INSTITUTIONAL, REGULATORY AND COOPERATIVE FRAMEWORK MODEL FOR THE NILE BASIN POWER TRADE

MANUAL FOR INFORMATION GATHERING TEMPLATES

Prepared for:

NILE BASIN INITIATIVE

"TO ACHIEVE SUSTAINABLE SOCIO-ECONOMIC DEVELOPMENT THROUGH THE EQUITABLE UTILIZATION OF, AND BENEFIT FROM, THE COMMON NILE BASIN WATER RESOURCES"

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MANUAL

This "Manual" contains explanations that detail for each of the questions of the Templates the objective of the question and the information that it is intended to be obtained through the question.

The questionnaire is designed to be applied in each country, so the questions refer all of them specifically to the country where the survey is being done. The only exception is for Section 8 which corresponds to questions to regional institutions. Therefore, if a country has the HQ of a regional institution, then questions corresponding to Section 8 should be filled for the specific institution.

1. ENERGY SECTOR POLICY

The general objective of this section is to obtain an adjusted and updated overview of the country's policy for the energy sector.

Section 1: ENERGY SECTOR POLICY			
QUESTION		ANSWER	ANSWERING Institution
1.1	Guidelines of the energy policy		
1.2	Role of the State		
1.3	Main companies intervening in each sub sector (oil, gas, power) and ownership		
1.4	Role of private sector: current and foreseen		
1.5	On going reform processes in sector oil and gas:		
1.5.1	Objectives of the process		
1.5.2	Advances in the process		
1.5.3	Expected advances for next years		
1.6	Basic socioeconomic information:		
1.6.1	GDP (last years) in constant dollars (USD)		
1.6.2	Population (total, urban and rural)		
1.6.3	Imports / exports (trade balance)		
1.7	% of National budget allocated to energy sector in last 5 years		

1.1. GUIDELINES OF THE ENERGY POLICY

Which are the main guidelines of the energy sector policy? Is there a document that resumes the government's objectives (if yes ask for it)? The main topics (but not limited to) are: i) participation of government in commercial activities in the energy sector ii) role desired for private sector iii) reform processes foreseen or ongoing iv) regional integration v) public – private partnership

1.2. ROLE OF THE STATE

It can be distinguished three main roles of the State: policy making, regulation and commercial activity.

Which are the roles currently performed by the State other than the obvious "policy making role"?

Is the regulation activity explicitly allocated in regulatory authorities? Which are the existing regulatory authorities?

Does the State have commercial activity? In which sub sectors (power, oil upstream, oil downstream, natural gas?

Which are the main State institutions that participate in the energy sector. If possible design a simple graph with the organisational structure indicating relationship among institutions as well as their main functions / responsibilities.

1.3. MAIN COMPANIES INTERVENING IN EACH SUB SECTOR (OIL, GAS, POWER) AND OWNERSHIP

Indicate in each sub sector which are the main companies that intervene and their ownership (basically state owned or privately owned). If the companies are owned partly by the State and partly by private sector indicate who owns the majority, who is responsible for management, if State does not own the majority indicate if there are special decisions that require the State approval.

1.4. ROLE OF PRIVATE SECTOR: CURRENT AND FORESEEN

Indicate the current participation of private sector in the energy sector. Indicate if there are plans for a future enhancement of this participation. If affirmative indicate to which extent if foreseen the private sector will participate and for when this is foreseen.

1.5. ON GOING REFORM PROCESSES IN SECTORS OIL AND GAS

Is there any reform process on going in the oil and/or natural gas sector?

Which are the objectives of this process?

When has the process began (date)?

Which is the degree of advance of the process up today? Is it “on schedule”?

Are there any problems for the process to advance?

Which are the advances expected for the next years?

1.6. BASIC SOCIOECONOMIC INFORMATION

Historic series of the main socioeconomic indicators, as long as possible, are expected to be gathered. Among them but not limited to:

GDP, population (total, rural, urbain), Imports / exports, etc.

1.7. % OF NATIONAL BUDGET ALLOCATED TO ENERGY SECTOR IN LAST 5 YEARS

For the last 5 years, indicate the percentage of total national budget allocated to the energy sector: investments (or contribution to investments), transfers to cover operational loses, subsidies, etc.

2. POWER SECTOR POLICY

The objective of this section is to enter in detail in the power sector policy. Questions are similar to the general ones proposed for the energy sector but focussed in the power sector.

Section 2: POWER SECTOR POLICY			
QUESTION		ANSWER	ANSWERING Institution
2.1	Guidelines of the power sector policy		
2.2	Which is the policy regarding power trade (with neighbouring countries or the region)?		
2.3	Main challenges of the power sector		
2.4	The role of the State		
2.5	Role of private sector: current and foreseen		
2.6	Sector structure: main actors, their roles		
2.7	Industry structure: companies intervening, ownership		
2.8	On going reform process if any		
2.8.1	Objectives of the process		
2.8.2	Advances in the process		
2.8.3	Expected advances for next years		
2.9	% of National budget allocated to electricity sector in last 5 years		
2.10	Role of consumers defence associations / bodies		

2.1. GUIDELINES OF THE POWER SECTOR POLICY

Which are the main guidelines of the power sector policy? Is there a document that resumes the government's objectives (if yes ask for it)?

The main topics (but not limited to) are: i) participation of government in commercial activities in the energy sector ii) role desired for private sector iii) reform processes foreseen or ongoing iv) regional integration: which is the opinion of government regarding regional integration in the power sector? v) public – private partnership.

2.2. WHICH IS THE POLICY REGARDING POWER TRADE (WITH NEIGHBOURING COUNTRIES OR THE REGION)?

Is there a decision on how to approach power trade?

Is there a policy of "self sufficiency" regarding power generation or would the country accept being somehow "dependent" on the region? To which extent?

In case of exporting countries: which is the policy regarding power exports? Which is the priority: domestic supply or exports?

In case of having an export contract, which is the priority in case of domestic shortages: honour the contract or domestic supply?

2.3. MAIN CHALLENGES OF THE POWER SECTOR

Which are the main challenges / problems that the power sector faces today? Please prioratise.

Among others and as example:

- Supply can not meet demand.
- Rural electrification
- Infrastructure old and bad maintained
- Losses (technical / non technical)
- Billing and collection
- Tariff level

2.4. THE ROLE OF THE STATE

Which is the role of the State in the power sector apart from policy making? Which is the Ministry responsible for the power sector?

Is there an independent regulatory authority? If not, who performs the regulatory role?

Does the State participate in commercial activities (generation, transmission, distribution)?

Are power sector activities a "state monopole"?

Is there a vertically integrated utility? Are changes foreseen in the near future regarding these aspects?

2.5. ROLE OF PRIVATE SECTOR: CURRENT AND FORESEEN

In which way private sector participates currently in the power sector?

Generation, transmission, distribution? Alone or in partnership with the State? In certain activities within generation, transmission or distribution?

Are changes foreseen in this aspect? If yes, detail which.

2.6. SECTOR STRUCTURE: MAIN ACTORS, THEIR ROLES

Which are the main actors in the power sector and which are their roles?

As an example (but not limited to):

- Ministry of Energy (other ministries like finances, development, water, etc)
- Private commercial companies
- State owned commercial companies
- Regulatory authority

It is intended to know all those institutions that in one way or another may participate in activities or in the decision making process regarding the power sector.

2.7. INDUSTRY STRUCTURE: COMPANIES INTERVENING, OWNERSHIP

It is necessary to establish "the map" of actors participating in commercial activities in the power sector. Indicate the companies and their ownership that participate in generation, transmission, and distribution. If there are IPPs indicate the capacity they are selling or their participation in the total supply.

2.8. ON GOING REFORM PROCESS IF ANY

Is there an ongoing reform process in the power sector (or foreseen for the near future)?

What does it consist of?

Which are their main objectives?

Which is the degree of advance of the process? When has it begun?

Which are the advances up today? Is it "in schedule"?

Which are the main problems that the process has had?

Which are the expected advances for next year?

2.9. % OF NATIONAL BUDGET ALLOCATED TO ELECTRICITY SECTOR IN LAST 5 YEARS

For the last 5 years, indicate the percentage of total national budget allocated to the power sector: investments (or contribution to investments), transfers to cover operational loses, subsidies, etc.

2.10. ROLE OF CONSUMERS DEFENCE ASSOCIATIONS / BODIES

Is there in the country any consumer defence association or body?

Which is its role?

Where is it located in the general institutional frame of the country? Who does it report to?

Which are the main objectives and activities?

Is it capable of enforcing decisions? If affirmative: how?

3. QUANTITATIVE INFORMATION REGARDING THE POWER SECTOR

Section 3: QUANTITATIVE INFORMATION REGARDING THE POWER SECTOR			
QUESTION		ANSWER	ANSWERING Institution
3.1	Power generation plants characteristics (indicate for each plant - existing or commited)		
3.1.1	Installed capacity (MW)		
3.1.2	Plant technology (gas turbine, combined cycle, steam, hydro, etc)		
3.1.3	Current available capacity (MW)		
3.1.4	Age of plant (years)		
3.1.5	Rehabilitation programs-addition of capacity over current available capacity (MW)		
3.1.6	Transformation capacity (MVA)		
3.1.7	Transformation relationship (kV)		
3.1.8	Generator capacity (MW)		
3.1.9	Generator spinning speed (r.p.m.)		
3.1.10	Thermal rate (kCal/kWh)		
3.1.11	Year of commissioning		
3.1.12	Investment foreseen per year in electromechanical facilities (million US$)		
3.1.13	Investment foreseen per year in civil works (million US$)		
3.1.14	Investement foreseen per year in studies (million US$)		
3.2	Generation cost (US$/MWh) per unit		
3.3	Energy produced (generated) in the last 10 years per company		
3.4	Production of energy by source (thermal, hydro, renewable, other) in the last 5 years		
3.5	Imported / exported energy by origin in the last 5 years		
3.6	Origin of fuel for generation: domestic production, imported (indicate country)		
3.7	Special supply agreements for fuel used for generation		
3.8	Hydro power plants (per plant)		
3.8.1	Indicate if plant has reservoir for regulation or not		
3.8.2	Regulation: daily, weekly, monthly, seasonal		
3.8.3	Reservoir capacity (Hm3)		
3.8.4	Height (h) between headwater and tailwater (m)		
3.8.5	Efficiency generators (m3/kWh)		
3.8.6	Average water flow in river (m3/second)		
3.8.7	Minimum water flow in river (m3/second)		
3.8.8	Maximum water flow in river (m3/second)		
3.8.9	Minimum operating level of reservoir by month (m)		
3.8.10	Maximum operating level of reservoir by month (m)		
3.8.11	Restriction for other uses: minimum water flow that must be guaranteed (m3/second)		
3.9	Energy distributed per type of client (residential, industrial, etc) in the last 5 years		
3.10	Annual revenue at distribution level in last 5 years (million US$)		
3.11	Percentage of revenue spent on purchase of generation assets per year in last 5 years (%)		
3.12	Percentage of revenue spent on purchase of transmission assets per year in last 5 years (%)		
3.13	Percentage of revenue spent on purchase of fuel for generation per year in last 5 years (%)		
3.14	Percentage of revenue spent on purchase of other materials and equipment in last 5 years (%)		
3.15	Percentage of revenue spent on personnel training in last 5 years (%)		
3.16	Percentage of revenue spent on research and development in last 5 years (%)		
3.17	Revenue collection ratio		
3.18	Billing method: pre paid (pre) or post paid (post)		
3.19	Number of customers in the last 5 years (# clients)		
3.20	Total staffing in sector companies (# persons)		
3.21	Percentage of technical staff (%)		
3.22	Population, electrification rate in the last 5 years (%)		
3.23	Average price to final consumer (US$/MWh)		
3.24	System peak (MW) in the last 5 years		
3.25	Systen load factor in last 5 years (%)		
3.26	System losses: transmission & distribution		
3.27	Inventory of cross border interconnections: which country connects, capacity, energy imported/exported in the last 5 years per interconnection		
3.28	Scheme of transmission system and characteristics (tension of lines, capacity of transport, congestion)		
3.29	Transformation capacity above 110 kV (MVA)		
3.30	Transformation capacity between 70 and 11 kV (MVA)		
3.31	Transformation capacity below 3 kV (MVA)		
3.32	Studies of demand forecast. Load shedding data / suppressed demand in last 5 years		
3.33	Expansion plans in generation and transmission: identification of main projects, characteristics of project and commissioning date foreseen		
3.34	Potential generation resources		
3.35	Basic indicators per company: annual memoir and/or statistical report		

3.1. POWER GENERATION PLANTS CHARACTERISTICS (INDICATE FOR EACH PLANT - EXISTING OR COMMITTED)

Indicate for each generation plant the following characteristics paying special attention to include units:

1. Installed capacity (nominal)
2. Plant technology (steam turbine, gas turbine, hydro, etc)
3. Current available capacity
4. Age of plant: years since commissioning.
5. Rehabilitation programs-addition of capacity over current available capacity (MW): indicate additional capacity planned for the future or rehabilitation plans to make available capacity that today is unavailable.
6. Transformation capacity (MVA) of the transformers of the plant.
7. Transformation relationship (input tension and output tension – kV)
8. Generators capacity: indicate capacity of each generator.
9. Generator spinning speed (r.p.m.)
10. Thermal rate (kCal/kWh): indicate for thermal generators the generator's efficiency (how many kCals are necessary to produce 1 kWh).
11. Year of commissioning: the year each generator was commissioned.
12. Investment foreseen per year in electromechanical facilities (million US$): indicate year per year, planned investments in electromechanical facilities in the corresponding power plant.
13. Investment foreseen per year in civil works (million US$): same as previous point but for civil works.
14. Investment foreseen per year in studies (million US$): indicate the investment in studies for generation expansion or rehabilitation foreseen for the next 5 years.

3.2. GENERATION COST (US$/MWH)

Indicate for the mentioned plants (if corresponds) the total generation cost (US$/MWh) disaggregated in variable generation (fuel cost, O&M and others), capital costs, etc.

The indicated cost should be the real one trying to eliminate eventual subsidies.

3.3. ENERGY PRODUCED (GENERATED) IN THE LAST 10 YEARS PER COMPANY

Historic series of generation (as long as possible) at least disaggregated by company and if possible by plant expressed in energy per year (GWh/year).

For the last years (2 – 3) disaggregating of the total generation per month.

3.4. PRODUCTION OF ENERGY BY SOURCE (THERMAL, HYDRO, ETC) IN THE LAST 5 YEARS

Indicate total energy produced annually by source of energy in the last 5 years.

3.5. IMPORTED / EXPORTED ENERGY BY ORIGIN IN THE LAST 5 YEARS

Indicate the energy imported / exported by origin / destiny in the last 5 years.

3.6. ORIGIN OF FUEL FOR GENERATION

Detail the origin of the fuel used for generation. Is it imported (where from)? Is it locally produced? Is

it locally produced in a refinery with imported oil? Is it imported under any special agreement / conditions?

3.7. SPECIAL SUPPLY AGREEMENTS FOR FUEL USED FOR GENERATION

Are there any supply agreements of fuel for generation?

Is there a special price for fuel used for generation? Which are these special conditions?

3.8. HYDRO POWER PLANTS (PER PLANT)

Indicate per plant:

1. Indicate if plant has reservoir for regulation or if it is a run river plant.
2. Regulation: daily, weekly, monthly, seasonal: if the plant has a reservoir indicate if the reservoir allows a regulation within the day, within a week, within a month or from season to season.
3. Reservoir capacity (Hm3): indicate the capacity or volume of the reservoir.
4. Height (h) between headwater and tailwater (m)
5. Efficiency generators (m3/kWh): indicate, n normal conditions, the quantity of water (m3) needed to produce 1 kWh by the plant generators.
6. Average water flow in river (m3/second): indicate the average flow of water of the river (cubic meter per second).
7. Minimum water flow in river (m3/second)
8. Maximum water flow in river (m3/second)
9. Minimum operating level of reservoir by month (m): indicate the minimum level that must be kept in the reservoir because of other constraints. Indicate this level month by month if the level varies according to the moment of the year.
10. Maximum operating level of reservoir by month (m)
11. Restriction for other uses: minimum water flow that must be guaranteed (m3/second): indicate the minimum flow of water that must be maintained in the river because of other restrictions.

3.9. ENERGY DISTRIBUTED PER TYPE OF CLIENT (RESIDENTIAL, INDUSTRIAL, ETC) IN THE LAST 5 YEARS

Establish the disaggregation per type of clients that it is done in the country and define each of the categories.

Specify for the last 5 years (annually) the energy consumed by each of the different types of clients established above.

Indicate if there are “special clients” that for their size are treated differently such a mining companies or others.

3.10. ANNUAL REVENUE AT DISTRIBUTION LEVEL IN LAST 5 YEARS (MILLION US$)

Indicate the total revenue of the distribution sector year per year in the last 5 years.

3.11. Percentage of revenue spent on purchase of generation assets per year in last 5 years (%)

In the last 5 years and year per year indicate the percentage of the total revenue (at distribution level) that was allocated to purchase (investment) generation assets.

3.12. Percentage of revenue spent on purchase of transmission assets per year in last 5 years (%)

Same concept as previous point but for transmission assets.

3.13. Percentage of revenue spent on purchase of fuel for generation per year in last 5 years (%)

Same concept as previous point but for fuel bought for generation.

3.14. Percentage of revenue spent on purchase of other materials and equipment in last 5 years (%)

Same concept as previous point but for purchases of other materials and equipment.

3.15. Percentage of revenue spent on personnel training in last 5 years (%)

Same concept as previous point but for training expenses.

3.16. Percentage of revenue spent on research and development in last 5 years (%)

Same concept as previous point but for research and development investment.

3.17. Revenue collection ratio

Indicate the following ratios:

Energy generated / energy distributed

Energy distributed / energy billed

Energy billed / energy collected and/or Billing ($) / collection ($)

3.18. Billing method: pre paid (pre) or post paid (post)

Indicate if pre – payment is implemented. If affirmative indicate how many clients use it (indicate also total number of clients). For clients that do not use pre payment system indicate frequency of billing (monthly, every two months, etc).

3.19. Number of customers in the last 5 years

Indicate number of clients per type of client (annually – at the end of the year for example) in the last 5 years.

3.20. Total staffing in sector companies (# persons)

Indicate total number of persons employed in the power sector.

3.21. Percentage of technical staff (%)

Indicate as a percentage of the total staffing, the technical staff.

3.22. POPULATION, ELECTRIFICATION RATE IN THE LAST 5 YEARS

Indicate for the last 5 years:

Total population (may have already been obtained in previous point)

Population in urban and rural areas

Population living in electrified areas

Electrification rate per area (rural, urban): electrificated population / total population

3.23. AVERAGE PRICE TO FINAL CONSUMER (US$/KWH)

Indicate average price to final consumer per type of client (US$/kWh):

Total billing (US$) to the category / energy billed and collected to the category (kWh)

Indicate average price to final consumer (US$/kWh):

Total collection (US$) / Total energy billed and collected (kWh)

3.24. SYSTEM PEAK (MW) IN THE LAST 5 YEARS

Indicate interconnected system peak (MW) in the last 5 years and day or month of peak.

If there is more than one system indicate peaks by system.

3.25. SYSTEM LOAD FACTOR IN LAST 5 YEARS (%)

Indicate system load factor year per year in the last 5 years.

3.26. SYSTEM LOSSES: TRANSMISSION & DISTRIBUTION

Indicate transmission losses in terms of percentage of total energy generated

Indicate distribution losses separated in technical and non technical as percentage of energy received by distribution system.

3.27. INVENTORY OF CROSS BORDER INTERCONNECTIONS

For each international interconnection indicate:

- Which countries interconnects
- Capacity of the interconnection. Limits of this capacity (actual transfer capacity) because of transmission system restrictions.
- Energy (GWh) imported / exported through the interconnection in the last 5 years.

3.28. SCHEME OF TRANSMISSION SYSTEM AND CHARACTERISTICS

Indicate tension in the transmission system

Diagram of transmission system

Characteristics of main lines (tension, length, capacity of transport, other technical indicators)

Identify congestion problems (in which lines, importance of the problem)

3.29. TRANSFORMATION CAPACITY ABOVE 110 KV (MVA)

Indicate total transformation capacity in tensions equal or superior to 110kV. Indicate number of transformers for these tensions.

3.30. TRANSFORMATION CAPACITY BETWEEN 70 AND 11 KV (MVA)

Same as previous point but for tensions between 70 and 11 kV

3.31. TRANSFORMATION CAPACITY BELOW 3 KV (MVA)

Same as previous point but for tensions equal or below 3 kV

3.32. STUDIES OF DEMAND

Require any existing master plan for power sector.

Require last demand forecasts made.

If there is no official master plan or demand forecast require any demand forecast made by the distribution companies.

Require any study or information available on suppressed demand. Estimations of amount of energy non supplied to existing customers. Load shedding data.

3.33. EXPANSION PLANS IN GENERATION AND TRANSMISSION

Require any existing study on system expansion for generation and transmission.

Identification of main project with their characteristics

Generation: capacity, plant technology, expected generation, location.

Transmission: characteristic of line, tension, capacity, points that will be connected, expected effects in the transmission system.

3.34. POTENTIAL GENERATION RESOURCES

Indicate if available the portfolio of power plants identified as possible projects for the future indicating at least technology.

Indicate hydro potential resources

Indicate renewables potential resources

Indicate if the country is torching natural gas, quantities and if there are plans to use this for generation.

3.35. BASIC INDICATORS PER COMPANY

Require any publication such as annual memoir, statistical report, etc. per company.

4. LEGAL FRAMEWORK

Section 4: LEGAL FRAMEWORK			
QUESTION		ANSWER	ANSWERING Institution
4.1	Role of the regulatory authority (functions, responsibilities, activities)		
4.2	The regulatory authority in the state framework: where is it placed? Depends on whom? Reporting line		
4.3	Regulatory authority set up		
4.4	Source of financing for regulatory authority		
4.5	Laws that regulate the power industry		
4.6	Regulation regarding generation:		
4.6.1	Degree of liberalisation		
4.6.2	Conditions to establish a power plant by IPPs		
4.6.3	Are there "market rules"?		
4.6.4	Is there a centralised dispatching?		
4.6.5	Main characteristics of the dispatching: is it an economic dispatching? How are the generation plants programmed?		
4.6.6	How are import / exports treated? How are they decided? Who decides?		
4.6.7	Which are the main difficulties from the legal / regulatory point of view for cross border trading?		
4.6.8	How system expansion is decided?		
4.7	Regulation regarding transmission:		
4.7.1	How is the transmission organised?		
4.7.2	Who and how performs system operation?		
4.7.3	How are the transmission services remunerated?		
4.7.4	Is there open access to the transmission grid? If yes, in which conditions? If not, is it planned for a future?		
4.8	Transmission expansion:		
4.8.1	Who plans system expansion?		
4.8.2	How is it decided?		
4.8.3	Who decides it?		

4.1. ROLE OF THE REGULATORY AUTHORITY

Require the text of the law that creates the regulatory authority and any other law / decree / by law that establishes functions, activities, responsibilities, composition, etc.

If there is no regulatory authority and is foreseen to be created soon, require any draft of law or document which establishes functions, activities, responsibilities, composition, etc.

If it is not possible have in written the information ask for:

- Integration of the regulatory authority
- Functions
- Activities
- Responsibilities

4.2. THE REGULATORY AUTHORITY IN THE STATE FRAMEWORK

Where is the regulatory authority situated in the general legal framework of the country?

Is it independent? Does it depend from a Ministry, directly to the president or any other institution?

To whom does it report to?

4.3. REGULATORY AUTHORITY SET UP

How is the regulatory authority organised internally?

Which is the general “organisation chart” of the regulatory authority?

Which are the main divisions or areas within the regulatory authority?

Who is the maximum authority in the institution? Is there a Board? How is it integrated? How are the members of the Board appointed?

4.4. SOURCE OF FINANCING FOR REGULATORY AUTHORITY

Indicate how the regulatory authority is financed (from the general budget of the State, by a levy on the activities of the power sector, etc).

4.5. LAWS THAT REGULATE THE POWER INDUSTRY

Require the laws that regulate the power sector industry.

4.6. REGULATION REGARDING GENERATION

Is the activity of generation separated from the rest of the activities of the power sector?

Are there specific regulations regarding generation?

Which is the degree of liberalisation? That is to say, is it possible for private sector to install a power plant? If yes, is it possible for the IPP to negotiate his production with customers or is it obliged to sell to someone?

Which are the main difficulties from the legal / regulatory point of view for smooth power trade?

Which are the conditions to establish a power plant by an IPP?

Are there formal “market rules”?

Is there a centralised dispatching?

Main characteristics of the dispatching: is it an economic dispatching? How are the generation plants programmed?

How are import / exports treated? How are they decided? Who decides?

Generation – system expansion planning:

Is there a centralised system expansion planning for generation?

Who performs this planning?

Who decides / approves the plan?

Who constructs what has been decided in the plan?

4.7. REGULATION REGARDING TRANSMISSION

Is the activity of transmission separated from the rest of the activities of the power sector?

Who performs the transmission activity? Indicate if it is performed by an independent company and the ownership of this company.

Are there specific regulations regarding transmission? Is there a “grid code”? If affirmative ask for the grid code.

Indicate who performs the system operation activity. Is it done by the transmission company? Is it a clearly separated activity within the transmission company?

How is it remunerated the transmission services? Indicate if there are explicit transmission tariffs and if affirmative require those tariffs.

Indicate if there are specific and explicit condition conditions for connecting to the transmission grid (Transmission System Use Agreement).

Indicate is there is open access to the transmission grid and if affirmative indicate the condititions to have access to the transmission grid.

If there is no open access indicate if it is foreseen for the near future.

4.8. TRANSMISSION EXPANSION

Indicate if there is a central planning for transmission expansion. (This planning can be made by the transmission company or by another institution).

Indicate who performs the system expansion planning for transmission. Indicate if there is a specific procedure and how frequently this planning is made.

Indicate who takes the decision regarding transmission system expansion.

Indicate how it is decided, which institutions participate in the decision making process, who is the final responsible or who is the one who takes the final decision.

5. INTERNATIONAL AGREEMENTS AND CONTRACTS

Section 5: INTERNATIONAL AGREEMENTS AND CONTRACTS			
QUESTION		ANSWER	ANSWERING Institution
5.1	International agreements for power trading		
5.1.1	Parties		
5.1.2	Characteristics		
5.1.3	Amounts traded		
5.1.4	Pricing		
5.2	Existing PPAs		
5.2.1	Main characteristics of PPA		
5.2.2	Remaining life of contract		
5.2.3	Parties		
5.2.4	Quantities sold		
5.2.5	Pricing formula and parameters		
5.2.6	Deviations treatment		
5.2.7	Clause for contract renegotiation ("re opening of contract negotiation)		
5.2.8	Term		
5.3	Opportunity exchanges of power, support in emergencies, ancillary services coordination, inadvertent energy		
5.4	Settlement of short term transactions		
5.5	Legal instrument for facilitating investments such as countries special agreements, investment protection protocols, security for private investment, etc		

5.1. INTERNATIONAL AGREEMENTS FOR POWER TRADING

Identify all the relevant agreements existing or foreseen for the near future regarding power trading.

For each of the agreements specify:

Parties: which countries take part. Indicate if a third country is involved (for example when its transmission system is being used)

Object: indicate the object of the agreement, if it is a general or frame agreement or if it is specific. Indicate general characteristics of the contract, if it contains take or pay clauses, if financing of infrastructure is involved in the agreement, etc.

Amounts traded: indicate the amounts of energy actually traded under this agreement and

the amounts previewed in the agreement.

Pricing: indicate which is the formula for pricing, the prices, the adjustment formula for prices. Indicate the price or pricing formula for balancing in case of differences between the amount actually traded and the amount previewed in the contract.

Term: indicate the validity of the agreement, when does it expire and when it began.

Settlement: indicate how the amounts traded are settled and how are settled the differences.

5.2. EXISTING PPAS

Indicate the most important characteristic of the PPA, for example but not limited to:

- If it contains take or pay clauses, detail of this clauses
- If it involves construction of infrastructure which is paid through the PPA
- If there are transmission lines "dedicated" to serve the power plant. If affirmative how these lines are treated, who operates them, have these lines spare capacity or is all capacity used by the project.

Indicate who the parties in the contract are: seller, buyer.

Remaining life of the contract (for how many years is the contract still valid or "date of termination").

Indicate the quantities to be sold under the contract, if there are take or pay clauses, if the amounts traded are according to the ones previewed in the contract or if in actual operation they differ.

Pricing: indicate which is the formula for pricing, the prices, the adjustment formula for prices. Indicate the price or pricing formula for balancing in case of differences between the amount actually traded and the amount previewed in the contract.

Treatment of deviations: in case of deviations from the agreed amounts of energy, how is this treated?

Term: indicate the validity of the agreement, when does it expire and when it began.

5.3. OPPORTUNITY EXCHANGES

Establish for each international interconnector:

- If there are any "opportunity exchanges of power"; this means, if there exists spot trading of energy, or trading of energy decided in the short term by the system operators because the short term prices of the system make this trading convenient for both countries. If affirmative indicate the principles and or procedures on which the trading is based.
- Indicate if there is support of one system to the other in case of emergencies.
- Indicate if there is ancillary services trading and/or ancillary services coordination.
- Indicate treatment of inadvertent energy.

5.4. SETTLEMENT

For each of the cases established in the previous point, establish the pricing principles, actual prices and settlement procedure.

5.5. LEGAL INSTRUMENT FOR FACILITATING INVESTMENTS

Indicate if the country counts with instruments for facilitating investments such as countries special agreements, investment protection protocols, security for private investment, etc

6. OPERATIONAL INFORMATION

This section corresponds to a series of standard indicators regarding operational information and unit costs. For indicators from 6.1 to 6.13, the definitions are self explanatory. Each indicator is clearly defined by its formula.

Section 6: OPERATIONAL INFORMATION			
QUESTION		ANSWER	ANSWERING Institution
6.1	SAIFI: number of customer interruptions / Total customers in system		
6.2	CAIFI: Number of customer interruptions / Number of customers who had at least one interruption		
6.3	SAIDI: sum of the durations of all customer interruptions / Total customers in system		
6.4	CTAIDI: sum of the durations of all customer interruptions / number of customers who had at least one interruption		
6.5	MAIFI: number of customer momentary interruptions / Total customers in system		
6.6	CALCI: sum of all customer load curtailments / number of customers who had at least one interruption		
6.7	MaxD: the maximum expected total time in a year that any customer in the area being studied will be without available power		
6.8	MaxF: the expected maximum number of times in a year that any customer in the area being studied will have power availability interrupted		
6.9	Loss of load expectation - LOLE - in last 5 years (MW)		
6.10	Annual expected unserved energy in last 5 years (GWh)		
6.11	Average connection cost per domestic customer (US$/customer)		
6.12	Average cost of transmission line (US$/kmt) per voltage level		
6.12.1	% corresponding to cost of labour		
6.12.2	% corresponding to cost of materials		
6.13	Average cost of distribution line (US$/kmt) per voltage level		
6.13.1	% corresponding to cost of labour		
6.13.2	% corresponding to cost of materials		
6.14	Design criteria for transmission (data and parameters)		
6.15	Design criteria for distribution (data and parameters)		
6.16	Typical load variation curves		
6.16.1	Week day dry season		
6.16.2	Holiday dry season		
6.16.3	Week day rainy season		
6.16.4	Holiday rainy season		
6.17	Power dispatch methodology and informatic tools		

Design criteria for transmission

Indicate the design criteria used for transmission system planning.

Design criteria for transmission

Same as previous point but for distribution.

Typical load variation curve

Indicate the typical load variation curve for a week day in a dry season, a holiday in a dry season, a weekday in rainy season, a holiday in rainy season.

Power dispatch methodology

Describe briefly how dispatching is made, if there is a central dispatch centre, if there is an economic dispatch, models used for dispatching, etc.

7. TRAINING NEEDS ASSESSMENT

Section 7: TRAINING NEEDS & OTHER RESOURCES			
QUESTION		ANSWER	ANSWERING Institution
7.1	Role of the organisation in the regional context		
7.2	Current knowledge of and involvement in NBI and Regional Power Trade		
7.3	Sector Drivers in the country		
7.4	Effectiveness of current power sector structure		
7.5	Effectiveness of institutional / company structure		
7.6	Institutional capacity strengths and weaknesses within the entity		
7.7	Staff Composition and Qualifications		
7.8	Existing capacity building in the entity		
7.9	Existing staff capacity in internal and regional power trade		
7.10	Understanding of the pros and cons of power trade		
7.11	Perception of available resources for power export		
7.12	Understanding of national or regional policies in power trade		
7.13	Perception of barriers to regional power trade		
7.14	Staff Composition and Qualifications matrix		
7.15	Training facility belonging to the institution		
7.15.1	Rooms surface (sq meters)		
7.15.2	Capacity (# of persons)		
7.15.3	Projector availability (y/n)		
7.15.4	Number of PCs available to use for training		
7.15.5	PCs conected in network (y/n)		
7.16	Training facility available in the country for the institution		
7.16.1	Rooms surface (sq meters)		
7.16.2	Capacity (# of persons)		
7.16.3	Projector availability (y/n)		
7.16.4	Number of PCs available to use for training		
7.16.5	PCs conected in network (y/n)		
7.17	Long term agreements with external institutions for staff training		

7.1. ROLE OF THE ORGANIZATION IN REGIONAL CONTEXT.

Which of the following best describes the role of [the entity] in the domestic power system and in power trade in the regional context?:

- Driver, Decision Maker
- Active Participant: Providing input to the dialogue, idea development, but not a key decision maker
- Passive Participant: Following the process to the extent possible, eventual beneficiary but not involved in the development of the system
- Irrelevant

7.2. CURRENT KNOWLEDGE OF AND INVOLVEMENT IN NBI AND REGIONAL POWER TRADE.

To what extent and how has [the entity] been involved in the NBI up to now? How well understood are the goals of the current initiative – Regional Power Trade? Has [this entity] been involved in this current initiative? How?

7.3. SECTOR DRIVERS IN THE COUNTRY.

What entity is the main driver in this country's power sector? Is power sector development largely a unilateral or cooperative process? Is the current driver effective, and if not, what entity would be the ideal driver? Why? (political, technical capacity, etc.)

7.4. EFFECTIVENESS OF CURRENT POWER SECTOR STRUCTURE.

Is the current structure of this country's power sector effective for meeting the needs of consumers? If not, how could it improve?

7.5. EFFECTIVENESS OF INSTITUTIONAL / COMPANY STRUCTURE.

Is the current structure of [this entity] effective and efficient for carrying out its mandate? Is there a need for change or improvement?

7.6. INSTITUTIONAL CAPACITY STRENGTHS AND WEAKNESSES.

Of the following areas, what are [this entity's] strengths and weaknesses? What capacities need improving to better carry out [the entity's] mandate?

- Energy or Power Sector Policy
- Technical Power Sector Operation
- Economic and Financial Issues
- Legal or Regulatory Issues
- Interaction with neighbouring countries and counterpart entities
- Other

7.7. STAFF COMPOSITION AND QUALIFICATIONS

The table indicates a series of activities which are relevant for regional power trade and an ordered form for gathering data on the qualification of the professionals involved in those activities.

The first column represents the activities that we intend to analyse; the following columns the institutions where the activity may be performed (totally or in part).

In each cell of the matrix it must be filled the following information:

#Prof staff: indicate the number of professionals involved in the corresponding activity in the corresponding institution.

Position of Department/Unit Head: indicate the professional title of the person responsible for the commercial activity in the institution.

Years of experience: indicate the number of years that the professional responsible for the task has as a professional in the sector (power sector).

Years in the position: indicate the number of years that the professional has been occupying the current position as responsible.

Other courses: indicate if the professional has made any course of specialisation in the subject which now he is responsible for and indicate length of the course. In case of more than one course, indicate total number of courses and length of the longest one.

7.8. EXISTING CAPACITY BUILDING.

Is there a central department within [the entity] that oversees on-going or new staff training?

If not, how are training needs determined (by employees themselves, by individual supervisors, by department heads)? Is it a systemized process or more ad-hoc? How does an employee request training?

What kind of training is available or have professional staff of [this entity] participated in related to:

internal system operations? Regional trade and cooperation?

Is training provided by local, regional or international experts? Are they funded by [the entity] or by external funds? Is it provided in the country or same city, or must staff travel to attend training?

Have staff participated in regional training, capacity building or exchange opportunities? If so, which ones? How are participants for these activities selected? Are they usually senior/executive staff, mid-level managers, or operational personnel?

Is there a process for knowledge transfer to younger staff from older, more experienced staff? Apprenticeships or through on-the-job exchange between the two levels? Is [the entity] facing a situation of losing experienced employees (i.e. through retirement) in the next 2-5 years, without qualified personnel to replace them? Is there currently adequate duplication among staff responsibilities so that loss of one employee (short or long term) does not mean that a key task will be left without a capable/experienced employee to cover it?

What are the Human Resource statistics for key departments responsible for power system operations and commercial transactions (financial & accounting departments, metering department, trading units, etc.)

- Number of employees
- Average age of employees
- Number of Management Level and Operational Level employees
- Number of employees with university-level degrees (Bachelor level)
- Number of employees with post-graduate degrees (Masters or higher)
- Number of Management employees with post-graduate degree
- Other indicators

7.9. EXISTING STAFF CAPACITY IN INTERNAL AND REGIONAL POWER TRADE.

Is the staff of [this entity] prepared to take on work related to increasing power trade across borders? What capacities do they need to be able to interact and work with counterpart entities in neighbouring countries?

- More complex dispatching procedures
- Drafting of new rules and codes
- Contract negotiation
- Other commercial, regulatory, or technical skills

7.10. UNDERSTANDING OF THE PROS AND CONS OF POWER TRADE.

What could be the benefits or drawbacks of regional power trade to [the entity]? To the country? To the Region? Is there a perception in the country that power or energy exports means “losing” national resources?

7.11. PERCEPTION OF AVAILABLE RESOURCES.

Does the country have the resources available (now or in the future) to be able to export power? What additional resources or infrastructure is needed to be able to export or import power? Are there barriers to investment in infrastructure by international companies? If so, what?

7.12. UNDERSTANDING OF NATIONAL OR REGIONAL POLICIES IN POWER TRADE.

Has [this entity] been involved in the development of the country's policies on power trade and regional cooperation? If so, how? If not, how have these policies been communicated to [entity] staff? Does the entity participate in the various regional initiatives (in water or energy resources) and power pools?

7.13. PERCEPTION OF OTHER BARRIERS TO REGIONAL POWER TRADE.

Aside from political, capacity or resource limitations already discussed, what additional barriers might there be to cross border power trade – cultural, economic, etc.?

7.14. STAFF COMPOSITION AND QUALIFICATIONS MATRIX

Activity	Ministry	Regulatory Authority	Utility	Transmission Company
Master Plan	# Prof staff: Position of Dep./Unit Head: Years of experience: Years in the position: Other courses:	# Prof staff: Position of Dep./Unit Head: Years of experience: Years in the position: Other courses:	# Prof staff: Position of Dep./Unit Head: Years of experience: Years in the position: Other courses:	# Prof staff: Position of Dep./Unit Head: Years of experience: Years in the position: Other courses:
System expansion generation			# Prof staff: Position of Dep./Unit Head: Years of experience: Years in the position: Other courses:	
System expansion transmission			# Prof staff: Position of Dep./Unit Head: Years of experience: Years in the position: Other courses:	# Prof staff: Position of Dep./Unit Head: Years of experience: Years in the position: Other courses:
Power Markets	# Prof staff: Position of Dep./Unit Head: Years of experience: Years in the position: Other courses:	# Prof staff: Position of Dep./Unit Head: Years of experience: Years in the position: Other courses:	# Prof staff: Position of Dep./Unit Head: Years of experience: Years in the position: Other courses:	
Development regulations (market rules, grid code)	# Prof staff: Position of Dep./Unit Head: Years of experience: Years in the position:	# Prof staff: Position of Dep./Unit Head: Years of experience: Years in the position:		

Activity	Ministry	Regulatory Authority	Utility	Transmission Company
	Other courses:	Other courses:		
System Operation			# Prof staff: Position of Dep./Unit Head: Years of experience: Years in the position: Other courses:	# Prof staff: Position of Dep./Unit Head: Years of experience: Years in the position: Other courses:
PPA negotiation	# Prof staff: Position of Dep./Unit Head: Years of experience: Years in the position: Other courses:	# Prof staff: Position of Dep./Unit Head: Years of experience: Years in the position: Other courses:	# Prof staff: Position of Dep./Unit Head: Years of experience: Years in the position: Other courses:	
PPA administration	# Prof staff: Position of Dep./Unit Head: Years of experience: Years in the position: Other courses:		# Prof staff: Position of Dep./Unit Head: Years of experience: Years in the position: Other courses:	

7.15. TRAINING FACILITY BELONGING TO THE INSTITUTION

For each institutions which has training facilities indicate:

Rooms surface (sq meters)	Indicate surface of rooms available for training. Do not consider administration areas or other services.
Capacity (# of persons)	Indicate the capacity of each of the rooms in terms of number of persons that can assist to a session.
Projector availability (y/n)	Is there multimedia facilities such as projector, etc?
Number of PCs available to use for training	Self explanatory
PCs conected in network (y/n)	Self explanatory

7.16. TRAINING FACILITY AVAILABLE IN THE COUNTRY FOR THE INSTITUTION

Are there facilities in the country that are not from the institutions but can be used by the institutions or rented by the institutions? If affirmative please indicate:

Rooms surface (sq meters)	Indicate surface of rooms available for training. Do not consider administration areas or other services.
Capacity (# of persons)	Indicate the capacity of each of the rooms in terms of number of persons that can assist to a session.
Projector availability (y/n)	Is there multimedia facilities such as projector, etc?
Number of PCs available to use for training	Self explanatory
PCs conected in network (y/n)	Self explanatory

7.17. LONG TERM AGREEMENTS WITH EXTERNAL INSTITUTIONS FOR STAFF TRAINING

Indicate if there are long term agreements with external institutions (domestic or from other countries) for staff training.

8. INSTITUTIONAL INFORMATION

8.1. INSTITUTION'S NAME, ADDRESS, AUTHORITIES

Indicate precisely institutions name, address, e-mail, web site, main authorities, person of contact, etc so that it would be easy to make contact again in case it were necessary.

8.2. GEOGRAPHICAL AREA THAT THE INSTITUTION COVERS

Indicate the countries that are members of the institution distinguishing between full members and non full members. Detail the differences between these two classes of members 8if it exists) or any other special status for special members.

8.3. INSTITUTIONAL ASPECTS

The objective of this question is to find out the main aspects regarding: organisation of the institution, the formal agreement that supports the institution, its relationship with the members etc.

Original agreement: indicate if there is a formal agreement, MOU, or any other document signed by the countries members that formally creates the institution. Require this document.

Supranational character: indicate if the decisions taken by the institution have a supranational character, that is to say, if these decisions oblige and are binding to its members. Indicate if any special procedure is required in these cases. On the contrary, indicate if the decisions of the institution have a character of "recommendation" and can not be imposed to the countries.

Direction: indicate which is the highest organism within the organisation, if there is a Board, how is it integrated, how are the members of the Board appointed, how long do they stay in office, is here any special issue regarding the representation of the countries? Are all the countries represented somehow in the authorities that govern the institution?

Internal organisational structure: indicated the broad lines how the institution is organised internally, is there a CEO or general secretary, which are the main divisions / areas in which the institution is organised, how many staff does it have? How many are professionals?

Communication with utilities / countries: indicate which is the channel of communication of the institution with the countries members. Does it have direct communications with the utilities? With which institutions of the countries members does it communicates normally?

Financing: how is the institution funded?

8.4. OBJECTIVES OF THE INSTITUTION

Indicate the objectives of the institution. These objectives should be specified in the original agreement/MOU that originated the institution. However, there may have been modifications to the original situation.

8.5. CURRENT ACTIVITIES OF THE INSTITUTION

Indicate which the activities that the institution carries out currently are. It can happen that although the institution has a series of objectives and activities that should be carried out to achieve the objectives, for one reason or another, not all of these activities are carried out. Either because there are not enough resources and it is necessary to give priority to certain activities, either because there are political reasons to carry out certain activities and not other, etc.

8.6. MAIN PROJECTS DEVELOPED UP TO THE MOMENT

Indicate and describe briefly the most important projects that the institution has carried out and have already been achieved.

Indicate the results of the project. If possible (if it is in digital format) require final reports or briefings or executive summary of the projects.

Indicate how these projects (each of them) are in relationship with the objectives of the institution.

8.7. MOST IMPORTANT CURRENT PROJECTS (IN EXECUTION)

Identify the most important projects that are currently in execution and describe them briefly. Indicate objectives of the project, degree of advance, main milestones achieved, funding of the project.

If possible, require (in digital format) additional information on the project: reports, executive summaries, terms of reference, etc.

8.8. MOST IMPORTANT PROJECTS ALREADY DECIDED FOR THE FUTURE

Identify the most important projects that are already decided for the near future and count with funding; describe them briefly indicating objectives of the project, degree of advance (bidding documents prepared, offers in study, terms of reference in preparation, etc).

8.9. INFORMATION MANAGED BY THE INSTITUTION

Indicate if the institution manages any data base. If affirmative describe the information contained in the data bases (variables, area covered, etc).

Indicate if the data bases are public or with restricted access. Inquire, in case of restricted access, the possibility for this project to have access to those data bases.