



REGULATORY STUDIES – LOT 2

ACTIVITY 3: THIRD PARTY ACCESS TO NETWORKS

REPORT 2: INVENTORY OF ACTIONS TO BE IMPLEMENTED TO PREPARE ACCESS TO THE NETWORK

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LIST OF ABBREVIATIONS AND DEFINITIONS

ACSP	Agent commercial du Service public/ Public Service Commercial Agent
ECOWAS	Economic Community of West African States
ERERA	ECOWAS Regional Electricity Regulatory Authority
GRPT	Public Electricity Transmission System Operator
ICC	West African Power Pool (WAPP) Information and Coordination Centre – body in charge of daily information-sharing between research centres
IPP	Independant Power Producer/ Producteur d'énergie Indépendant
MO	Free Market Organizer
OMVG	Organisation for the Development of the Gambia River
OMVS	Organisation for the Development of the Senegal River
PPA	Power Purchase Agreement/ Contrat de fourniture d'énergie
PTS	Public Transmission System
SCADA	Supervisory Control and Data Acquisition
SEL	Free limited service
SEP	Public service
SO	System Operator
System Services	System services generally comprise load-frequency control including keeping reserves, voltage control, black starting and compensation of for differences
WAPP/EEEOA	West African Power Pool/Echanges d'Énergie Electrique Ouest Africain

1 - INTRODUCTION

This is the second report on Activity 3 relating to third party Access to the Network.

The Terms of Reference require that this report present “the actions to be conducted to ensure free access of eligible customers to the regional interconnected network, as the Consultant focuses particularly on:

- ✓ the legal and regulatory framework;
- ✓ electricity sector policies;
- ✓ key stakeholders;
- ✓ such activities as progress assessment of doing separate accounts;
- ✓ impact on systems’ conduct of the choice of suppliers by eligible customers;
- ✓ the rules of access to and use of transmission systems;
- ✓ electricity prices and tariff methodology to be used;
- ✓ metering problems ; etc.”

This report primarily aims to comply with the Terms of Reference by considering the present situation regarding liberalization of the electricity sector in the ECOWAS zone. Access to the system is clearly the most palpable and measurable component of such a liberalization.

The report, prepared as part of activity 5 concerning best contractual practices, presents an inventory of the legal and regulatory frameworks of countries in the zone with a view to their institutional organization.

The first report on activity 3 presenting the strategy note for third party access to the system showed that, save Ghana, all ECOWAS countries are very far from a situation where an electricity consumer is free to negotiate the conditions for electricity supply with a producer of its choice (at home or in a neighboring country), knowing that their registration with a system operator assures them that the transaction they have concluded with the chosen producer will be channeled via the transmission (and distribution) network(s).

The recommendation of the first report was obviously to give an Instruction of the ECOWAS Commission to force States to modernize their national electricity laws and regulations, as a first step towards the development of national sector structures in order to ease the effective liberalization of transactions.

Within this context, this report first of all seeks to make a few practical recommendations with a view to enabling countries of the region, based on the situation of their domestic market and sectorial organization, to progress towards the opening of their market and the introduction of an even limited access to the network.

That is why the report is organized as follows:

1. Preliminary conditions for third party access to the network,
2. Identification of countries having the basic conditions for access to the network,
3. Recommendations for the establishment of national networks where a limited free market coexists with a regulated market,
4. Inventory of aspects of the electricity sector to be reviewed in order to ensure an opening for the introduction of limited access to the network,

5. Considerations relating to certain actions for the limited opening of access to the network,
6. Special characteristics of countries having the basic conditions for access to the network.

2 - CONDITIONS FOR THIRD PARTY ACCESS TO THE NETWORK

2.1 - Preliminary conditions for third party access

In order to allow third party access to the network, some conditions must be fulfilled, notably:

- ✓ Demand/supply balance, considering "structural" export possibilities on the supply side;
- ✓ The possibility of introducing competition on the supply side, that is to say at least the existence of a sufficient number of producers that are not interdependent, to ensure (at least in principle) effective competitive conditions.

Both conditions combined enable the existence of several generators, in principle, at all times, which have a non-contracted generation capacity (an available energy supply) on offer through new contracts.

The overall demand/supply balance will be of use in section 3 below in the selection, of countries in the region that meet the basic conditions for opening access to the network.

However, it can immediately be noted, from information received and from our analysis, that conditions of producers' competitiveness exist only in Ghana, hampered by arbitration difficulties in sharing among "historic" buyers the hydroelectricity production (Akosombo, Kpong), which is much cheaper than all other forms of generation.

Indeed, it can be observed that in the region, almost all independent producers are bound by exclusive long term contracts (whose duration is most often equal to their plant's lifespan) regarding their full production capacity, with the Single Buyer, which is a vertically merged operator of the country where the plant is located. These contracts are thus a real impediment to the sale of energy to other potential buyers.

Moreover, in most cases, it seems that independent producers do not take risks on the fuel purchase price: it is provided by the Single Buyer or the State by contract.

The revision of existing PPAs (access to the generators' network) in order to release a generation capacity meant to supply eligible customers (access to the customers' network) will thus constitute a very crucial and indispensable stage prior to the effective start-up of an even limited free market.

2.2 - Recommendations for the implementation of new projects

As mentioned above, some electricity supply contractual obligations make it difficult to access the system in the region. Accordingly, in the implementation of new projects, whether they are national or regional, some precautions are supposed to help untie the knot of obligations, notably:

- ✓ For new Independent Producers, exclusive long term PPAs for the full production capacity are to be avoided;
- ✓ For transmission lines, which are not or will not be the property of national transmission companies, access to these lines will have to be entrusted in each country to the company already in charge of the national transmission network.

3 - IDENTIFICATION OF COUNTRIES WHERE BASIC CONDITIONS FOR ACCESS TO THE NETWORK WOULD BE MET

To identify the countries, that will have the right basic conditions for the implementation of third party access to the network in the near future, it is worthwhile to also consider the impact of new regional production and transmission projects, provided for under WAPP-sponsored projects, on the demand/supply balance.

3.1 - Regional plants

As part of WAPP-sponsored projects, there are several regional generation capacity building projects. In the short-medium term (2015-2016), the main projects will help increase the installed power by:

- 450MW in Ghana
- 450 MW in Benin (Maria Gleta project)
- 150 MW on the area covered by OMVS.

These new plants will have a special status. They will be:

- international,
- located in free zones, on land made available to WAPP by the host States,
- managed by private operators.

Access to the production of these plants will be contractual. These will be bilateral contracts with national companies or state-designated representatives for this purpose. Part of the generation capacity will be sold as a “take or pay” to allow investment costs recovery.

3.2 - WAPP-sponsored new international lines

As part of its master plan, WAPP plans to promote the construction of several regional lines to which access by all producers is provided for. Taking for example the CLSG (Côte d’Ivoire – Liberia -Sierra Leone – Guinea) line, WAPP states that the access conditions will be as follows:

“The four countries’ national corporations have to sign energy transmission contracts with the company operating the line. The case is the same for producers that will sell energy using the line.

The buyer and seller will work together to pay transmission charges in a manner as to recover the costs incurred by the line operator.”

3.3 - Identification of countries that will fulfill the essential condition of demand/supply balance

The first report (strategy note) indicated that at least up till 2020 only **Côte d’Ivoire** and **Ghana** will remain in a position where the national electricity supply should on a permanent (structural) basis sufficiently exceed the national demand, with even a “normal” reserve capacity. This would enable

them to release an extra yield for sale to third parties at home and within the region. Both countries will thus remain in their net exporter current position.

Senegal should be able to become a net exporter provided it implements its program to construct coal plants. However, known shortages, at best, are likely to undermine reaching the balance well ahead of the official deadline for access to the system (as per information at our disposal, the deadline has now been set for 2019).

Burkina Faso could be in a sustainable balance position if it succeeds in completing its interconnected network in order to secure its imports (line towards Bolgatanga in Ghana), and in diversifying its supply sources through medium and long term import contracts: besides Côte d'Ivoire, contracts are supposed to be concluded with Ghana, Togo and/ or Benin.

The situation is about the same for **Mali**, which is supposed to be able to put in competition, through the interconnected network, generators of countries of the south coast with generators of countries of the west coast such as Senegal (from the time the coal plants go operational) or Mauritania (from the time its natural gas resources are exploited), using the OMVS transmission infrastructure.

Finally, Togo and **Benin** are supposed to reach the demand/supply balance thanks to the Maria Gleta (450MW) combined cycle project.

3.4 - The specific case of Gambia

Gambia, in its electricity law, has enshrined its political will to separately privatize the three segments of the electricity sector: production, transmission and distribution.

As per the law, each of these segments enjoys an adapted managerial delegation. An independent (multisectoral) regulator must actively supervise the functioning of the sector and tariff management.

However:

- ✓ As of now, NAWEC is still a vertically merged company, which is the single buyer of the three IPPs' production (only one of them has a significant size),
- ✓ There is no national transmission system yet,
- ✓ The sector current small scale implies that competition is bound to be limited at the level of production and the number of eligible customers is bound to be (very) limited. The establishment and operation costs of a partially liberalized market alongside with a regulated market lead us to **recommend the postponement of third party access to the network for Gambia alone.**

3.5 - Reasons why other ECOWAS countries do not currently meet the minimum conditions for opening access to the network

In **Nigeria**, progressive liberalization planned since the early 2000s is fully enshrined in the regulations. It should be emphasized that the legislation relating to the regulation of the sector that have been put in place, and regularly adapted/updated by the regulator or through the initiative of the latter, is a great reference, both in its form and in its content. Liberalization is greatly effective at the operators level. Indeed, the historic operator has been vertically and horizontally de-integrated with respect to generation and distribution. Network access by IPPs is laid down in the regulations and is ongoing. However, access by end consumers (eligible customers) to the network, although actually laid down in the regulations, will become effective when the demand-supply balance will be achieved. We had highlighted in our first report (strategy note), that, given the large size of its domestic market,

Nigeria should be able to achieve this balance without the intervention of neighbouring countries, which have much smaller markets.

Niger, without any real national network but with an interconnection that enables it to import energy from Nigeria is, in our opinion, to be considered for a long period (10 or 15) as an extension of Nigeria's network. In other words, Niger may be able to open its market and access to its network(s) at the same time as Nigeria, competition then being guaranteed by (future) suppliers of Nigeria ... who are also suppliers of Nigelec.

Concerning, **Guinea, Sierra Leone and Liberia**, they are too far from the minimum requirements to liberalize the electricity sector:

- ✓ institutional regulations are still very far from the idea of competition, let alone an open market,
- ✓ existing electricity systems are far from fully developed with respect to the size of the countries,
- ✓ There are currently no IPP.

Taking into account the CLSG power-project line of 225 KV sponsored by WAPP, the essential and current decision for these countries is to open (or not) access to this line to companies (probably mining companies) with a strategic interest at the national level, at the same time, of course, to national companies in place.

We are confident that for these countries (see our first report presenting the strategy note) the development pathway of national power plants should be subject to a participation of the mining industry in the leasing of hydroelectric generation sites.

Finally, it is presently impossible to make whatsoever projections on **Guinea Bissau**. Given the state of extreme underdevelopment of the public utility electricity system, the country is far from being able to meet the minimum requirements for a significant liberalization of the sector.

3.6 - Essential additional condition for granting access to the network: independence of networks operators

Admittedly, access to the network or the ability of consumers to purchase electricity from a generator of their choice implies that the transmission and distribution networks, that are natural monopolies, are open and neutral paths for the flow of energy. The amounts of energy flowing in these networks are the result of energy trade contracts freely entered between generators and consumers.

The transmission system operator should be completely independent from generators and consumers so as to operate, without discrimination, the monopolistic tool of the networks for the benefit of all users.

It is essential to have a network code specifying the rights and duties of network operators and users, whether they are generators or consumers.

Presently, only Ghana and Nigeria de-integrated their entire electricity sector. The generation sector is also de-integrated horizontally and thus has several stakeholders that are legally independent from one another. Each country has its own GRIDCO, State-owned corporation and operator of the national transmission network, based on a national network code. Each distribution company, legally independent, has a franchise area for consumer supply. In addition, Ghana has authorized network access for eligible consumers (whose registered power reaches or exceeds 3 MVA or whose annual consumption exceeds 6 GWH).

All other ECOWAS countries have vertically integrated national electricity companies. Moreover, they are the single buyers of the generation from third parties plants, which supply the national public utility

electricity. Finally, except from Burkina Faso, none of the vertically integrated electricity companies has implemented cost accounting, which is the first indispensable step towards vertical de-integration.

3.7 - Lessons to be learnt from Ghana and Nigeria

Ghana and Nigeria are the two most advanced countries in the region from which lessons can (should) be drawn. The first lesson is that the liberalization process in the electricity sector requires a lot of time.

The experiences of Nigeria and Ghana in the domain are telling.

Starting from a severe deterioration of its national electricity company (a situation that is far from being resolved), Nigeria decided to move towards liberalization of the sector in 1998. Functional, vertical and horizontal de-integration entered into force in late 2005. Privatization of "successor companies" is still underway. The move towards a free market for all consumers is planned in 4 stages. Eligible consumers only appear at the beginning of the third stage. In 2013 Nigeria is still in the transition between the 1st and the 2nd stages.

Ghana was faster. The political decision was taken in 1995 and the Basic Act was adopted in 1997. Vertical de-integration became a reality in 2007 and a limited free market accessible to eligible customers and medium-term bilateral contracts were initiated in 2008. The market is currently undergoing expansion and product diversification.

As could logically be expected, in both countries, the part of the process relating to the de-integration of vertically integrated historic operator is time consuming.

Our first report on network access recommended the issuance by the ECOWAS Commission of a Directive laying down guidelines and principles to be instituted in national electricity sectors to achieve the objectives of free movement and free trade specified in the Energy Protocol. We believe that this Guideline is essential to:

- ✓ Force "defiant" countries to respect the protocol;
- ✓ Establish a reference framework that will force a harmonization of national regulations and laws, as well as participation and functioning rules for national markets within a regional market.

Nevertheless, if are added to the durations observed in Ghana and Nigeria, the promulgation period for a Guideline, the adaptation of national legislations to this Guideline and the implementation of the Guideline within the framework of national sectors, it must be admitted that there are very long term plans...

And yet, needs are urgent and imperative. It is especially necessary to create a more incentive framework to attract new private generation capacities, which indirectly facilitate access to financial resources for the improvement and extension of networks, which are natural monopolies intended to remain public participation companies.

Opening the networks to eligible customers is an advantage for generators/suppliers as it provides them with access for their generation to customers other than national public corporations or Single Buyer in place. The latter often have not very favourable financial situations, which sometimes lead to high recovery risks. In this regard, it is significant to note that several PPAs were secured by the payment to large customers of invoices, issued by Single Buyer corporations, via an escrow account. .

Given the needs, is proposed the following outline of a national transitional sector organization inspired by an organization that has been established for some years in several European countries during the progressive liberalization/de-integration phase of companies and initialization of limited free markets.

4 - RECOMMENDATIONS FOR THE ESTABLISHMENT OF NATIONAL SYSTEMS ENABLING THE COEXISTENCE OF LIMITED FREE MARKET WITH REGULATED MARKET

To enable a faster opening of the markets, it is important to start with an at least partial liberalization of the sector, with access to networks that yet remains limited.

This reorganization of the market mainly targets:

- ✓ The creation of two parallel markets at the national level,
- ✓ The de-integration of the current electricity companies at the accounting, legal and functional levels if possible, e.g. through subsidiaries within a holding company. Such an organization is easier to absorb at the political level and does not prejudice the model to be adopted in the longer term for each major business component: generation, transmission and distribution.

4.1 - Organization of a limited free market coexisting with a regulated market

4.1.1 - First opening stage and reorganization of the present national company

The coexistence of a free market, limited to eligible customers, with a regulated market, is a first transition stage, almost indispensable, in a process of gradual opening of the electricity market, where the regulated market will shrink gradually.

This opening of the market requires a new organization of stakeholders of the sector, with regard to the terms of billing non-eligible customers. It requires the creation of new competences, at the level of the transmission system operator.

The market organization will include:

- ✓ a central buyer for the entire regulated market (Public Service Commercial Agent - ACSP)
- ✓ alongside with an organizer of the open market (OM)

These two bodies must coordinate themselves to maintain operational optimization of the overall generation - transmission system.

This organization implies that the operator responsible for transmission fully separates itself from its generation and distribution activities. The separation should at least be accountable and functional, but preferably legal, for example through a transfer of the activity.

This separation is justified by the fact that it is the only way to ensure that:

- The operator's generation activity is on an equal footing with that of independent generation: the usage terms of the transmission network should be identical for all generators of the market (principle of equal treatment and non-discrimination);
- Distribution activity is also on an equal footing with that of other distribution operators, since distribution companies will be invited to move towards a position of growing buyer in the open market.

Note, however, that regarding distribution, the legal separation of the network operation functions from those of energy supply to regulated customers is not necessary at the start of the access process, while eligible customers only constitute a small minority.

The direct protection of consumers is still regulated by the Regulator that controls the two components of the distribution activity: through the CPSA, it controls the wholesale purchase price of the distributor and approves both the tariffs applying to regulated consumers and the tariffs applying to the usage of distribution networks (common tariffs for regulated consumers and eligible consumers).

This stage of separation of activities really becomes necessary when the free choice of the supplier is programmed for all customers. Then, several professionals will be active in bulk buying for retailing. A complex process of generalized profiling of all consumers should be developed for the distribution of sales (and losses) between the various suppliers independent from the network operator. s

As can be seen, a strict accounting separation is essential to achieve the clarity and transparency of tariffs applying to the use of transmission networks on the one hand, to the use of MV and LV distribution networks on the other hand and, eventually the clarity and transparency of the supplying costs of the lone generation. Thus, the first step that should be implemented in a relatively urgent manner is the generalization of the implementation of cost accounting in the present consolidated companies.

In the specific case of Senegal and Mali, it is important to note that the reorganization of the functions referred to here also extends to the cross-border multinational operator-SOGEM OMVS (Senegal, Mali, Mauritania), which integrates generation and transmission activities.

4.1.2 - Market stakeholders

Stakeholders of the market can be categorized as shown in the table below:

- ✓ The actors mentioned in the first column refer to the Electricity Public Utility (EPU).
- ✓ IPPs, which have long-term exclusive agreements (PPAs) with the entity in charge of the public utility, are considered as belonging to the Public Utility.
- ✓ The other stakeholders mentioned in the second column are Free Service (FS).

Categories of market operators	Type of market : Regulated	Type of market : Limited free
Transmission and organization of trade		
a) the operator of the national transmission network that has several functions: the Public Service Commercial Agent (ACSP), the market operator, the system operator, the administration and operation of the transmission network	X	X
Generation		
b) generators that entered a contract with a purchase obligation clause (PPA) at least partial with a GRPT <i>NB : the incumbent generator falls under this category</i>	X	X
c) the independent power producers (IPP) connected to the national transmission network		X

Categories of market operators	Type of market : Regulated	Type of market : Limited free
d) external operators, who through international interconnections, wish to buy or sell electricity in the country		X
Distribution		
e) operators of the public distribution network	X	
f) the other registered independent electricity distributors		X
Users		
g) Eligible customers		X
h) public utility customers	X	

Thus:

- ✓ The limited free market is open to eligible customers and independent generators, while the regulated market is accessible only to non-eligible customers and eligible customers who wish to maintain a regulated service.
- ✓ Independent operators of combined generation of heat and electricity or from renewable energy, which benefit from special conditions or subsidies for their generation, are considered as actors of the regulated market.
- ✓ Self-generators are concerned only if they have access to the transmission or public distribution network with the aim of buying or selling energy. In this case and according to their choice, they are attached to the Public Utility or Free Service.
- ✓ Operators of the public distribution network become stakeholders of the free market, when part of their needs is purchased in the free market, for example through compulsory auction controlled by the national regulator.

The increase in the presence of network distribution operators and the evolution of the eligibility criteria will normally lead to an increase in the volume of transactions on the open market. These developments must meet their counterparts from the supply side on the open market through new independent generators and/or revision of existing PPAs.

4.2 - Possible trend

When the opening process starts, the majority of the countries in the region will present a relatively similar situation in terms of market organization. This situation is characterized in particular by:

- ✓ A reduced number of eligible customers and contracts between IPPs and direct eligible customers. Therefore, there is no need for intermediaries ("traders");
- ✓ The predominant weight of the historic generator, increased by that of IPPs that require that current PPA be, at least partially, maintained;

- ✓ The historic generator remains the owner and operator of hydroelectric plants, i.e. plants that offer the most favourable characteristics for the supply of services to the system, particularly with respect to secondary and tertiary reserves;
- ✓ Risks of difficulties in ensuring high service continuity at affordable costs for IPPs without long-term contracts, especially if the generation output is not divisible (as it normally happens in diesel plants for example) when there is no power reserve market.

In the case of an initial situation meeting these conditions, it can be projected that access to the network and market expansion in terms of number of eligible customers will follow the steps below.

4.2.1 - First stage

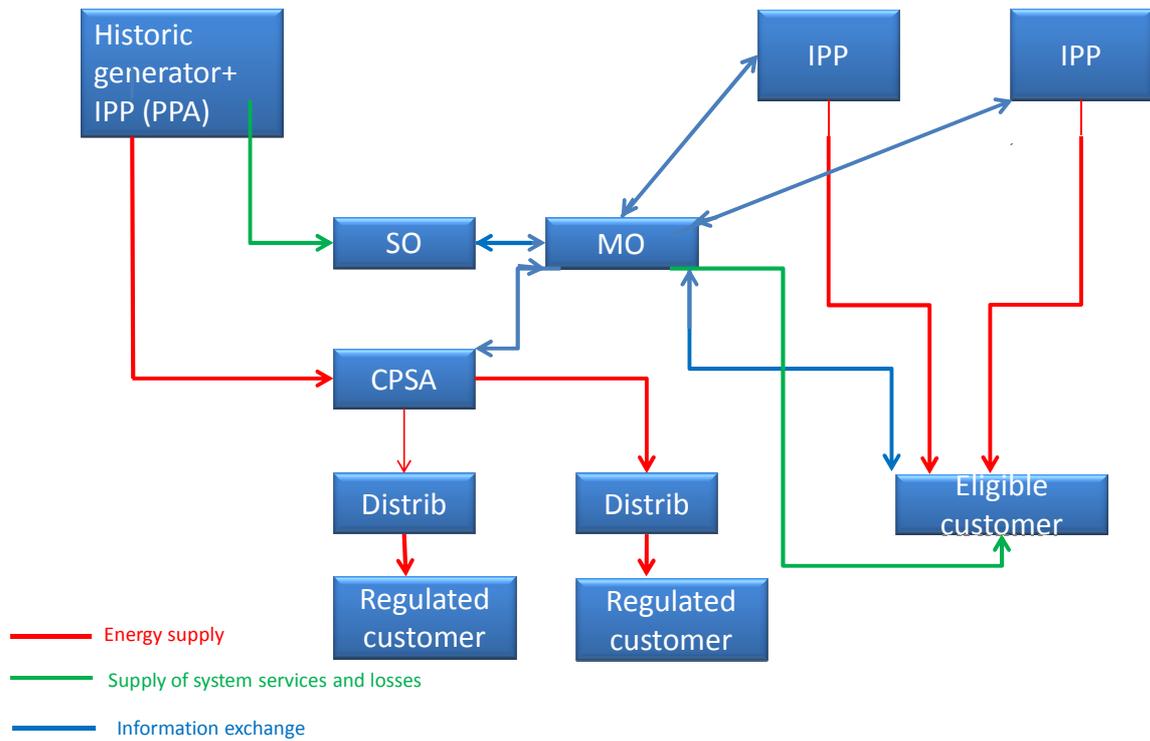
In the first stage, the generation block of the (dominant) regulated sector provides regulated customers with the total energy generation and provides (against remuneration) the System Operator (SO) with all the system services. Eligible customers (who often have their own relief generation capacity) may have (or not) an option to subscribe to the supply of emergency power in case of unforeseen failure of the chosen generator. The SO optimizes (maximizes) these energy purchases with the main supplier in the context of its purchases of ancillary services.

The Public Service Commercial Agent (ACSP) calculates and bills the use of emergency power to eligible users.

An additional bilateral contract between the ACSP and one (or several) IPP may be necessary for the supply and demand balance in each market.

The following diagram shows the transactions during this first stage of a partially free market.

1st stage

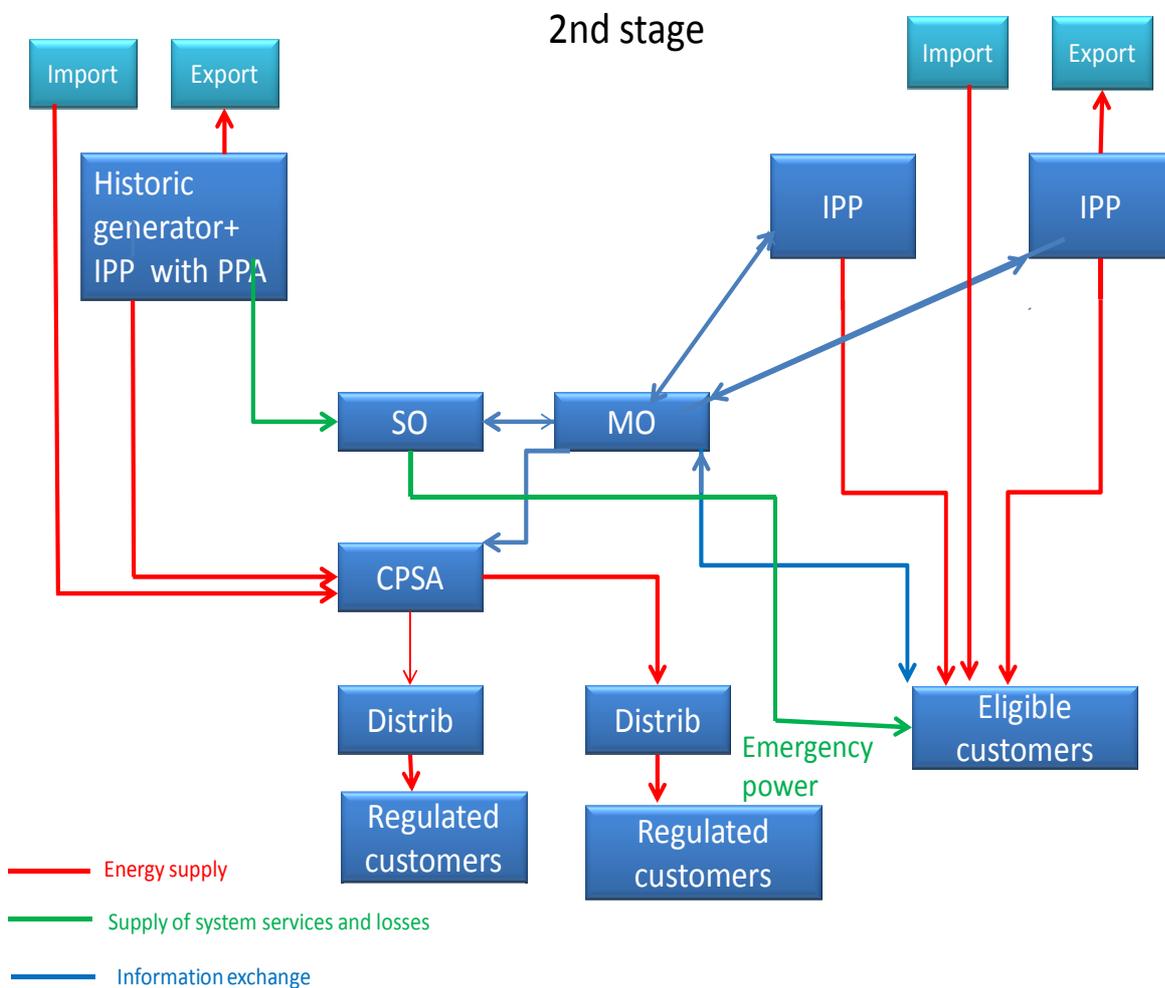


4.2.2 - Second stage

In each market, authorized operators may conclude bilateral import or export contracts.

Of course, this step assumes that neighbouring countries that allow these types of exchanges have already started the access process, albeit limited, to their respective networks.

The following diagram shows the transactions during the second stage of the partially free market.

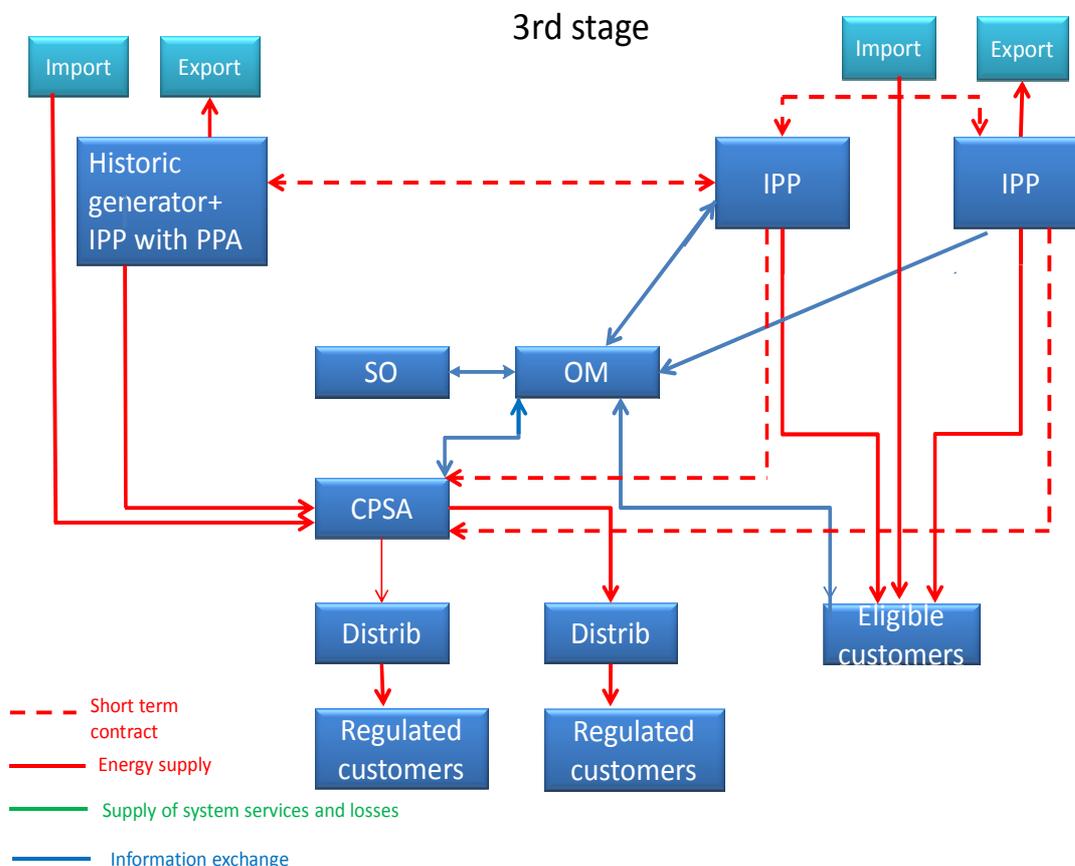


4.2.3 - Next Stage

The following events are characteristics of the evolution of systems in the process of a growing liberalization, which change the original balance between free market and regulated market:

- Changes in the eligibility criteria will normally cause an increase in the number of eligible customers and in the volume of transactions in the free market. These changes must of course be able to meet their counterparts from the supply side in the free market thanks to the entrance of new independent generators and/or the revision of existing PPA enabling a concomitant expansion of the capacities offered in the free market,
- PPAs between IPP and CPSA gradually become obsolete. In principle, any new generation is under the 'pure' IPP regime (free market),
- With the increased volume, the generation block of the regulated sector can no longer guarantee the supply of the entire service system. The System Operator (SO) must acquire at the best price partly from the generators of the regulated market and partly from the generators of the free market,
- Operators of the public distribution network become actors of the free market. For example, a portion of their energy requirements are purchased on the free market via mandatory auction controlled by the national regulator.

The following diagram shows the transactions in this market still partially liberalized but at a more advanced stage already.



Transactions between operators and consumers are always materialized by medium term bilateral contracts. However, the need for short term market, accessible to both operators of free market and of regulated market becomes unavoidable.

Market will then be structured from:

- bilateral contracts in the medium term, with physical supply,
- Short term market, necessary to make it possible the balance of supply and demand in each of the two segments of the market, for a financially optimized balance of overall supply-demand.

Nevertheless, there is a very delicate balance to be sought with regard to the adaptation of markets and their operating rules. Indeed, it will be necessary to:

- Set clear and predictable rules of the game inspiring mutual trust;
- Provide the necessary flexibility to adapt the rules of the game when necessary insofar as it will be for actors to progress on a new ground.

4.2.4 - Subsequent trend

A final step for the opening and development of market is achieved when:

- purchase agreements (PPA) between some IPPs and ACSP expire,
- distribution companies have acquired the maturity to buy directly in the free market the energy required for the supply of regulated customers. Indeed, from that moment, the function of the ACSP naturally stops,
- eligibility criteria facilitate access of a significant number of new customers to the network, and/ or free choice of supplier is programmed for all customers.

At this stage of market development, it should be necessary to separate, at the distribution level, the functions of network operation and supply. Indeed, at this stage the retail supply will be carried out by several professionals involved in buying wholesale for retail resale, in competition to end consumers.

As already mentioned, at this stage it is important to up a process of generalized profiling of all consumers for the distribution of supplies to distribution networks, including losses between the various suppliers independent from the network operator.

5 - INVENTORY OF SECTORIAL ASPECTS TO BE REVIEWED FOR A LIMITED OPENING OF THE MARKET

The first stage before a limited opening of the market is, of course, confirming that there is a potential for this free market through an inventory of eligible customers and generators who are candidates for direct sales to these customers. It is clear that among generators who are candidates for direct sales to eligible customers, there are IPP currently involved that must agree to abandon completely or at least partially their exclusive long term sales contract with a Single Buyer.

From their side, the authorities should stand firm on their commitment to give the market a leading role at the expense of a full administration of the prices.

Given that access (even limited) to the network means an increase of consumers, it is generally accepted that all new processes should be primarily focused on the customer expectations' satisfaction, which gives an important role to the control function.

De-integration is also positive as it enables each actor involved to be more directly accountable for its mission. Thus, priorities, mentalities and behaviours of operators in a liberalized context may therefore change significantly. Sector leaders must then very soon establish an information system, for preparation and "support" of this change.

Finally, for the market to play its role, a wide range of provisions and practices should be reviewed / upgraded / invented and implemented for its opening.

Is presented below an inventory that could not be exhaustive for each and all the countries concerned, but that gives the first approach to the full extent of the changes to be planned.

5.1 - General organization of the sector

Changes to be envisaged at the level of market organization involve all actors. Actions and their implications are at least the following:

- Generation, transmission and distribution functions performed by the historic operator are at least functionally and accountably independent, as already mentioned, ideally and legally separated through subsidiary activities.
- The Basic Act and the implementing regulations must be adapted to enable establishing structure and new transactions. Conditions of eligibility for certain (major) consumers must be defined by decree or equivalent if the law does not provide for it.
- The powers of the national regulator will expand to market supervision and control of applied tariffs of natural monopolies (transmission and distribution networks).
- The General Public Utility Delegation is, if appropriate, preferably granted to the Public Transmission Network Operator (GRPT).
- All generation plants of the historic operator become one of the actors in the generation primarily if not exclusively related to the regulated sector. A medium term Memorandum of sales binds him to the Public Service Commercial Agent (ACSP). Existing PPAs that could not be renegotiated/ adapted to make their owners real independent generators are transferred to GRPT (represented by the Public Service Commercial Agent - ACSP).
- The GRPT is also the buyer by default of generation from renewable energies receiving guaranteed subsidized prices.

- The conditions for invitation and authorization of new independent producers (licensing system) can be made simpler and more attractive.

The general quality of service must be monitored and analyzed, including by methods of benchmarking among operators. In particular, special attention should be given to weaknesses, source of recurrent incidents on the networks, which should be quickly removed. For example, situations where a contract to supply energy suffers interruptions/abnormal repetitive situations and where the supplier on the one hand and GRPT on the other hand are disputing over their respective responsibilities, can only be exceptional and of short duration. The national regulator should be able to play its full role.

5.2 - Generation

In the free market, part of the production shall be ensured by truly independent producers, that is to say, producers that are not bound by exclusive PPAs or that are at least released for part from their generating capacity.

In principle, in accordance with the ECOWAS Energy Protocol, and as soon as possible but depending on the evolution of liberalization in different countries, foreign operators have access to eligible customers through interconnection lines. Conversely, domestic generators can export to authorized foreign buyers.

Also, in case there are no real independent producers in the country, the following must be carried out:

- Give to one or more plants of the current operator a status of “virtual power plant” that can act on the free market,
- Facilitate/encourage access of eligible customers to foreign generators, duly registered with the GRPT from their country of residence, and duly authorized to contract freely. Here, the authorization for the function of “trader” can facilitate contacts between cross border sellers and buyers.

Subsequently, when the number of eligible customers increases, it can be expected that new production capacity will be made available by real IPP. However, if the number of eligible customers remains stable, additional production will be commissioned at least partially in a PPA regime with GRPT (medium term) in order to ensure a level of income to new generators and make new investment more attractive.

5.3 - Transmission

Transmission function is provided by the Public Transmission Network Operator (GRPT) that meets the following characteristics:

- It is a State-controlled commercial company.
- The GRPT performs its mission within the framework of a long term concession contract.
- It must be a company totally autonomous and independent from generation and distribution operators. To this end, its revenues exclusively stem from the charges related to the use of the public transmission network.
- The GRPT structure is adapted to receive activities of Central Buyer of the Regulated sector operator, of the free market operator as well as for the marketing of its services.

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- The design and update of medium and long term development plan of the generation - transmission system, in accordance with the policy guidelines of the government is entrusted to GRPT.
- The GRPT exercise its mandate in line with a network code, approved by the national regulator.

With regard to ancillary services, in the first stage of opening access to the network, the weight of the production deriving from the de-integration of the national society is in general paramount. Also, most often, in this first stage of opening, one may decide that the main ancillary services (frequency control, tertiary reserve, balance and compensation between forecast and actual demand, energy purchasing to offset losses) are purchased by the GRPT to this major actor. The position of the producer is also essential for the provision of services. The quantities required are estimated from simulations of the system on an annual basis and the prices are controlled by the Regulator. When the market has matured or the dominant producer cannot provide ancillary services alone anymore, the GRPT buy them from various producers in competition.

These ancillary services are a component of national transmission rate controlled by the independent national regulator.

The functionality of the national control centre must then be analysed in light of new GPRT tasks. In this context, the suitable information system aid (hardware and software) is essential to make it possible rapid exchange of information between numerous actors. In particular, tools and procedures for a centralized management of metering at the national control centre to the benefit of market actors should be studied and implemented and all instruments and metering and tele-metering devices should be upgraded as necessary, which may represent relatively important investments.

5.4 - Distribution

The public utility delegation concerning public distribution must be adapted. At least at a first stage of network access, the functions of network operation and of supply to regulated customers may continue to be exercised by the same distribution company; however, the latter must organize its accounting to distinguish functions:

- Network operation (technical function) that will lead to determine tariffs applying to access to and use of MV and LV networks. Each of these rates must be approved by the National Regulator,
- Supply and sale only to regulated customers (marketing functions), according to tariffs equally approved by the Regulator.

In the open market, each distribution company buys its energy from the Public Utility Central Buyer in a two-part tariff. The retail sales contracts must contain incentives aiming at optimizing the load curve (with for instance dual hourly rates, peak voluntary power cuts, etc...) and then at obtaining the lowest average purchase price per kWh. Loss rate likely to be incorporated into network usage rates is capped by the regulator, which is another challenge for the distributor: making a loss rate lower than the minimum set by the regulator and thus making savings on its energy purchases.

Operators of public distribution networks will increasingly buy some of their needs in the open market in order to support and also benefit from competition. Purchases of distribution network operators in the open market can be done through periodic public auction, to provide a more transparent reference price controlled by the Regulator for transactions of the Public Utility Central Buyer in order to resale to distribution companies for delivery to regulated customers. The rise of bidding by distribution companies is also done under the supervision of the regulator, depending on changes in the volume of "open" generation compared to the overall generation.

5.5 - Market

The market will consist of actors who are contractually bound through:

- Supply contracts: The free market will consist of bilateral supply contracts for a period of 1 to 5 years. A model bilateral contract should be approved by the national regulator in collaboration with the regional regulator in the context of harmonization of conditions for cross-border trade.
- The sales contract(s) of the Public Utility Central Buyer to the distribution company (ies) should determine the commitments and performance of these distributors (demand forecasting, management of peak and load factor, losses of distribution networks).
- Market rules and procedures to be established in accordance with the missions of the three bodies of the GRPT:
 - ✓ The Generation-Transmission System Operator, including the national control centre
 - ✓ The Public Service Commercial Agent (ACSP)
 - ✓ The organizer of the Free Market

All these rules and procedures must be approved by the national regulator who will have a key role to timely trigger the process of adaptation / revision of the market rules.

6 - REMARKS ON SOME OF THE INVENTORY ACTIONS

6.1 - At the contractual and legal level

Two important aspects should be highlighted:

1. The eligibility threshold was set at 5 MW in Senegal and Mali; this threshold was intended to be gradually reduced to 1 MW in Senegal over a period of 10 years. It is currently at 3 MVA in Ghana and Energy Commission intends to reduce it soon.

One should be aware of two opposing factors:

- the volume of the free market is the main attraction for the new independent production;
- the increased number of eligible customers means a decrease in their average size and a significant increase in the complexity of system operation, both at the levels of planning and conducting as well as on the sales management and marketing levels.

It may be considered that the range of the eligibility threshold, which stands between 2 and 5 MW, is a reasonable target for the first opening stage in ECOWAS. A more precise figure depends on a national analysis of the characteristics of MV customers.

2. The revision of PPA exclusivity clauses will require months of negotiation with existing IPPs, given their incidence on warranty and compensation clauses. Simulations of system operation within 3 or 5 years will certainly be needed to guide negotiations. Likewise, additional procedures regarding information exchanges and billing will be necessary.

In addition, the direct bank domiciliation of some customers (probably eligible) or commercial agencies revenues should no longer be accepted as payment in negotiating BOT contracts (see GTI and Kounoune in Senegal), because this results in making eligible customers captive.

Finally, the success of the revision of exclusivity clauses should normally largely depend on the clarity and credibility of the proposed reorganization of the sector and on the objectives (volume and deadline) of market liberalization.

6.2 - At the institutional level

The de-integration applicable to national electricity companies aims at dividing up and reaching functional independence in generation, transmission and distribution activities within the same company, which will possibly become a holding company.

However, de-integration may be the first step towards further development differentiated on each open market segment. The strategy of the States should be to plan a long-term future for each of these segments while taking into account their impact on the development of subsidiaries such as, the complete or partial privatization of generation, splitting distribution into regions by creating mainly competitive companies at the level of performances, etc.

6.3 - At the organizational level

The description of new attributions in keeping with PPAs, the regulated market and the open market will be further detailed in the following report on the organization of the opening.

It will be the same as concerns the content of the network code.

Currently, the consumption profiles of eligible customers are unknown or poorly known. There is no continuous recording of their power demand, nor any recording of electronic metering making it possible to analyse significant temporal profiles.

Electronic systems to meter power demand of eligible customers would make it possible to get this information (which is obviously important for the signature of supply contracts, including the estimates of expansion coefficients). It is therefore recommended to start a campaign to modernize metering among all HV and MV customers, regardless of the opening of access to the network. This metering will then be used for contract management (billing) and measuring gaps from contractual removal programs.

Subsequently, these counts will help develop profiles that will usefully precede each stage of the market expansion.

As already mentioned above, the conditions to transfer the Commercial Agent from the national utility to distribution companies to supply regulated customers should include incentives for the mastery of the load factor and losses reduction accepted and audited by the national independent regulator.

6.4 - At the pricing level

A certain number of basic principles regarding pricing should be respected :

- a) The tariff set by regulators should reflect the full costs to ensure the financial stability of the various operators, each in its area,
- b) The principle of transmission tariff at the national level will certainly be, at least for the first phase, postage stamp tariff considering its simplicity,
- c) In particular, the rules for setting a tariff for the access and use of networks should normally take into account the foreseeable needs for the expansion of those networks and thus they should be based on medium term development costs.

In any event, the financial models used to determine them should be audited by independent auditors.

In the first stage of opening access to the network, a simple and user-friendly pricing of ancillary services should be sought. For example, in some countries, energy relief supply was earmarked for the Public Service Commercial Agent from which eligible customers could (or could not) subscribe.

- d) Public subsidies granted by governments should be transparent and should not introduce deviations from competition (for instance tax exemption on fuel). In case of subsidies granted by governments, they should only fund the social tariff (first LV category). Cross-subsidization between tariff classes should be reconsidered so that they do not influence competitive bids for eligible customers.
- e) The existing (OMVS / SOGEM) and future (OMVG, CLSG) multinational transmission companies should also be able to provide all information needed in order to appraise the right transmission cost in each country.

7 - SPECIFIC CHARACTERISTICS IN THE COUNTRIES MEETING THE BASIC CONDITIONS FOR ACCESS TO THE NETWORK

Significant characteristics of the countries meeting the basic conditions for access to network should be taken into account while conducting specific actions in order to establish a limited open market in each of these countries.

7.1 - Togo and Benin

The problem of these markets is the repositioning of CEB on :

- Its activities: CEB is the generator, carrier, importer, central buyer (non-exclusive) and operator of the transmission center covering the two countries,
- Contracts: CEB signed individual supply contracts to with the most important industrial customers in both countries,
- The management bodies of the CEB: they are characterized by the direct presence of eight ministers of both countries in its Board of Directors,
- The difficulty of imposing independent regulation on this transnational operator.

In addition, in both countries there is no significant and competitive generation in the national companies in place. Therefore, from the outset, the GPRT will have to create a competitive market to purchase energy in order to supply non-eligible customers and to buy ancillary services.

7.2 - Côte d'Ivoire

The revision of agreements with Independent producers and associated PPAs is likely to be difficult.

Vertical de-integration will also be more complicated because of the presence of an asset management company alongside with a lease operator, both stakeholders covering the functions of generation, transmission and distribution.

7.3 - Senegal

The methodology defined in 2009, remains valid. As a reminder, Senegal decided to postpone eligible customers' access to network to 2019.

7.4 - Mali

Adverse conditions to an opening reported in 2009 have changed. Mali now has two IPPs and industrial customers (primarily gold mines), which should be significant customers (in terms of volume consumed, but also as business customers).

However, both PPIs have a purely thermal generation fleet and will hardly compete with the prices of EDM that has its own hydroelectric generation, in addition to exclusive contracts with more favorable

prices from SOGEM and Côte d'Ivoire. The question will be whether it is possible / acceptable to plan a quota system for allocating supplies at favourable prices, similar to the system of virtual power plants established in Europe (e.g. French nuclear)?

7.5 - Burkina Faso

Burkina Faso currently has no IPP.

Competition concerning the SONABEL production should come from external generators or from the privatization of part of the SONABEL generation facilities.

The Electricity law currently in force provides for the creation of an asset management company leased by SONABEL. This facility is not yet implemented, but it could complicate the de-integration that should precede network access.

7.6 - Ghana

Finally, as concerns Ghana, are just reported some performances currently reached in the country in terms of liberalization of the electricity market that seem significant for further developments that can be expected :

- The current size of the open market in Ghana: 25% of total energy traded,
- Market products are currently bilateral contracts between producers and eligible customers and short-term contracts (spot market) between all market players,
- The number of eligible customers: 29 including 15 powered directly in HV,
- Eligibility criteria: subscribed power greater than or equal to 3 MVA, or consumption greater than or equal to 6 GWh/year,
- The tariff for the use of transmission network is 1.2421 USc / kWh
- Energy Commission believes that the experience of access to the network is a success and is now considering lowering the eligibility criteria.