REGULATORY STUDIES – LOT 2

ACTIVITY 6: BENCHMARKING

REPORT 1: BASELINE REPORT

March 2013

Contact : Marie d'ARIFAT
ARTELIA V&T - Département ICEA
50 avenue Daumesnil
75579 Paris Cedex 12– France
Tél. : +33 (0)1 48 74 04 04
Fax : +33 (0)1 48 74 04 35
icea.paris@arteliagroup.com

Planning Energy
for a Sustainable World

Contact : Neil PINTO
PPA Energy
1 Frederick Sanger Road
Guildford GU2 7YD, UK
Tel: +44 1483 544944
Fax: +44 1483 544955
marketing@ppaenergy.co.uk

1 - INTRODUCTION 1
1.1 - REVIEW OF TASK 6 OBJECTIVES AND THIS REPORT'S OBJECTIVES 1
1.2 - DATA COLLECTION: MODALITIES AND SITUATION 1
1.3 - METHODOLOGY 4
2 - SOCIO-ECONOMIC CONTEXT 5
2.1 - DEMOGRAPHIC COMPARISONS 5
2.2 - ECONOMIC COMPARISONS 7
2.3 - CONCLUSION 9
3 - REGULATORY INSTITUTIONS 10
3.1 - GOVERNANCE BENCHMARK 10
3.2 - REGULATION CONTENT BENCHMARK 24
4 - MARKET OPERATORS 34
4.1 - METHODOLOGY OF QUALITATIVE ANALYSIS 34
4.2 - FEASIBILITY OF QUANTITATIVE ANALYSIS 39
4.3 - PRELIMINARY RESULTS 41
5 - PRELIMINARY CONCLUSIONS 48
6 - ANNEX 49
INTERVIEWS AND PERSONS CONTACTED DURING CIRCULAR MISSIONS 49

1 - INTRODUCTION

This report falls under task 6 aimed at achieving a regional benchmark. In accordance with the study's Terms of reference and with our technical proposal, this is the Initial Report of the aforementioned task.

1.1 - Review of task 6 objectives and this report's objectives

This task aims to produce a detailed and complete report, showing a benchmark of multiple performance indicators concerning utilities and national regulators alike. The benchmark concerns all ECOWAS countries and seeks to highlight regulation practices, the output of public utilities and national regulators, as well as the financial and technical performances of the sector and utilities.

The report presents the methodology adopted to carry out a proper regional comparison. It also provides primary evaluation of the information gathered using questionnaires administered to countries by ERERA or collected during missions to those countries by Consultants.

The report is also the first-ever assessment of the initial situation of the electricity market and the state of regulation in the ECOWAS region based on available information. It also identifies what data is lacking at this stage.

1.2 - Data collection: Modalities and situation

The collection of data necessary to achieve the benchmark, both for regulation and for utilities of the sub-region, was organized in two phases:

- Dispatch of questionnaire
- Conduct of country mission

1.2.1 - Collection using the questionnaire

The first phase consisted in sending a questionnaire constructed by the Consultant and validated by ERERA (cf questionnaire presented in the start-up report).

This questionnaire, dealing with institutional and technical aspects, comprised the following sections:

0. Request for necessary documents to supplement answers to the questionnaire
1. Institutional framework
2. Organisation and structure of electricity companies
3. Tariff methodologies
4. Process of consulting stakeholders
5. Utilities' technical performance

6. Main statistics on utilities (for each utility)
7. Transmission pricing
8. Capacity building of regulatory bodies

Sections 1, 2, 3, 4 concern notably a "Handbook for Evaluating Infrastructure Regulation" prepared by the World Bank.

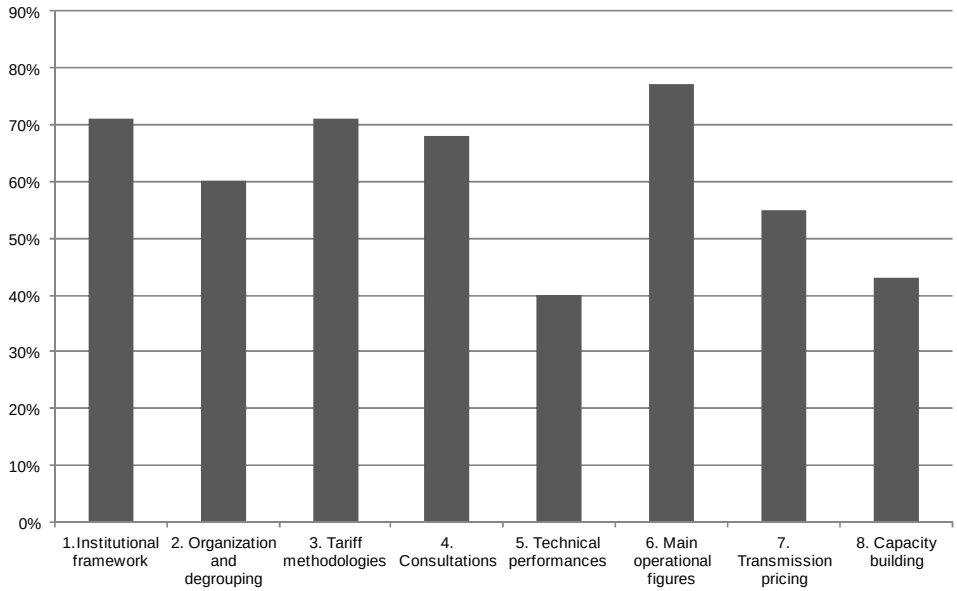
The questionnaire was forwarded by ERERA to focal points of the various countries in December 2012. Out of the 15 countries, 9 returned the questionnaire between 21 January and 25 February 2012.

Table 1 : Countries having returned the completed questionnaire

Country	Date of return of questionnaire
Benin	6 February 2013
Burkina Faso	18 February 2013
Cape Verde	Not sent
Côte d'Ivoire	4 February 2013
Gambia	25 January 2013
Ghana	25 February 2013
Guinea	Not sent
Guinea Bissau	Not sent
Liberia	Not sent
Mali	21 February 2013
Niger	Not sent
Nigeria	31 January 2013
Senegal	21 February 2013
Sierra Leone	Not sent
Togo	25 January 2013

It should be noted that some of these questionnaires were not completely filled in. Some of the information lacking was gathered during the visits mentioned in the next paragraph or from reading the progress reports of utilities and regulators submitted to the Consultant, but most of it remains unfurnished, as shown in the graph below. The graph shows the ratio (**number of fully or partially answered questions /total number of questions**) divided by all 9 countries that filled in the questionnaire:

Figure 1 : Rate of questions answered by each of the 9 countries that returned the questionnaire



We note that the rates of parts 5 (Technical performances), 7 (Transmission pricing) and 8 (Capacity building) are particularly low (below 55%). The specification and number of KPIs presented as the studies unfold were impacted.

1.2.2 - Country missions

The second phase consisted in conducting missions in some countries following a list drawn up by the Consultant and validated by ERERA. The countries were chosen on the basis of their "representativeness" and the existence of regulatory entities therein. The country visits were meant to further investigate issues raised in the questionnaire, to understand fully and thoroughly each country's details, the real challenges faced by each stakeholder, inter-country disparities, current and effective practices, etc required immediate attention. During such visits the hard or soft copies of some documents were also collected.

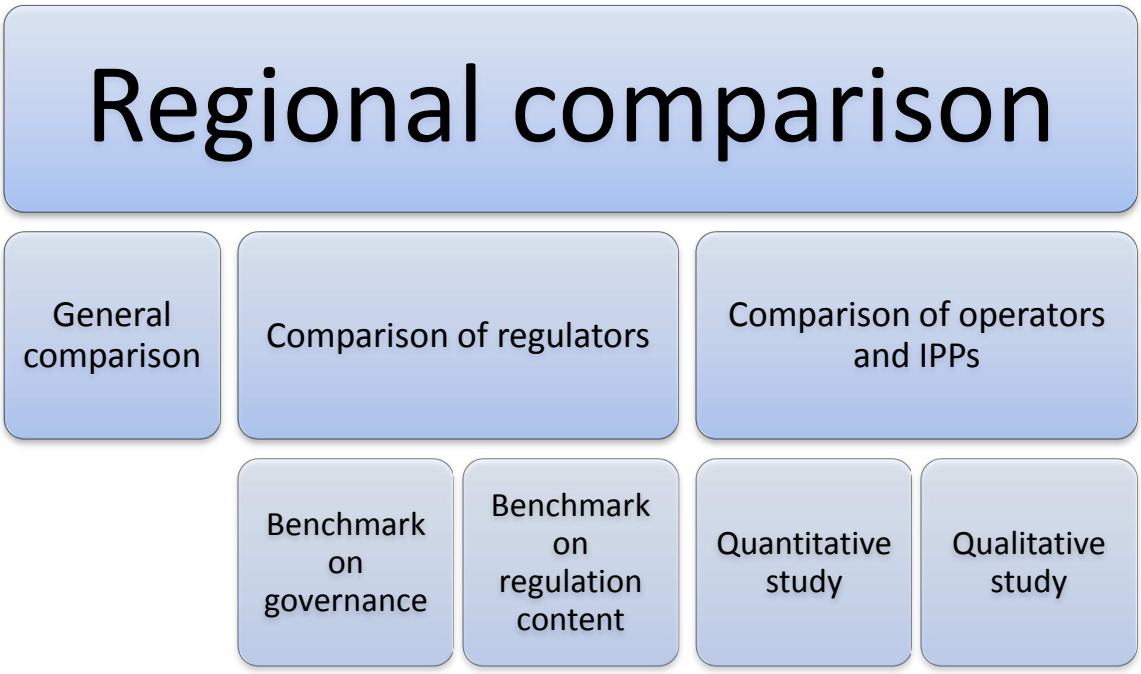
In all, the Consultant conducted interviews in 7 countries[1], meeting the main stakeholders in the energy sector (Ministry, Electricity Corporation, Regulator, Independent Producer, major consumers and consumer associations). The country visits were carried out by two teams dispatched by the Consultant: team A went to Burkina Faso, Togo and Côte d'Ivoire while team B went to Ghana, Gambia, Senegal and Nigeria. The list of bodies and enterprises that were contacted during the missions is appended hereto.

[1] The organization of those visits was undermined by difficulties in obtaining a visa (particularly in Nigeria) and in communicating (the malfunctioning of the CRSE mail server, regulator in Senegal, prevented them from notifying our visit and thus from holding meetings with them well ahead of time). These difficulties led to a one-month delay in the schedule.

The information gathered enabled the Consultant to produce a first database which will be used as a benchmark for comparing the regulatory authorities on the one hand and utilities in ECOWAS countries having answered the questionnaire on the other.

1.3 - Methodology

For this activity to be smooth, we present the following structure:



Quantitative studies will hinge on the comparison of performance indicators (KPIs) whose selection we back up in this report from our experience in similar projects and duly gathered information.

Qualitative studies will consist in the comparison of countries grouped in categories following the trends identified in the quantitative study. This part will be tackled only in the second report.

2 - SOCIO-ECONOMIC CONTEXT

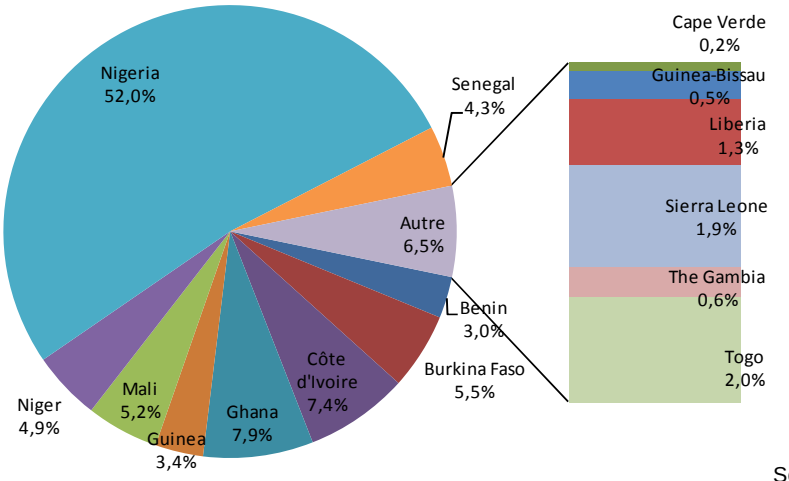
Before comparing regulators and electricity companies themselves, it is worthwhile to situate the context. There are wide disparities (in size, economy, density) between ECOWAS countries such that they are worth reiterating in this introductory part. Our parameters have been selected based on a number of similar general studies, including the study entitled "Tariffs and Performance Indicators" conducted by the energy regulator in South Africa in 2009.

2.1 - Demographic comparisons

2.1.1 - Population distribution

It is important to understand how the ECOWAS total population (317 million people) is distributed among the various member countries:

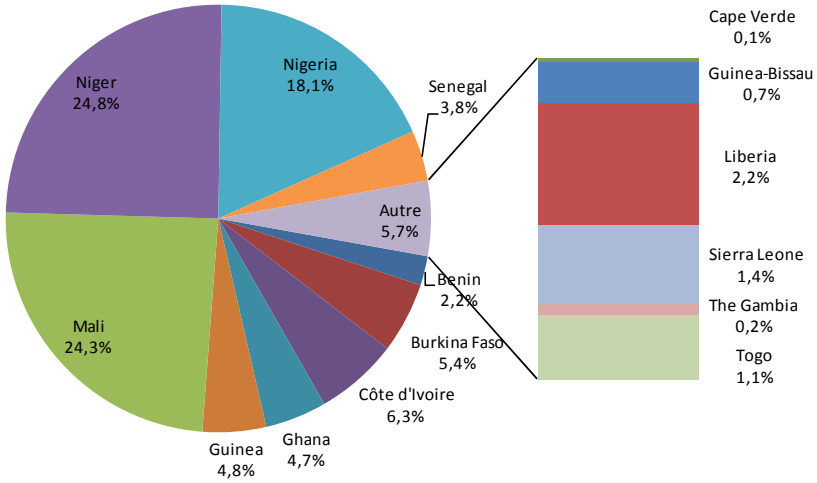
Figure 2 : Distribution of the ECOWAS population in 2012 among various countries



Source: IMF

It can thus be noted that more than half the population lives in Nigeria. Conversely, only 6.5% of the population is distributed among 6 countries: Liberia, Togo, Guinea Bissau, Gambia, Cape Verde, and Sierra Leone. On the other hand, if we consider the surface areas of the countries that make up ECOWAS, three countries (Niger, Mali et Nigeria) cover more than 68% of the total surface area of the zone. Thus, electrification stakes are bound to be very different from country to country.

Figure 3 : Distribution of the surface area of ECOWAS member countries

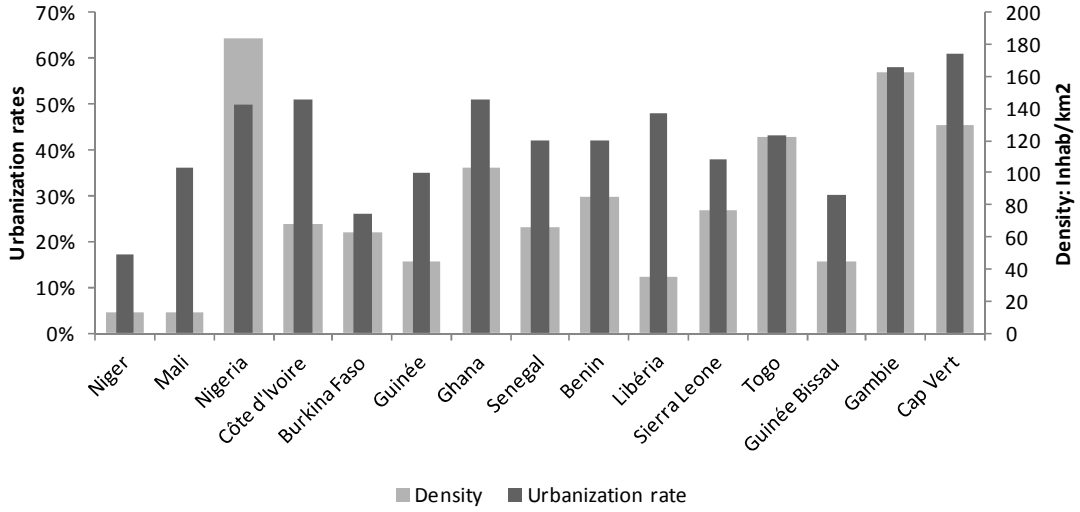


Source: CIA Factbooks

2.1.2 - Urbanization

Apart from surface area, as presented above, the rate of urbanization is a crucial factor of discrimination between countries within the framework of electric systems analysis. This observation, supplemented by that of the population density, gives an idea of the challenges faced by a country in supplying electricity. Both indicators effectively and indirectly contribute to a better understanding of the electricity network, and the stakes and constraints related to its development. A low urbanization rate, combined with a low population density, generally means that the population is scattered, making it difficult and costly for people to benefit from an interconnected network, while a high urbanization rate and /or high population density facilitates deployment of an interconnected network.

Figure 4 : Urbanization and population density of ECOWAS countries



Source: CIA Factbooks

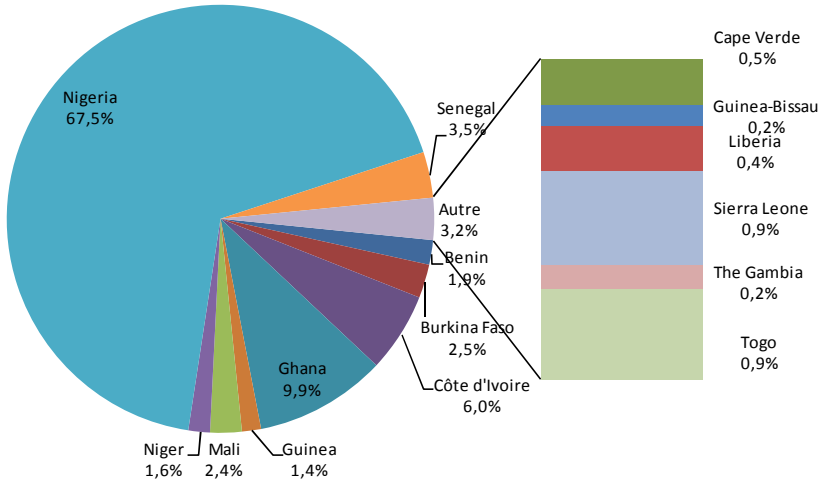
Accordingly, one can notice a particularly low urbanization rate in Niger, Burkina Faso and Guinea Bissau, while it is high in Nigeria, Gambia and Cape Verde. Some countries, such as Liberia or Mali, have a high urbanization rate but low population density.

2.2 - Economic comparisons

2.2.1 - Regional GDP distribution

Regional disparities naturally include economic disparities, evidenced primarily in GDP differences, showing the full "wealth" and economic health of a country.

Figure 5 : 2012 GDP distribution (current value)



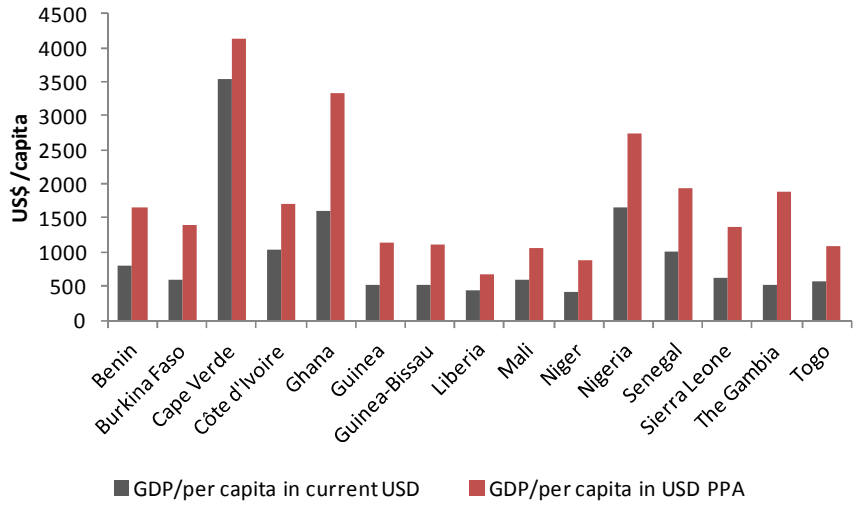
Source: IMF

Again, Nigeria alone produces 67% of the regional GDP, while less than 4% of the regional GDP is generated by Guinea Bissau, Cape Verde, Liberia, Gambia, Togo and Sierra Leone.

2.2.2 - Per capita GDP

Although a comparison of each country's GDP share in the zone gives an idea of the respective economic weight of the country, it does not indicate its wealth and the population's economic development level because the demographic disparities earlier identified are not considered. To better gauge the population's wealth, it seems more appropriate to use per capita GDP. However, development differences, cost of factors of production and consumer goods among various countries directly affect households' purchasing power. Thus, a dollar in one country will not have the same purchasing power in another country. Effective inter-country comparison requires fully analyzing per capita GDP in current dollars against per capita GDP in purchasing power parity (PPP).

Figure 6 : Per capita GDP of ECOWAS countries in current US dollars and PPP in 2012



Source: IMF

Although Nigeria takes the lead again, we also note a high per capita GDP for Ghana and Cape Verde. Liberia and Niger have a very low per capita GDP, below 1000$/inhabitant. Purchasing Power Parity tends to increase the average wealth per inhabitant without as much reducing the wealth gaps between the richest and the poorest countries.

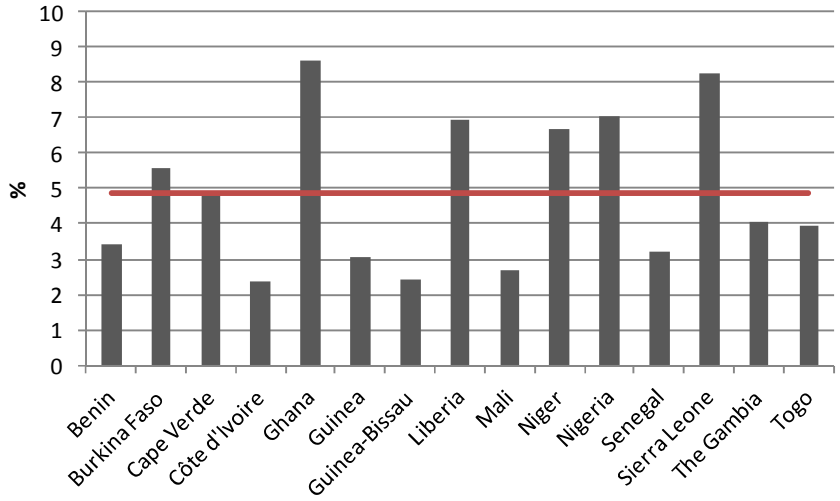
The average per capita GDP of the zone stood in 2012 at close to per capita US$1740 PPP. Out of the 15 countries of the ECOWAS zone, only 5 countries are above the average level (Cape Verde, Ghana, Nigeria, Senegal, and Gambia). These significant wealth gaps must be kept in mind when analyzing tariffs and recommendations. In fact the richer the country, the more latitude for the Government's/Regulator's manoeuvre, such as during the review or possible tariff increases.

Lastly, it is important to keep in mind that this notion of per capita GDP does not allow for consideration of unequal wealth distribution within the population, nor of informal economy which is lacking in terms of official statistics and is not calculated in the GDP.

2.2.3 - Growth

Apart from socio-economic indicators which provide a "fixed" vision in 2012, it is interesting to restate the indicators in a more dynamic vision. To do this, we consider GDP growth (expressed in constant dollars in order to neutralize the impact of inflation) over the past five years. The zone's average annual growth stands at 4.9%. The most dynamic countries are those above the average and number seven (Burkina Faso, Cap Verde, Ghana, Liberia, Niger, Nigeria, and Sierra Leone). Out of the 7 countries, 3 (Cape Verde, Ghana, Nigeria) also feature in the group of the "richest" countries as identified in terms of per capita GDP while 3 (Liberia, Niger and Sierra Leone) are clearly trying to catch up as they are still among the poorest countries.

Figure 7 : Average annual GDP growth (in constant U.S. dollars) between 2005 and 2011



Source: IMF

2.3 - Conclusion

In conclusion, we need to consider the population and economic disparities when comparing regulators and utilities. In the quantitative analysis section, it will be necessary to tailor most of the results to the country's size, population, GDP or inflation.

3 - REGULATORY INSTITUTIONS

The "Handbook for Evaluating Infrastructure Regulation" suggests that a benchmark of regulatory bodies can be carried out following two dimensions. The first dimension refers to the notion of governance and the legal and institutional conception of the regulatory system as well as to the regulator's decision-making framework. The second dimension, for its part, concerns the regulation content and stresses the regulator's decisions. In this report, we propose a primary analysis of the governance dimension based on responses to the questionnaire sent to each country. An analysis of the regulation content will be carried out later, since only the first implementation of the methodology adopted is presented here concerning pricing.

3.1 - Governance benchmark

The issue of governance takes us to "how" the regulations have been laid down. Asking about the governance of the regulatory authorities leads to studying how the regulatory authorities of various countries position themselves in relation to the following six points:

- What is the scope of independence and responsibility of the regulatory body?
- What is the relationship between the regulator and public policymaker(s) ?
- How are the processes used in the regulator's decision-making guided?
- Is there transparency in the regulatory body's decision-making?
- Are the decisions taken by the regulator public?
- What are the organizational structure and resources at the disposal of the regulator?

The first part of the questionnaire, sent by ERERA to the focal points of various countries, addresses these issues. Below we present a summary of answers to questionnaires for 9 respondent countries while comparing them with the six points presented above.

The contribution of the different questions to the questionnaire in assessing the various governance components of the regulatory authority is presented on the table below:

	Independence and responsibility	Relationship between the regulator and public policymaker(s)	Formalization of decision-making process	Transparency of decision-making	Publicity of decisions	Structure and resources
Existence of a regulator	X					
Status of the institution	X	X				
Supervisory authority of the institution	X	X				
Seniority of regulatory authority	X					
Funding method	X					X
Institution's management method	X					X
Institution's responsibilities				X		
Authority's control				X	X	
Relationship with stakeholders			X	X	X	

In order to carry out the comparison between questionnaire respondent countries, we propose for each question a marking scale that allows for the classification of responses between them. The sum total of marks (possibly weighted) for each country will thus make it possible to conduct a primary assessment of each country's position regarding regulation governance.

The marking principle adopted generically consists of using the following scale

	Mark
The characteristic is absent	0
The characteristic is present but corresponds to the lowest governance modality as per the criterion considered	1
The characteristic is present with a positive impact on governance higher than the previous mark	2 à 6

For some criteria, another marking scale will be used in order to better show the indicator's complexity. In each case, the marking will be in ascending order depending on the criterion's contribution to the improvement of governance.

3.1.1 - Existence of a regulator

Several questions address the issue of regulation independence starting from that relating to the institution in charge of regulation. Here is a scale to assess responses:

- No regulatory institution: 0
- A ministry: 1
- A regulatory agency: 2

For the 9 respondent countries, the answers are presented as follows:

Country	Regulatory body	Mark
Benin	Ministry	1
Burkina Faso	Electricity sub-sector regulatory authority	2
Côte d'Ivoire	Ministry of Mines, Petroleum and Energy National Electricity Sector Regulatory Authority (ANARE), CI-Energies	2
Gambia	PURA (Public Utilities Regulatory Authority)	2
Ghana	PURC (Public Utilities Regulatory Commission)	2
Mali	Electricity and Water Regulatory Commission (CREE)	2
Nigeria	NIGERIAN ELECTRICITY REGULATORY COMMISSION	2
Senegal	CRSE : Senegal's Electricity Sector Regulatory Commission	2
Togo	Electricity Sector Regulatory Authority (ARSE)	2

3.1.2 - Institution's status

The second regulatory authority's governance constituent element is the status of the regulatory authority.

The marking scale drawn up to assess status-related responses is as follows:

Status type	Mark
The Ministry/Minister ?	1
An independent advisory organ answerable to the Minister?	2
A regulatory agency within a ministry?	3
An independent and autonomous regulatory agency?	4

Questionnaire responses and the corresponding marks are as follows:

Country	Regulatory body	Mark
Benin	Ministry	1
Burkina Faso	Autonomous regulatory agency	3
Côte d'Ivoire	Autonomous State-owned corporation	2
Gambie	Independent agency	4
Ghana	Independent entity	4
Mali	Independent and autonomous agency	4
Nigeria	Independent and autonomous authority	4
Senegal	Autonomous and Independent	4
Togo	Independent and autonomous body	2

3.1.3 - Institution's supervisory authority

The third regulatory institution's governance component is the body's supervisory authority. The closer the supervisory authority of the area regulated by the institution, the more the risk of conflict of competence and/or closer the risk of interference by the supervisory authority. Here is a marking scale to assess the degree of independence.

Supervisory authority	Mark
Ministry's Department	0
Ministry of Energy	1
Ministry other than that of Energy	2
No direct supervision	3

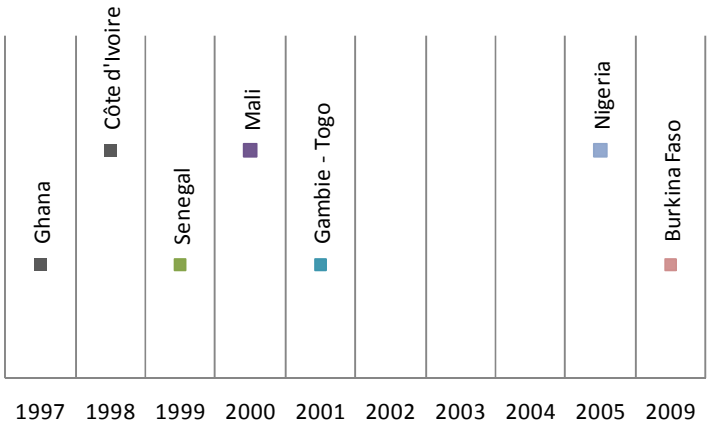
Responses and corresponding marks are presented as follows:

Country	Body in charge of regulation	Mark
Benin	-	0
Burkina Faso	Ministry of Mines and Energy and Ministry of Finance	1.5
Côte d'Ivoire	Ministry of Energy and Finance => Directorate General of Energy (DGE)	0.5
Gambia	Ministry of Finance	2
Ghana	Ministry of Energy	1
Mali	-	3
Nigeria	Ministry of Energy	1
Senegal	-	3
Togo	Ministry of Mines and Energy	1

3.1.4 - Regulatory authority's seniority

Even if the seniority of the regulatory body is not a guarantor of its good governance, experience has shown that the regulatory organ improves over the years as it acquires expertise. Moreover, the regulatory body's seniority will be a significant assessment element in the second part of the benchmark concerning the regulator's actions.

The first regulatory agency was established in 1998 in Ghana, the most recent being that of Burkina Faso, established in 2009.



The marking system consists of giving the highest mark 1 to the oldest entity, and the other institutions are graded in descending order of start-up.

3.1.5 - Funding of regulatory body

The degree of financial autonomy is an important factor of the regulatory institution's somewhat considerable independence and thus a constituent element of the institution's good governance.

We propose the following marking scale to analyze the responses that we weight by the share of each funding type in the total.

Supervisory Authority	mark
Financial donors	1
State budget	2
Regulated entities' own contribution	3
Consumers' own contribution	3

The funding methods of the various institutions and the weight of each method in the total are as follows:

Country	Funding source and pattern	Mark
Benin	-	
Burkina Faso	100% State	2
Côte d'Ivoire	Funding by the sector	3
Gambia	100% regulated entity	3
Ghana	*Information awaited*	
Mali	91.2% contribution by consumers 8.8% PEDASB subsidies since 2005 (World Bank)	2,8
Nigeria	State 36.13% (2006) Regulated entities : 61.83% (2006) Other : 2.03% (2006)	2,6
Senegal	100% own contribution by regulated entities	3
Togo	100% own contribution by regulated entities	3

It should be noted that in all the countries, the funds are legally allocated to the agency allowing it to freely use them.

3.1.6 - Institution's management method

The management and decision-making method is an important factor of good governance. The existence of a college (sharing responsibilities and taking collegial decisions) or of a director general (whose decisions are less well argued out) is likely to have a direct impact on the institution's capacity to proper self-governance.

We adopt the following marking scale:

Management method	Mark
One person (President or DG)	1
A college	2

For respondent countries, the results are as follows. We also call to memory the method of designating the regulatory institution's officials but without considering it during marking because it does not discriminate between countries since it is used exclusively by the executive power:

Country	Type of management	Appointment method	Mark
Benin	-		
Burkina Faso	College of 5 members	Council of Ministers	2
Côte d'Ivoire	Director General	Board of Directors	1
Gambia	Director General	Head of State	1
Ghana	Secretary General and a Management Board	Head of State	2
Mali	Commission of 5 members including a president	Council of Ministers	2
Nigeria	College of 7 members	Head of State	2
Senegal	President	Head of state	1
Togo	College of 3 members	Council of Ministers	2

3.1.7 - Institution's responsibilities

For a range of subjects falling under regulatory responsibility, we identified those for which the regulatory agency was specifically solely responsible, those for which it shared responsibility with another institution (ministry, utility, competition authority …) and those for which it had no responsibility.

We adopt the following marking scale: 0 if no responsibility, 1 if shared responsibility, 2 if solely responsibility. The overall mark is divided by the number of themes analyzed.

The results for each of the themes chosen are presented below:

Authority in charge :	Burkina Faso	Côte d'Ivoire	Gambia	Ghana	Mali	Nigeria	Senegal	Togo
Tariff structure	1	0	2	2	0	2	2	0
Level of tariffs	1	0	2	2	2	2	2	0
Service quality	2	1	2	2	1	2	1	2
Consumer complaint provisions	2	1	2	2	1	2	1	2
Sector development planning	0	0	1	2	0	0	1	0
Investments planning	0	0	0	2	0	0	0	0
Wholesale market structure	0	0	0	2	0	2	0	0
Restrictive conduct	2	0	2	2	2	2	1	1
Validation of mergers/acquisitions	0	0	2	2	0	2	0	0
Technical norms and standards	1	0	2	2	0	2	0	1
Grant/ withdrawal of Utility's licences	0	0	1	2	0	2	0	1
Approval/validation of bilateral electricity purchase and sale contracts	1	2	1	2	0	2	1	0
Approval/validation of contracts of access/use of the transmission network and electric interconnections	1	0	1	2	1	2	1	0
TOTAL	0.85	0.31	1.38	2.00	0.54	1.69	0.77	0.54

3.1.8 - Regulatory institution's activity control

If the regulatory institution is responsible for a certain number of decisions which could strongly impact the sector (licences, tariffs, norms, etc), controlling it is an important governance factor. We tackle this problem from various angles: Existence of a progress report, publication of a progress report by the agency over the past 5 years, conduct of an accounts audit, publication of audits, identity of auditor and auditing of the Agency by the legislative power.

For each of these items, we give the mark 1 if the element is present and 0 if the contrary. Lastly, the number of reports published over the past five years is marked as the ratio between the number of publications and the number of years, representing 1 for every 5 published reports and 0.2 for one published report in 5 years.

Regulatory institution's control method	Burkina Faso	Côte d'Ivoire	Gambia	Ghana	Mali	Nigeria	Senegal	Togo
Obligation to publish a report	1	0	1	1	1	1	1	1
Number of progress reports published by the agency over the past 5 years	0.4	0	1	1	1	1	0.4	0.8
Conduct of accounts audit?	1	1	1	1	1	1	1	1
Publication of audits	0	0	1	1	1	1	1	1
Agency heard by legislative power?	1	0	1	1	1	1	0	0
TOTAL	3.4	1	5	5	5	5	3.4	3.8

3.1.9 - Relationship with stakeholders

The last element used in assessing regulatory authorities' governance is the relationship of the institution with electricity sector stakeholders, notably enterprises on the one hand and consumers on the other.

The institution's communication policy with stakeholders is tackled using 6 criteria, making it possible for the institution's openness to be evaluated. The mark given to each criterion is as follows:

Regulatory institution's control method	Yes	No
Existence of a consultation process prior to the regulator's decision	1	0
Openness to the public of meetings/seminars organized by the regulator	1	0
Legal obligation to publish information on its events	1	0
Accessibility to the public of the regulator's legal decisions	1	0
Regulator's legal obligation to publish decisions	1	0
Publication by the regulator of commentaries and explanations on its decisions	1	0

Regulatory institution's control method	Burkina Faso	Côte d'Ivoire	Gambia	Ghana	Mali	Nigeria	Senegal	Togo
Existence of a consultation process prior to the regulator's decisions	1	0	1	nd	1	nd	1	0.5
Openness to the public of meetings/seminars organized by the regulator	1	1	1	nd	0	nd	1	1
Legal obligation to publish information on its events	0	0	1	nd	0	nd	1	0
Accessibility to the public of the regulator's decisions	1	0	1	nd	1	nd	1	1
Legal obligation of the regulator to publish decisions	1	0	0	nd	0	nd	1	0
Publication by the regulator of commentaries and explanations on its decisions	0.5	0	0	nd	0	nd	1	0
Total	4.5	1	4	nd	2	nd	6	2.5

3.1.10 - Preliminary summary on the governance of regulatory bodies

The exploitation of responses from the questionnaire provides the first mapping of the regulatory authorities following various governance criteria. The following graphs provide easy identification of each country's strengths and weaknesses based on various criteria used in evaluating governance in each country.

Figure 8 : Positioning of each country following criteria

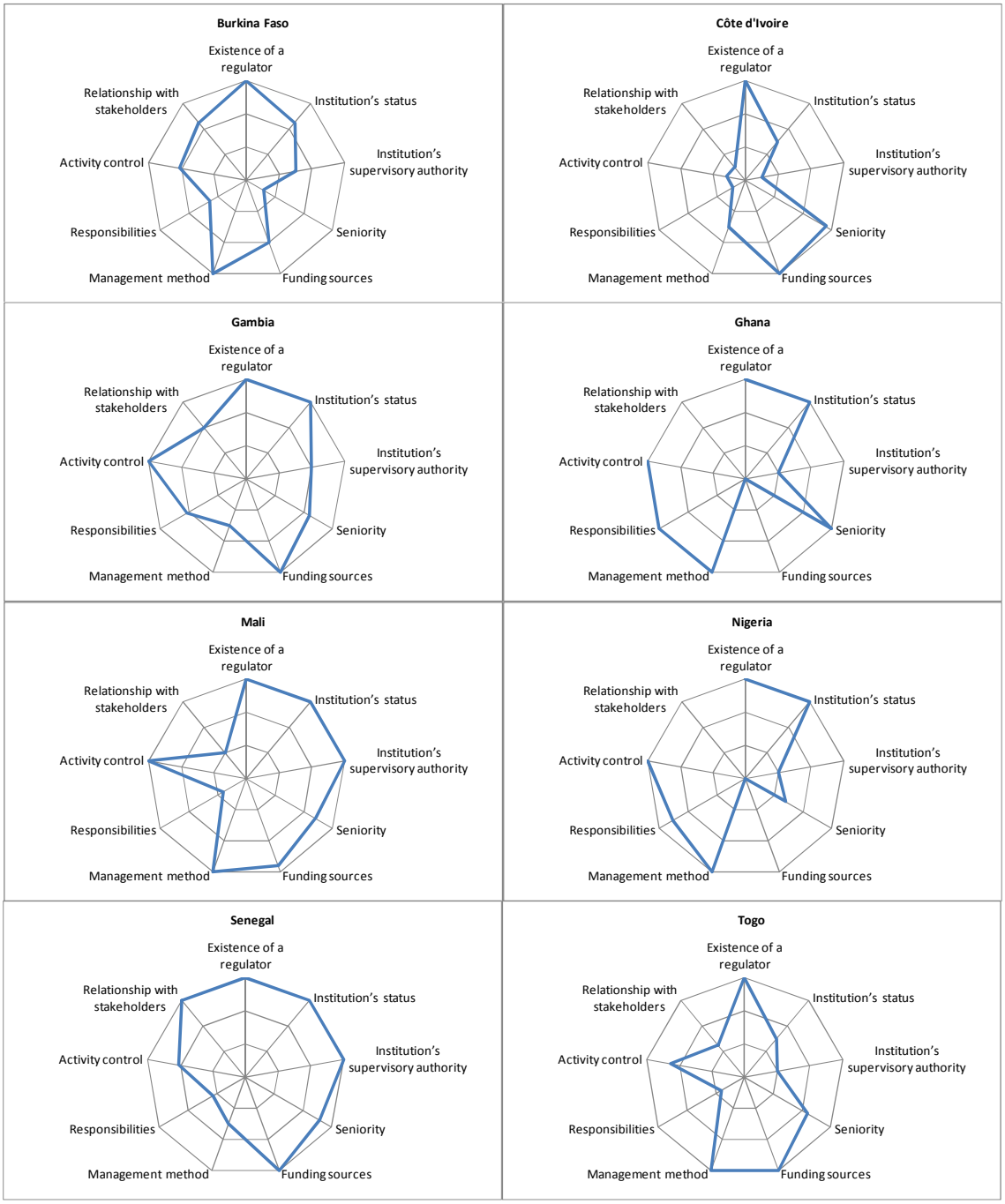


Table 2 : Summary indicators

	Existence of a regulator	Institution's status	Institution's supervisory authority	Seniority	Funding sources	Management method	Responsibilities	Activity control	Relationship with stakeholders	Note Totale
Benin	3	1,5	0	0	0,0	0	0,0	0	0	**2**
Burkina Faso	6	4,5	3	1,2	4,0	6	2,5	4,08	4,5	**30**
Côte d'Ivoire	6	3	1	5,6	6,0	3	0,9	1,2	1	**22**
Gambia	6	6	4	4,4	6,0	3	4,2	6	4	**38**
Ghana	6	6	2	6	nd	6	6,0	6		**32**
Mali	6	6	6	4,8	5,6	6	1,6	6	2	**38**
Nigeria	6	6	2	2,8	nd	6	5,1	6		**28**
Senegal	6	6	6	5,2	6,0	3	2,3	4,08	6	**39**
Togo	6	3	2	4,4	6,0	6	1,6	4,56	2,5	**30**

3.1.11 - Governance analysis provisional conclusion

The first results presented below have not yet been thoroughly analyzed to include more quantitative elements such as those gathered during missions in various countries. This qualitative analysis will be carried out in the final report of the task.

Moreover, the goal of this analysis is not to produce a list of regulators in order of merit but to identify best practices. Also, some information is still outstanding, notably for Ghana, Gambia or Liberia, and this is likely to falsify any comparison. Furthermore, we do not set out to do inter-country comparison.

3.2 - Regulation content benchmark

Here, we propose a first application of the benchmark on regulation "content" which will be enriched with other themes in the final report. However, the difficulties encountered in collecting information necessary to carry out this analysis are worth mentioning. In fact, questionnaire responses allowing the address of regulation content are so far deeply fragmented.

We intend to illustrate the methodology we have used to carry out this content benchmark by applying a tariff methodology to a specific theme and its handling by regulation in each of the countries.

3.2.1 - Tariff methodology

We have here decided to use World Bank standards to compare all the countries concerned. We shall thus give each country a mark following the scale below:

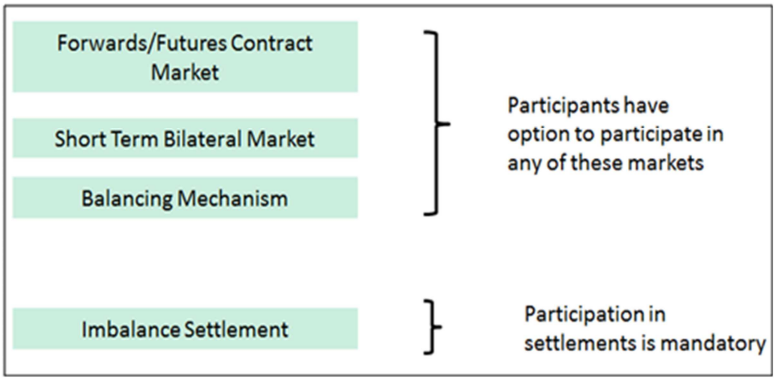
	-1	0	1	2
Scale	NO	UNKNOWN	PARTIALLY/ PLANNED	YES

To compare tariff methodologies, without temporarily using available information, we prescribe the following KPIs:

- **State of energy markets** (sum total of the following results) :

	-1	0	1	2
Presence of energy markets	NO	UNKNOWN	PLANNED	YES
Bilateral contracts	NO	UNKNOWN	PLANNED	YES
Spot market	NO	UNKNOWN	PLANNED	YES
Pool	NO	UNKNOWN	PLANNED	YES
Futures market	NO	UNKNOWN	PLANNED	YES
Balance market	NO	UNKNOWN	PLANNED	YES
Major consumers	NO	UNKNOWN	PLANNED	YES
IPPs	NO	UNKNOWN	PLANNED	YES
Access by eligible third parties	NO	UNKNOWN	PLANNED	YES

We notice that getting the highest mark would not be appropriate, since all the above components are not expected to be presented in each country. However, a relevant combination of the latter shows market efficiency compared to other countries in the world. In England for example, a combination of balance markets, short term bilateral markets and futures market, has been adopted (as follows).



In Mozambique on the other hand, the regulator has chosen long term bilateral contracts and short term balance markets.

- **Tariff level:**

We do not plan to compare electricity prices among various member countries. In fact, tariff structures in themselves differ from country to country. Some countries such as Côte d'Ivoire have binomial tariffs (comprising a fixed share depending on the power subscribed for) unlike Burkina Faso for example. Besides Nigeria, for example, has a regional tariff (depending on the consumer's region), while countries such as Gambia have a single rate for the whole country (by means of cross-subsidies). Lastly, the price in US$ is closely related not only to a country's inflation (whose disparities we have shown in ECOWAS) but also a baseline exchange rate varying from one day to another. It will thus be more relevant to highlight the presence of tariff mechanisms (tariff cross-balancing, tariff components) than on their impact on rates.

- **Tariff methodology** (sum total of the following results):

	-1	0	1	2
A clear methodology is used to fix consumer tariffs	NO	UNKNOWN	PLANNED	YES
A clear methodology to fix transmission tariffs is used	NO	UNKNOWN/NOT APPLICABLE	PLANNED	YES
Separate tariffs for commercial/industrial/residential consumers	NO	UNKNOWN	PLANNED / PARTIALLY	YES
Single tariff	NO	UNKNOWN		YES
Cross-subsidies in the interest of the most underprivileged	NO	UNKNOWN	PLANNED	YES
Losses are considered in the tariff	NO	UNKNOWN	PARTIALLY	YES
A tariff for peak/off-peak hours is proposed	NO	UNKNOWN		YES
The tariff depends on the energy consumed (kWh)	NO	UNKNOWN		YES

From our experience, the above criteria must feature in the terms of reference of an efficient tariff methodology. The price/kWh criterion is to be tallied to the method consisting in billing electricity on the basis of the power subscribed for and not the energy consumed (in Senegal before 2009 for example).

- **Tariff review and consultation (sum total of the following results) :**

	-1	0	1	2
Frequency F	NEVER	UNKNOWN	P <= 1 ou P>5	P > 1
The process is laid down and complied with	NO	UNKNOWN	PARTIALLY	YES
Consultation of all stakeholders	NO	UNKNOWN	PARTIALLY	YES
The final decision is in the hands of the regulator	NO	UNKNOWN		YES
The decision is published and notified	NO	UNKNOWN	OFTEN YES	ALWAYS YES

It is the onus of the regulator to organize a tariff review that considers all players. The Ministry for Energy is one of the players, but to ensure the regulator's independence, his opinion must not supersede the opinions of others. Moreover, the first criterion (review frequency) is very important: an annual tariff review does not make it possible to consider investment projects of the coming years. Thus when a major investment is required, a tariff review over several years helps prevent an upward trend for several years.

- **Price increase** :

We will consider inflation disparities (highlights in the introductory part of this report) during this comparison.

- **Investment conditions** :

We will compare:

  - **Return on targeted investment**
  - **Return on real investment**
  - **WACC**
  - **Internal loan rate**
  - **External loan rate (World Bank, FDA…)**

- **Openness to the international community**

	-1	0	1	2
International lines	NO	UNKNOWN	PLANNED	YES
International lines belonging to the country (utility/government)	NO	UNKNOWN	PARTIALLY	YES
International lines regulated by the national regulator	NO	UNKNOWN	PARTIALLY	YES
Use of lines by electricity companies to exchange energy	NO	UNKNOWN	PLANNED	YES
Use of lines by IPPs to sell energy	NO	UNKNOWN	PLANNED	YES
Use of lines by major consumers to buy energy	NO	UNKNOWN	PLANNED	YES

Feasibility of the study

Although we cannot now clearly define the indicators likely or not to be calculated, from information gathered using questionnaires and during the circular mission, we can estimate the available information necessary for each theme, such as the number of countries we can compare with one another.

And we first of all do not think it is possible in the final report to consider the themes highlighted in red in the list below.

		Complete available information for … countr(y)(ies)
State of energy markets		
1	State of energy markets	9
Tariff methodology		
2	Tariff methodology	6
Tariff review and consultation		
3	Tariff review and consultation	7
Investment conditions		
4	Return on targeted investment	3
5	Return on real investment	2
6	WACC	4
7	Local loan rate	2
8	Loan rate with financing funds	2
Openness to the international community		
9	Openness to the international community	9

In the absence of additional information, it will be impossible to carry out a relevant quantitative analysis on the theme concerning the impact of regulation on investment levels.

3.2.2 - Preliminary results

At this stage, our results are only provisional. They will be refined, following regional disparities, updated using feedbacks during workshops under activities 4 and 5 from now up till the final report. Moreover, our quantitative study here also reiterates that one of the fundamental goals of the final report is a qualitative study, or identification of profiles, of “best practices”, disparities, regional difficulties and recommendations to continually improve each country’s performance.

ENERGY MARKETS		Benin	Burkina Faso	Côte d'Ivoire	Gambia	Ghana	Mali	Nigeria	Senegal	Togo
-1: NO or N/A	Presence of energy markets ?	2	2	-1	-1	2	2	2	-1	-1
0: NO RESPONSE	Bilateral contracts?	2	2	-1	-1	2	2	2	-1	-1
1: PLANNED/PARTIALLY	Spot markets?	-1	-1	-1	-1	2	-1	1	-1	-1
2: YES	Pool?	2	-1	-1	-1	-1	-1	1	-1	-1
	Futures markets?	-1	-1	-1	-1	-1	-1	1	-1	-1
	Balance markets?	2	-1	-1	-1	-1	-1	1	-1	-1
	Major consumers?	0	0	2	2	0	2	1	0	0
	IPPs?	-1	2	2	2	2	2	2	2	2
	Access of Eligible Third Parties?	1	0	-1	1	2	1	1	1	-1
	TOTAL	**6**	**2**	**-3**	**-1**	**7**	**5**	**12**	**-3**	**-5**

Results disparities (between -5 and 12) are a clear indication of inter-country differences in the energy market implementation. There is for example a great difference between Nigeria (the most deregulated country) and Senegal (with SENELEC being the sole buyer).

Tariff methodology		Benin	Burkina Faso	Côte d'Ivoire	Gambia	Ghana	Mali	Nigeria	Senegal	Togo
-1: NO or N/A	Clear and public methodology for fixing distribution tariffs?	-1	-1	2	2	2	2	2	2	2
0: NO RESPONSE	Clear and public methodology for fixing transmission tariffs?	-1	-1	-1	-1	-1	2	2	-1	-1
1: PLANNED/PARTIALLY	Separate tariffs for residential/commercial/industrial consumers?	2	2	2	2	2	2	2	2	2
2: YES	Single tariff?	2	-1	2	2	0	2	2	2	2
	Cross-subsidies in the interest of the most underprivileged?	2	-1	2	2	0	2	1	2	2
	Peak/off-peak tariffs ?	0	-1	2	1	0	0	0	2	2
	Tariff is based on consumption (kWh)	2	2	2	2	2	2	2	2	2
	Tariff is based on power subscribed for (kVA or kW)	-1	-1	2	-1	-1	-1	2	1	-1
	Different groups of consumers (based on consumption)	0	2	2	2	0	2	2	2	2
	TOTAL	**5**	**0**	**15**	**11**	**4**	**13**	**15**	**14**	**12**

Two profiles can be identified: an elaborate methodology (Nigeria, Mali, Senegal, Côte d'Ivoire) and a more simplified methodology (Benin, Ghana). We will try to attempt a detailed description of each of them and compare their advantages with their disadvantages.

TARIFF REVIEW AND CONSULTATION		Benin	Burkina Faso	Côte d'Ivoire	Gambia	Ghana	Mali	Nigeria	Senegal	Togo
	Frequency F (years)			3	1	1	1	5	3	
-1: NO or N/A	Frequency F (-1: none / 0: No response / 1: P<=2 / 2: P > 2)	-1	-1	2	1	1	1	2	2	-1
0: NO RESPONSE	The process is laid down and respected by all participants	2	2	2	2	2	2	2	2	2
1: PLANNED/PARTIALLY	Consultation of stakeholders	-1	1	-1	2	0	2	2	2	1
2: YES	The final decision is under the responsibility of the regulator	-1	2	-1	2	2	-1	2	-1	2
	The final decision is published and explained by the regulator	1	0	-1	2	0	2	2	2	-1
	TOTAL	**0**	**4**	**1**	**9**	**5**	**6**	**10**	**7**	**3**

It is the billing process, the regulator's role therein, and the role the regulator grants to other stakeholders. We will show that these results show the scope of independence and impartiality each country's regulator enjoys.

PRICE INCREASE/DROP	Benin	Burkina Faso	Côte d'Ivoire	Gambia	Ghana	Mali	Nigeria	Senegal	Togo
Average of the last three variations		6%	8%	8%		7%	0%	-33%	11%

Senegal's result is here related to the change of billing methodology in 2009. These results will make it possible to compare tariff review mechanisms and their consequences on consumers. They will also not be analyzed independently of the economic disparities between countries likely to impact billing.

RETURN ON INVESTMENT	Benin	Burkina Faso	Côte d'Ivoire	Gambia	Ghana	Mali	Nigeria	Senegal	Togo
Return on authorized investment				13%	8%				
Return on real investment					5%				
MIN WACC (real after tax WACC)				5%		7%	7%		
MAX WACC				12%		7%	7%		
MIN internal loan rate				20%			24%		
MAX internal loan rate				20%			24%		
MIN external loan rate (World Bank, FDA…)			3%	5%					
MAX external loan rate			5%	12%					

We have only very limited statistical data in this regard. A detailed qualitative analysis is however carried out throughout activity 4 (Billing methodologies) to come up with a harmonized methodology for calculating WACC based on examples from Nigeria and Senegal.

OPENNESS TO INTERNATIONAL COMMUNITY / TRANSIT		Benin	Burkina Faso	Côte d'Ivoire	Gambia	Ghana	Mali	Nigeria	Senegal	Togo
-1: NO or N/A	International lines?	2	2	2	1	2	2	2	2	2
0: NO RESPONSE	Do international lines belong to the country/national utility?	2	2	2	-1	2	-1	2	-1	2
1: PLANNED/PARTIALLY	Are international lines regulated by the national regulator?	0	0	0	-1	0	0	0	-1	0
2: YES	Lines used by electricity utilities?	2	2	2	1	2	2	2	2	2
	Lines used by IPPs ?	-1	0	-1	-1	0	-1	0	2	2
	Lines used by consumers?	-1	0	-1	-1	0	-1	0	-1	-1
	TOTAL	**4**	**6**	**4**	**-2**	**6**	**1**	**6**	**3**	**7**

There are still disparities in openness to the international community. The trends targeted at regional level will constrain all the countries to adopt a common billing and regulation strategy as legal framework. We will use these results to analyze the main challenges this measure will pose.

4 - MARKET OPERATORS

4.1 - Methodology of qualitative analysis

The task gets more difficult here because most countries have a different structure (vertical merging, production separation, presence or absence of IPPs…).

In order to consider these disparities between countries, we will tackle the "production" aspect separately and compare it country to country.

We have already properly done so in the past, in East Africa, for example. The themes generally dealt with are:

PRODUCTION

- Generation sources
- Short and medium term generation capacity building

TRANSMISSION, DISTRIBUTION, RESALE

COMPARISON OF THE MAIN UTILITIES

- General statistics (Sales, Wage bill, etc…) **for the main company**
- Health and security **for the main company**
- Customer service **for the main company**

IMPLEMENTED MEASURES AND SYSTEM'S GENERAL PERFORMANCE

- Return on investment
- Income management and billing
- System losses
- Service quality
- Environment

It is absolutely important for the "general data", "health and security", "customer service" categories to stop comparing countries, but to concentrate on comparing utilities, owing to the considerable difficulty posed by structural disparities among utilities thus making the process more complex. For these aspects, we consider the main corporation (historical background) of the country. For the other categories, we will evaluate by considering stakeholders in the country.

Since this study is general in nature, we will not consider "Health and security" and "Environment" but will focus only on the global parameters for the other categories.

Like in the previous part, we will list the relevant KPIs without worrying about the information now available. It is in concluding this part that we will evaluate the potential relevance of selected KPIs using information at our disposal.

4.1.1 - Production

4.1.1.1 - Production sources

ENERGY MIX

It is extremely delicate to compare the mix energy of several countries. In fact this distribution underlies the natural resources each country has (coal, oil, hydroelectric, wind power, detectable power reserves…). The distribution of generation sources can however not be excluded from our comparison for it describes a country's dependence on fuel supply, weather resistance (renewable energies) or neighbouring countries: we will continue with a qualitative rather than a quantitative analysis in the final report. We however base our analysis on statistics we now have in the feasibility study part of this report in order to quantify available information.

GENERATION SYSTEM

- **Per energy source, Available Production / Installed Production ratio**

The idea here is to know the share of installed production that is available. A production not available is generally related to a high fuel cost or recurrent technical problems. This ratio will have to be examined with energy mix and, notably the diesel and coal cost share.

- **Maximum Demand / Available Production Ratio**
- **Maximum Demand / Installed Production Ratio**

Here, the idea is to compare the capacity of generating facilities to meet the country's real and maximum demand.

- **IPP Installed Production / Total Installed Production Ratio**

This information is somewhat separate, it helps compare penetration by independent producers in the country's generating facilities.

- **Historical relative trend of the Maximum Demand / Available Production Ratio**
- **Historical relative trend of the Maximum Demand / Installed Production Ratio**

Here, we intend to compare the strategies and initiatives of various countries to meet maximum demand.

4.1.1.2 - Short and long term production capacity building

Here we specify the following KPIs:

- **% of short term generation system trend (1 year)**
- **% of mid-term generation system trend (3 years)**
- **% of long term generation system trend (5 years)**

Here, we seek to compare the ambitions (and manœuvre margins) of various countries with regard to production capacity-building. These data will be compared with the current Maximum Demand/Installed Production Ratio.

4.1.2 - Transmission, Distribution, Resale

4.1.2.1 - Comparison of main utilities

We will compare the following utilities:

Country	Utility
Benin	CEB
Burkina Faso	SONABEL
Côte d'Ivoire	CIE
Gambia	NAWEC
Ghana	ECG
Mali	EDM SA
Senegal	SENELEC
Togo	CEET

As earlier indicated, these utilities have various structures, sizes, and seniorities.

Structurally, the level of vertical merging is effectively not the same in all countries:

	Generation	Transmission	Distribution	Retail
CEB	X	X		
SONABEL	X	X	X	X
CIE	X	X	X	
NAWEC	X	X	X	X
ECG			X	X
EDM SA	X	X	X	X
SENELEC	X	X	X	X
CEET	X		X	X

The comparison of general data (next paragraph) has the primary objective of highlighting the other disparities (finance, size, staff) of those utilities before comparing them secondly with nondimensional KPIs.

4.1.2.1.1 - GENERAL DATA

Here we recommend the following KPIs:

- **Annual sales (GWh)**
- **Number of employees**
- **Annual turnover (US$)**
- **Number of customers**
- **Network length (km)**
- **Distribution network coverage (%)**

These are two absolute data which only facilitate comparison among utilities, excluding regional disparities. Do they reflect regional disparities or define a different country distribution?

- **Annual turnover / GDP**
- **Number of customers / Country's population**
- **Total network length / Country's surface area**

These last comparators take regional disparities into account.

- **Salary strength (MW installed/number of employees)**
- **Salary strength (MWh generated/year/number of employees)**
- **Salary strength (number of customers/number of employees)**

Here, we will compare utilities' capacity to squarely address production and consumption issues for which they are responsible.

4.1.2.1.2 - CUSTOMER SERVICE

Here we recommend the following KPIs:

- **Average time to connect a new consumer (days)**
- **Number of registered claims (/1000 customers/year)**

These indicators facilitate the comparison of utilities' responsiveness to connection claims and requests.

4.1.2.2 - Implemented measures and system's general performance

4.1.2.2.1 - INVESTMENT RETURN

We recommend the following KPIs:

- **Return on authorized investment**
- **Return on noticed investment**

Here, we will review KPIs already referred to in the Regulatory Party's Tariff Section, which allow the comparison of utilities' authorized and real manœuvre margins (concerning investment, recruitment, etc…).

4.1.2.2.2 - REVENUE MANAGEMENT AND BILLING

Here we recommend the following KPIs:

- **Distribution counting performance (sum total of the following results) :**

	-1	0	1	2
Coverage of distribution network meters	VERY PARTIAL/NON-EXISTENT	UNKNOWN	PARTIAL, EXPANDING	TOTAL OR QUASI-TOTAL
Pre-paid meters	NO	UNKNOWN	LIMITED	YES
Smart meters	NO	UNKNOWN	PLANNED	YES

Here, the idea is to compare customer counting methods and their technological advancement.

- **Unbilled energy / Total sales**
- **Uncollected energy bills / Total sales**

Both indicators add to "distribution counting performance" in comparing the real effects on utilities' distribution counting finances. We will also examine the statistical trend in recent years.

- **Transmission counting performance (sum total of the following results :**

	-1	0	1	2
Coverage of transmission network meters	VERY PARTIAL/NON-EXISTENT	UNKNOWN	PARTIAL, EXPANDING	TOTAL OR QUASI-TOTAL

Here, we compare utilities' transmission network coverage (and indirectly the utility's capacity to precisely estimate transmission losses).

4.1.2.2.3 - SYSTEM LOSSES

We recommend the following KPIs:

- **Technical distribution losses (%)**
- **Non-technical distribution losses (%)**
- **Total distribution losses (%)**
- **Technical transmission losses (%)**
- **Non-technical transmission losses (%)**
- **Total transmission losses (%)**
- **Total technical losses (%)**
- **Total non-technical losses (%)**
- **Total losses (%)**

It is interesting to compare transmission losses and distribution losses separately, same as it is crucial to compare technical and non-technical losses separately. This makes it possible for each country's difficulties to be properly identified to produce different profiles.

4.1.2.2.4 - SERVICE QUALITY

We recommend the following KPIs:

- **CAIDI (Average customer interruption time-limit)**
- **CAIFI (Average customer interruption frequency)**
- **Total number of minutes for customer interruption (/year)**
- **Number of minutes of non-compliance with frequency norms (min/year)**
- **Energy not delivered (MWh/year) / Sales**

The idea is to compare the service quality of various utilities and, notably, their ability to address customer interruptions. As such, it will be interesting to check the average interruption frequency and the average interruption time-limit.

We will make recommendations for the "Customer Service" and the "Quality Service" based on minimum quality standards drafted in the past by PPA ENERGY for AFUR (which Gambia, for example, said it had adopted).

4.2 - Feasibility of quantitative analysis

The previous part listed common KPIs tailored to this study. However, we will have to work on the basis of available information.
Before examining the first results in detail, we would like to summarize the information at our disposal. For as indicated in the introductory part, much information is lacking in the questionnaires we have received.

Thus we do not think that it is first possible in the final report to consider KPIs highlighted in red in the list below.

		Complete information available for … countr(y) (ies)
PRODUCTION SOURCES		
1	Diesel share	7
2	Gas share	7
3	Coal share	7
4	Hydroelectric share	7
5	Share of the other renewable energies	7
6	Per energy source, Available Production / Installed Production ratio	7
7	IPP Installed Production / Total Production Ratio	8
8	Maximum Demand/Available Production Ratio	7
9	Maximum Demand / Installed Production Ratio	7
10	Historical relative trend of Maximum Demand/ Available Production Ratio	7
11	Historical relative trend of Maximum Demand/ Installed Production Ratio	6

PRODUCTION SOURCES		
12	% short term generation system trend (2 years)	9
13	% long term generation system trend (5 years)	9
GENERAL DATA		
14	Annual sales	7
15	Number of employees	8
16	Annual turnover	5
17	Number of customers	6
18	Network length	6
19	Network coverage	1
20	Salary strength (MW installed/number of employees)	7
21	Salary strength (MWh generated/year/number of employees)	6
22	Salary strength (number of customers/number of employees)	6
23	Annual turnover / Country's GDP	5
24	Number of customers / Country's population	6
25	Total network length / Country's surface area	6
CUSTOMER SERVICE		
26	Average time to connect a new consumer	0
27	Number of registered claims	0
ECONOMIC EFFICIENCY		
28	Return on authorized investment	3
29	Return on noticed investment	2
REVENUE MANAGEMENT AND BILLING		
30	Distribution counting performance	4
31	Transmission counting performance	3
32	Energy not billed	4
33	Billed energy not collected	4
SYSTEM LOSSES		
34	Technical distribution losses	2
35	Non-technical distribution losses	2
36	Total distribution losses	8
37	Technical transmission losses	3
38	Non-technical transmission losses	3
39	Total transmission losses	6
40	Total losses	8

SERVICE QUALITY		
41	CAIDI	0
42	CAIFI	2
43	Total CI	4
44	Number of minutes of failure to comply with the frequency norms	0
45	Energy not delivered / Energy produced	4

And though 9 countries answered the questionnaire, much information is lacking in each of the questionnaires. Although the circular mission helped gather fresh information, much information is still lacking. It appears unrealistic for us to proceed with a relevant comparison on service quality, revenue management or investment returns despite the importance of these categories.

4.3 - Preliminary results

Like for the regulatory party, at this stage the results we can present are only provisional. The discussions we will have with utilities from now until then and the consultation of the progress report that will be submitted to us from now until then will enable us to complete these results. The final report will also dwell on an in-depth qualitative comparative study.

PRODUCTION SOURCES	Benin	Burkina Faso	Côte d'Ivoire	Gambia	Ghana	Mali	Nigeria	Senegal	Togo
Hydroelectric share		9.4%	25.6%		60.6%	55.8%	33.4%	11.6%	49.4%
Diesel share		44.6%	0.1%		2.2%	43.9%	0.0%	85.5%	50.6%
Gas share		0.0%	73.8%		10.9%	0.0%	66.6%	3.0%	0.0%
Coal share		0.0%	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%
Combined Cycle		0.0%	0.0%		10.2%	0.0%	0.0%	0.0%	0.0%
HFO		0.0%	0.0%		16.1%	0.0%	0.0%	0.0%	0.0%
Share of the other ENR		0.0%	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%
Imports share		45.9%	0.5%		0.0%	0.3%	0.0%	0.0%	0.0%
Available capacity (MW)	20	182	1080	46.15	2169.5				
Installed capacity (MW)	20	201	1400	99.38	2835	450		854.5	259
IPP Installed capacity (MW)		61	720	3		178			
Maximum Demand	185.5	174	1000			240.68		466	
Available Production / Installed Production Ratio	100%	91%	77%	46%	77%				
IPP Installed Capacity/ Total Installed Capacity Ratio		30%	51%	3%		40%			
(1) Maximum Demand / Available Production Ratio	928%	96%	93%						
(2) Maximum Demand / Installed Production Ratio	928%	87%	71%			53%		55%	
Average of the ratio's last two trends (1)	884%	112%	91%						
Average of the ratio's last two trends (2)	884%	92%	69%			55%		53%	61%

4.3.1 - Production

The Maximum Demand / Available Production ratio for Benin seems erroneous, though it is based on responses to the questionnaire. We shall present the given energy mix qualitative analysis, but we can already highlight the importance of each country's natural resources therein (for example Ghana's hydroelectric potential).

PRODUCTION PROJECTS	Benin	Burkina Faso	Côte d'Ivoire	Gambia	Ghana	Mali	Nigeria	Senegal	Togo
% installed production capacity increase / short term (1 year)	400%	9%	15%	6%	10%	19%		9%	0%
% installed production capacity increase / medium term (3 years)	650%	45%	49%	45%	59%	43%		49%	44%
% installed production capacity increase / long term (5 years)									

Again, the data we have for Benin seems erroneous. The short term objectives vary among the other countries between 0% (Togo) and 20% (Mali), but it would also be important to know whether the reliability of production projections (negotiation by IPPs, OMVG project, transmission lines) do not vary from one country to another. The countries, on the contrary, seem to have relatively similar medium-term projections (despite the disparity in Maximum Demand/Installed Production ratios of the previous table).

4.3.2 - Transmission, Distribution, Resale

4.3.2.1 - Comparison of utilities

GENERAL DATA		CEB	SONABEL	CIE	NAWEC	ECG	EDM SA	SENELEC	CEET
DISPARITIES	Annual sales		856643	4493972		3085	1040115	2313413	685870
	Number of employees	1495	1530	3581	1437	5941	1310	2505	1039
	Number of customers		401176	1154067	105799	2451046	261008	944801	203306
	Turnover (last available data, US$)		217.1	171.3			197.5	715.1	
	Installed capacity (MW)		309818	704	85		394.6	854.5	65
	Production (GWh/an)		612	2014	241		1299	2884	849
	Network length 33kV - 90kV			2629	115		344.4	8642	1931
	Salary strength (MW installed/number of employees)		202.5	0.2	0.1		0.3	0.3	0.1
	Salary strength (GWh/year/number of employees)		0.4	0.6	0.2		1.0	1.2	0.8
	Salary strength (number of customers/number of employees)		262.2	322.3	73.6	412.6	199.2	377.2	195.7
	Turnover/GDP		21.1	7.1			20.6	51.3	
	Number of customers/Country's population		2%	5%	6%	10%	2%	7%	3%
	National coverage				35%				
	Network length 33kV - 90kV ² / Superficie du pays			21.4	1.2		0.1	379.6	65.7

This comparison first highlights the disparities between the utilities compared. As regards annual sales for example, the difference is significant between ECG (Ghana) and SENELEC (Senegal). There are also wide disparities when one considers proportioned KPIs (salary strength, network length²/area…).

4.3.2.2 - Implemented measures and system's general performance

REVENUE MANAGEMENT AND BILLING		Benin	Burkina Faso	Côte d'Ivoire	Gambia	Ghana	Mali	Nigeria	Senegal	Togo
DISTRIBUTION COUNTING PERFORMANCE	Coverage of distribution network (meters)	0	2	1	1	0	0	2	0	0
	Prepaid meters?	0	2	0	2	0	0	2	0	0
	Smart meters?	0	-1	-1	1	0	0	-1	0	0
	TOTAL	0	3	0	4	0	0	3	0	0
TRANSMISSION COUNTING	Coverage of transmission network (meters)	1	1	1	-1	1	0	1	1	0
	TOTAL	1	1	1	-1	1	0	1	1	0
	Unbilled energy								10.18%	
	Unpaid bills / Total sales		8.85%							

Here the lack of information will undermine quantitative and qualitative studies.

SYSTEM LOSSES	Benin	Burkina Faso	Côte d'Ivoire	Gambia	Ghana	Mali	Nigeria	Senegal	Togo
Technical distribution losses									
Non-technical distribution losses									
Total distribution losses	15.59%	13.43%			22.65%	24.37%		20.53%	23.70%
Technical transmission losses	4.50%								
Non-technical transmission losses									
Total transmission losses	4.50%	6.31%	7.98%		4.70%			4.38%	
Non-technical losses									
Technical losses									
Total losses	20.09%	19.74%		23.00%	27.35%			24.91%	

The lack of information here obliges us, as explained in the “Feasibility” part, to restrict ourselves to total distribution and transmission losses. It will be necessary in the final report not only to review the disparities noted here (9 % difference between Burkina Faso and Ghana), but also to give explanations and recommendations for this phenomenon. It will be worthwhile to pay attention to the counting disparities and hence evaluate losses between countries (previous table).

SERVICE QUALITY	Benin	Burkina Faso	Côte d'Ivoire	Gambia	Ghana	Mali	Nigeria	Senegal	Togo
CAIDI									
CAIFI		2174				532			
Total CML (number of interruptions/year/customer)	17841	57	2754	2190		34884.5			
Number of minutes / year outside the authorized frequency zone									
Energy not furnished (MWh/year) / Sales		1.38%	0.68%			0.40%		11.54%	

Here we only have very limited information. Concerning the two data we will primarily be able to compare (Total CML and unfurnished energy/sales) we will have to prioritize and investigate into the differences between Burkina Faso, for example, and other countries. It will also be necessary for us to confirm the "Unfurnished energy/sales" ratio at our disposal for Senegal.

4.3.3 - Provisional conclusion to the comparison of utilities

The first results we presented in this part will have to be completed in the course of the project. As explained, it already gives us guidelines for reflection and analysis to continue with this activity. Disparities between regions and utilities, which are an initial condition underlying this project will make us very vigilant and relocate each comparison in its demographic and economic context.

5 - PRELIMINARY CONCLUSIONS

The preliminary conclusions presented above have, in particular, highlighted the importance of having reliable and complete information in order to carry out relevant comparisons..

The benchmarking needs to be carried out repeatedly and periodically by ERERA so the latter can be fully capable of performing its regulatory tasks and disseminating best practices to national regulators.

The information we have used in drawing up the various KPIs has basically been gathered from questionnaires returned by countries. As such, the information is declarative and at this stage of analysis, the Consultant is unable to guarantee the reliability of the information sent especially for countries that have not been visited under this task. These visits made it possible to identify certain gaps between responses to the questionnaire, based on what was provided for in texts (for example publication of an annual report, the agency's funding method …) and the reality facing the regulatory body

Thus, among the measures to be rapidly implemented by ERERA in order to achieve these objectives, information management and the constitution of a databank are a priority to us. Such a database will need that:

- A systematic data collection system should be introduced (via for example a adapted from that for this task),
- in each country a person in charge of collection and entry of relevant data in the questionnaire should be designated,
- country knowledge and expertise should be developed within ERERA to facilitate evaluation of the quality of data sent.

6 - ANNEX

Interviews and persons contacted during circular missions

COTE D'IVOIRE - TEAM A	
Ministry of Energy	Deputy Director of Cabinet
	Technical Director ANARE
Directorate General of Energy	Director of Energy Monitoring and Regulation
	Jurists of the DGE
CI Energy	Officer in charge of the Legal Affairs Unit
CI Energy	Director of Economic Studies
	Director of External Relations
ANARE	Technical Director ANARE
	Technical Adviser to the Director General
	Director of Economic and Financial Studies
	Director of Legal Affairs
CIPREL	Technical Adviser ANARA
	Director Delegate of CIPREL
Meeting with consumers	
BURKINA FASO - TEAM A	
Start-up meeting	Commissioners
	A representative of the DGE
	A representative of SONABEL
	A representative of the Rural Electrification Fund
Meeting with the Rural Electrification Fund	Planning, Evaluation and Monitoring Service Head
	Deputy Service Head, Mission focal point
Meeting with SEMAFO (candidate IPP)	President of ARSE
	A commissioner of ARSE
	The Director General of Windiga
	Director of Corporate Affairs SEMAFO
Réunion avec SONABEL	WAPP/RERA focal point
	Economic and Financial Studies Service Head
	Director of the Planning Service Financial Department
	Department of Energy Transmission and Movements

Meeting with DGE	President of ARSE
	Representative of DGE
	Commissioner of ARSE
Meeting with ARSE	Counsel for ARSE
TOGO – TEAM A	
Start-up Meeting	Director General
	Legal Officer
	Economic Studies Officer
	RERA focal point
Meeting with DGE	RERA ARSE focal point
	Director General of Energy
Meeting CEET	DGA CEET
	Financial Director
	Marketing Director
	Director of Planning
	Technical Director ANARE
	Director of Operation
	RERA ARSE focal point
Meeting with Contour Global (IPP)	Representative of ARSE
	Contour Global Director of Financial Affairs
Meeting with CEB	Director General
	Director of Management Control
	Energy Strategy and Movement Service Head
	Technical Director ANARE
	Representative of ARSE
GAMBIA - TEAM B	
Meeting with PURA	Technical Director
	Director of Contracts
	Director of H&R
	Other directors
Ministry of Energy	PURA Representative
	Permanent Secretary of the Ministry of Energy
Meeting with NAWEC	Director of Distribution
	Commercial Director
	Director H&R
	Director of Finance
	Director IT

	Directo of Operation
	Director of Production
	Director of Contracts
Meeting with an IPP (Batakunku and GAMWIND)	IPPs Proprietor
	PURA Representative
	President of the Village Development Community
Meeting with a hotels association (major consumers)	PURA Representative
	Executive Secretary of Gambia Hotel Association
	Manager of Senegambia Hotel
	Maintenance Officer of Senegambia Hotel
GHANA – TEAM B	
Meeting with PURC	Representative of PURC and former GRIDCO employee
SENEGAL – TEAM B	
Meeting with SENELEC	Director of Transport and Energy Purchases
	Director of Energy Purchases
Ministry of Energy	Permanent Secretary of the Ministry of Energy
	SENELEC Representative
Meeting with CRSE	CRSE Expert Electrician
	CRSE Senior Economist
	CRSE Senior Expert Electirician / Focal point
Meeting with SENELEC	Revenue Control Expert
Meeting with SENELEC	Representative of the General Studies Department
	Director of Production