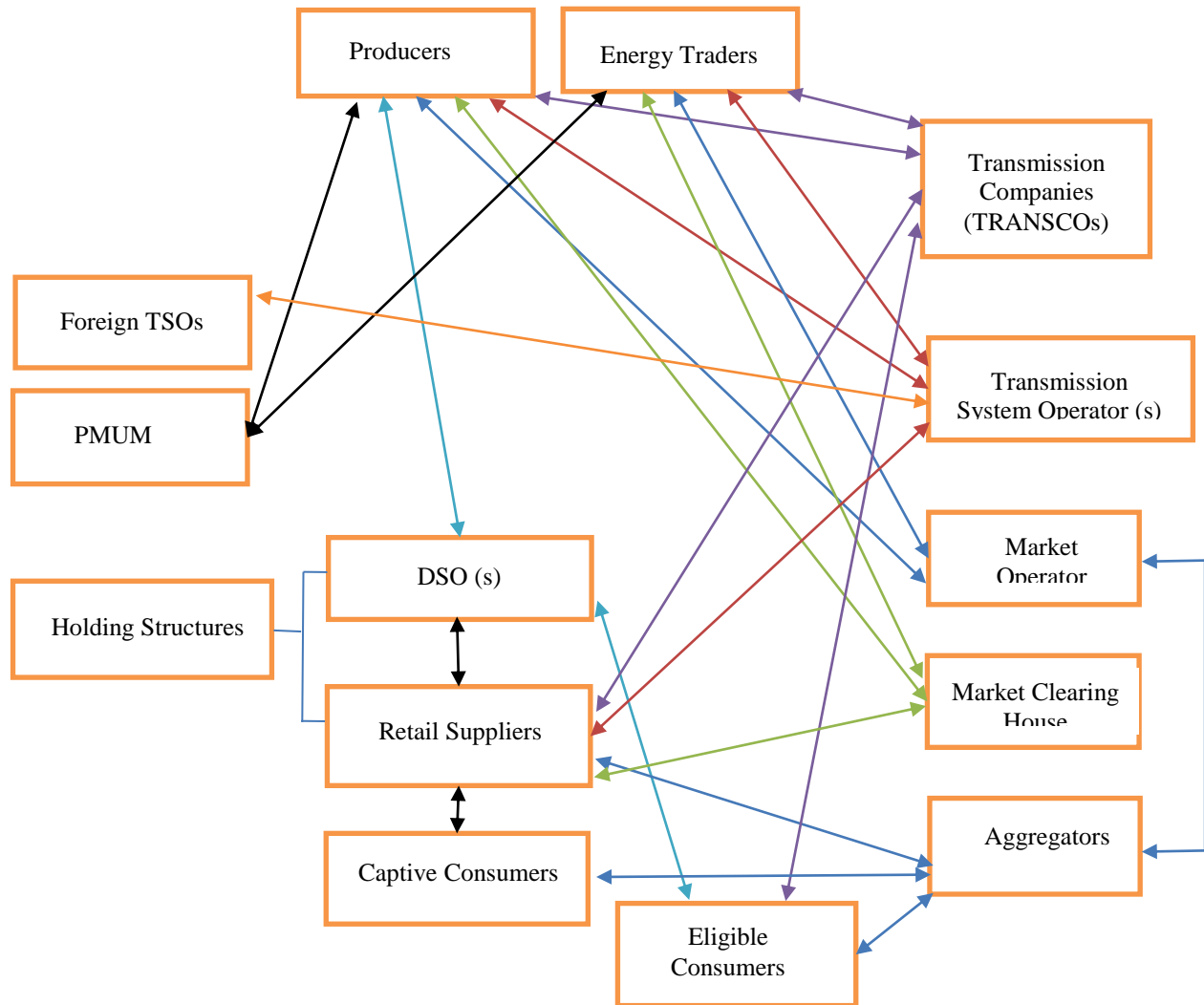
The second and the most crucial in tapping the full potential of demand response is metering. Electricity market is to be open for manufacturers of smart technologies in order to exploit still untapped potential of demand side resources. Smart meters will enable measuring the contribution of domestic consumers to peak load and varying charges across customers in ways that reflect their differential impacts on the need for network development. In doing so, they will remove the technical barriers for dynamic pricing for demand response measures. However, different customer potential and needs and smart metering policies should be taken into account. In Georgia, as in most EU member states, the Distribution Service Operator (DSO) both owns the metering assets and is responsible for meter reading, for estimation and for validation of metering data. Initially, it will be the task of GNEWRS to decide about the complexity of meters that will be applied. But before rolling out of smart meters the costs for the IT systems and additional smart meter infrastructure that are necessary for dynamic tariffs should be estimated in advance.

One of the benefits of developing the GEMM 2015 and ETM is that a greater number of participants will be attracted to a liberalized electricity market. Among the new entities (except of those licensed market service providers) who will participate in electricity market, will be: Traders, Independent Power Producers (IPPs), Consolidator for Small HPPs, Retail Public Suppliers (RPSs), Market Clearing House (MCH). But to ensure that the full potential of DSR is realized under GEMM2015, both Eligible Customers⁷ and Tariff Customers⁸ should have ability to provide balancing or ancillary services to system operator, either directly or through aggregator, at a system level.

Thus, although the full implementation of GEMM 2015 and ETM is the first step to a liberalized electricity market but it is impossible to reap benefits from demand response flexibility under them. If the full potential of the demand side is to be realized, the flexibility of smaller industrial and commercial loads, and specifically the residential sector, will need to be “aggregated” by entities capable of acting on consumers’ demand to deliver energy services at a scale that is useful to system operators. For this purpose, We have made modification to GEMM2015(see Scheme 1).

⁷Eligible Customers are customers that are entitled to purchase electricity from any source. Pursuant to the Basic Directions of State Policy of the Energy Sector of Georgia, all consumers will be Eligible Customers by 2017. Hydropower Investment Promotion Project, p.33-34

⁸ Tariff Customers are electricity consumers that are connected to a Distribution System and purchase electricity from their RPSs at rates regulated by the GNEWRC. Hydropower Investment Promotion Project, P.34

Scheme 1. Parties to Service Contracts (Modified Georgian Electricity Market Model 2015)

Source: Own adjustment based on RAP analysis

According to the modified GEMM2015, the entities so called “Aggregators” should be established that can “parcel up” demand response from small commercial and domestic customers and provide services to Market Operator (MO)⁹. They will function as a Balance Service Providers (BSPs) without the need of compensating suppliers for the

⁹It is envisaged, by the new market design, that Electricity System Commercial Operator (ESCO) is replaced by a Market Operator (MO) Unit which will be legally separated from ESCO and become the successor entity to ESCO and be licensed by Georgian National Electricity & Water Services Regulatory Commission (GNEWRC) as the MO.

“revenue losses” they don’t incur as learned from the RAP analysis discussed above in this article. Aggregators will act on behalf of customers allowing them to reduce demand and avoid expensive generation costs. They will operate on platforms that target customers through the mail, web, mobile applications, and in-home display devices. At the same time, aggregators, acting as Balance Service Providers (BSPs), should be able to operate independently of Balance Responsible Parties (BRPs) without the need for negotiation over the management of a BRP’s customer end uses. Thus, Our hypothesis that “Only under the fully liberalized customer-centric demand response electricity market with “Aggregators” on place Georgia’s domestic customers can reap the benefits from their “demand response” behavior in the form of reduced energy bills without the need of compensating suppliers”, is proved.

As a conclusion We can say that although the proposed GEMM and ETM flexible to meet imbalances occurred due to the constant electricity load fluctuations, they don’t consider participation of demand side resources for covering any shortfalls in demand that the schedules do not meet. Instead of paying to generators that sell energy in the balancing market a “market-clearing price”¹⁰ (in the event of “over-scheduling”) or compensating generators to reduce generation (in the event of “under-scheduling”), it would be more reasonable to deploy responsive demand for balancing purposes. But before doing so, the electricity market should be open for aggregators that will help customers to reduce their energy consumption as a response to the signals of MO. Besides, GNEWRC should commission the study aimed at assessing demand response contribution to national peak demand.

Member States currently take only limited account of demand-side participation when assessing resource adequacy. A recent study by Sia Partners suggests that demand response in many Member States could amount to 6 to 14 percent of peak demand and total 52 GW for the European Union. (Partners, 2014) It is also estimated that demand response could economically displace approximately 9.2 percent of forecast U.S. national peak demand, i.e. around 72 GW.(FERC, Assessment of Demand Responce & Advanced Metering, 2014)Furthermore, in 2009 the Federal Energy Regulatory Commission (FERC) estimated that by 2020 the U.S. could achieve 138 GW of demand response. (FERC, National Assessment of Demand Response Potentatial, 2009).

¹⁰ The market-clearing price is the price MO pays for the last megawatt procured for balancing energy and this amount is paid to all generators providing this service.

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