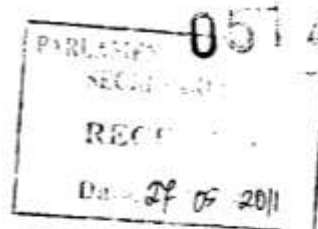
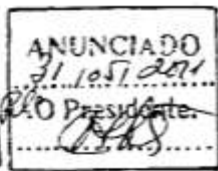
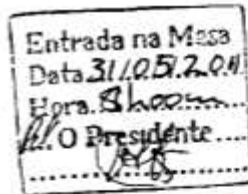


This report is from the independent external audit on EDTL by Deloitte, delivered to the Prime Minister and Parliament in May 2011. La'o Hamutuk scanned the Portuguese original document and translated it to English, and we may have accidentally introduced some errors. For the original document, or more information on the national electricity project, see www.laohamutuk.org/Oil/Power/10PowerPlant.htm.



REPÚBLICA DEMOCRÁTICA DE TIMOR-LESTE

GABINETE DO PRIMEIRO-MINISTRO

Ref. N.º 0730 /GPM/V/2011

*Aferente ao parecer e parecer
Plenário
Distribuição de cópias a
Todos os Distritos Deputados.*
[Signature]
31/5/2011.

Exmo. Senhor
Presidente do Parlamento Nacional
Dr. Fernando Lasama de Araújo

Excelência,

Na sequência
Nacional
Distinto

Following the audit by Deloitte of five national institutions, I submit for the knowledge and consideration of Your Excellency and Distinguished Members of Parliament the 2009 Audit Reports for the following institutions:

- Electricity of Timor-Leste (EDTL);
- National Police of Timor-Leste (PNTL);
- National University of Timor-Leste (UNTL);
- National Elections Commission (CNE);
- Autonomous Medical and Health Equipment Service (SAMÉS).

Peço de
deles ao
de Minis

I apologize for the delay in handing over the documents, but in the meantime the services involved know about them, and I also instructed the legal advisors of the Council of Ministers to examine them in detail.

Alguma
haviám
correcc

Some of the situations identified in the reports were already in our knowledge, so we had already taken steps in this regard and in other cases, services will implement the corrections necessary to improve their operation.

Accept, Excellency, the assurances of my highest consideration and esteem.

Aceite, Vossa Excelência, os protestos da minha mais elevada consideração e estima.

Díli, 27 de Maio de 2011

[Signature]
Kay Rala Xanana Gusmão
Primeiro-Ministro da República Democrática de Timor-Leste

Government of the Democratic Republic of Timor-Leste

Review of Electricity of Timor-Leste (EDTL)

April 2011

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Limitations

The services provided are in the nature of advice and do not constitute an audit or any work of ensuring reliability in accordance with Australian Auditing Standards. Therefore not be expressed. under those rules. any opinions or conclusions that purport to give any form of security.

Because of the inherent limitations of any internal control structure, it is possible that errors or irregularities may have occurred undetected. The issues identified in this report are only in that they came to our attention during our work and do not identify themselves as a comprehensive statement of all weaknesses that exist or improvements could be implemented.

Our work is done on a sample basis. In practice, we cannot review all activities and procedures, nor can we replace the direction in its responsibility to maintain adequate controls over all levels of operations and responsibility for preventing and detecting irregularities, including those related to fraud.

Any projection for future periods, evaluation of control procedures, is subject to the risk that systems become inadequate because of changes in conditions or due to deterioration of complying with them.

The recommendations and suggestions for improvement should, prior to its implementation, be assessed in view of its overall business impact.

We understand that the statements contained in this report are accurate. However, there is no guarantee as to the completeness, accuracy or reliability of the statements made and information obtained from the staff of the Democratic Republic of Timor-Leste. Was not undertaken any attempt to independently corroborate such sources, except as expressly stated in the report.

Limitations on Use

This report is intended solely to inform and to internal use by the Government of the Democratic Republic of Timor-Leste, according to Addendum 5 to the Contract with the number RDTL-900 001, of March 26, 2009. This report is not intended use, nor should it be used for any other person or entity. No other person or entity must support each other, in any form or for whatever purpose, in this report. We do not accept or assume any liability to third parties, beyond the Democratic Republic of Timor-Leste, in our work. by this report, or any trust that is attached to this report by anyone other than the Democratic Republic of Timor-Leste.

Privately-this document and the information contained therein is confidential and should not be used or disclosed without our consent.

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Glossary of Terms

Alternating Current (or AC): Most systems generate alternating current electricity (i.e., the energy fluctuates between positive and negative in the form of a sine wave at 50 or 60 cycles per second). The system operating in Timor-Leste as a power system with alternating current at 50 cycles per second.

Request for payment (or CPV): a document issued for the reserve funds to pay for goods, services and other capital investments.

Direct current (or DC) means that the electricity system maintains a constant voltage relative to earth, either positive or negative. In electricity supply systems, the direct current is primarily used in large transmission lines, and long submarine cables.

EDTL means Electricity of Timor-Leste, who is the producer and provider national electricity.

Freebalance corresponds to resource planning software from Government.

Kilovolt (kV): a Kilovolt equals one thousand volts, being a measure used to describe the operating voltage of transmission lines and distribution (e.g., the line operates at 20 kV).

Kilowatt (kW): a Kilowatt equals one thousand watts, being a measure used to describe the electricity distributed by a motor or electric instrument (for example, the engine will deliver 100 kW).

Kilowatt hour (kWh) is a universal measure of electrical energy and drive used for the sale of electricity. 1 kWh corresponds to the electricity used by a load of 1 kW in one hour. Electricity meters usually measure electricity consumption in kWh.

Hours of energy requirements: "hour of energy requirements" is the term used to describe the deliberate cutting of electricity supply to parts of the grid and thus to customers in these areas. When there is a shortage in electricity supply, there may need to reduce the demand for an acceptable level very quickly or risk the entire electricity grid becoming unstable, turning it off completely. This event is known as "cascade" and may end the interruption of supply in all or most of the network, affecting large areas of a country or system.

MW means millions of watts being used to describe the electricity delivered by an engine or electric instrument (for example, the power plant will deliver 150 MW).

Vertical integration: Vertical integration is the term that describes a situation in which two or more phases of a sector are combined under common control. The total vertical integration includes all functions, from production of electricity to consumers.

1 Executive Summary

1.1. Historical Context

The electricity sector in Timor-Leste was seriously damaged in 1999. Since then, successive governments and international organizations have made significant efforts to improve and expand the supply of electricity to consumers. Despite such efforts, interruptions in electrical supply and other problems related to the provision in Timor-Leste continue to occur regularly.

The conducted review was aimed at obtaining an understanding of the electricity sector in Timor-Leste and the general examination of key processes and procedures of the Electricity of Timor-Leste (EDTL). EDTL is the supplier for the national electricity system in Timor-Leste and is supervised by the Secretary of State for Electricity, Water and Urbanization, in the Ministry of Infrastructure (“the Ministry”).

1.2. Scope and objectives

The Ministry of Finance asked us to:

- Develop an understanding of the issues that contribute to the interruption of electricity supply, including examination of relevant documents, in particular contracts with major suppliers
- Generally we examine the key internal controls and accounting procedures
- We examine high value transactions, as disclosed in the statement of receipts and payments for the 21-month period ended September 30, 2010
- Proceed to review the commercial register and the shareholding structure of a sample of goods suppliers
- Prepare a report on situations detected a report and recommendations

Our approach in this study consisted mainly of interviews with key stakeholders, in order to obtain their perspectives on the challenges of efficiency and financial process, and inspection of documents. A summary of the terms of reference of the work is presented in Annex O.

1.3. Brief summary of the electricity sector

1.3.1. Electricity sector in Timor-Leste

The electricity sector in Timor-Leste is a set of non-integrated power generation and distribution networks spread across the country. Currently, electricity is not connected through a transmission infrastructure.

1.3.2. Construction of a national transmission system and power generators

With a view to building a national transmission system and new power generators, the Government has signed contracts with China Nuclear Industry 22nd Construction Company Ltd and Puri Akraya Engineering Limited, respectively.

Additionally, the Government contracted with the consultants Electroconsult & Bonifica SpA to manage the construction processes mentioned above. They are also employed to obtain advice on the proposed improvements to the electricity sector.

Section 2 provides more detailed information about the EDTL and electricity sector in Timor-Leste.

1.4. Key factors that contribute to disruptions in electricity supply

There are several factors that contribute to disruptions in electricity supply. Such factors include:

- Power plants and obsolete equipment
- Inefficient procurement processes
- Failure to implement the *Utilities Board*
- Ineffective contract with the contractor to manage the operation of EDTL (hereinafter referred to simply as “the management contractor”)
- Funding difficulties
- Poor recovery of amounts owed by customers
- Ineffective supply chain of fuel to the districts and sub districts
- Insufficient supply of strategic spare parts
- Restrictions on the level of human resources

Section 3 describes in detail the situations encountered and the recommendations relating to the factors that contribute to energy supply interruptions in the electricity sector in Timor-Leste.

1.5. Detected situations related to internal controls and accounting procedures

1.5.1. Supply

1.5.1.1. Decentralization

During 2010, the Government undertook decentralization of supply to provide greater autonomy to line ministries at this level. As part of this process, it was expected that the Supply Technical Secretariat (STA) would supervise and arrange guidance on major purchases. However, there were significant delays in the time that the STA was slow to approve projects, which demonstrates that the STA has not worked as planned, either before or after the resignation of Deputy Prime Minister.

1.5.1.2. Major investment projects - Changes to the terms of the national transmission system

The China Nuclear Industry 22nd Construction Company (CNI22) was contracted by the Ministry of Infrastructure to build national transmission network. The corresponding contract included the construction of power plants. The Ministry of Infrastructure has commissioned and was responsible for the acquisition of the national transmission grid and has been given authorization to its construction. After signing the contract with CNI22, the Government decided, contrary to what had been agreed, to acquire power plants via the entity Puri Akraya Engineering Limited (Puri Akraya). The contract with CNI22 is currently being revised to reflect these changes.

1.5.1.3. Major investment projects - Purchase of electricity generators

The entity Puri Akraya Engineering Limited was contracted to build new generating electricity through direct award. The total amount of the contract amounted to \$352,569,123 USD.

Recommendation

The amendments to the contract with the entity Puri Akraya Engineering Limited must be formalized in accordance with the terms and conditions of contract.

1.5.1.4. Procedures for procurement of goods addressed to only one supplier

There have been several acquisitions, including contracts related to electricity distribution, whose associated process developed by the Ministry of Infrastructure has involved consultation with just one supplier. In many cases, the purchase of their property and their request was not initiated by EDTL.

Recommendations

- EDTL must have a procurement process that is independent of the Ministry of Infrastructure, being, however, in accordance with all aspects foreseen in decree-laws relating to procurement.
- The Ministry would maintain oversight through its role of governing EDTL, but not be involved, however, in day-to-day operations of this entity.
- While single-supplier procurement processes, can provide rapid and high quality solutions, allow access to known suppliers and promote local businesses, other processes that involve consultation with various vendors, as specified by applicable law, can create less expensive solutions.

1.5.1.5. Goods ordered and approved but not paid

In some cases, payments were not made to suppliers on receipt of invoice and supply of property. In the case of a supplier, for example, payment was processed with almost a year late, since the request for payment (CPV) was not authorized by the Ministry of Infrastructure, holding up release of funds.

Recommendation

- EDTL must have a procurement process that is independent of the Ministry of Infrastructure, being, however, in accordance with all aspects foreseen in ordinances relating to the supply.
- Provisionally, because of the critical importance of electricity supply in Timor-Leste, so that purchase orders are approved by EDTL, the corresponding process of acquisition should be immediately operated in the Ministry of Infrastructure. If the Ministry of Infrastructure cannot approve such purchase orders, EDTL management and supplier shall be notified promptly of the reasons for such impossibility.

1.5.1.6. Suppliers of high value transactions

The Terms of Reference for this work include:

- The examination of transactions for large amounts, as disclosed in the statement of receipts and payments for the period of 21 months ended September 30, 2010
- Review of business registration and ownership structure of suppliers of high value transactions

Annex L contains a list with details of the ownership structure of the main suppliers.

1.5.2. Receipts

1.5.2.1. Revenue collection and bad debts

EDTL has a billing system that operates only for customers located in Dili. Customers with credit risk still represent a problem, since many customers do not pay their bills. Only about 40% of commercial and governmental customers located in Dili pay their bills.

Additionally, there are important customers with unpaid bills from the years 2009 and 2010. Talks with EDTL Management revealed that the electricity supply was not cut off for customers with outstanding balances over 90 days old, once the program that allows for the interruption of electricity supply is not yet operating.

Recommendation

The Management of EDTL should give priority to the implementation of the program that allows cutting off the electricity supply. A program of cutting electricity supply to customers with unpaid bills, applied consistently, will encourage the adoption of a culture of "those who use should pay."

1.5.3. Fixed assets

1.5.3.1. Incomplete registration of fixed assets

The recent decentralization of fixed asset management requires that each ministry or agency be responsible to register, update and manage their fixed assets. The register of fixed assets of EDTL on December 31, 2009, is not sufficiently detailed. For example, it does not include the date of acquisition of the property, as well as its location and its cost. The register of fixed assets does not have enough information for proper registration of the goods and to prevent misappropriation of the same.

Recommendation

EDTL should include all the essential information of the assets in its fixed asset register, including:

- description of the property,
- acquisition date,
- category,
- type of asset,
- cost of the asset,
- location of the goods

1.5.3.2. Purchases of fixed assets not reconciled with the Freebalance

Purchases of fixed assets recorded in Freebalance not been reconciled with the additions of property in the register of fixed assets. As a result, there is the risk that the investments made by EDTL may not be included in FreeBalance and / or the register of fixed assets.

Recommendation

Purchases of fixed assets recorded in FreeBalance should be reconciled monthly with the additions of assets recorded in the register of fixed assets, with correction of any errors/omissions. An official with a leading position must sign and date the reconciliation as evidence of their review.

1.5.3.3. Physical counts of fixed assets

The staff has not made EDTL physical counts of existing fixed assets. Physical counts should be performed periodically to identify any missing or fixed assets in excess, since the goods may be lost, may change in location, to be sold or be misappropriated and remained still registered entries in the assets of EDTL and Government.

Recommendation

A physical count of all periodic fixed assets should be made to identify missing goods, surplus goods or unrecorded disposals/write-offs of fixed assets. Each counted item should be reconciled with the register of fixed assets. The fixed assets register should be updated to reflect the fixed assets held and if there are discrepancies, they should be investigated.

Section 4 details the situations identified and recommendations regarding internal controls and accounting procedures.

1.6. Business logic

The Government of Timor-Leste should consider the activity of EDTL following business logic. This will imply that the EDTL acts as an autonomous entity, with a greater degree of accountability to its stakeholders, including relevant government ministries and, in particular, their clients.

It is likely that EDTL will be subsidized by the Government in the coming years. Consequently, a business logic should assist the Government to implement processes that accurately capture the cost of the electricity sector. This will help the Government to determine appropriate tariffs and subsidies associated with the fund for future State budgets.

Key components of a business logic include:

- Service obligations to customers
- Management autonomy
- Performance management
- Pricing
- Asset Management
- Human resource management
- Capital structure

Recommendation

The Government should consider the activity of EDTL to follow business logic. The adoption of business logic is often a substantial reform initiative, and should be relevant to the requirements of the population and the Government of Timor-Leste.

See section 3.9 for more detail on the situations identified.

1.7. Follow the recommendations

Given the critical importance of the electricity sector for the development of Timor-Leste, a process should be implemented to monitor the adoption of these recommendations by the EDTL and the Ministry of Infrastructure.

The National Directorate of the Autonomous Public Authorities (DNAP) in the Ministry of Finance has implemented a process to monitor the recommendations made from previous reviews of the autonomous agencies. Annex N includes a template from DNAP to document the status of recommendations.

1.8. Recognition

We would like to take this opportunity to thank the management and staff of EDTL, the State Secretariat for Electricity, Water and Urbanization, the Director of Corporate Services of the Ministry of Infrastructure and the Directorate of the Ministry of Finance for their cooperation and assistance in course of this work.

Deloitte Touche Tohmatsu

April 7, 2011

2 Description of EDTL

2.1. Constitution, laws and principles

2.1.1. Decree-Law No. 13/2003 - Bases of the National Electricity

The 1st Constitutional Government of Timor-Leste has established, among other things, the objective of organizing and regulating the National Electricity System (SNE), as defined in Decree-Law No. 13/2003, which lays the foundation of the SNE.

This legislation led to the creation of the Electricity of Timor-Leste (EDTL) as the nation’s electricity supplier. The main objectives of EDTL are:

1. construction and development of infrastructure in the country;
2. provide, at affordable prices, businesses and the general population, a wide range of services with quality of electricity Supply

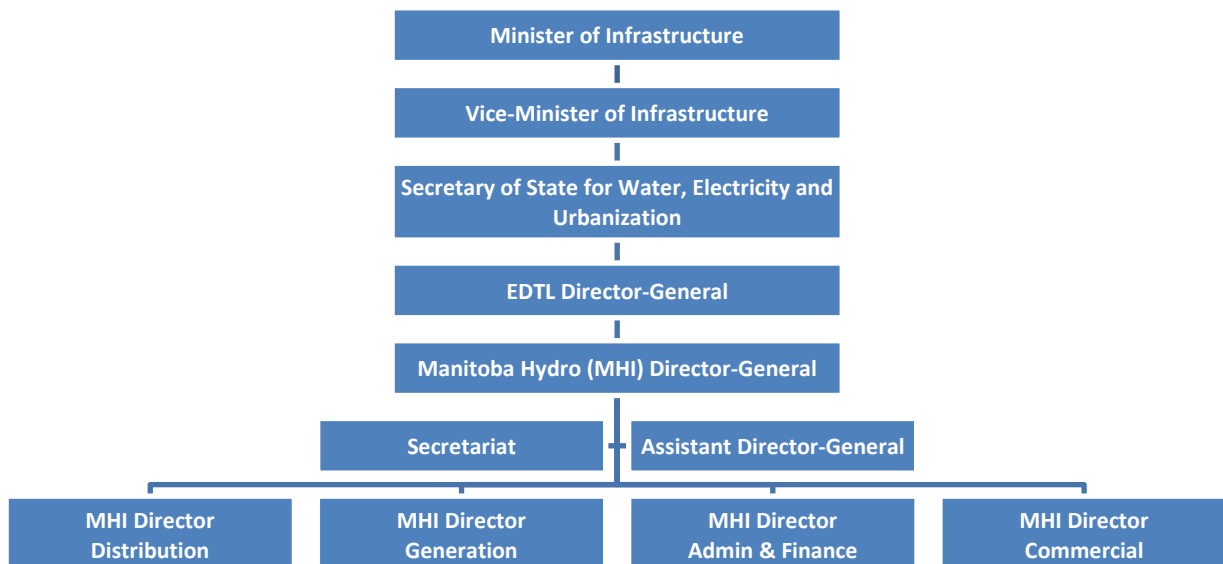
The principles that govern EDTL under Article 2 of Decree-Law No. 13/2003 are as follows:

1. Ensure the satisfaction of basic electricity supply needs of populations and public and private entities in various sectors of activity through the creation of conditions conducive to the development of such services.
2. Ensure:
 - a. The existence and availability of the provision of universal service under conditions of adequate quality and affordable prices to all users;
 - b. The economic and financial viability of the provision of universal service;
 - c. To users, in identical circumstances, equal treatment in access to and use of supply of electricity;
 - d. The use of energy sources more suitable for the production of electricity;
 - e. The promotion of rationality and efficiency of the resources available, from production to transmission, distribution and consumption in order to contribute to the progressive improvement of technical and economic conditions of operation;
 - f. Domestic and foreign private investment are attracted to the SNE for creating stable, equitable, transparent and favourable conditions for investment.

2.2. Organizational Structure

The Ministry of Infrastructure is the largest ministry of the Government of Timor-Leste. The Minister has three secretaries of state who will report, including Secretary of State for Electricity, Water and Urbanization.

The organizational structure of EDTL is currently as follows:



Additionally, under the guidance of directors MHI (Manitoba Hydro International), there are several department heads, consultants and other personnel. On September 30, 2010, the EDTL had approximately 410 employees.

2.3. The electricity sector

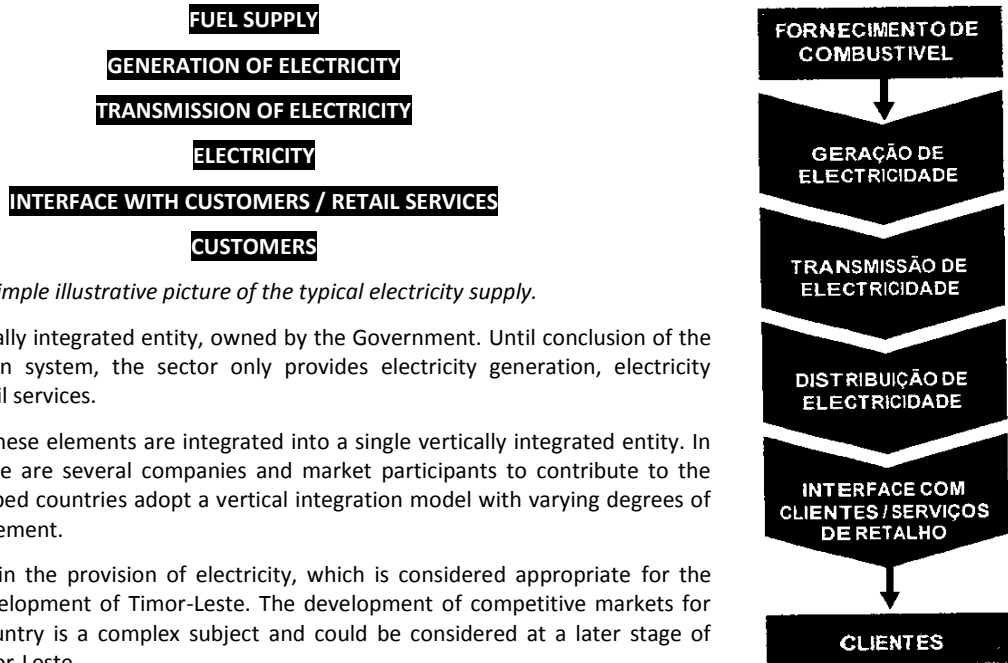
This section details a typical structure in the electricity sector and its importance for Timor-Leste. Includes a description of the

current system in Timor-Leste, the commissioning of new power stations and the national transmission system.

2.3.1. Typical structure of the electricity sector and its importance for Timor-Leste

The electricity sector translates a particular source of energy (e.g., diesel, gas or coal) into electricity, and supplies it to their customers. The sector comprises essentially four elements shown in the diagram below:

Figure 1 - Components of the Electricity Sector



Annex A contains a simple illustrative picture of the typical electricity supply.

EDTL is now a vertically integrated entity, owned by the Government. Until conclusion of the national transmission system, the sector only provides electricity generation, electricity distribution and retail services.

In some countries, these elements are integrated into a single vertically integrated entity. In other countries there are several companies and market participants to contribute to the sector. Most developed countries adopt a vertical integration model with varying degrees of private sector involvement.

EDTL is monopolist in the provision of electricity, which is considered appropriate for the current state of development of Timor-Leste. The development of competitive markets for electricity in the country is a complex subject and could be considered at a later stage of development of Timor-Leste.

The current situation in the electricity sector in Timor-Leste already involves the use of subcontractors who perform important suppliers significant roles in the sector. The use of a subcontractor to manage the EDTL, as is the case of Manitoba Hydro International, is an example of a subcontractor to support the day-to-day operation of infrastructure sector.

Subcontracting for the implementation of major construction work is also common in the industry, both in developed economies and in economies in developing countries. Examples of this situation are the construction of Hera and Betano power plants and the national electrical transmission network of currently in progress (described in more detail in Section 3.4). In these cases, there would also be the use of contractors for operation and maintenance of systems that are being built. That will eventually require EDTL personnel trained and ready to take over that operation and maintenance.

2.3.2. The electricity sector in Timor-Leste

The electricity sector in Timor-Leste is described according to their current situation, and then a description of the schemes that are planned following the completion of major power stations and the national transmission system.

2.3.3. Generation of electricity - Current Power Plants

The current system is the supply of electricity generated in a large number of diesel power plants located throughout the country. These are typically organized as described in Figure 2 and consist of the following components:

1. Diesel engines burning light distillate fuels, commonly referred to as “diesel fuel”, which put the generators in operation. The size of these generators varies depending on the size of the localities where they are located - from 50 horsepower to 250 horsepower in Dili and smaller in power stations in the districts.
2. Electric generators that generate low voltage (400 volts AC), or moderate / high voltage in some larger cases.
3. Transformers that boost the voltage to 20 kV, which corresponds to the voltage used in Timor-Leste for electricity distribution.
4. Outdoor high voltage (20 kV) which allows for switching and control of various components and electrical protection equipment and lines. The system incorporates a bus to connect the components together and circuit breakers to open and close the connections as necessary.
5. 20 kV feeders that take the streets of the towns. There are six feeders in Dili and two or three in the district capitals. These are installed along streets in the form of areas with rows of bare aluminium conductors insulated from the poles, with your arms crossed for porcelain insulators. The poles in Timor-Leste are generally made of steel tubular.

Figure 2 - Outline of a Typical Power Plant

Electricity Distribution - Systems

From the power station, 20 kV feeders spread, forming the basis of the distribution system that carries electricity through the streets of towns, cities and the countryside. The distribution system consists of the following main components, as illustrated in Figure 3:

1. Distribution feeders (20 kV) power plants.
2. Distribution substation. Is a small transformer (usually between 50 kVA and 500 kVA), which reduces the voltage to 400 volts, so as to enable the distribution of electricity by households and commercial surfaces. Most of these transformers is mounted on poles above the ground.
3. System typical of low voltage (400 volts) of each surface transformer that serves a commercial or even hundreds of homes. The wires in this system are mounted above the ground conductors in insulated packages. Run beneath the 20 kV conductors when they are mounted in these same poles.
4. Generally, the supply to a neighbourhood is under-powered from a location at a distance between 5 and 50 km.

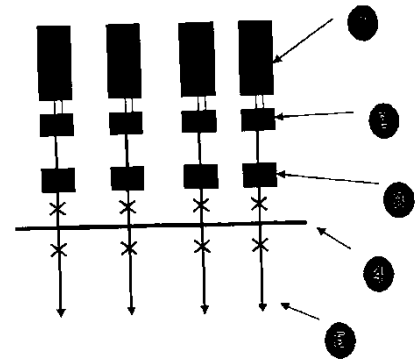


Figure 3-Typical Distribution System

Connecting to customers

The components of the system that serves the customers are repeated thousands of times throughout the system in order to provide service to every customer. The main components of this part of the system are, as shown in Figure 4:

1. Feed the low voltage (400 volts) across the street from the house.
2. Cable customer service. Consists of an insulated cable and is in line with best practices, built as a "cable concentric" with the neutral conductor around the live conductor to hinder the interference in cable and electricity theft. This type of construction is being progressively implemented in Timor-Leste.
3. Counter consumption of the customer. This instrument measures the amount of electricity consumed by each customer. In Timor-Leste there is an increase in prepayment consumption. Customers buy the amount of electricity they want to consume in the form of a card and type a unique code on the keypad of the meter. This procedure adds the amount of electricity purchased from the counter to the intended use. Commercial customers are more likely to have a "credit" or "post-payment" of consumption. In this system, utility meter readers read the meters of EDTL on a monthly basis, inserting the corresponding information in the customer billing system, which generates an invoice. Prepayments of consumption have proved very useful in Timor-Leste, since they constitute a powerful method to ensure that the customer actually pays for the electricity they consume.
4. Switchboard client that feeds several circuits in the facility.

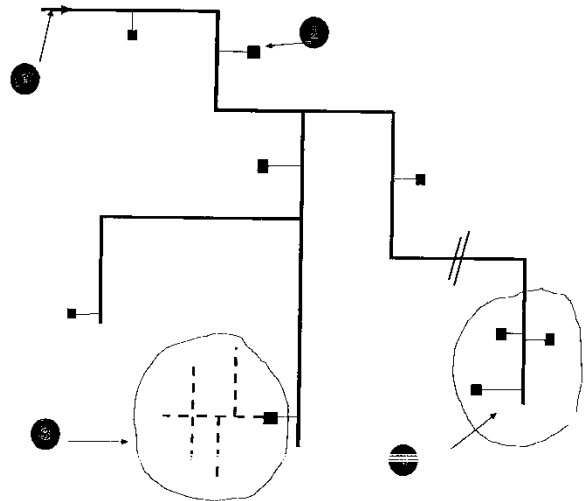


Figure 4 Typical connection with customers

How is the provision made for very small sub-districts

The very small sub-districts have not yet reached by the distribution lines of 20 kV power plants are fuelled by very small customers who feed through systems of low voltage (400 Volt). These are illustrated in Figure 5 below.

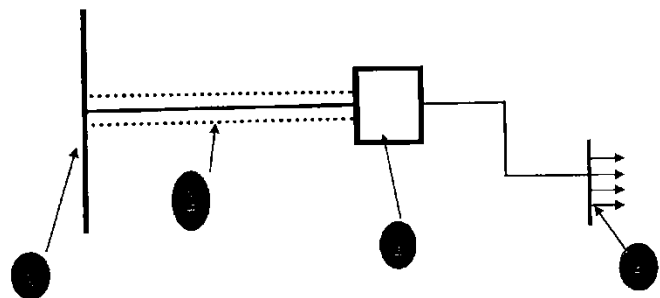
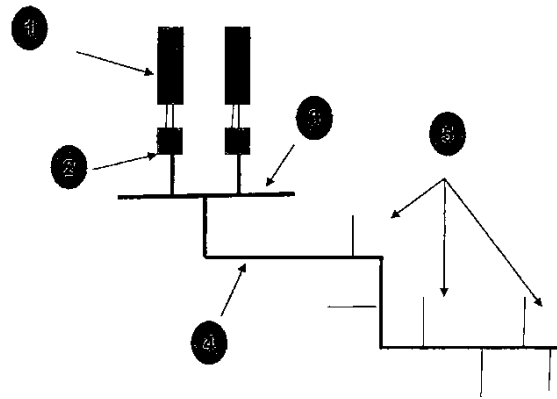


Figure 5 - Provision of a typical sub-district with its own power plant

It is planned to replace these systems for future supply through distribution lines from 20 kV substations in the district. The components are usually described in Figure 6.

1. Small diesel engine (usually 100 horsepower)
2. Low voltage generator
3. Table of low-voltage distribution
4. Low-voltage feeder
5. Typical connections with customers



Number of systems currently operating in Timor-Leste

Large Power Plants (only in Dili)	1 (Comoro)
District Power Plants	10
Power Plants of Sub-District	about 50
Connects to Clients	approximately 55.000

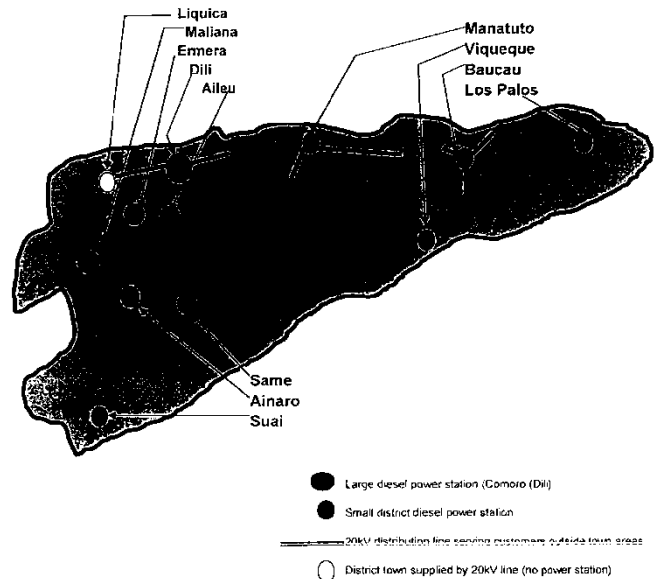
Note that there is a power station in Liquiçá district, once the supply is provided from Dili, by a 20 kV feeder.

Figure 6 - Existing Supply System

2.3.4. New power stations and new national transmission system

Currently Timor-Leste does not have a transmission infrastructure. Consequently, the power plants and distribution networks operate only on a local basis. See Figure 5. The construction work currently underway will equip Timor-Leste for a new comprehensive electricity supply system. The new system is illustrated in Figure 6. Contracts were concluded for the construction of major facilities to generate electricity and the national transmission system. This system includes the following main facilities:

- Hera Generating Station, comprising generating an average speed of 7 x 17 MW, for a total capacity of about 119.5 MW. The plant will include storage facilities for fuel. The station will include a substation that raises the voltage to 150 kV, for the purposes of connection with the transmission system.
- Betano Generating Station, comprising generating an average speed 8 x 17 MW, for a total capacity of about 136.6 MW. The plant will include storage facilities for fuel. The station will include a substation that raises the voltage to 150 kV, for the purposes of connection with the transmission system.
- A system of 150 kV transmission, consisting of approximately 715 km of line forming a ring around Timor-Leste.
- Nine substations to reduce the voltage located in district capitals of Timor-Leste. These substations will allow connection to the existing lines of 20 kV distribution.
- A control centre located at the substation of Dili.



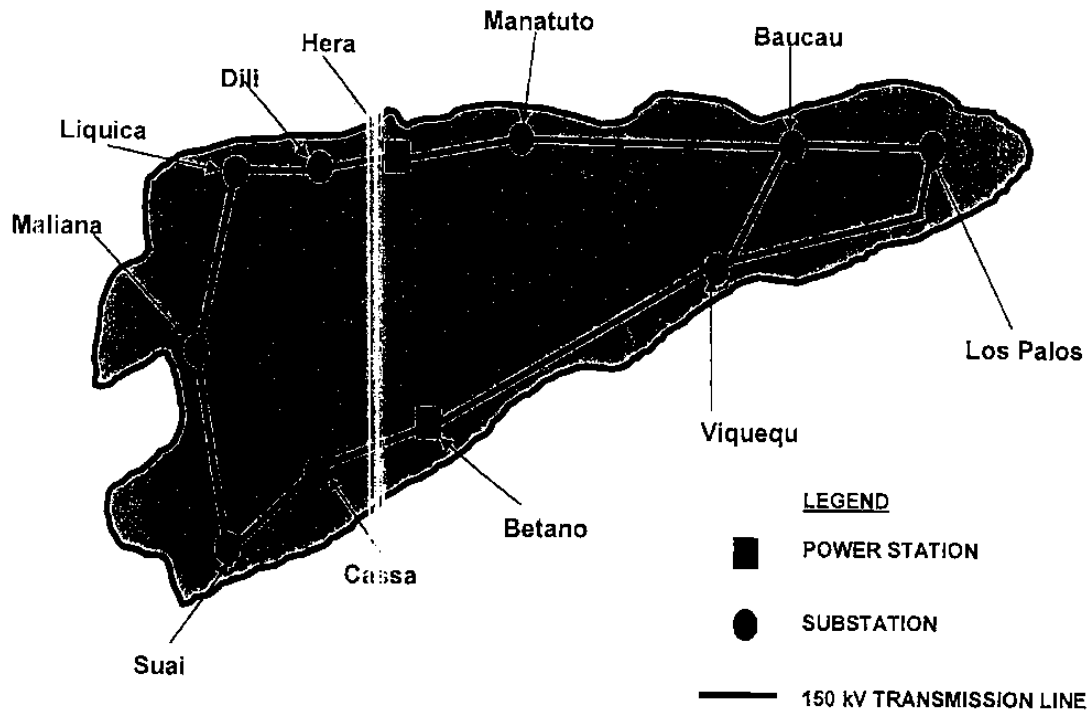
Power plants will have more than sufficient capacity to meet the current demand from customers. Such capacity will still respond to an expected future growth in demand, remaining adequate for many years. The nine new substations are well located in the country, so that the distribution feeders of 20 kV substations these can reach all corners of the country, with the possible exception of the Oecussi enclave, which lies on the west side of the island, in Indonesian territory.

Once the new system is operational, the existing power plants will be disconnected, and the existing 20 kV feeders connected to new substations. The projects also include construction of new 20 kV feeders to reach the power stations of the sub-

districts, which will permit their gradual closure. Consequently, soon after the entry into operation of the national transmission system, all electricity will be generated by the Hera and Betano power plants.

The ongoing process of rural electrification will proceed through the extension of 20 kV distribution lines to areas for which there is no supply. Individual solar energy systems will be used in remote areas, where construction of 20 kV distribution lines is not justified, or where the terrain is very difficult. See Figure 7 below on new power stations and the national transmission system.

Figura 7 Novas Centrais Eléctricas e Sistema Nacional de Transmissão



3 Situations detected and observations related to issues that contribute to disruptions in electricity supply

3.1. Government

3.1.1. Utilities Board

A Utilities Board was never established, contrary to what was anticipated in the contract signed between the contracting Manitoba Hydro International (Manitoba) and the Government of Timor-Leste. The Finance Ministry had earlier recommended the implementation of a Utilities Board, and gave guidance on the roles and responsibilities of such body.

The purposes of the Utilities Board consisted in supervising the supply of electricity and ensuring corporate governance and transparency in the operations of EDTL. Some of the functions of the Utilities Board, as indicated in the management contract described above, are:

1. Establish reporting formats to be used in reporting structure of EDTL
2. Reviewing the financial reports and quarterly management issued by the Manitoba
3. Review monthly reports of operations
4. Stay informed on the activities of EDTL
5. Provide feedback, guidance and direction to EDTL
6. To approve the hiring and firing of personnel to and from EDTL
7. To establish the basis for calculating key performance indicators (KPI) as well as incentive schemes based on the nominal operating surplus of EDTL
8. Agree procedures for purchases of EDTL through the implementation of a supply unit for this entity.

The original intention of the Government of Timor-Leste was the creation of a Utilities Board to arrange:

- A group with extensive experience in the electricity sector that would review the decisions related to the development and management of EDTL
- A mechanism to project authority and confidence to management and staff of EDTL, which provides the Minister and the Government of Timor-Leste expert advice, which disseminates information to electricity consumers who expect reliable services sector, and that such a vision strategy for the sector
- A discussion forum on the future direction to make the electricity sector

A body with these characteristics would necessarily include members of high standing appointed by the Government of Timor-Leste and the appropriate experts in the electricity sector (with deep expertise in the management, engineering and financial matters).

Such a body could function effectively, regardless of the administrative structure of EDTL. The Utilities Board could be effective as an advisory body, the EDTL was structured as a government department. It would also be effective as an executive body to EDTL if EDTL became an entity with statutory independence.

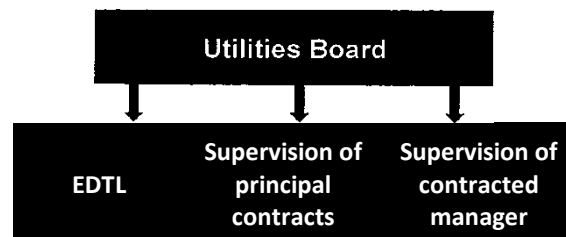
Bodies of this nature are typically composed of a total of 6 to 10 members with appropriate expertise and authority, which are the main criteria for their nomination.

It would be necessary to develop some preliminary work to develop prior to the implementation of this body, in order to establish the terms of reference, protocols government, the criteria for appointment and the members of this body.

It could also be necessary to create a structure that facilitated such a body, though probably it could operate temporarily without such structure.

The proposed role of the Utilities Board is illustrated in Figure 7 below:

Figure 7: Proposed Structure for EDTL



Recommendation

It is recommended to create a Utilities Board for the direction of the operations of EDTL.

3.1.2. Manitoba Hydro - contractor to manage EDTL

Manitoba is the entity currently contracted to manage EDTL, having been, for the purpose, improving operations of EDTL by putting a set of industry experts working together with the Management of EDTL. The contract includes short-term and medium term goals related to human resources training. Currently, the staff of Manitoba holds the following positions:

- Director General
- Administrative and Financial Director
- Commercial Director (covering mainly the area of customer relationship)
- Director of Distribution
- Operations Director (Generation)

Once the Utilities Board has not yet been created, the entity Manitoba established a direct working relationship with Secretary of State for Electricity, Water and Urbanization.

Implementation of maintenance contracts

EDTL, with support from the management contractor, has managed to award several contracts related to maintenance tasks in the electricity sector. It has also improved the supply of spare parts through the supply system.

Supply systems are still slow and heavy, but will work. Somehow, the entity contracted to perform the management has set the delays, successfully anticipate purchasing needs.

Review of contractual performance

Under the contract, is required an annual review of the performance of the contractor to process management. There was no review since signing the contract in 2007.

It would require a review to assess performance over the years in various functional areas of EDTL such as:

- Measurement of consumption and services provided to customers.
- Current distribution system in Dili, including new substations, and the review of low-voltage networks. The total number of power plants in operation currently stands at 60.
- Supply of spare parts and materials distribution.
- Maintenance contracts relating to specialized equipment.
- The creation of management systems within the EDTL.
- Electricity generation, including reviews of the facilities located throughout the country.

Payments related to the nominal operating surplus in default

There are outstanding invoices issued by Manitoba Hydro that the State Secretariat of Electricity, Water and Urbanization has not yet approved, related to the nominal operating surplus, since it is the understanding of the State Secretariat that the purpose of the nominal operating surplus is to compensate Manitoba by the performance improvements and management of the institution.

We identified several aspects of the current contract which take the commercial agreement concluded by the Government advantageous to Manitoba.

Conditions of contract

The entity contracted to perform management and EDTL already acknowledged that there are opportunities to improve the current contract, consequently causing EDTL for best results.

Renewal of contract

Have been seen little progress in training staff EDTL with a view to preparing for the day when they will have to manage operations without support.

When the current management contract expires, we will need a new contract. The wording of the statement in such a contract and looking for a partner takes a considerable amount of time, as it is essential that the new partner is identified and formalized agreement prior to the expiration of this contract. This is the only possible way to ensure an orderly transition. It is therefore necessary for actions to be undertaken immediately in order to formulate the requirements of the new contract.

Discussions with EDTL staff suggest that it is the right time to opt for a different kind of structure that underlying the contract with the entity that currently manages the EDTL. The staff of EDTL reveals the need for expert advice, support at management and engineering and technical support in certain areas. However, it remains adamant about the fact that it must manage EDTL with the assistance of third parties, as opposed to observing these entities to manage EDTL, as it does today.

If you intend to follow this approach, then a different model of support will be developed with staff and EDTL with the

contractor to process management. This process will take some time, and is therefore urgent that it will start as soon as possible.

Recommendation

- It is recommended to start immediately (in consultation with the Management of EDTL and the management contractor) working towards the formulation of the requirements of the contract management support that will come after the current contract.
- The Government should request a review of the contract, under which future contractual payments to Manitoba would become the key performance indicators (KPI). Listed below are specific opportunities to strengthen the results of the contract. Additional details are provided in Annex B.
 - **Review of key performance indicators:** Most of key performance indicators in the current contract or are too complex or lacking in definition. As a result, they do not add sufficient value in terms of performance measurement. Needs to develop a small number of key performance indicators that are measurable, to allow monitoring of the contract and be used to measure the incentive payments set out therein.
 - **Increase in the number of heads and supervisors:** EDTL this level needs to strengthen its organization, and the current management contract provides only for staff to Director level. Providing managers and supervisors by the appropriate contractor to carry out management will result in much fewer counterparts in the structure of EDTL, with significant benefits for the daily operations and development of competence within the EDTL. We estimate that more than 10 employees are required with the necessary language skills.
 - **Team of engineers:** The inclusion of a small team of engineers (up to 4 people) to carry out design tasks, project management and planning for small jobs, would improve the performance of the contract for EDTL. Currently, the directors of the entity contracted to perform management perform enough work where they are forced to “get their hands on” when that work could be done more efficiently by the appropriate personnel for these tasks.
 - **Procurement team:** If the Utilities Board delegates the functions of supply to the entity contracted to perform management in order to make the process more expedient, it becomes necessary to purchase a small team working together with the purchasing people of EDTL. It would take approximately four additional people. Much of this work will involve the monitoring of procurement processes created in the Ministry of Finance and will support the current global initiative of the Government in this area.
 - **Additional services director for the district and sub-district:** The additional director will be responsible for all aspects related to services provided outside of Dili EDTL (including Baucau). We draw attention to the fact that this application has already been submitted by the management contractor for approval.
 - **Change of scope in the event of privatizing generation:** should be allowed to decrease the scope so as to relieve / reduce the responsibilities of the contractor to carry out management in the event that a privatized generator (IPP) becomes operational.

In accordance with the contract, there shall be a review of the performance of the management contractor. Payments arising from the review should only be made after reviewing the contract between the Government and the contractor to manage.

3.2. Budget

3.2.1. Budget cuts

EDTL submitted to the Secretariat of Electricity, Water and Urban Development and the Minister for Infrastructure an initial budget for the year 2009 which amounted to 26 million USD. The budget was reduced to 11 Million USD (a 58% cut). In 2010, compared with the 2009 budget, allocation for goods and services was reduced by 30% and the budget allocation for small investments was reduced by 40%. Given the large amount of existing aged equipment in EDTL, attention should be paid to adequate funding in order to maintain the current network. See detailed budgets in Annex C.

This cut in funding has been disproportionate to the growth in responsibility, as well as growth in production that EDTL has been showing. The possible consequences of such reductions include higher levels of faults and failures in responding to requests for expansion by customers. The advantages of preventive maintenance for the maintenance on the repair of faults are presented in Annex H. Preventive maintenance should be made to the current system, as well as for the new system.

Recommendation

Sufficient funding should be provided to enable the achievement of the electrical supply, as established in Decree-Law No. 13/2003.

Additionally, the Secretariat of Electricity, Water and Urbanization should review, in conjunction with the Management of EDTL and the contractor to carry out management, budgets submitted by EDTL. This is because EDTL and the contractor to perform the management are in possession of technical and operational knowledge that formed the basis of the budgets submitted.

3.3. Fuel management

For reliable electricity generation, it is essential to have proper budgeting, supply and storage of good quality fuel for power plants. Since independence, the fuel supply in Timor-Leste has sometimes proved problematic. A logistic supply has contributed to unreliable electricity supply interruptions.

However, more recently, this situation has improved and the fuel supply contract signed with the supplier Esperenca Timor Oan (ETO), which began on September 1, 2010, has proved very satisfactory. However, there are still logistical problems with delivery outside of Dili. The fuel quality has improved and is now acceptable. The aforementioned contract expired on February 28, 2011, having been extended by two months until the conclusion of new contracts.

Production increased during the period covered by the review, as well as fuel consumption, as shown in the table below. However, the efficiency of electricity generation, measured as the electricity generated per litre of fuel, decreased significantly during the period, as shown in Annex E.

The supply of fuel for new power plants to be built in Hera and Betano has not yet been delineated. It is not clear which fuel delivery method will be used for these plants. It is problematic to use the road from Dili, because of poor quality roads. Currently there are no port facilities completed with any of the power stations that allow unloading fuel. Additionally, the contracts do not contemplate the construction of pipelines to enable the transport of fuel from ports to power stations.

It is very important to the resolution of fuel supply for the new power plants (of Hera), since this may delay the operation of power plants.

We asked the Secretariat of Electricity, Water and Urban for access to all new contracts related to supply and fuel storage. We were not even informed at the time of finalizing this report, if such contracts exist.

Recommendation

Because the contract to supply fuel currently in force has a short term basis, long term supply contracts should be negotiated and awarded, in accordance with the procurement laws.

3.3.1. Fuel Efficiency

The efficiency of electricity generation decreased significantly during the period under review. Efficiency was measured by the monthly production of electricity per gallon of fuel. See Annex E for details about the decrease in efficiency. In accordance with our discussions with the Management of EDTL, this comes from age of equipment, poor plant maintenance and the increasing number of small power stations in districts and sub-districts, which are less efficient per kWh produced than larger plants.

It is hoped that the new electric generators will result in greater efficiency per kWh produced.

3.3.2. Agreements for fuel storage and delivery

The fuel delivery arrangements are operating satisfactorily in Dili. However, arrangements for delivery to districts and sub-districts are less refined. Once delivered into the power plants, safety in relation to the fuel storage tanks (other than at Comoro) is generally weak. Apparently, the fuel is often used to fuel EDTL vehicles and other Government vehicles, and situations of theft have been identified. The delivery of fuel in some power plants is difficult as a result of road conditions, particularly in the southern part of the island. Additionally, the fuel for electricity generation is also used to fuel EDTL vehicles, and there is no rigorous monitoring of the removal of fuel from the fuel storage tanks.

These problems will diminish considerably once the new power plants are operating, assuming robust procedures for delivery of fuel will be implemented.

Recommendation

The current fuel management system will change substantially as a result of current construction projects. Consequently, it is suggested the implementation of systems to replace parts of the sector. However, parts of the sector will continue to exist, and for new construction systems should be implemented to ensure that inventories of fuel are stored in secure facilities and that all fuel consumption is recorded based on valid documentation. An accounting process should be implemented that allows the movements and monitor fuel levels, the latter being supported by documentation for authorization of fuel consumption. Additionally, fuel measurements should be performed daily, which will be compared with records of fuel, to ensure that no unauthorized fuel consumption. Policies should be implemented to establish who within the EDTL can use fuel and for what purposes, and what restrictions, if any, existing at the level of such use.

3.3.3. Fuel Inventories

The fuel supply has improved under the new agreements and fuel inventories have shown greater stability. The lack of inventories of fuel in some remote locations delayed the introduction of electricity supply for 24 hours, 7 days a week. The management of inventories of fuel should be much easier with the coming into operation of new power stations and the national transmission system.

However, the Government relies on fuel reserves that suppliers will maintain to guarantee the necessary supply.

Recommendation

The Government should evaluate the possibility of maintaining its own strategic fuel reserves.

3.4. Electricity generation

A significant proportion of electricity supply interruptions in Timor-Leste are caused by problems in power stations. An equally important part of such interruptions relate to failures in the distribution lines, which are to some extent, inevitable in a harsh tropical climate, such as Timor-Leste.

The problems in power stations are mainly related to failures. All power plants in Timor-Leste are approaching the end of their economic lives, having usually been subject to maintenance levels below what is ideal and, at times, a clear abuse during their long lives.

Additionally, many power plants show a capacity insufficient to meet the client load associated with them, even in a scenario where all the machinery is operating properly. This means that power plants are not large enough to reliably meet the load of clients associated with them.

EDTL has tried to make revisions to the machinery of power plants in accordance with the recommendations of their manufacturers. However, this process has often been frustrated by delays in supplies. In some cases, the machines failed while waiting to acquire review services. This resulted in the increase of hours of interruption of electricity supply, as shown in Annex G.

The responsiveness of the current procurement processes in EDTL and the Ministry of Infrastructure has not proved sufficient for the efficient operation of a system of electricity supply. As a consequence, electricity supply disruptions result and repair costs increase for failures caused by the delay in review work. The procurement process is discussed in more detail in section 4.2.

The current situation should improve dramatically when the new national electricity system is in operation, because of the following reasons:

- The equipment will be new and not equipment worn by decades of hard work;
- The new power plants will have more than enough capacity to meet the needs of all consumers in Timor-Leste.

However, it is important that the new entity to contract to operate the system has the ability to procure parts and equipment required for maintenance and operation of power plants when they are in operation. The contract with Puria Akraya addresses this situation, provided that the Secretariat of Electricity, Water and Urban will give full assistance to that entity.

Recommendation

It is recommended that EDTL be given authority to establish its own supply system independent of the Secretariat of Electricity, Water and Urbanization. Thus, they can purchase parts and materials efficiently. This system of supply will, in all material respects, conform to the relevant decree-law.

3.4.1. Comoro Power Station

The current Comoro power station is reaching the end of its useful life, although some plant components have been recently acquired. These components are fairly new and can be used for other functions.

There is a risk that the new items of Comoro plant that still work well will be abandoned to ruin, or will be misappropriated when new power stations are operational.

Recommendation

It is recommended to undertake a review of items in Comoro plant to determine:

- The items that can be sold at market prices.
- Alternatively, if unsold, items which can be disabled safely and kept for possible future use, in case they will not be part of the new national electricity system.

3.4.2. Generation of electricity to the district capitals and sub-districts

The centres outside of Dili and Baucau is mainly supplied by small diesel power plants, whose capacity ranges from 1 MW in the case of the major centres, and 50 kW in the case of smaller sub-districts.

Once the new power stations and the new national transmission system are working and those connections are made to all substations of the various districts and sub-districts, the existing power stations will no longer be needed. The resources required to keep these power stations active as reserve generators will be considerable. It is understood that these plants should be removed when no longer needed.

Recommendations

It is recommended that all power stations of various districts and sub-districts be abandoned and demolished when no longer needed.

3.4.3. New power stations and the national transmission system

Contracts were concluded for the construction of major facilities for generating electricity and for the national transmission system. This system consists of the following main facilities:

- Hera power station, comprising generating an average speed of 7 x 17 MW, for a total capacity of about 119.5 MW. The plant will include storage facilities for fuel. The station will include a substation that raises the voltage to 150 kV, for the purposes of connection with the transmission system
- Betano power station, comprising generating an average speed 8 x 17 MW, for a total capacity of about 136.6 MW. The plant will include storage facilities for fuel. The station will include a substation that raises the voltage to 150 kV, for the purposes of connection with the transmission system
- A 150 kV transmission system, consisting of approximately 715 km of line forming a ring around Timor-Leste.
- Nine substations that reduce the voltage, located in district capitals of Timor-Leste. These substations will allow connection to the existing 20 kV distribution lines.
- A control centre located at Dili substation.

Notes relating to the electricity generation system and the national transmission system:

1. Transmission lines and substations are being built by Chinese Nuclear Industry 22nd Construction Company Ltd (CNI22).
2. Power plants will be built by the entity Puri Akraya Engineering Limited. The engines will be the type of Wartsila VV18V46 prepared initially for light or heavy fuel oil. They may subsequently be converted to natural gas.
3. The work will be overseen by a joint venture ELC & Bonifica S.p.A
4. The operation and maintenance of power plants for five years after construction, will be the task of Wartsila.
5. The operation and maintenance of the national transmission system for one year after construction will be the task of CNI22.

Following discussions with ELC & Bonifica, Wartsila was asked whether it was concerned about the light load conditions it will see the first years of operation of new power plants. The defined capacity of the new power plants will be very large compared to the system load. For example, for a system load of 30 MW with three operating power station sets, the average load is 10 MW per machine, or approximately 60% of engine capacity. High rates of wear may occur when large diesel engines operate with light loads. ELC & Bonifica said that Wartsila was perfectly aware of the loading conditions and was confident that the scheme would not damage their engines.

The technical aspects related to construction work in progress are not covered by this report. However, we identified several aspects that have direct impact on the operations of EDTL. These aspects are detailed below.

3.4.4. Operation and maintenance of the national transmission system

The period of one year which is currently planned for operation and maintenance of the national transmission system by the manufacturer is not enough for EDTL develop capacity to take on these tasks. EDTL will require additional manpower, extensive training, new equipment and new tools and budget to be able to take on these tasks. Significant government decisions are still needed, including the adoption of expanded levels of manpower, additional budget allocation, development of management systems for the supply and availability.

If this job is not carefully planned and executed, there is a significant hazard to EDTL not be able to operate and maintain the transmission system efficiently. As a result of this situation, there could be technical failures, which could have a negative impact on the concept of a system of robust and reliable electricity that is embodied in the work currently contracted.

Recommendation

Should be taken into account the hiring, with the builder or other entity qualified to operate and maintain the lines for a period of five years after construction. After this period, EDTL should already have internally developed the skills necessary to perform these functions.

3.4.5. Connections between the new substations and currently existing 20 kV distribution systems

So far there are no connections between the new substations and currently existing distribution systems. It was confirmed that there was not even a preliminary discussion between ELC & Bonifica and Manitoba, representing EDTL, on what needs to be done. Additionally, it becomes evident that this action is not seen at present as a priority by ELC & Bonifica. If this work is not developed quickly and contractual resources for the construction of infrastructure are not obtained, the new transmission system will not be able to operate when they finish the construction. This is because there will be no physical connection between the new substation and existing systems.

The situation in Dili is the most urgent. The new substation is located on the eastern edge of town, almost as far as possible

from the distribution source of the current distribution system in Comoro. This will make the integration of the new substation with the existing 6 x 20 kV distribution feeders hard enough. Apparently, the location of the substation was set without having considered the difficulty of connecting it with the existing distribution system. The situation is further complicated because of the apparent absence of suitable rights of way between the substation and the western region, which must be obtained to connect the interface to existing feeders.

It is also apparent that there is an insufficient number of circuit breakers built into the current design of the new substation. Six breakers were provided, one of which will be used to connect the new line to Aileu and Gleno. There are therefore five breakers available to feed Dili. Currently there are six distribution feeders, requiring more to satisfactorily manage the ever increasing load on the town.

Other aspects of the new substation suggest that it was planned to meet a growing demand for a long period of time. However, restricting the level of circuit breakers puts a constraint on future growth. As the substation is under construction, four breakers should be added.

Recommendation

- It is recommended that, at all substations being built, urgent actions are undertaken with a view to planning and development of supply to connect between the nine new substations and 20 kV distribution feeders.
- It is recommended that the number of power circuit breakers will be reviewed on all new substations in order to determine whether they are adequate.

3.4.6. Interconnecting the Comoro power station and the national transmission system

ELC & Bonifica said the Comoro power station will not be connected with the new national transmission system. However, EDTL and the contractor continue to manage the construction of new generating capacity at Comoro (4 x 5 MW medium speed diesel engines).

These two views are in direct conflict with each other, having the ability to waste a considerable amount of money. The following options present themselves, apparently, as solutions to this conflict:

- Agreement on a strategy for connecting and the Comoro national transmission system.
- Cancel the project to increase generation in Comoro and deciding to not interconnect Comoro with the national transmission system.
- Proceed with the construction of the generation of 4 x 5 MW to Comoro, but put it in a secure covered storage for possible future use elsewhere. Decide not to connect Comoro with the national transmission system (note that part of this unit may be suitable for Oecussi in the long-term).

Recommendation

It is recommended that the issue of interconnecting the Comoro power station to the national transmission system is resolved and that depending on the decision, appropriate actions are taken regarding the current proposed increase of 24 MW capacity at Comoro Power Station.

3.4.7. Reserve transformers for the 150/20 kV substations

Substation transformers are under construction that have no slack in terms of installed capacity. In Dili there will be two transformers, but both are needed to meet loads of 31.5 MVA and 63 MVA. All other substations contain only a single 31.5 MVA, 20 MVA or 10 MVA transformer.

Although the likelihood of a transformer failure is low, the consequences of failure in the circumstances described above will be drastic. The electricity supply to the affected localities fed by the substation would be utterly cut off until they obtain a new transformer, or during the period in which the transformer would be outside the country to be repaired. The only exception to this would be Dili, where the capacity would be halved, which could lead to disruption in supply to some customers.

Additionally, these transformers are heavy and hardly transportable on deteriorated roads in Timor-Leste. It is highly unlikely that a transformer could be repaired in Timor-Leste in the event of serious internal failure.

There are several strategies to provide reserve transformers for these substations, being, however, recommended the following:

- An additional 31.5 MVA transformer should be purchased, placed in Baucau and connected to the substation in parallel with the single transformer currently scheduled.
- An additional 20 MVA transformer should be purchased, placed in the substation to the substation Suai and connected in parallel with the single transformer currently scheduled.

Notes on reserve transformers:

1. Reserve transformers should preferably be placed in substations with transformers of the same size.
2. Reserve transformers should be kept connected and operate in parallel with existing transformers. This is the best way to keep them in good operating condition.
3. The installation of the transformers will require additional equipment at the 150 kV and 20 kV levels, and a bay for the backup transformer. This work would be more conveniently performed if it followed the course of construction works on site, involving an amendment to the contract with CNI22.
4. It is more logical to place a 31.5 MVA reserve transformer in Baucau than Dili since Dili has two transformers. Thus, the failure of a transformer on this site may cause restrictions in the supply, but not a complete interruption of it.
5. It is more logical to put the other reserve transformer in the southern part of the island, since, if a transformer were to fail in this region, it would not be necessary to transport the transformer across the mountains.
6. It should be borne in mind that transformer failures are more common in the tropics because of heavy rain (water leakage into the transformer) and the highest incidence of thunderstorms, which are the biggest risk to the transformers.

Recommendation

It is recommended to obtain two reserve transformers 150/20 kV to be installed in new substations that are currently under construction.

3.5. Electricity distribution

The electricity distribution system carries power from the generating station (in the case of small systems such as those used in districts and sub-districts) or a large substation to supply customers. It consists of a network of longer high voltage feeders feeding distribution substations, which are voltage transformers that make the adequate supply of electricity to individual homes and trade (low voltage). An important consideration in relation to the distribution system has to do with the fact that it is essentially independent of the electricity generation system, and therefore challenges within this element of the sector can be addressed independently of the challenges associated with the generation.

3.5.1. The distribution network

The electricity distribution systems in Timor-Leste are similar in urban and rural areas, comprising essentially the following:

- 20 kV feeders, extending from power plants into the adjacent towns and rural areas
- transformer substations that convert electricity from 20 kV to 400 volts
- low-voltage lines (400 volts) located on most streets
- connections to service customers, including metering of consumption

In many areas, the systems are overloaded and have not been properly maintained (in particular since 1999) and are therefore in a weakened position.

Failure to address these issues will lead to severe disruptions in electricity supply, even if problems in electricity generation are completely resolved. The problems are likely to be characterized by: (a) an increased frequency of interruptions in electricity supply, as the systems become overloaded, (b) an increased frequency of interruptions in electricity supply during storms that occur in rainy season, due to the growth of trees along the wires, and (c) general deterioration of system performance due to a defective voltage control in low voltage networks. This latter aspect will result in further damage to the level of customer equipment and the failure of some customers' equipment to operate properly.

Recommendation

These systems require, generally, attention in the following areas:

- Reviews and extensive repairs.
- Routine maintenance on a permanent basis.
- Continuous monitoring of tree growth, we identified a situation in which a proposed thinning of vegetation, which involved personnel and equipment for 6 months, was cancelled because of the prices asked were higher than the amounts approved / budgeted.
- Increase of transformers and low-voltage lines to improve the quality of electricity. Generally, voltage fluctuations in low-voltage networks far exceed the levels of electrical appliances. This represents an additional burden for customers who thus bear the costs associated with electrical failure caused by low supply voltages and the poor performance of electrical appliances.
- Adding to systems to enable load increases.
- Improvements in high-voltage switchgear and protection mechanisms in most electric power plants.

3.5.2. Private sector involvement in the distribution network

Previously, the distribution network was expanded, repaired and maintained only by EDTL. Recently, there has been a growing involvement of the private sector. Suppliers have been often referred directly by the Secretariat of Electricity, Water and Urban Development and not by EDTL (see section 4.2.3).

The advantages of private sector development at the level of the distribution network include:

- stimulus to local businesses
- creating efficiencies in the distribution network
- EDTL being able to focus on core activities of electricity generation and transmission
- development of a supply chain of strategic stocks of inventories through the private sector, potentially at lower cost to the Government

Risks include:

- The employment of local citizens, who may not possess the requirements of the sector and have no technical knowledge required to perform the work, and intermediaries, which may result in poor performance and lower quality than the contractual standards.
- The quality of work done by suppliers will not be consistent with that required by EDTL, particularly if these vendors are not identified with the involvement of EDTL.
- When the procurement processes are not followed according to the system of supply, there is a risk of not getting quality appropriate for the price paid.

The involvement of the private sector should facilitate the creation of local employment.

Recommendation

- Suppliers should be appointed by EDTL and work directly under its supervision.
- When contracted local citizens do not meet industry requirements and have the necessary technical expertise, the Government should provide training and assistance in developing the local business community.

3.5.3. Transportation for distribution operations

In order to perform their functions properly, the distribution people should have high mobility. This is because the distribution systems are spread over large geographic areas. Additionally, the tools, parts and equipment they need for their work are bulky and heavy. Consequently, they cannot operate efficiently unless they have adequate transportation. Vehicles in EDTL (ideal form of transportation engineers engaged in the distribution) are still scarce. Still, this situation has improved considerably over the past two years.

In some districts, there is only one vehicle to support the entire operations of EDTL in those districts. The vehicle is used for all purposes, including support for electrical systems of various sub-districts with their own power plants and various sub-districts served by long 20 kV distribution line. Other purposes include the collection of revenue and patrolling transmission lines.

Most vehicles are not in working condition and there is no regular program to maintain and repair them. This situation is highly unsatisfactory and damages the ability of EDTL staff perform their functions.

Recommendation

EDTL must be provided with appropriate vehicles, and equipment that allows them to expand, repair and maintain the distribution lines. Additionally, a program of vehicles repair and maintenance should be implemented.

3.6. Relations to customers

The connection services to customers are reflected in areas where customers come in contact with the electricity supplier. Usually the connection services to customers include the following:

- The connection service between the existing low-voltage current in the streets and the premises.
- Electricity meters that record the consumption of customers.
- The billing system that records customer data and generates invoices.
- The function of recovery through the sale of pre-consumption chips purchased directly or through the collection of claims from clients.
- The connection and disconnection of service.
- Answer customers' questions and communications breakdowns.
- Other value added services such as advising on the level of energy efficiency.

As detailed below, we still need a lot of work to ensure the measurement of consumption, billing and debt collection systems across the country. However, considerable progress has been registered in recent years as a result of numerous programs. These programs should be maintained and supported.

For example, the "Return to User Pay" established in 2008. This program was designed to control the consumption demand, and its implementation is critical to curb theft of electricity, which develops through practices such as evading measurements, illegal connections and intimidation. This program has witnessed a small increase in the number of prepaid customers, which currently stands at 16,575. These represent approximately 70% of total EDTL customers. This program has experienced numerous delays as a result of shortages of materials.

The use of prepaid consumption has been very successful in changing public perceptions regarding the need to purchase

electricity and should be maintained. The charges also improved in recent years. An effort in this direction must also be maintained.

3.6.1. Tariff structure

The Government has structured the current tariffs taking into account the social needs of Timor-Leste. The initial monthly cost for residential customers for the first 20 kWh amounts to 5 cents / kWh.

The higher residential rate of 12 cents / kWh is a good compromise between ability to pay and the cost of production. The rate for the corporate sector is representative of the cost of electricity throughout the world. The current rate for the corporate sector is:

- Small Customers (0-1000 kWh / month) 15 cents / kWh
- Medium customers (1000-3600 kWh / month) 20 cents / kWh
- Large Customers (above 3600 kWh / month) 24 cents / kWh

However, even though the measurement systems of usage and billing to ensure the billing of all electricity consumed, these rates are clearly insufficient to allow recovery of costs. Currently, approximately 30% of generated electricity is counted. The remaining 70% is related to technical losses through transmission, illegal connections and unpaid consumption and not counted.

3.6.2. Measurement of service consumption

An intelligent transmission system is implemented effectively in Comoro, which measures accurately the generation of electricity through the production and recording of data. However, this does not cover the consumption of electricity, which can only be verified using existing meters at customer sites. Most customers in Dili have EDTL electricity meters installed in their premises, which is not true of many of the consumers of the districts and sub-districts. While there has been a traditional practice of circumventing metering in Timor-Leste, Manitoba reports that the situation is improving.

The installation of shielded cables (cables where the neutral wire is wrapped around the active wire, making it more difficult for customers to interfere with connections) contributed to this improvement. The use of prepaid metering and availability of associated records also helped. However, there are only three places to buy tokens associated with the intake system of prepaid cards, in Caicoli, Comoro and Bekora. Approximately 70% of EDTL customers are prepaid. There are no pre-payment facilities available outside of Dili.

Currently there is no policy focus on the complexities of the measurement of consumption in Timor-Leste. For example, a multi-use building, like a block of flats or a hotel, will require a measurement system to fairly ascertain the consumption of electricity per unit (for example, a meter in each apartment), to facilitate the allocation of electricity charges to the different units.

Recommendation

- Expanded facilities are associated with the prepayment (the availability of pulsa) to other areas outside of Dili, as well as install meters in the districts and sub-districts.
- It should be a planned policy to implement meters in compounds with multiple units, such as, for example, apartments and hotels.

3.6.3. Illegal connections

EDTL embarked on a program called "Rewiring" in an effort to reconnect all damaged local cables with concentric cables. According to EDTL operational reports, the areas covered by concentric cable have a 10% rate of illegal connections, whereas this rate is 70% in areas covered by regular cable. However, EDTL has experienced numerous difficulties in the acquisition of concentric cable and as a result, in April 2009, it was decided to embark on the use of regular cable, rather than the use of concentric cable. This decision contributed to the problem currently faced by EDTL related to illegal connections.

Recommendation

There should be an appropriate allocation of funds for the acquisition of concentric cable in order to permit completion of the "Rewiring" program. This program will reduce illegal connections and boost EDTL revenue.

3.6.4. Program for the reinstallation of meters

Manitoba and EDTL are currently implementing the program "Return to User Pay", mentioned above, on the reinstallation of electricity meters. This program, which began in Dili and is yet to be implemented in other districts, aims to respond to:

- Illegal connections to the EDTL system.
- Manipulation of usage meters.
- Other problems associated with the connection to customers / measurement of consumption, such as inoperative

meters, changing conventional meters to prepaid meters, and reinstallation of uncounted currents through the use of coaxial cable, which is more difficult to access.

Recommendation

The current reinstallation of meters in Dili should extend to all districts and sub-districts, beginning with Baucau. The program should be supported by adequate funding and an educational campaign.

3.7. Human Resources

For the electrical service to operate efficiently, it is important that the EDTL workforce be effectively managed.

EDTL currently has 410 employees and must be provided sufficient funds to ensure that the characteristics associated with an effective work environment are present in EDTL. One of the official duties of the *Utilities Board* was the hiring and dismissal of staff in EDTL. However, such a body was never formed, falling at present to the Government. Special attention should be given to the following.

3.7.1. Training human resources

Currently there are four EDTL employees who are seconded in Thailand and Indonesia. A training program for human resources is being implemented. This is a positive step in the right direction and additional funds should be made available for the training and development of EDTL employees, having particular regard to the technical skills needed in the electricity sector.

EDTL should continue to take advantage of the numerous investment projects that are currently being developed for the electricity sector by international experts in the industry. It should also take the opportunity to ensure that their employees enjoy the same. This can be achieved by focusing, as a first step, on skills associated with the electricity service through training and then developing employees through training and secondments, which will satisfy the long-term needs of EDTL.

The performance evaluation is still important after successful completion of the assessment program for employees in April 2009. The implementation of a culture of performance evaluations will require a significant effort to ensure that staff understand and recognize the purposes of performance appraisals.

Recommendation

EDTL must continue to focus on implementing regular performance and strengthening a culture of performance.

Additionally, the Government must channel to EDTL a reasonable share of the budget related to human resources training. In accordance with Section 3.1.2, the role of contractor to manage the development of human resources training should be reviewed and, if necessary, implemented in accordance with the new contract.

3.7.2. Worker health and safety

There is no evidence of a coherent system of workplace health and safety under EDTL. Worker health and safety is a discipline area that affects any organization worldwide, and is extremely important for EDTL. The aim of the programs on health and safety at work is to promote a safe working environment and as a side effect, can also protect co-workers, relatives, employees, customers, suppliers and other members of society who are affected by involvement with EDTL.

During the year there were some incidents related to health and safety at work, for example, on September 12, 2009, the case of a man who, when he tried to cut off the current in where he was working, suffered first and second degree burn injuries that led to surgery.

Employees and society must be aware that any form of energy, if not controlled or used properly, can result in serious danger for those who use it. Additionally, the risks of electrical power may include a variety of hazards, including electric shock, burns, neurological damage, psychological damage and ventricular fibrillation which can result in death.

Recommendation

EDTL should introduce a comprehensive health and safety policy, at a level corresponding to the minimum standards of the industry.

Additionally, there should be a campaign aimed to alert employees and society to the dangers of electricity.

3.8. Operating Systems

There are many opportunities to improve operating systems that support daily EDTL operations. As a complement, the following is a summary of opportunities not previously identified in this report:

Storage, Spare Parts and Registration: The existence of spare parts at all levels of EDTL operations requires review and improvement. It appears that this has improved markedly over the past two years. This applies to spare parts for equipment for generation, distribution equipment, measuring equipment and motor vehicle consumption. It is essential to have registration systems of appropriate spare parts.

Tools and Test Equipment: The existence of tools and test equipment at all levels of EDTL operations requires review and

improvement. It appears that this has improved markedly over the past two years. This applies to tools and equipment for the generation, distribution and connection for customer sites.

Communication Systems for Operations: This aspect in relation to the districts and sub-districts, was treated elsewhere in this report. The question regarding the adequacy of technical communications in Dili requires investigation.

Staff Accommodation: The rules relating to the allocation of accommodation to staff, particularly in remote areas, are unclear and have not been investigated. This matter should be examined, including aspects of related policies.

Security at Sites: Some sites visited evidenced security. However, many others, including those with fuel storage, have no security. In some cases it would be useful to have adequate fencing, while, in the most important, it is necessary to ensure personal safety. Security is always an issue for the storage of fuel, however, as the spare parts, tools and equipment improve, EDTL locations will contain higher amounts of attractive items. The existence of security requires a careful analysis and planning and the solutions will vary from site to site.

Security Equipment & Clothing: There was some improvement in this area over the past two years. The Management of EDTL needs to keep alert to the industry's minimum standards that are universally accepted in this area.

Health and Safety Systems: There is no evidence of a coherent system of health and safety at work under the EDTL. This issue should be resolved in order to carry the EDTL to a level corresponding to the minimum standards of the industry.

Recommendation

Continue to develop a set of revisions to systems and EDTL operational processes, to ensure that future operations are efficient. Such revisions should allow the identification of opportunities for improvement and, together with Management, the presentation of action plans to address any shortcomings. The following are examples of revisions that could be made:

- Storage, Spare Parts and Registration
- Tools & Test Equipment
- Communication Systems for Operations
- Safety Sites
- Safety Equipment and Clothing
- Health Systems and Safety at Work
- Staff Accommodation

3.9. Business logic

Currently, the internal control structures, operational processes and accounting procedures are not achieving the objectives set out in Decree-Law No. 13/2003, and the objectives of the Government of Timor-Leste.

The implementation of the national electricity grid and new power generators is an opportunity for the government to improve the effectiveness and efficiency of operations and controls.

Business logic can provide the government the opportunity to improve operations, accounting processes and internal controls of EDTL.

3.9.1. Principles of a business logic

There are various definitions of business logic, however, generally, the principles of a business logic include:

- Adoption of operational marketing practices
- Billing for services rendered
- Clear objectives and not conflicting
- Management responsibility, autonomy, authority and accountability to third parties

3.9.2. Stages of implementing business logic

Governments that choose this path usually take a phased approach. This approach includes:

- Firstly, the creation of a professional trade organization;
- Secondly, adopting a commercial approach to the management and planning and the establishment of contractual relations with business customers and suppliers – partial business logic;
- Thirdly, allowing competition, through which customers can choose the delivery - complete business logic.

Clearly, the full business logic in the context of EDTL cannot be established in the foreseeable future. However, partial business logic can be achieved in the immediate future.

3.9.3. Components of EDTL business logic

The key components of EDTL business logic include, without being limited thereto, the following aspects:

3.9.4. Accountability and management autonomy

The Government should establish a set of policy directions for EDTL but not, however, be involved in detailed operational policies and day-to-day management. The key parts include:

Minister for Infrastructure

The Minister of Infrastructure will establish the EDTL strategic policy directions. The objectives, nature and scope of the main activities of EDTL and non-commercial activities shall be specified in an annual performance contract.

To ensure that Management is fully liable for the performance of the entity, the Minister for Infrastructure should not be involved in managing the day-to-day operational policies or detailed EDTL.

Minister of Finance

The Minister of Finance will play a key political role with effect on the financial and economic performance of EDTL.

Secretary of State for Water, Electricity and Urbanization

The Secretary of State for Electricity, Water and Urbanization is ultimately responsible for the effective operation of the department as a whole.

Utilities Board

The *Utilities Board* will provide strategic direction for EDTL.

Management

A high level of autonomy and authority for the Management will provide appropriate incentives for management to maximize efficiency of its operations and improve economic return.

Performance Contract

Before each fiscal year, the expectations and requirements of the Government shall be clearly defined in a formal annual performance contract that will involve all key parties. The contract period should be three years in order to allow sufficient time for training human resources.

The details of the contract should be agreed between all parties, i.e. the *Utilities Board*, the Secretary of State for Electricity, Water and Urbanization, the Minister for Infrastructure and Minister of Finance. The contract will be reviewed and renegotiated annually.

3.9.5. Performance Management

Significant autonomy in goal setting provides the EDTL commercial management with incentives to seek efficiencies. However, there should be a corresponding responsibility for the effective operation of EDTL. A regime of performance monitoring ensures appropriate that such accountability is achieved.

3.9.6. Rates and allowances

Typically, efficient market prices for services are essential to promote a rational economic choice in the allocation and use of resources. The inefficiencies are usually minimized in a competitive market, where prices should reflect the "cost efficient" with the supply of goods or services. To the extent possible, operation under a system of market prices is critical for successful adoption of a reform of business logic. However, in the context of the electricity sector in Timor-Leste, there is no competitive market. Thus, one of the main benefits of adopting business logic on the part of EDTL is to implement processes that accurately capture the costs of the electricity sector. This should allow the Government to determine an appropriate rate as well as have a clear picture of associated subsidies that must be obtained from the state budget for financing the electricity sector.

3.9.7. Asset Management

EDTL is a capital intensive activity, so that business logic should include an examination of plant and equipment, land and buildings, including factors such as:

- Ensure that the register of fixed assets and accounting records are accurate
- Ensure that the remaining useful life and value of the assets are captured and are updated
- The property, rights and obligations related to assets are fully documented

3.9.8. Human resource management

Generally, human resource management within a commercialized entity involves the adoption of standards relating to best commercial practices. The human resource management should occur in the context of the principles and standards of the Government to ensure adherence to standards of best practice in equality, merit and impartiality.

3.9.9. Service commitments to customers

The service commitments to customers consist of guidelines that commit EDTL to provide service to its customers and may include aspects such as prices, service levels and connections, as well as the requirements of customers. A transparent system should be put in place that includes the publication of these commitments in the form of a letter to customers.

Commitments must be measured annually, and the results published.

3.9.10. The risk of “status quo”

In the event the Government decides not to proceed with the process of adopting a business logic for the activity of EDTL, the substantial investment currently being made in the electricity sector may require repair or replacement much sooner than expected, since adequate procedures to monitor and protect vital infrastructure cannot be implemented.

Recommendation

The Government should explore the option of adopting business logic for EDTL. The adoption of a business logic and, often, a substantial reform initiative, and should be relevant to the requirements of the population and the Government of Timor-Leste.

4 Situations detected and observations related to key internal controls and accounting procedures

4.1. Governance

4.1.1. Audit of financial reports

Article 40 of Decree-Law No. 13/2003 states:

1. Regulated entities must prepare and submit to the Government an audited annual report, including Balance Sheet and Accounts.

By failing to obtain audited financial statements, the EDTL is in default of Decree-Law No. 13/2003. Additionally, by not having an annual audit, the prepared annual report risks containing undetected errors.

Recommendation

An independent external auditor shall be appointed to audit the EDTL annual financial information.

4.2. Procurement

Procurement is a critical EDTL process, and EDTL was expected to create a procurement unit within the EDTL under the direction of the Utilities Board, as mentioned above in Section 3.1.1 (8). That board was never created, and the same happened to the EDTL procurement unit. As a result, procurement for EDTL is handled by the Ministry of Infrastructure.

EDTL operates critical infrastructure in Timor-Leste and is operating 365 days a year. Consequently, procurement for the service of electricity supply must be executed with speed and skill. There have been various issues, as evidenced below, which indicate that procurement processes are not operating as necessary to support the objectives of EDTL.

We identified the following issues:

4.2.1. Major Investment Contracts

4.2.1.1. Construction of the national power station and its facilities

As a result of poor state of the electricity sector, the Government of Timor-Leste signed in October 2008, a contract with the China Nuclear Industry 22nd Construction Co. Ltd (CNI22) for the design, construction, testing, delivery, installation, pre-commissioning, commissioning and performance testing of the national electricity grid and related facilities. Originally, the two power plants should be located in Manatuto and Same, using reconditioned motor-generators. This contract included the following:

- \$ 91,038,377 for power plants and related facilities;
- \$ 269,328,570 relating to the electricity grid and related facilities;
- \$ 3,000,000 annually for five years after construction on the management and operation of power plants and grid
- The supply of fuel is the responsibility of CNI22

The contracting of services occurred prior to the decentralization of the procurement function and has subsequently been revised by the central procurement unit of the Ministry of Finance.

The Government has decided that the power plants and facilities should be provided by Puri Akraya and their subcontractors, as mentioned in Section 4.2.1.2.

There have been several changes to the contract, including:

- This contract was amended in February 2009 to reflect the change in the signatures by the supplier;
- The contract was amended in December 2009 to reflect the change of technical specifications;
- It is currently being drafted an amendment to reflect the removal of power plant construction contract. We present details about contractors in Annex J. This should be done soon, since the non-submission of a valid current contract to the Treasury, could result in denial of payment requests.

Recommendations

Contract

The contract with CNI22 must be renewed and, if necessary, changed as soon as possible to reflect:

- Removing the purchase of power plants on CNI22 and other changed circumstances.
- The inclusion of management services for power plants and the grid by the CNI22 after its construction. Since CNI22 will no longer build power plants, should be taken into account the need to change the terms and conditions of the

contract that specify the role of this entity in plant management and network.

The amendments to the contract must be reviewed by the central procurement unit of the Ministry of Finance, in conjunction with engineering consultants Electroconsult & Bonifica S.p.A. (joint venture). This should ensure that there is consistency between the results specified in contracts with the entities Puri Akraya and CNI22.

Feasibility study

The Government should consider carrying out feasibility studies for larger projects. A feasibility study usually includes:

- A study of the systems
- A study of where development will occur
- An environmental study
- A review of strategic and service plans and a study plan
- An analysis of requirements for delivery of services and relationships
- The identification of viable options
- The evaluation of options
- The identification of the full scope of work
- An estimate of the capital cost of the options
- The implications of recurrent costs
- Drawings
- A review of methods of procurement
- Program implementation

4.2.1.2. Construction of two power stations and facilities

After reviewing the contract with CNI22, as described in the letter the Prime Minister sent to National Parliament, the Government of Timor-Leste signed an agreement with the entity Puri Akraya Engineering Limited (Puri Akraya). The entity Puri Akraya was formed in August 2010.

The purpose of the contract consists of replacing the construction of two power stations referred to in paragraph 4.2.1.1. Power plants will be located in Hera and Betano. This contract has an associated value of \$ 352,569,123.

Under the terms of the contract, Puri Akraya gets the exclusive right on the part of Wartsila Finland Oy to supply equipment for Betano and Hera facilities, and subsequently subcontracted this entity for the construction of the power plants. The contract does not specify the roles of Puri Akraya and subcontractors. View details on the ownership of Puri Akraya in Annex I and the list of subcontractors in Annex J.

The performance of the entities CNI22, Puri Akraya and subcontractors will be monitored by the engineering consultants Electroconsult & Bonifica SpA (joint venture ELC / Bonifica).

Contracting process

In early 2010, according to Article 23 of Decree-Law 1/2010, responsibility for assisting the Government with the big contracts lies with the Technical Secretariat of Supply, under the responsibility of the Prime Minister or his designee. Prior to the promulgation of this Decree-Law, such responsibility rested with the central procurement of the Ministry of Finance. The central procurement in the Ministry of Finance now only has responsibility to advise the Government on procurement policies, systems development and training.

Due to capacity constraints, the Technical Secretariat of the Procurement Office of the Prime Minister has had significant difficulties providing adequate assistance to the Government, as provided in the promulgation of Decree-Law No. 24/2008, which introduced the legislation associated with the decentralization of procurement.

In August 2010 the Deputy Prime Minister resigned and left the Technical Procurement Secretariat to review contracts. After the resignation of Deputy Prime Minister, was issued Decree-Law No. 14/2010 Temporary Procurement Measures. Decree-Law No. 14/2010 includes the following:

Article 1.

Temporary procurement regime

The competent authorities of each Ministry or Secretariat of State under the Prime Minister, are responsible for their procurement procedures, regardless of value.

In order to accelerate the State procurement, quality control of each procedure is done "a posteriori" (post quality control), aiming to achieve best value for money.

Article 2

Direct procurement award

All procurement processes of a value exceeding one million U.S. dollars, as proposed to use of private award must be

approved by the Council of Ministers.

Article 3.

Procurement processes in processes

In procurement processes already initiated by the Technical Procurement Secretariat, it remains responsible for the process but the procurement services of each ministry with it, so intense, procedures, providing technical and human resources required for their completion.

According to our conversations with Secretary of State for Electricity, Water and Urbanization, we believe that the conclusion of the contract with the Puri Akraya resulted from a direct award. During our review, we had no access to any documentation that showed the existence of a consultation process from multiple vendors. The contract was approved by the Council of Ministers.

4.2.2. Human resource capacity to manage projects of large infrastructure

There are a number of suppliers working for the government under the new electricity generators and the national transmission system, including:

- Electroconsult & Bonifica SpA Joint Venture
- China Nuclear Industry 22nd Construction Company Ltd
- Puri Akraya Engineering Limited
- Subcontractors of the above entities

Currently, the government has a shortage of qualified and experienced engineers in order to provide oversight of projects related to infrastructure and major suppliers. The Government is currently implementing the National Development Agency, through which project managers will oversee the suppliers.

4.2.3. Purchases without a public consultation process

There were purchases by the Ministry of Infrastructure, including those relating to the supply of power plants that did not involve consultation with various suppliers. The processes associated with some of these acquisitions have not experienced the involvement of EDTL, although these have been financed from the budget of this entity.

For example, as a result of our conversations with the management of EDTL, we found that the contracts described below relate to purchases of goods with similar specifications. The first contract was associated with a process of consultation with various vendors, whose proposals were evaluated, resulting in savings of \$166,585. The second contract, however, was associated with a process that did not involve consultation with various suppliers, resulting in a substantially higher price.

	PO No	Amount according to the estimate of the CPV	Actual amount of the contract	Supplier	Description
1	10004861	954.500 USD	787.915 USD	Magirus Motoren Parts	Transformer, LBS and connector for the distribution system
2	10004815	950.000 USD	950.000 USD	Scogna Unipesoal Lda	Transformer, LBS for the distribution system

Recommendations

- EDTL must have a procurement process that is independent of the Ministry of Infrastructure.
- While procurement processes directed to a single vendor can provide a high quality solution, allowing access to known suppliers and promote local businesses, other processes that involve consultation with various vendors, as specified by applicable law, may lead to less expensive solutions.

4.2.4. Goods ordered and approved but not paid

In some cases, payments to suppliers were not made on receipt of invoice and delivery of goods. In the case of a supplier, for example, payment was processed with almost a year late, since the payment request (“CPV”) was not timely authorized by the Secretariat of Electricity, Water and Urbanization, hence the necessary funds cannot be released. A corresponding bill has a date of June 2009, with final authorization of the CPV occurred only in May 2010. Suppliers with loans in arrears have less incentive to pursue the provision of additional goods and services to EDTL, which will have a negative impact on the procurement process of EDTL (fewer suppliers with intent to supply the EDTL).

Recommendation

- EDTL must have a procurement process that is independent of the Ministry for Infrastructure, which, however, must conform in all material respects, to the decree law related to procurement.

- Tentatively, because of the critical importance of electricity supply in Timor-Leste, so that purchase orders are approved by EDTL, the corresponding process of acquisition should be immediately operated in the Ministry of Infrastructure. If the Ministry of Infrastructure cannot approve such purchase orders, they should promptly notify the EDTL management and the supplier of the reasons for such impossibility.

4.2.5. Investigation of irregularities in procurement and payments

A team of EDTL and the Ministry of Infrastructure conducted an investigation which focused on irregularities in connection with the contract RDTL-90219: supply and installation of air compressors, valued at \$ 290,000. The situations identified in the report of investigation include:

- The Management of EDTL prepared a purchase requisition that included financial and technical specifications and a list of companies able to provide air compressors. This request was approved by the appropriate signatures within the EDTL;
- The purchase requisition was later changed to verify the substitution of technical specifications, so that they coincided with the technical specifications of a brochure from a local supplier;
- The research team was unable to obtain the corresponding documentation of consultation with suppliers;
- The goods received were incomplete and important items were missing. However, the corresponding report on the inspection on receipt of the goods was signed;
- The inspection of the property in question was made at the supplier and not on receipt in the warehouse of the Government;
- The supplier has received the full amount that was contracted, despite the verified lack of items in receipt of goods.
- The investigation report stated that there was a considerable level of intimidation and coercion to obtain some documents.

Recommendation

The appropriate authorities of Timor-Leste must decide whether that investigation warrants further investigation.

All documentation relating to each purchase process should be retained and stored securely, is available for inspection by any duly authorized person.

4.2.6. Referendum Package (Pakote Referendum)

Previous projects in 2009 covered by the budget of EDTL, which the Secretariat of Electricity, Water and Urban is committed without the involvement of EDTL. Such projects were not approved by the Minister of Finance because they did not meet the criteria of the referendum package. The referendum package approved by Cabinet and Parliament did not include those purchases by EDTL.

However, these projects have been associated with the Secretariat of Electricity, Water and Urban Referendum Package budget, and subsequently paid by circumventing the normal procurement. We were told that payments were processed in that they were supported by documentation that has been properly authorized, which stated the payments were covered by the referendum package.

Once the Treasury has identified the situation, the payments were reclassified to the EDTL budget.

View a list of these projects in Annex K.

Recommendation

The Secretariat of Electricity, Water and Urbanization must ensure that all payments are linked to budget lines. When such situations occur, it must ensure that an investigation is conducted and that appropriate actions are taken if there is a specific intent to circumvent the procurement process.

4.2.7 Suppliers of high value transactions

The Terms of Reference of this work include:

- The examination of transactions for large amounts, as disclosed in the statement of receipts and payments for the period of 21 months ended September 30, 2010
- Review of business registration and ownership structure of suppliers of high value transactions

Annex L contains a list with details of the ownership structure of the main suppliers.

4.3. Receipts

4.3.1. Revenue collection and bad debts

EDTL has a billing system that operates only for customers in Dili. Only limited attempts have been made for cost recovery in the districts and sub-districts, since there is no operating billing system to customers in these places and there is no EDTL delegation or office where you can pay electricity bills (even when customers intend to pay).

In Dili, where there is an operating billing system, the majority of domestic customers have prepayment meters. In Dili the discipline of customers has improved and a "more normal" culture is emerging from "those who use should pay." Customers with a conventional meter (payment to be made after use) still pose a problem, since many customers do not pay their bills. Only about 40% of commercial and government customers located in Dili pay their bills.

Three of the largest customers of EDTL have outstanding bills from 2009 and 2010. The total of these balances for settling varies between \$ 3,403 and \$ 45,616, with the oldest invoice has a length of 328 days. Additionally, customers with balances due for more than 90 days remain actively connected with the EDTL electrical equipment, despite the existing policy of deactivating the connections of customers with balances due. The Management of EDTL said that the electricity supply was not interrupted for such clients as the program that allows them to make the interruption is not yet operating. This limits their collection activities to sending notes to settle overdue bills by mail. These activities so far have proved ineffective.

It is important that there are adequate budget allocations to enable the continuation of the EDTL program of installing usage meters throughout the country. Is it possible to address this situation if there is appropriate support and resources from the government.

Recommendation

The Management of EDTL should give priority to the implementation of the program that allows them to interrupt the supply of electricity. A program of interruption of electricity supply to customers with unpaid bills, applied consistently, will encourage the adoption of a culture of "those who use should pay."

4.3.2. Reconciliations of cash receipts

There are no regular reconciliations of the amounts received by EDTL and deposited in the EDTL accounts managed by the Ministry of Finance. The main payment method used by customers of EDTL consists of cash payment at the counters of EDTL. This results, therefore, the existence of a significant level of cash balances at the counters of EDTL, particularly in Caicoli, which is the main centre for processing receipts. The money is deposited in the bank by EDTL. There are no reconciliations between the cash received and the bank deposits.

Additionally, the absence of such monitoring procedures and reconciliation results in a high risk of misappropriation of money, especially in other branches of EDTL (such as Becora and Comoro), where there is less supervision of the receiving process by senior staff.

Recommendation

Staff of the EDTL financial department should carry out weekly cash reconciliations. The process should involve all of the cash balances held in branches of EDTL, the amounts in bank accounts and any amounts in transit, such as amounts not yet shown in cash or bank statements sent to processing or not yet registered. The reconciliations should be subject to a review by the top financial management in order to ensure that errors are identified and that the cash balances are regularly monitored.

4.3.3. Segregation of duties in respect of charges

The counter official responsible for receiving the cash payments by customers who have an account with EDTL under the conventional method of billing is also responsible for updating clients' accounts in the billing system (CS4U). The lack of segregation of duties in the level of receipts and updating of customer accounts presents a risk of undetected misappropriation of money, especially since procedures for collecting customer accounts in arrears are generally ineffective.

Recommendation

The functions that involve the handling of receipts and updating of customer accounts should be performed by different officials. Additionally, to improve the segregation, the Commercial Directorate should regularly monitor the account balances of clients, thus ensuring that the balances are correct and that the collections process is properly started.

4.4. Salaries

4.4.1. People on the payroll without any official function

In the course of our review, we became aware of a situation in which the contractor has managed to identify an employee without any official function who was included in the payroll of EDTL.

Recommendation

EDTL must ensure that all employees have a description of their duties, which is put in practice. Should continue to conduct regular reviews of employees who are on the EDTL payroll in order to identify, authenticate and reconcile any additions and

deletions that have been made by the Government.

4.4.2. Payslips not issued to employees

The PNTL (sic) officers are not receiving the pay stubs at the time their wages are paid. Thus, they are not able to confirm whether the amounts received are correct.

Recommendation

A process should be implemented that allows employees to receive their monthly pay stubs detailing the salary and any additional allowances and deductions made.

4.4.3. Verification of time sheets

EDTL has no method of verifying the time worked by employees, as recorded on their time sheets. Fingerprint machines were acquired but have not yet been installed, to check time actually worked by employees. This is particularly important in situations where employees claim overtime work.

Recommendation

EDTL should install as soon as possible, the fingerprint machines.

4.5. Fixed assets

The custody and recording of fixed assets are particularly important for the activities of EDTL, inasmuch as its performance depends heavily on the effective operation of fixed assets.

4.5.1. Absence of a formal policy/ manual for fixed assets

There are documented policies and procedures relating to registration and management of fixed assets. As a result, there is a risk of such errors and inconsistencies in the recording and management of fixed assets.

Recommendation

A handbook of fixed assets should be prepared with clear guidelines on the registration process and management of fixed assets

4.5.2. Incomplete registration of fixed assets

The recent decentralization of asset management requires each ministry or agency to be responsible to register, inventory and manage its fixed assets. The EDTL fixed assets register on December 31, 2009, is not sufficiently detailed. For example, it does not include the date of acquisition of the property, as well as its location and its cost. The fixed assets register does not have enough information for proper registration of the goods and to prevent misappropriation of the same.

Recommendation

EDTL must include all essential information about its goods in the fixed assets registry, namely:

1. description of the property,
2. acquisition date,
3. category,
4. type of asset,
5. cost of the asset,
6. location of the property

4.5.3. Purchases of fixed assets not reconciled with Freebalance

Purchases of fixed assets recorded in Freebalance has not been reconciled with the additions of property in the fixed assets register. As a result, there is the risk that the investments made by EDTL may not be included either in Freebalance or in the fixed assets register, either on both records.

Recommendation

Purchases of fixed assets recorded in Freebalance should be reconciled monthly with the additions of assets recorded in the fixed assets register, and any errors / omissions corrected. A supervisor must sign and date the reconciliation as evidence of their review.

4.5.4. Physical counts of fixed assets

The EDTL staff did not perform physical counts of existing fixed assets. Physical counts should be performed periodically to identify any fixed assets missing or in excess, since the goods may be lost, may change in location, be sold or be misappropriated and still remain in the EDTL and government asset registry.

Recommendation

A periodic physical count of all fixed assets should be made so that unrecorded missing goods, surplus goods or disposals /

write-offs of fixed assets can be identified. Each item must be fully reconciled with the fixed assets register. The fixed assets register should be updated to reflect the fixed assets held and if there are discrepancies, they should be investigated.

4.5.5. Review of records of fixed assets

The register of fixed assets is prepared and updated by the head of logistics. However, there is no evidence that it is reviewed by an independent official with management rank. The lack of review of records of fixed assets can lead to errors in recording the assets are not identified and addressed in due time, hindering thus the accuracy of the register.

Recommendation

The fixed assets register should be regularly reviewed by an independent official with management rank, who must sign and date a copy of the record as evidence of their review.

4.6. Financial Reporting

4.6.1. Absence of a reporting structure

The contract with the management contractor (Manitoba) provides that the *Utilities Board* should establish a reporting structure by which the Manitoba should consistently report its activities in EDTL on a regular basis. Since the *Utilities Board* was never created, there is no formal reporting structure for the operations of EDTL.

Recommendation

The reporting structure for EDTL should be defined with the shortest possible time.

4.6.2. Access to Freebalance

The organization contracted to manage EDTL not have access to Freebalance, being forced to request downloads of Freebalance from the Treasury (Finance Ministry), in order to be aware of their bank balances, wages, etc. ... This affects their ability to report accurately on a monthly basis.

It is hoped that this situation is resolved with the completion of the Freebalance update project.

5 Challenges and opportunities for planning

During preparation of this report, we identified several issues related to planning and strategy, which in many ways, are currently being investigated. Most of these initiatives reflects the wealth of natural resources in Timor-Leste and provide opportunities not available in many other countries. These opportunities should be investigated more thoroughly in order to maximize the potential use of low cost electricity generation. Some of these challenges and opportunities are as follows:

5.1. Strategic Plan

EDTL needs to establish its strategic direction to achieve its objectives and be able to meet the Government's expectations. In this sense, a strategic plan must be drafted and implemented within EDTL. The development of an effective plan will involve consultation with Management, governments, customers and other stakeholders. Undertaking these consultations makes it more likely that the plan will be comprehensive, viable, sustainable and well understood.

The definition of the plan and its communication should consider:

- A time horizon of the plan at least five years, preferably ten years
- The results of consultations with above stakeholders
- Forecasts of growth in electricity load and sales
- Operational targets and service delivery that are clear and measurable
- The incorporation of infrastructure maintenance and development initiatives, including opportunities highlighted below
- Potential opportunities for procurement and privatization
- An abstract, preferably in a single page, that is accessible and readily understandable by all staff
- Methods for managing customer expectations and communicating the plan to the public
- Frequent review processes, such as annual reports on the status of accomplishments, and refining
- Integration of alternative energies, the options include the issues described in Annex M

5.2. Policy of rural electrification

The electrification of rural areas is critical if economic development is to occur outside the major urban areas. This is an area where the Government can be visionary, to use some of the opportunities identified below and to commit to a process that will reap great benefits in terms of long-term national development. It will contribute significantly towards enabling the achievement of the Millennium Development Goals.

The development of this policy should be collaborative and it should involve all the ministers and the public. The electrification of rural areas is likely to be supported by the wider community and should thus be seen as a low risk strategy. The only downside is a permanent commitment in order to have adequate funding.

Currently, there are 55,000 households connected to electricity supplies across the country, serving approximately 40% of the population. The ultimate goal will be to reach every home in the country, either through the expansion of the conventional system of electricity, perhaps through the use of renewable energy. This is an ambitious plan that will require considerable resources, consisting, however, a long-term goal.

Such policy objectives must be supported by a comprehensive feasibility study, to determine priorities, methodologies, costs and resources required for their achievement. It should be borne in mind that the cost of this project will be substantial, but their benefits will be significant.

5.3. Long-term outlook for gas

A feasibility study should be carried out to assess the long-term prospects of attracting gas processing facilities to Timor-Leste.

There are various social benefits (e.g. employment) and techniques (e.g., existence of natural gas) resulting from a gas processing plant in the country. From the standpoint of electrical supply, the availability of natural gas for electricity generation has the potential to provide much cheaper and cleaner fuel than liquid fuels. In environmental terms, for the same amount of electricity produced, the greenhouse effect of natural gas is considerably less than that resulting from liquid fuels.

The gas processing companies do not necessarily value domestic customers near their factories. If your product is liquefied natural gas (LNG), the size of its sales contracts, compared with the existing reserves in its gas fields, determine their attitude towards the domestic sales of piped gas. However, the proposed study should emphasize the benefits to such undertakings as a result of domestic sales, which represent the very long term, stable customer base. It should include the benefits of domestic employment within the economy of Timor-Leste.

Once completed, the study could be used by government as a tool to persuade the gas companies to locate their facilities in Timor-Leste.

5.4. Privatization

In some countries, the electricity industry is privatized. The perceived advantage of privatization is the fact that private companies be more effective and efficient than public enterprises, and can therefore provide electricity at a lower cost. However, private sector organizations also aim at making profit, which by nature has associated risk. Within acceptable business principles, the objectives related to the profit will reflect the associated risk.

In many countries with significant shares of the privatized electricity sector, the electricity price for consumers has increased significantly. Consequently, the balance between increased efficiency and effectiveness and the rising cost to the consumer must be carefully considered by the Government to take into account when deciding options for privatization.

One way to get some of the advantages of privatization is the outsourcing of part of the sector, as the functions of generation or distribution, while retaining the services of connection to customers, including revenue collection and management. Partial privatization may be an option for Timor-Leste if and when considering contracting with an independent electricity producer. The Government should obtain independent financial advice if and when it considers options for privatization.

5.5. Demand management

“Demand” in electricity supply means the load placed on the supply system by all users connected to the system. This varies according to daily, weekly and annual cycles. It also varies between districts, towns and rural centres.

Demand management involves placing constraints on consumers in order to persuade them to conserve energy, avoid waste and to understand the relationship between the amount of electricity they consume and the corresponding cost. Such constraints typically include:

- The cost of electricity used. This is by far the most important constraint on electricity consumption. Most suppliers of electricity structure tariffs in order to persuade their customers to restrict their consumption of electricity.
- The ability of the system to provide electricity. In Timor-Leste, this form of demand management has been implemented by means of interruptions to supply, when power plants are unable to meet the loads placed on them. In some countries, the electricity supply is cut off if we observe an exaggerated consumption by individual consumers.
- No-cost incentives, such as public awareness campaigns by the Government with a view to saving electricity for the benefit of society as a whole.

Demand management is important in that it is the mechanism that controls the growth of demand placed on the electricity system. It may also influence the rate at which capital and other resources must be consumed to meet increases in demand and play an important role in helping to constrain investment.

The establishment of a tariff structure that is understood by customers is an essential part of the orderly development of the electricity supply system.

5.5.1. Demand management in Timor-Leste

Electricity consumption in Timor-Leste is growing at a rapid pace. However, while there is still a widespread evasion of tariffs, EDTL will remain powerless to manage demand. The electricity billing system and demand management are the most powerful tools available to EDTL. Any other form of demand management will not succeed if such a tool is not properly implemented.

The main result of the tariff system would be to reverse the current culture of disrespect for payment services. After eroding this culture, EDTL will have the opportunity to increase tariffs to reflect economic realities. In the immediate future, the responsibility for changing the outlook of the population should be within the sphere of government. The message must be conveyed from the highest level of government hierarchy, be filtered by various ministries and agencies, coming through the media, to the public. There is now increasing evidence that this is happening.

The current tariff structure is discussed in Section 3.6.1.

6 Millennium Development Goals

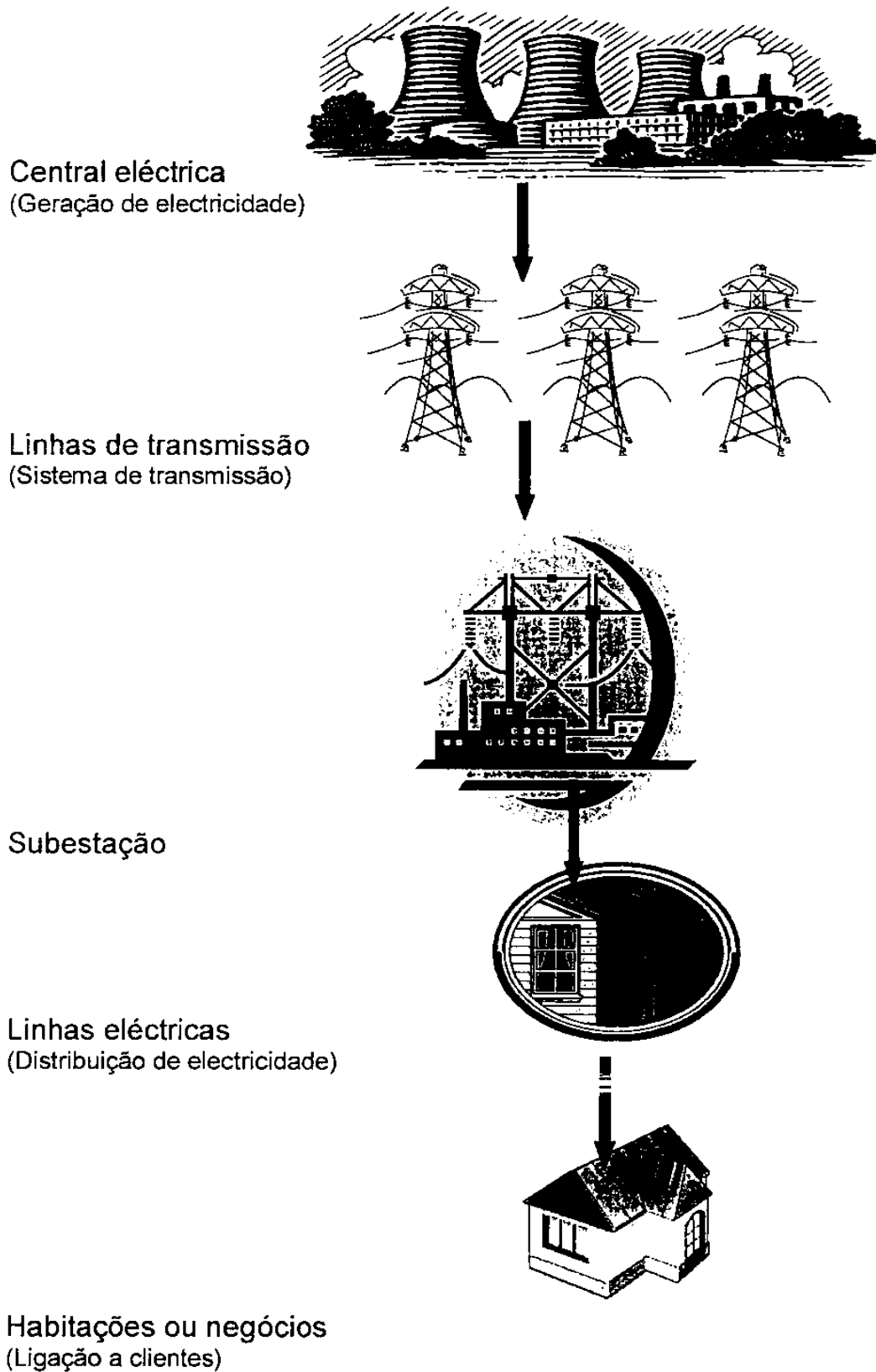
The Government has set targets under the Millennium Development Goals (MDGs) process. While such objectives are not addressed directly to the electricity sector, that sector should be seen as an important enabler across all areas of national development.

The achievement of most MDGs will be boosted if the electricity supply system is improved. In particular, the provision of education and health will be more easy if a reliable supply of electricity is available for those working in these sectors, in addition to the beneficial effects for the general population.

The programs of poverty reduction will also be improved if it adopted a policy of rural electrification, as previously recommended in this report. It is also possible to increase food production if the electricity is available to communities involved in this production.

In short, it is clear that providing a reliable source of electricity to communities in Timor-Leste is a key enabler of economic and social development. The recommendations of this report should be used as an aid to developing an action plan that allows this to be achieved.

Annex A: Illustrative picture of the Electricity Sector



Annex B: Management of Subcontracting Opportunities-Building Contract

See recommendation 3.1.2

1. Heads and Supervisors

- The necessary staff should have knowledge of the sector, skills in people management and language skills in order to relate closely with the EDTL manpower.
- Subject to further investigation, 10 people may be needed for the areas of generation, distribution and trade.

2. Engineering Team

- The necessary staff should have knowledge of the electricity sector in terms of engineering, documentation, development and research. Preferably, such personnel shall have knowledge of languages in order to relate closely with the manpower of EDTL.
- Subject to further investigation, 2 to 4 people should be sufficient to cope with work at the level of generation, distribution and measurement of consumption, as well as for small civil works.

3. Procurement Team

- The staff required must have experience in procurement, preferably in the electricity sector. Should also have good language skills to be able to communicate in Timor-Leste at all levels.
- Subject to further investigation, 2 to 4 people should be sufficient. Its main task will be the monitoring of procurement processes.

4. Key Performance Indicators (KPI)

- The range of KPI should be simplified and limited in number.
- The 5 most critical KPI's set specifically in the contract could be:
 - o Cost / kWh sent
 - o Percentage of losses in distribution system
 - o Percentage revenue / billing
 - o Rate of time lost due to malfunction
 - o Capacity of power plant
- Payments based on contracted performance should be based on these indicators.
- The compilation of statistics should be made independently and released quickly.
- KPIs should be followed on a monthly basis.

Annex C: Approved Budget of EDTL for the Years Ended December 31, 2009, 2010 and 2011

Category / Item	2009 Budget	2010 Budget	2011 Budget
Salaries	854	863	1,000
Salaries	832	841	910
Overtime	22	22	90
Goods and Services	2,985	2,081	45,489
Local travel	41	41	50
Training and workshops	50	50	60
Consumables	70	70	50
Fuel for vehicles	82	82	99
Car Maintenance	140	64	108
Car rent and insurance	18	0	0
Office supplies	58	58	26
Operational material	120	111	10
Fuel for generators	0	0	44,314
Maintenance of buildings and equipment	2,196	1,536	708
Operating Expenses	149	0	3
Professional Services	12	0	0
Translation services	24	0	0
Other miscellaneous services	25	69	60
Capital Investments	1,651	991	471
Safety equipment	0	0	2
Computer equipment	0	35	19
Communication equipment	5	0	0
Water equipment	18	0	0
Office Equipment	25	38	0
Other equipment	1,500	840	450
Furniture and accessories	30	0	0
Purchase of vehicles	73	78	0
Capital and Development Investment	5,509	36,300	1,200
Investment in equipment	5,509	36,300	1,200
Total Expense	10,999	40,235	48,159

The above amounts for the 2011 budget were obtained from the state budget for 2011 published at the time of our review does not include any adjustments made in the fourth quarter of 2010 or in 2011.

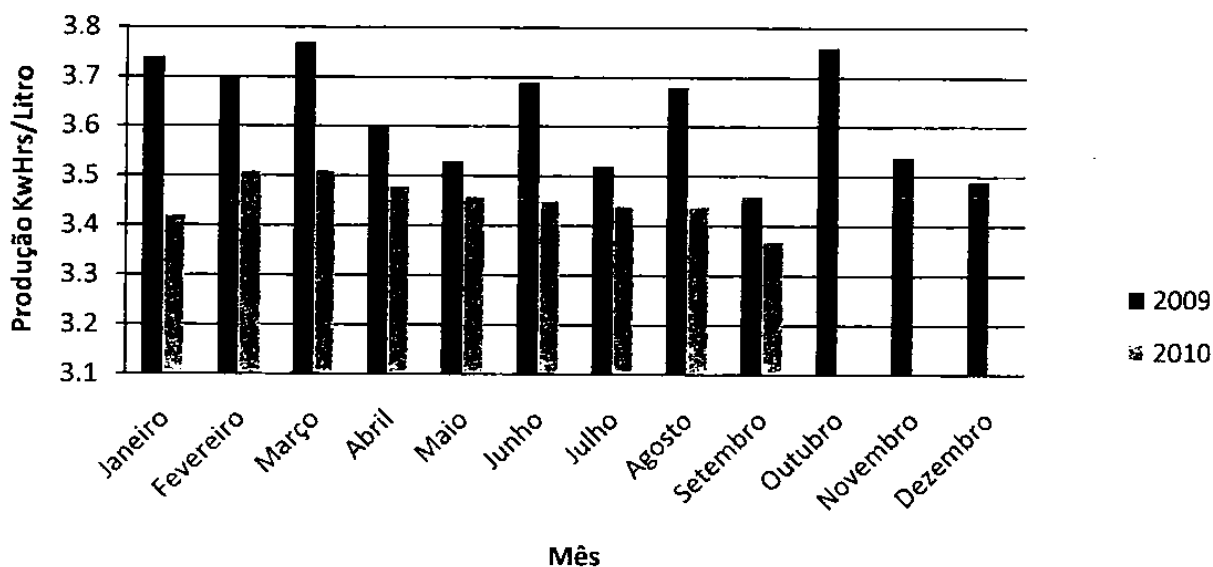
Annex D: Actual Budget and Expenses

Category/Item	2009 Budget	Actual 2009 Budget	2010 Budget	Actual expenses as of 30 September 2010
Salaries	854	766	863	725
Salaries	832	711	841	663
Overtime	22	55	22	62
Goods and Services	2,985	2,725	2,081	740
District advances				25
Local travel	41	44	41	16
Training and workshops	50	59	50	46
Consumables	70	52	70	34
Fuel for vehicles	82	82	82	41
Car Maintenance	140	99	64	61
Car Rent, insurance and service	18	0	0	0
Office supplies	58	61	58	2
Operating Expenses	120	62	111	11
Fuel for generators	0		0	0
Maintenance of buildings and equipment	2,196	2,147	1,536	407
Operating Expenses	149	5	0	14
Professional Services	1	8	0	0
Translation services	2	0	0	0
Other miscellaneous services	25	61	69	83
Capital Investment	1,651	1,450	991	181
Safety equipment	0	0	0	0
Computer equipment	0	0	35	8
Communication Equipment	5	5	0	0
Water equipment	18	0	0	25
Office Equipment	25	19	38	83
Other equipment	1,500	1,373	840	0
Furniture and accessories	30	1	0	65
Purchase of vehicles	73	42	78	0
Capital and Development Investment	5,509	4,818	36,300	142
investment in equipment	5,509	4,818	36,300	142
Total Expense	10,999	9,759	40,235	1,788
Fuel (budgeted separately)	40,986	30,829	30,942	25,241

The above amounts were obtained from the results published in the 3rd quarter.

Annex E: Fuel Efficiency

The table below shows the monthly output per litre of fuel (efficiency) for the period covered by the review.



The table below shows the fuel consumption for the period covered by the review.

Note that this includes fuel used in electricity generation and supply of motor vehicles.

Month	2009	2010
January	2,921,663	3,103,352
February	2,754,937	2,971,723
March	3,038,339	3,444,826
April	3,164,419	3,397,185
May	3,326,314	3,560,466
June	2,915,733	3,382,387
July	3,043,651	3,290,140
August	2,878,303	3,331,632
September	2,918,000 (?)	3,281,415
October	3,011,426	-
November	3,235,531	-
December	3,211,581	-

Note: The period covered by the review extends from January 1, 2009 to 30 September 2010, there is, therefore, no comparison for the period October to December 2010.

The table above is based on information obtained from the monthly reports of EDTL.

Annex F: Actual Production vs. Losses

2009:

Month	Production (kWh)	Consumption (kWh)	Loss (kWh)
January	10,914,532	5,557,599	5,356,933
February	10,212,503	4,829,210	5,383,293
March	11,455,706	4,737,360	6,718,346
April	11,406,419	5,095,450	6,311,430
May	11,734,457	5,535,193	6,199,264
June	10,759,345	5,400,457	5,358,888
July	10,711,308	5,556,617	5,154,691
August	10,581,262	5,740,381	4,840,881
September	9,869,969	5,563,247	4,306,722
October	11,342,357	6,164,465	5,177,892
November	11,481,448	6,775,339	4,706,109
December	11,231,010	6,638,920	4,592,090

2010:

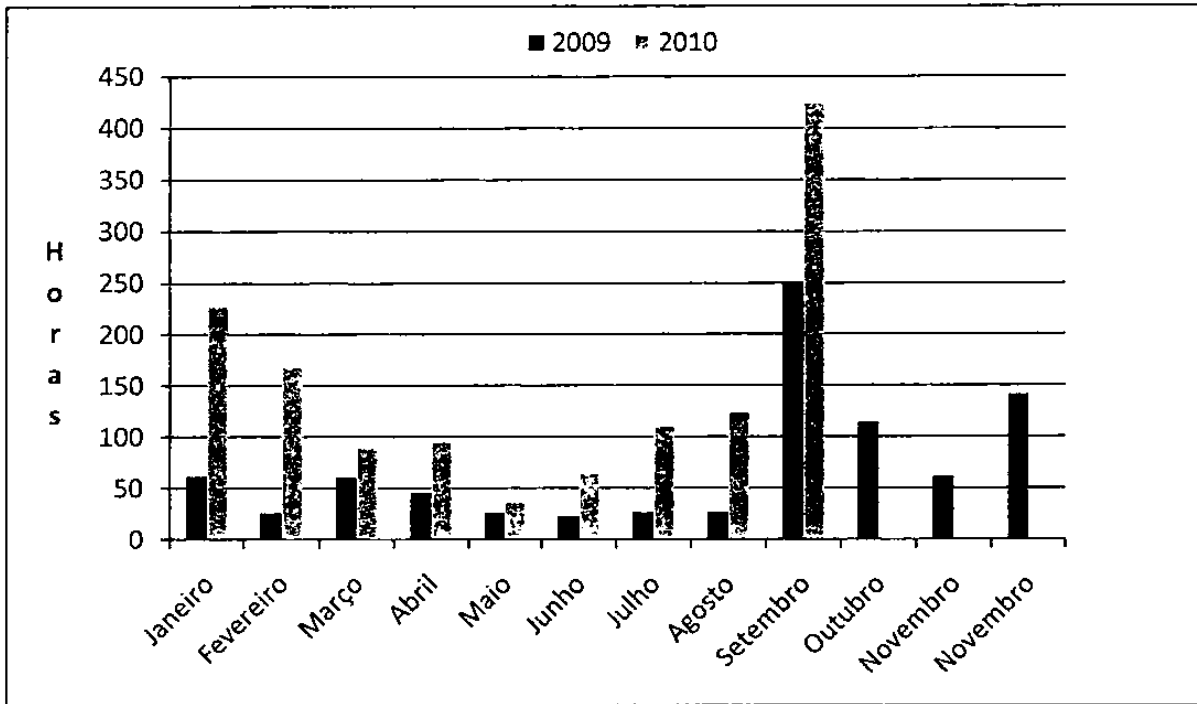
Month	Production (kWh)	Consumption (kWh)	Loss (kWh)
January	10,635,971	6,401,734	4,234,237
February	10,438,244	6,199,068	4,239,176
March	12,124,195	6,964,610	5,159,586
April	11,847,226	7,304,275	4,542,951
May	12,320,977	6,834,488	5,486,489
June	11,677,214	7,003,076	4,376,995
July	11,344,446	6,646,782	4,697,665
August	11,477,303	5,999,107	5,478,196
September	10,999,019	6,548,668	4,450,351

Note: The period covered by the review extends from January 1, 2009 to 30 September 2010, and therefore does not include data for the period October to December 2010.

Loss: Includes usage not metered and not charged, in addition to technical losses in transmission and distribution

The table above is based on information obtained from the monthly reports of EDTL.

Annex G: Hours of Power Requirement



Note: The period covered by the review extends from January 1, 2009 to 30 September 2010, and therefore does not include data for the period October to December 2010.

The table above is based on information obtained from the monthly reports of EDTL.

Annex H: Preventive Maintenance and Related Outages

When considering the recommendations of Manitoba relating to matters of maintenance, it should be borne in mind that a well planned maintenance is always cheaper than relying on maintenance-related failures. More importantly, planned maintenance will result in more reliability.

Reliance on maintenance-related failures leads invariably to catastrophic failures, such as the failure of a diesel engine crankshaft problem, fires and short circuits in equipment and alternators and collapse of the distribution and transmission poles.

In contrast, the most catastrophic failures can be avoided by implementing a planned maintenance routine. This does not imply unreasonably high costs, since most routine maintenance procedures are less expensive than waiting for the breakdown of machinery and their subsequent repair.

Routine maintenance requires adequately trained resources (staff and subcontractors) to be available on time and that these resources have immediate access to tools and parts that enable them to perform maintenance.

Particular critical is regular maintenance of diesel engines at specified time intervals (usually hours of operation), according to the recommendations of the suppliers.

Another example of key routine maintenance is to trim trees around transmission lines and distribution. Failure to perform this kind of maintenance will invariably result in interruptions in electricity supply, as well as costs associated with the removal of trees from lines and repair damage.

Annex I: Register of Directors and Shareholders - Puri Akraya Engineering Limited

Directors:

Date	Name	Address
12-Aug-10	Tan, Eng Ho	Jl. Terogong Baru B2, RT/RW 011/007, Gandaria Selatan, Cilandak, Jakarta Selatan, Indonesia.
12- Aug -10	Subrata, Dany	Jl. Dr. Semeru I No. 32, R.T./R.W. 013/007 Grogol, Grogol Petamburan, Jakarta Barat, Indonesia.
24- Aug -10	Puri, Raul	Jl. Alexandri I Blk J2/17 Permata Hijau, Kel. Grogol Utara, Kec. Kebayoran Lama, Jakarta Selatan, Indonesia
24- Aug -10	Laroya, Chander Vinod	Kav. W-9 Simprug, RT. 005, RW.008, Sub District., Grogol Selatan, Distrit Kebayoran Lama, South Jakarta, Province DKI Jakarya, Indonesia.

Shareholders:

Date of issuance of shares	Name of company shares which were issued	Address	Number of shares	Total value of shares issued	Secretary of the society
29-Jul-10	Full Blossom Limited	Suite 1306, 13/F, ING Tower, 308 Des Voeux Road Central, Hong Kong	1	1 USD	Amicorp Hong Kong Limited
23-Aug-10	Pearl Energy Worldwide Ltd	P.O. Box 3444, Road Town, Tortola, British Virgin Islands	1	1 USD	Amicorp Hong Kong Limited
18-Nov-10	PT. Puri Energi Kencana	Gd. Plaza Bapindo Citibank Tower Lt.25, Jl. Jend. Sudirman Kav. 54-55, Kel. Senayan, Kec. Kebayoran Baru, Jakarta Selatan	779	779 USD	Amicorp Hong Kong Limited
18-Nov-10	Akraya International, PT	Menara Kadin Indonesia LT, 19Unit C JL, Hr Rasuna Said, Blok X-5 Kav. 2-3, Kuningan Timur, Setiabudi, Jakarta Selatan	779	779 USD	Amicorp Hong Kong Limited
3-Dec-10	PT. Puri Energi Kencana	Gd. Plaza Bapindo Citibank Tower Lt.25, Jl. Jend. Sudirman Kav 54-55, Kel. Senayan, Kec. Kebayoran Baru, Jakarta Selatan	999	779.220 USD	Amicorp Hong Kong Limited
3-Dec-10	Akraya International, PT	Menara Kadin Indonesia LT, 19Unit C JL, Hr Rasuna Said, Blok X-5Kav. 2-3, Kuningan Timur, Setiabudi, Jakarta Selatan	999	779.220 USD	Amicorp Hong Kong Limited
3-Dec-10	Dooks Group Holdings Limited	Marcy Building, 2nd Floor, Purcell Estate, P.O. Box 2416, Road Town, Tortola, British Virgin Islands	8.000	6.240.000 USD	Amicorp Hong Kong Limited
			11.558	7.800.000 USD	

Annex J: List of subcontractors

Contract RDTL-812931, China Nuclear Industry 22nd Construction Co. Ltd.

Name of subcontractor
Sichuan Electric Power Design Institute
Central Southern China Hubei Electric Power Engineering Consultation & Supervising Co. Ltd
Xi'an Marine Equipment Engineering Research Academy
Xi'an Tianhong Electric Appliance Co. Ltd.
Ningbo Huyong Electric Power Material Co. Ltd.

Contract RDTL - 10004115: Puri Akraya Engineering Limited

Name of subcontractor
Wartsila Finland Oy
P. T. Wartsila Indonesia
P. T. Wijaya Karya insan Pertiwi
P. T. Rekayasa Industri
P. T. ABB Sakti Indonesia
P. T. Samapta Nusantara
IOT Infrastructure & Energy Services Limited

Annex K: Suppliers Related to Referendum Package

Supplier Name	Contract Number	Amount of Contract
Dili Machineries Unipessoal Lda	96311	1.124.228,35
X Ray Co. Ltd	96312	98.288,86
Adula Construction	96313	1.362.845,89
Lumarsol Lda	96314	725.031,02
L Three Unipessoal	96315	47.920,37
Mahawen Unipessoal	96316	304.969,85
Mahawen Unipessoal	96317	36.741,00
Aquadus 1	96318	348.000,01
Dili Machineries	96319	127.742,68
Dili Telha Co. Ltd	96320	54.782,69
Fodiak Supply Lda	96321	1.440.199,32
Fodiak Supply Lda	96322	310.728,00
Malere Unipessoal	96323	103.973,98
Dili Machineries Unipessoal Lda	96324	507.236,18
Fantija Unipessoal	96325	715.991,64
Power Engineering	96326	186.000,00
Hadomi Timor Unipessoal	96327	1.071.377,68
Alecrim Lda	96328	1.474.939,77
T L Tech Lda	96329	510.000,00
Alvorado Limitada	96330	4.669.223,68
Cornei Supply	96331	1.462.797,30
Divita Co. Unipessoal Lda	96332	1.381.014,98

Annex L: Details of Shareholders of Principal Suppliers

Fuel suppliers:

Company	Shareholders	Pct. of shares
Esperança Timor Oan, LDA	Nilton Teimo Gusmao dos Santos	70%
	Sidalia Rosa M. Sousa Vidigal	30%
Sunshine Petroleum Group Unipessoal Lda	Joao Martins	100%

Other suppliers (distribution lines and equity investments):

Company	Shareholders	Pct. of shares
Lian Forte Unipessoal LDA	Higinio Antonio Trindade	100%
Scogna Supply Unipessoal Lda	Francisco Borja da C. Soares	100%
Paul Electric Lda	Eland a Sujona	49%
	Samuel Belo	51%
Esperança Timor Oan, IDA	Nilton Teimo Gusmao dos Santos	70%
	Sidalia Rosa M. Sousa Vidigal	30%
Waida Unipessoal Lda	Jose Sebastiao da Silva	100%
SM Bark Technology Lda	Amelia Antonia da Costa	90%
	Bendita de Jesus Santos	5%
	Felix dos Santos	5%
Dili Machineries Unipessoal Lda	Eduardo Johannes Arjanto Widjaja	100%
Terra Santa Lda	Nheu Su Nham	50%
	Tome Yap	50%
Alecrim Lda	Faustino Henrique Xavier	100%
Fodiak Supply Lda	Estevios Soares Guterress	51%
	Moises Amaral Magno	49%
Carya Timor Leste Lda	Vemancio Madeira Tchong	51%
	Ho Foe Goan	49%
Alvorada Unipessoal Lda	Josefa Henriques da Silva	100%
Comei Supply Unipessoal Lda	Rogério Manec Marcal Viegas	100%
Magirus Motoren Parts Unipessoal Lda	Chandrawan	100%
Sunshine Petroleum Group Unipessoal Lda	Joao Martins	100%
Perwira Negara Electric Unipessoal	Maria da Costa Noronha	100%
Esquire Unipessoal Lda	Jose Maria Guterres	100%
Divita Co. Unipessoal Lda	Fernando da Silva	100%

The above details were obtained from the Ministry of Justice (MOJ) and Ministry of Trade and Industry (MCI). It is intended to be a comprehensive list of major suppliers, however, includes those identified within our sample testing.

Annex M: Potential Alternative Options for Electricity

1. Ira Lalaro hydroelectric project

This project has been under construction for many years, making it the largest hydroelectric project in the country. The natural lake is located east of Los Palos. The lake is at a high level and one river (which is a potential source of energy) flows from the lake to the ocean. It was estimated that the project could produce 27 MW, which constitutes a large proportion of the national electricity demand today. With the construction of the national transmission system, currently underway, the Ira Lalaro project will soon be at a convenient distance from a transmission line that can carry electricity across the country.

This project has the potential to provide electricity at low cost, but only after a significant investment. There are also uncertainties about the potential impact of climate change over the long term.

2. Micro-hydro Projects

There are several potential micro-hydro locations in Timor-Leste. These represent an opportunity for low-cost electricity to supply the electrical system of some district capitals.

The newly built Garuai project south of Baucau is a typical example of these perspectives. It has a capacity of 342 kW and is connected to the 20 kV Baucau distribution system. Its capacity is approximately one fifth of the current peak demand of Baucau. The project was initiated in late 2008. However, it was damaged by a landslide shortly after and has not yet resumed work.

Projects of this nature are usually entitled "run of the river" schemes where there is no large dam, but rather a diversion structure that carries the water pipeline located right above the power station. The fall of water is used to turn a turbine in the existing power plant. The turbine, in turn, drives a generator. The water then returns to the river course. The best locations are on rivers fed by sources with constant flows throughout the year.

Micro-hydro projects are environmentally friendly and have demonstrated that they are sustainable and beneficial to the communities they serve. Assuming that are designed and built according to high engineering standards, they usually require reduced levels of maintenance, have low operating costs associated with a long life.

International experience in this technology area has been positive, there are adequate resources in many countries to carry out the design and construction of such schemes.

One of the main dangers associated with such schemes is the lack of adequate information on water resources, which can lead to conservative engineering assumptions. In other developing countries, knowledge of local communities has helped to fill the gaps in scientific knowledge available.

3. Gas well projects

These projects use from gas wells of small areas where natural gas (methane) seeps out of the ground through fissures. The gas is collected through a technique which consists of a simple "tent" of plastic placed over the area of seepage. The gas is collected and fed as a fuel to gas engines or dual fuel engines available in a small conventional power plant. The bi-fuel engines operate by burning a gas mixture with a small amount of diesel.

A pilot project of gas wells is underway south of Viqueque. However, this project has not been successful because of the amount of gas available is lower than it had originally been expected. Other sites may prove more successful.

4. Isolated solar projects

Isolated solar photovoltaic systems installed in homes can provide electricity in remote areas that are unlikely to be linked to distribution systems in the foreseeable future. Such projects may result in electrification of rural areas more quickly than waiting for the construction of alternative technologies. Operating power plants in remote areas usually involves the installation of expensive distribution lines, maintaining a steadily increasing number of very small power plants and take into account logistical issues related to the supply of fuel. Solar energy installations can be installed and maintained by small local teams with limited training.

Facilities of this nature could provide lighting, radio and TV in limited areas where currently there is no electrical service.

Considerations related to isolated photovoltaic solar projects include:

1. Objective	Provide electrical supply limited to isolated homes in remote areas.
2. Service Level	Each facility should be able to supply one or two fluorescent lights and a radio or a small television. All devices must operate at 12 volts direct current. Maximum daily consumption approximately 250 watt-hours.
3. Technical description	<ul style="list-style-type: none"> • A solar photovoltaic¹ 12-volt, 80 watts nominal power of, mounted the roof of the house. • A battery of 12 volt deep cycle (lead acid type, similar to a battery of a car), with a minimum capacity of 50 amp-hours. • Accessories, including wireless connection, governor of electric charge and outlets for charging devices.
4. Installation and maintenance	Installation should be simple and could be carried out by local staff working in teams of two or three individuals in a given geographic area. Such individuals would need only limited training. The same team could carry out maintenance, including replacement of battery after approximately 5-8 years.
5. Cost	About \$1,000 USD / house
6. Help / finance	It is possible to obtain bilateral aid for the purpose of providing materials and training.

5. Wind systems on a village scale

Electricity generated from wind power has not generally been successful in tropical areas, due to the absence of regular winds. There may be some potential use of wind in communities located near the mountaintop.

While some wind systems may be less expensive in places where many houses are supplied through a turbine, this configuration requires mini distribution systems, forcing families to share the system to ensure an equitable distribution of limited power available. Compared with photovoltaics, wind turbines require more maintenance and their potential is probably limited in Timor-Leste.

¹This type of cell converts sunlight directly into electricity with a panel of solid-state silicon chips.

Annex N: Example of Monitoring the Status of Recommendations

Review of EDTL: Goals and Deadlines - Monitoring of Recommendations

	Recommendation	Action to be taken	Completion date	Status	Comments
1	Must be urgently established an interim EDTL Directorate	1. Get legal advice 2. Develop proposal 3. Submit to COM	Oct Dec Mar-11	G	Meeting with APA advisors and legal - 8 / 7. Request for legal advice 23 / 7.
2	The Government should carry out the restructuring of EDTL, so that it becomes a more independent entity, owned by the Government				
3	EDTL of future budgets should be set at appropriate levels so as to enable the sector to perform in line with what was requested by the Government				
4					
5					
6					

Status- **G** On Track **Y** = Issues (no escalation required) **R** = Issues (escalation required)

Annex O: Summary of Terms of Reference

Scope

We were asked to:

- Obtain an understanding of the issues that contribute to the interruption of electricity supply, including examination of relevant documents, in particular contracts with major suppliers
- Generally examine the key internal controls and accounting procedures
- Examine high value transactions, as disclosed in the statement of receipts and payments for the 21-month period ended September 30, 2010
- Proceed to review the commercial register and the shareholding structure of a sample of suppliers of goods
- Prepare a report on situations detected and recommendations

Report

We will prepare a report for each institution, in the agreed format, containing an executive summary which is defined as follows:

- a) Objectives of work
- b) Significant situations detected
- c) Suggested recommendations for improvement related to the significant situations found

Procedures performed under this project do not constitute an audit, review or any other limited service assurance in accordance with rules issued by the IAASB.

Our work is for the exclusive use of the Ministry of Finance and should only be used by V.Exas. and only for agreed purposes. We do not accept any liability to any person or entity that obtains a copy of our work / reports without our written consent. We reserve the right to include a statement in our report to limit its use, indicating the purposes for which it may properly be considered as an indication of possible limitations on the scope of services and defining the respective responsibilities of Deloitte and the Ministry of Finance.

Annex P: The answers of the Secretary of State

The Secretary of State did not respond in Portuguese, therefore, we did not translate his answer

We have attached responses below, other than those previously incorporated into the report, from the Secretary of State of Electricity, Water and Urbanisation to matters in the report.

Section 3.4.5

The Contractor during the 5 years period of Operation & Maintenance of the two Power Plants will provide training to about 150 local technical staff & engineers, training will start abroad in the Generating Sets Supplier factory in September 2011.

As far as Operation and Maintenance of Transmission Line and Substations is concerned EDTL and the Consultant ELC & Bonifica are presently selecting 300 staff , local Workers & Technicians & Graduated Engineers to be trained for erection of towers , stringing of conductors and operation of the substations.

Section 3.4.6

The connection from the new Dili Substation to the Existing 20KV Distribution System is already in advanced stage of definition.

Meetings between EDTL, Manitoba and ELC & Bonifica are held regularly every fortnight.

The location of the substation, originally placed in the centre of the town close to Comoro Power Plant , has been shifted in the present area to avoid interference with the fast growing and expansion of the town.

The connection of the new substation with the existing 20KV feeders in Comoro is not difficult at all, obstacles of right of way and of private land do exist, but not impossible to solve.

The Circuit Breakers in the new Dili Substation are 10 and not 6 as stated , therefore there is space for future expansion.

Section 3.4.7

<ELC & Bonifica have stated that Comoro Power Station will not be interconnected with the new National Transmission System.> Actually ELC& Bonifica has recommended the Interconnection.

<However EDTL and the Managing Contractor are proceeding with the construction of new generating capacity at Comoro(4x5 MW medium speed diesel engines) and intend that Comoro will be connected to the National transmission System>. Actually EDTL stated that the interconnection is not required.

Interconnection of Comoro Power Station to the 150KV National Transmission System is not foreseen for the time being, but it can be done in the near future by installing two circuit breakers and two circuit feeders from Comoro to Dili.

The 24 MW expansion of Comoro Power Plant, now under implementation, is intended to be a stand- by reserve for Dili.

Decision, eventually, to shift some of the new generators sets to Oecussi may be taken by the Government.

Section 4.2.1.1

To be noted that the original contract signed in October 2008 with CNI22 and amended in February 2009 was based on a Power Grid designed at 110 KV (China Standard) and on two Power Plants : Manatuto 120 MW and Same 60 MW.

For the procurement of fuel CNI22 was responsible only to select the source, but payment would have been made by the Government.

The Amendment (No.2) signed in December 2009 was the result of the re-design and re-configuration of the entire Project done by the then appointed Consultant ELC Electroconsult & Bonifica S.p.A Joint Venture.

In the new design the power grid was changed from 110 KV (single circuit) to 150 KV (partially single circuit and partially double circuit) for two reason : first to have a transmission line capable to support higher power for longer distances , secondly to have the system equal to the Indonesian one for future interconnection.

The length of the transmission line was increased from 630 KM to 715 KM in order to cover all the Districts.

20KV distribution lines for a total length of 120 KM were added to the system.

As per the Owner requirements : Same Power Plant was relocated in a better place in Betano with the capacity increased from 60 MW to 130 MW and all the second hand engines for both power plants to be replaced with brand new ones. CNI22 to submit the corresponding proposal for these new engines.

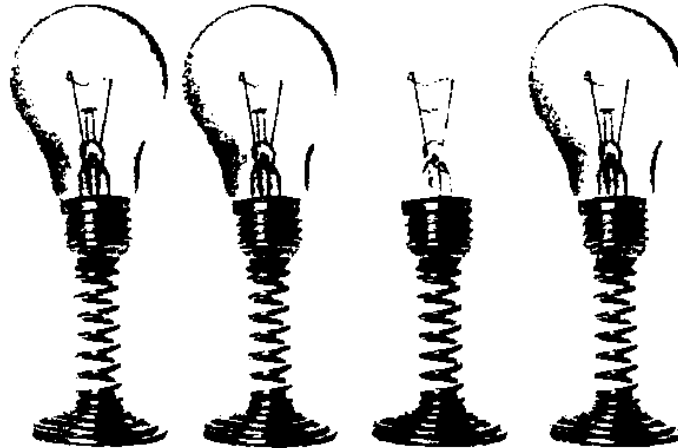
Section 4.2.1.2

Puri Akraya Engineering Limited is the Main Contractor for the EPC two Power Plant Project and is providing Bank Guarantee and Performance Bond.

Puri Akraya Engineering Limited was established, on purpose for easily handling this project, by merging of two companies : Puri Energi and Akraya International.

These two companies have good experience in Indonesia on Power Plants construction.

It is common practise for the Main Contractor (retaining its full responsibility) to implement the project by using different suppliers and subcontractors.



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