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Utilities Regulatory Authority of Vanuatu

Utilities Regulatory Authority

Electricity Tariff Review

Final Decision

May 2010

1 Preface

The Utilities Regulatory Authority (the URA) is Vanuatu's economic regulator of electricity and water services throughout Vanuatu. The Government of Vanuatu established the Utilities Regulatory Authority on 11 February 2008 under the *Utilities Regulatory Authority Act No. 11 of 2007* (the Act).

The URA is responsible for the regulation of certain services in the electricity and water sectors. Our role differs in each regulated industry but generally involves regulating prices, service standards, market conduct and consumer protection. We also investigate and advise the Government on regulatory matters that affect Vanuatu's regulated utilities.

The Act states that our primary objective is to regulate these utilities to ensure the provision of safe, reliable and affordable regulated services and maximise access to regulated services throughout Vanuatu.

The Vanuatu Government has awarded concession contracts for the provision of water and electricity services to a private operator. These contracts delegate the exclusive responsibility for the provision of water and electricity services in Port Vila, and electricity services in Luganville, Tanna Island and Malekula to UNELCO (a subsidiary of the GDF SUEZ Group). The contracts specify rules regarding service coverage, the quality of service to be provided, and the maximum tariffs that may be charged for these services. As the counterparty to each of these contracts, the Government has been responsible for monitoring UNELCO's compliance with the contractual provisions.

Furthermore, the power supply concession in Luganville commenced on 23 January 1990 and is due to expire on 31 December, 2010. In accordance with the concession contract the Government has advised UNELCO of its intention to re-tender the concession agreement. The tender process commenced in March 2010.

The Government's concern about the high cost of electricity has led to the URA undertaking a full review of the level and structure of tariffs for all concession areas. Under Section 2 paragraph 27 of the Luganville concession agreement and under Section 7.5 of the Port Vila concession agreement, and at the request of the Government, the electricity tariff will be reviewed as more than five years have lapsed since the previous review.

This tariff review provides guidance to the Government on the level and structure of consumer tariffs for the four UNELCO concession areas. It also provides guidance on issues relating to the re-tender of the Luganville concession.

Johnson Naviti

Chairperson

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Executive Summary

1.1 Overview and Introduction

The Utilities Regulatory Authority (the URA) has made its Final Decision on the prices and service levels applying to the four electricity concession areas managed and operated by UNELCO for the period 2010 – 2014. This overview summarises the key outcomes, issues and future regulatory policy implications that have emerged from this, the first major independent review of electricity tariffs for the monopoly utility.

The key theme and objective of this review has been to substantially increase the accountability of UNELCO for maintaining and improving the delivery of reliable electricity services to Vanuatu customers.

This review has provided an opportunity for Vanuatu customers to consider their service related requirements and the prices that they are willing to pay for those services. It has also provided an opportunity for the URA and stakeholders to review the current regulatory approach and identify areas that could be improved based on the experience to date.

The URA has undertaken extensive consultation with stakeholders and information gathering and analysis in reaching this final decision. Consultation began in April 2009 and has taken the form of consultation papers, workshops, public information sessions in Port Vila and Luganville and submissions from UNELCO and other stakeholders.

The URA released its Electricity Tariff Review Application Report and Position Paper in March 2010 that provided stakeholders with the opportunity to comment on the URA's views before it made its final decision. Advice has also been obtained from technical consultants.

This paper sets out the URA's final decision regarding the electricity tariffs applying to the concession areas of Port Vila, Luganville, Malekula, and Tanna Island over the period 2010 to 2014.

In accordance with the requirements set out under the concession agreements between the Government and UNELCO the new tariff level, structure and formula will take effect upon signing of an addendum to the existing concession contracts.

1.2 Key outcomes of the review

The tariff established for the four concession areas provides UNELCO with 15.2 billion vatu in revenue for the period of 2010 – 2014.

This represents 1.3 billion vatu as return on the regulated asset base including on new investments as indicated in UNELCO's investment plan submitted to the URA; and 13.9 billion vatu that covers all costs including fuel, other costs, provisions, maintenance, staff and depreciation (including depreciation on new capital investments in UNELCO's investment plan)

The URA considers that this level of revenue is appropriate to account for the demands of network reinforcement, new customer connections, asset replacement and safety and environmental obligations.

The URA's Final Decision will result in an average price reduction of 6.80 percent. The price reduction is different for each type of customer. This new price level is based on the methodology set out in the Electricity Tariff Review Tariff Application Report March 2010, and calculated using forecasts of operating and capital expenditures, the cost of capital and the calculation of benefits derived from the wind farm generation.

The new tariff structure includes a significant reduction in tariffs for "Small Domestic Customers", who are customers that use less than 120kWh per month. The level of the reduction will vary according to electricity usage; for example, a household using 50kWh per month will have a 49 percent lower bill. In its final tariff decision, the URA advocates a redistribution of cost savings towards the lowest-income consumers.

The new formula will pass through the benefits of the wind farm directly to the price of electricity.

Table 1.2.1 compares the recommended tariff to the current tariff for a sample set of consumers.

Table 1.2.1 – Tariff comparison

Customer Group & monthly usage	Current bill	New bill	% difference
Small Domestic Customer 50 kWh	1,550	792	-48.89%
Small Domestic Customer 100 kWh	3,719	3,205	-13.81%
5A 30 kWh pre-pay card (Tanna & Malekula only)	930	866	-6.80%
10A 30 kWh pre-pay card (Tanna & Malekula only)	1,500	1,398	-6.80%
Other Domestic Customer 2.2kVA 180 kWh	10,727	10,659	-0.63%
Other Domestic Customer 4.4kVA 300 kWh	18,574	17,936	-3.44%
Commercial Customer 4.4kVA 800 kWh	39,188	36,523	-6.80%
Commercial Customer 8.8kVA 1500 kWh	74,027	68,994	-6.80%
High Voltage Customer 80kVA 18,000 kWh	729,775	680,155	-6.80%
High Voltage Customer 120kVA 30,000 kWh	1,199,630	1,118,064	-6.80%

The Base Price (P) is set according to a formula that is calculated each month. The new base price P is applied using the new Tariff Structure in Table 1.2.2 to calculate individual bills.

Table 1.2.2 – URA recommended new Tariff Structure

Customer group	Price per kWh	Monthly fixed charge	Security deposit
Small Domestic Customers	Up to 60 kWh = 0.34 x P 61 to 120 kWh = 1.21 x P Over 120 kWh = 3 x P	None	70 x P
Other Low Voltage Customers	1.21 x P	5 x P per subscribed kVA	150 x P per subscribed kVA
Business Licence Holders – Low Voltage	0.87 x P	20 x P per subscribed kVA	150 x P per subscribed kVA
Sports Fields	1.00 x P	None	None
Public Lighting	0.54 x P	None	None
High Voltage Users	0.70 x P	25 x P per subscribed kVA	150 x P per subscribed kVA

1.3 Issues arising from the review

Whilst the assessment of UNELCO's service performance across reliability and service standards demonstrates that UNELCO is delivering a level of service that is reasonable to its customers, the role of economic regulation in guiding further improvements has never been more important.

A utility that displays monopoly characteristics will often give rise to tensions between the utility seeing to maximise returns to shareholders and the expectations and objectives of customers. The task of economic regulation is therefore to design incentives that align the commercial interests of the utility with the interests of society at large, namely securing a reliable supply at an optimal price and quality.

A challenge for the URA as Vanuatu's economic regulator has been to overcome a number of not insubstantial hurdles when implementing effective regulatory controls. The most notable of these relates to information asymmetry that exists between the regulator and the utility. The combination of reliance on the information provided by the utility and a focus on shareholder value means the utility have a clear incentive to "talk up" the future operating cost and investment requirements of the networks and "talk down" their future sales potential in order to secure a more generous tariff.

The regulatory approach and methodology introduced by the URA in this first tariff review was designed to provide UNELCO with an incentive to reveal their efficient costs over the course of the first regulatory period.

In the time since the introduction of the Utilities Regulatory Authority Act and the implementation of the URA as the economic regulator for Vanuatu's electricity and water services, UNELCO's compliance with both regulatory and contractual requirements has improved significantly.

Notwithstanding this picture of improved performance, there remain some areas where the level of service has not kept pace with the demands of customers in a growing economy, particularly in the regional areas of the concession and rural areas. As explained below, an important focus of this review has been to establish arrangements that will address these areas of concern.

This section outlines the URA's planned activities to continue to review and investigate specific areas of concern.

1.4 URA Planned Activities

1.4.1 Luganville re-tender

The Luganville concession contract expires at the end of 2010. This has implications for the tariff, including:

- The clauses defining the Sarakata savings will expire, and so the tariff no longer needs to include the contributions to the Sarakata Fund
- There is the possibility of a second operator, which means a revenue-balancing mechanism must be introduced to maintain uniform tariffs between concession areas.

A separate report will be issued by the URA to address these points.

1.4.2 Updates to the tariff review methodology

In several instances the methodology used in the price review has been restricted by the available information. The URA, in consultation with stakeholders, aims to update and improve the methodology allowing future tariff reviews to be simpler and more transparent.

1.4.3 Cyclone reserves

Given the prevalence of cyclones in Vanuatu and the potential for significant disruption to electricity delivery, the URA intends to review the level of UNELCO's current reserves, the management of these funds and UNELCO's disaster planning.

A separate report will be issued by the URA to address this point.

1.4.4 Reasonable costs

The URA's role is to test that costs and investments made by the utility are done at a reasonable cost level. To give UNECLO more guidance in this area the URA, in consultation with stakeholders will work to define efficiency and prudency criteria and processes with which to test costs and investments against.

A separate report will be issued by the URA to address this point.

1.4.5 Cost of new connections

The URA is concerned as to the high cost of new connections and the slow take up of electricity in some places even when it is available. The URA will examine these charges and investigate methods to enable widespread connections where possible. The URA has other options to encourage new connections beyond the tariff review and will be investigation these further.

1.4.6 Explaining electricity bills and tariff levels

The URA has noted some confusion with electricity consumers as to how the price of electricity changes and the differences between the various tariff levels. The URA will work with UNELCO to develop consumer friendly guidelines to help electricity users better understand their bill, why it varies month to month and what tariff best suits their needs.

1.4.7 Regulatory accounting and reporting

Regulatory needs are not always meet by traditional financial accounting .The concession agreement defines certain accounting procedures such as depreciation; these are used for valuing the concession for transfer or at the end of its life. The concession agreement does not require that they be used for a tariff review.

In this tariff review, the URA relied on the existing accounting standards of UNELCO as it was the best source of information available at the time of the review. For future reviews and in consultation with stakeholders the URA will develop more appropriate regulatory accounting standards. These standards will:

- ensure the correct allocation of revenue and costs between concessions, between regulated and non regulated business and between business segments;
- allow for valuation of the Regulated Asset Base and depreciation on an economic basis;
- clearly define Concessionaire and Government owned assets;
- better inform tariff determinations and benchmarking;
- report on related party transactions and transfer pricing;
- better measure the financial condition of UNELCO;
- further improve the level of transparency in the regulatory processes;
- ensure information is consistent and comparable across years, across concessions, and across utilities;
- ensure that information is easily verifiable;
- develop pro forma reports; and
- further support the objectives of the Utilities Regulatory Authority Act No. 11 of 2007.

These standards will make the tariff setting process simpler and more transparent. Also, standardised reporting will make it possible to efficiently track and report on the performance of utility companies.

1.4.8 Copra purchasing

Statements submitted by UNELCO reflect the fact that the business has entered into contracts with Socometra (a related entity) to provide a significant proportion of their copra oil supply.

As the weighted average price for diesel and copra fuel is passed through to electricity customers through the indexation formula, the supply of fuel by a related entity has the potential to create a situation where unfair gains are being retained within the total corporate group.

In establishing whether to take into account the price charged or the underlying costs, the URA must consider three fundamental questions:

- Is there a competitive market for the service?
- Is there an incentive for UNELCO to enter into the arrangements "at arm's length"?
- Was a competitive tender process conducted to establish the price for the services?

It is not the URA's intention to prevent or prohibit arrangements between UNELCO and third parties for the supply of services but rather to ensure that they do not result in customers paying more because of them.

Indeed, the URA recognizes that, in the normal course of providing regulated services, UNELCO may find it beneficial to enter into arrangements with third parties for the supply of certain services. However, the URA expects that such arrangements would only be entered into where the services could be provided more efficiently than if the UNELCO provided those services itself. It also expects that, in entering into any such arrangements, UNELCO would seek to secure the best possible price from the market.

The URA will conduct a separate review into the 'fair' price of copra to address this pont.

The URA is encouraged by UNELCO's response in their second submission:

"Regarding the purchase price of processed coconut oil, UNELCO further confirms that it will make every effort to ensure that the average price remains below or at the most equal to the substitution cost of imported diesel."

The URA will insert this condition to the addendum to the concession agreement.

1.4.9 Use of Sarakata funds

The **Sarakata Special Reserve Fund** was established on 3 March, 1995 in an addendum to the Luganville concession agreement with UNELCO. Under the addendum, UNELCO is responsible for the operations and maintenance of the Sarakata hydro plant (2 X 300 kW units) and tariffs are set for Luganville on the basis that all electricity is produced using diesel fuel. The savings in generation costs, after deductions for maintenance and management fees, and for contributions to a 'renewal fund', are credited to the **Sarakata Special Reserve Fund** to be used primarily to finance rural electrification, but may be also used for subsidizing tariffs. The third phase of the Sarakata Hydro Project (an additional 600 kW unit) was completed in May 2009 with funding from Japan.

The Japanese aid agency, JICA, financed the construction of the Sarakata hydroelectric power station, which is owned by the government of Vanuatu. Sarakata is on the island of Espiritu Santo, and the plant provides power to Luganville and the surrounding area. The power is distributed by UNELCO. The hydro-power is a substitute for power previously generated by the UNELCO's diesel generator at Luganville, and greatly reduces the variable costs of producing

power to supply Luganville. The Japanese government's objective in financing the hydro-project was to promote, among other things, rural electrification, with the savings in power production costs being available to pay for rural electrification schemes throughout Vanuatu.

By the "Addendum to the Contract of Concession for the Generation and Public Supply of Electric Power in Luganville" of 3 March 1995 it was agreed that UNELCO would be responsible for operating and maintaining the Sarakata plant.

It was also agreed that the cost-savings resulting from use of the hydroelectric generation station (compared to diesel generation) would be calculated by a detailed formula set out in the Addendum.

These cost savings are then applied first to a fund for the renewal of the hydroelectric generation station called the **Sarakata Renewal Fund**. Savings in excess of 10 million vatu per annum are then allocated to the **Sarakata Special Reserve Fund**.

The **Sarakata Special Reserve Fund** is transferred to the Government of Vanuatu (the Government), and may be used for the following purposes:

- To assist in extending the electrical networks
- To assist in individual connections
- To electrify public facilities
- To subsidize individual electricity bills
- To assist in rural electrification in Vanuatu.

The Addendum establishes a Technical Committee comprising: the Minister of Energy or his representative, a representative of the Energy Unit, a representative of UNELCO, a representative of the Ministry of Finance and Economic Management and one representative each of the SANMA Provincial Council and the Luganville Municipal Council.

This committee assesses the technical and financial viability of each proposal and makes recommendations on network extensions and individual connections. The Government is required to consider their recommendations, but is free to decide how the fund should be allocated among the various permitted purposes.

In its tariff application, UNELCO proposed that the full amount of the Sarakata savings be used to further reduce the level of tariff.

During this tariff review the URA has also concluded an assessment of the Sarakata hydroelectric scheme and undertaken an independent financial audit of the **Sarakata Special Reserve Fund**.[1]

The URA will further advise the Government on the management and operation of the Sarakata Fund.

Nonetheless, the URA is of the view that the existing Sarakata funds be used for lowering tariffs across all concessions over the next two years.

[1] Sarakata Hydroelectric Scheme – Luganville Santo Audit Report is currently being finalised and is scheduled to be released in June 2010.

1.4.10 Incentive to Promote Renewable Energy

UNELCO in their Additional Submission requested a performance based scheme to promote the use of renewable energy such as the wind farm.

The URA agrees with the intention of such a scheme but highlights the difficulty in defining the structure of the scheme and the benchmarks it should be based off.

In consultation with UNELCO it was agreed that the introduction of such a scheme was outside the scope of this tariff review and would require further review at a future date.

1.4.11 Excise on fuel for electricity

From January 1st 2010, the Government increased duty payable on fuel from 5 to 15 Vatu per litre.

In December 2009, the URA wrote to the Government expressing its concerns regarding the increase in excise tax on fuel used for the production and generation of electricity.

In its letter, the URA made the following submission:

"A review by the URA assesses the impact of an increase in fuel excise is likely to increase electricity tariffs by approximately seven percent.

The URA is of the view that the Government needs to be fully aware of the impact on electricity tariffs due to this change in excise.

As the tax is on fuel generally, the additional tax will negatively impact on electricity tariffs charged to consumers. It is important to note that any excise tax charged on fuel for electricity generation is paid by the electricity customer and not UNELCO.

Due to the nature of the electricity concessions currently in place within Vanuatu, it is important to note that any change (such as an increase in fuel excise) must be financially neutral, that is, it is not possible for the Government to levy more tax on UNELCO without it being passed through to the electricity customers.

The economic impact therefore is that the excise on fuel paid by UNELCO will come out of the pockets of electricity customers and not UNELCO.

The URA wishes to clarify this point for the Government, so that it is fully informed of its policy decision.

The role of the URA is to advise government and inform all stakeholders including the public on any matters relating to electricity and water services.

The URA is required under the Utilities Regulatory Authority Act No. 11 of 2007 to fully inform all customers of such an increase in electricity prices due to excise tax imposed by the Government. The public will need to be informed that UNELCO is required to pass through the additional excise on fuel that is being imposed by the Government and not by UNELCO.

In terms of the current tariff review being undertaken by the URA, the impact will be that the net price of electricity may not change in terms of the tariff currently charged. The review will have little impact on reducing electricity tariffs in Vanuatu.

The URA is currently working with all stakeholders to deliver a fair and reasonable level of electricity tariff for all of Vanuatu.

It is important to note that previous media communications by the Government of Vanuatu it expressed a strong desire to establish the URA to improve economic development and investment by delivering fair and reasonable electricity prices to consumers. An increase in excise tax on distillate fuel for electricity production will lead to negative publicity for the Government.

In terms of the net economic impact, the URA provides the following comments:

- *Electricity will become less affordable for small households and for small businesses, which will restrict overall economic development in terms of health, communication, productivity, and attractiveness for foreign investment.*

- *Access to electricity services will become less affordable and restrict the opportunity for improved access and rural electrification throughout Vanuatu.*

- *Providing a more favourable tariff outcome to encourage economic development and business investment in Luganville, Santo will be limited.*

The URA respectfully seeks that the Government fully consider its policy decision in light of the above comments and concerns."

The URA will continue to lobby the Government to reconsider its position on excise tax on fuel by granting an exemption on fuel duty for the purposes of electricity generation. Due to the nature of the concession contracts, any duty is automatically passed through to electricity bills, thus becoming an extra tax on electricity customers.

2 Introduction

2.1 Background

The *Utilities Regulatory Authority Act No. 11 of 2007* (the Act) establishes the Utilities Regulatory Authority (the URA) of Vanuatu. The URA is a body corporate with perpetual succession, acting independently from the Government. The URA's Commission consists of three Commissioners, a Chairperson and two part-time Commissioners of which one is the Chief Executive Officer of the Authority.

The Act empowers the URA to regulate certain utilities, in particular, the provision of electricity and water services in Vanuatu.

The URA's core functions with respect to existing water and electricity utilities include:

- Monitoring and enforcing existing concession contracts which include checking monthly price adjustments made by the utility, monitoring service standards and technical performance, reviewing yearly financial reports and auditing operating report processes;
- Renegotiating tariffs with the utility in accordance with the relevant concession contracts;
- Managing consumer complaints by assisting consumers resolve grievances and/or complaints with the utilities;
- Advising Government on utility-related matters as requested; and
- Communicating with the Government, utilities, customers and the general public in order to provide information about matters or updates relating to utilities.

The Vanuatu Government has awarded concession contracts for the provision of water and electricity services to a private operator. These contracts delegate the exclusive responsibility for the provision of water and electricity services in Port Vila, and electricity services in Luganville, Tanna Island and Malekula to UNELCO (a subsidiary of the GDF SUEZ Group). The contracts specify rules regarding service coverage, the quality of service to be provided, and the maximum tariffs that may be charged for these services. As the counterparty to each of these contracts, the Government has been responsible for monitoring UNELCO's compliance with the contractual provisions.

The Act empowers the URA to exercise the functions and powers of the Government relating to the existing concession contracts for electricity and water supply services, which remain unchanged. Policies regarding electricity and water supply continue to be set by the relevant Government ministries and departments.

More than the required five years has lapsed since the previous review and the Government has expressed concern about the high cost of electricity. This has led to the URA undertaking a full review of the level and structure of tariffs for all electricity concession areas.

Existing electricity concession contracts between the Government and UNELCO provide clear specifications as to when electricity tariff resets can occur. The contracts do not, however, make any provision for the methodology or process to be used for resetting tariffs. This tariff review process conducted by the URA provides guidance for: negotiating the level and structure of consumer tariffs for all current concession contracts; formulating the process for tariff-setting for the expiring (end 2010) concession in Luganville; and establishing the methodology for future utility tariff reviews in Vanuatu.

The URA has completed a full review of service standards, the cost of, and structure of tariffs for electricity services in Port Vila, Luganville, Tanna Island and Malekula. As part of this review

the URA will also provide the Government of Vanuatu with recommendations relevant to the tendering of the Luganville Concession Contract (Luganville Concession) and the improved administration of the Sarakata Special Reserve Fund.

Therefore, the URA has:

- Developed, in consultation with UNELCO, an approach and methodology for conducting tariff renegotiations now and in the future – to specify the principles, guidelines, process, and financial models needed for reviewing tariffs;
- Developed, in consultation with UNELCO, the information needed for an electricity tariff renegotiation, including accounting and technical definitions;
- Developed a view as to the reasonableness of service standards for electricity currently specified in the concession contracts, and the possible cost implications of any changes to the service standards, to inform its decision on whether to request changes in service standards in conjunction with any tariff renegotiation;
- Reviewed the current costs to develop an estimate of the efficient cost of electricity service in Vanuatu and the associated revenue requirement for the utility;
- Assessed the impact of alternative generation technologies such as wind, hydro and copra oil on costs, revenue requirements and periodic tariff adjustments (due to corresponding variability of diesel volumes and prices);
- Reviewed the structure of tariffs for all concessions and determined the impact on consumers from alternative tariff schedules; and
- Reviewed the tariff adjustment formulae for all concessions and recommended a method of indexation that ensures the viability of the operator, a fair price for consumers, and considers the impact of the re-tender of the Luganville concession.

2.2 Electricity tariff review regulatory framework

The URA is empowered under the Act to determine the maximum price which may be charged in relation to any aspect of a regulated service.

Further, section 20 of the Act sets out that the rights exercisable by the Government in the concession contracts described in Part B of Schedule 1 are assigned to the URA, but may only be exercised by the Authority upon receiving written approval of the relevant Minister.

On 25 March 2009 the URA wrote to the Minister for Lands Geology Mines and Water Resources and the Minister for Infrastructure and Public Utilities seeking approval to commence a review of electricity and water tariffs in Vanuatu.

On 17 June 2009, the Minister for Lands Geology Mines and Water Resources requested the URA to undertake a review of electricity tariffs in Vanuatu.

In accordance with sections 5 and 18 of the specification relating to the concession for the generation and supply of electric power in Luganville; sections 5 and 17 of the specification to the concession for the generation and supply of electric power in Port Vila; and article 31 and 32 of the Tanna and Malekula Island concession contract for the generation and public supply of electric power, the URA commenced as part of the tariff review a revision of the base price and of the adjustment formula concerning all concessions and has requested UNELCO's assistance in providing the URA with all relevant accounts and statistical statements.

2.3 Electricity tariff review process

In April 2009, the URA published its Electricity Tariff Review Framework Paper inviting interested stakeholders to comment on issues set out in the paper in relation to the process and methodology of the tariff review.

The URA conducted two public consultation workshops to seek further comment on its proposed tariff review approach and methodology. The public consultation workshops were held in Port Vila and Luganville.

In developing its approach and methodology, the URA set out the following process for undertaking the tariff review:

- **Establishing the methodology** for the tariff calculation. The URA established the method to be used to calculate the level of the tariff in consultation with UNELCO;
- **Tariff application** submitted by UNELCO. UNELCO has submitted an application for a level of tariff using the methodology. The application takes the form of a completed financial model and a list of all the assumptions used in the model. The URA has provided a summary of the tariff application in the Electricity Tariff Application Report March 2010.
- **URA's Electricity Tariff Review Position Paper**. The URA responded to the tariff application with its Electricity Tariff Review Position Paper March 2010, indicating the assumptions that the URA believed were appropriate for the setting of the tariff. The Electricity Tariff Review Position Paper March 2010 also set out the URA's recommended tariff formula.
- **Consultation**. The Electricity Tariff Application Report March 2010 and Electricity Tariff Review Position Paper March 2010 were made available to the public and all interested stakeholders. Consultation forums were held in Port Vila and Luganville, and information sessions were held in Port Vila to the public and all interested stakeholders. The URA invited submissions on the Electricity Tariff Review Position Paper March 2010 from the public, Government, UNELCO and other interested stakeholders.
- **URA's Final Decision & Tariff Recommendation (this document)**. Following consultation on the URA's Electricity Tariff Review Position Paper March 2010, the URA published its Final Decision. This tariff is to be included in a new addendum to the existing concession contracts between the Government and UNELCO. In the event that the final tariff is not agreed between the Government and UNELCO, the matter will be referred to arbitration, as specified within the concession agreements. Following agreement on the new tariff level, structure, and formula, the new tariff will take effect upon signing of an addendum to the concession contracts by the Government and UNELCO.

2.4 The URA's consultation process

The URA has engaged in an extensive process of consultation with UNELCO, Government, customers and other industry stakeholders in reaching this Final Decision. It has also sought expert advice on forecasting of demand, on the review of UNELCO's expenditure proposals and on a range of economic and legal issues more generally. In summary the process has involved:

- a Review by independent consultants of the cost of service, tariff and service standards of UNELCO beginning in March 2009;
- consultation on the framework and approach for the review, over an extended period beginning in April 2009;
- several consultation papers and workshops, including public forums were held in Port Vila and Luganville;
- numerous requests for further clarifying information to UNELCO and other interested stakeholders;
- the publication in April 2009 of a Framework Paper which set out the URA's preliminary approach and methodology for conducting the review and seeking submissions from stakeholders on a range of key issues in the Framework Paper;
- the publication in March 2010 of a Tariff Application Report which set out UNELCO's basis for its proposed electricity tariff and described UNELCO's assumptions including any supporting evidence for its application;
- the publication in March 2010 of a Position Paper which set out the URA' preliminary thinking on a range of key issues and assumptions for the review, seeking further submissions from stakeholders to the Position Paper;
- extensive consultation and negotiations with UNELCO on its Electricity Tariff Application and the URA's Position Paper;
- review of further submissions from UNELCO and other stakeholder to the Position Paper; and
- this Final Decision.

The URA has undertaken extensive consultation with stakeholders and information gathering and analysis in reaching this Final Decision.

Throughout the tariff review the URA faced considerable difficulties with obtaining information to enable a proper assessment to be made of the costs incurred in providing electricity services. In some instances the difficulties were confined to delays, whilst in others a well defined regulatory reporting of financial information was not provided.

The URA has approached this review, first by applying the existing legal framework as it best sees fit and, second, by articulating the principles it has applied and the facts it has considered as clearly as possible.

Although, there is considerable debate over how company specific cost data is used in regulation the ability for a regulator to have access to, and rely on, reliable, consistent and robust information on the provision of regulated services is critical to the effective implementation of all forms of regulation, including tariff setting.

2.5 Purpose of this paper

In this paper the URA sets out its Final Decision and reasons on the targeted levels for service reliability, quality of supply and customer service measures, demand forecasts, generation forecast, cost forecast, regulated asset base, and reasonable return that underpin the Final Decision on the revenue requirements for UNELCO.

This paper sets out the final tariff level and provides detail on how the new recommended tariff will affect customer bills.

Further, the URA has set out in this paper, recommendations for future policy considerations, regulatory reporting standards and requirements, and provides relevant tariff advice for electricity customers.

2.6 Structure of this paper

Section 3 gives an analysis of quality of service, and a decision regarding service standards.

Section 4 sets out the URA's recommended tariff and reasons for its decision in relation to the demand forecast, generation forecast, cost forecast, regulated asset base and reasonable return including efficiencies and impact of wind farm savings.

Section 5 describes the structure of tariffs across the different customer groups.

Section 6 describes the new tariff indexation formula to be applied by UNELCO in calculating the monthly electricity price.

Section 7 sets out the addendum to the concession contracts that contains provisions aligned with the final decision of this tariff review.

Appendix A: Summary of assumptions in URA's Final Decision

Appendix B: Stakeholder submission and correspondence from interested parties to the URA's Electricity Tariff Review Tariff Application Report March and Electricity Tariff Review Position Paper March 2010.

3 Service Standards

In this section, the URA sets out its Final Decision and reasons on the level of service reliability, quality of supply and customer service measures that underpin the Final Decision on the revenue requirements for UNELCO

UNELCO is held accountable for their performance through monitoring and compliance with concession contracts and publicly reporting on their performance against targeted levels as well as through incentive arrangements that the URA has set in place.

The URA has assessed the reliability of the service provided by UNELCO. Reliability of supply is a key measure of performance of an electricity operator. In its simplest terms, reliability of supply is defined as whether or not electricity is available when sought by a customer. Reliability measures typically focus on the extent of availability, or non-availability, of electricity to customers.

The purpose of this analysis was to understand if a change in reliability should be factored in to the new tariff level, as a change in reliability would require a change in the cost of providing the service. The URA also examined whether any changes to service standards would be required as part of this tariff review.

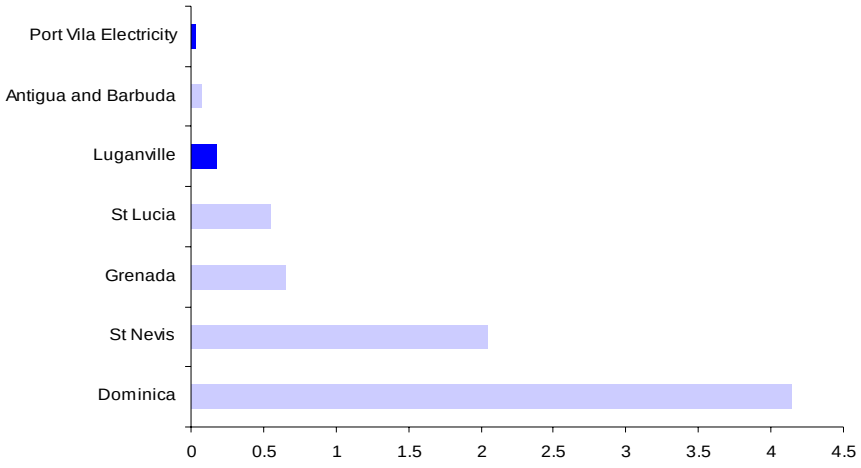
The URA has benchmarked UNELCO's reliability performance against three indicators:

1. System average interruption duration index (SAIDI) benchmarked in Figure 3.1.1
2. Peak load per kVA of transformer benchmarked in Figure 3.2.1 below; and
3. Number of customer complaints per thousand customers benchmarked in Figure 3.3.1.

3.1 System average interruption duration index (SAIDI)

The system average interruption duration index (SAIDI) is the total minutes, on average, that a customer could expect to be without electricity in a year due to supply interruptions. UNELCO's performance on this benchmark when compared to international data is very good. As shown in Figure 3.1.1, UNELCO manages to provide a service with very little interruptions in Port Vila and Luganville.[2]

Figure 3.1.1: System Average Interruption Duration Index (SAIDI) (Hours per customer per year)



[2] UNELCO has not provided data for Tanna and Malekula

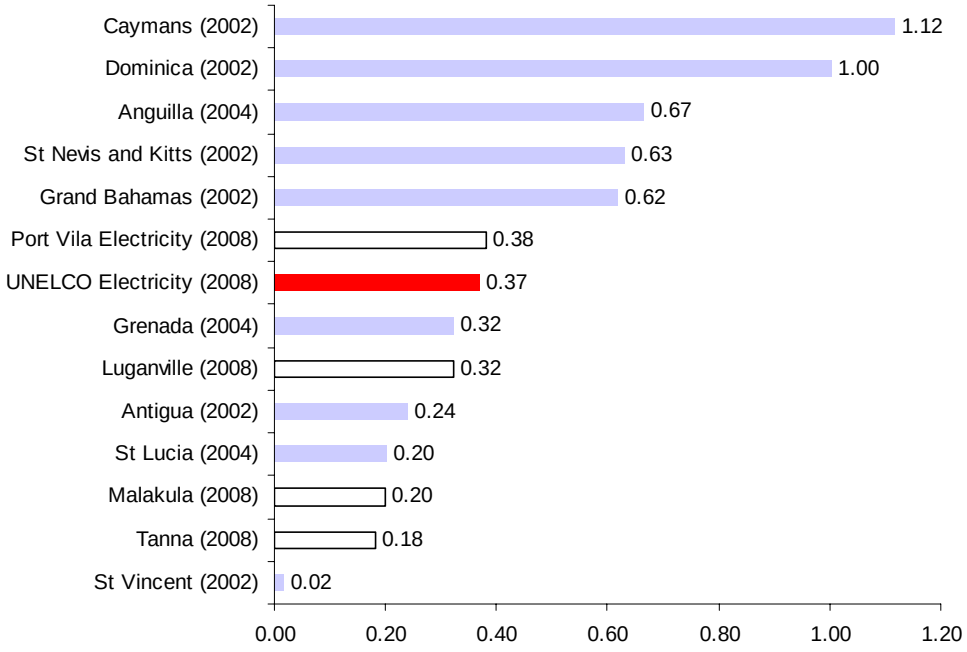
3.2 Peak load per kVA of transformer

The capacity of transformers on a utility's network relative to the load on its network affects the performance of the network and provides an indication of the amount of investment in the network that has been undertaken.

An indicator that describes this, peak load per kilovolt-ampere (kVA) of transformer capacity is shown in Figure 3.2.1.

A high ratio indicates that there is less capacity relative to load, which will result in poorer network performance. A low ratio can indicate over investment in the network. UNELCO's average performance across the four concession areas sits in the middle of the range when compared to other similar utilities which suggests that it has avoided over or under investment in the network.

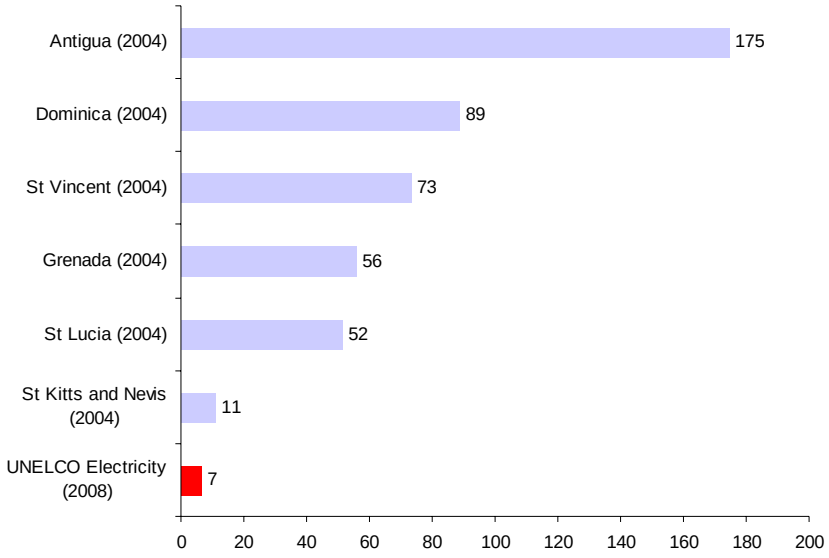
Figure 3.2.1: Peak load per kVA of Transformer (MW/kVA)



3.3 Number of complaints per thousand customers

Based on the data that was made available, UNELCO has demonstrated very low levels of complaints per thousand customers when compared to other utilities in island countries. It is not clear if the very low level of reported complaints is due to an exceptionally low number of complaints or difficulties with UNELCO's complaints recording and reporting system.

Figure 3.3.1: Number of Complaints per Thousand Customers



Source: UNELCO and audited financial reports (2004) of other utilities

One of the key features of the URA's decision on the tariff level to apply for 2010 – 2014 regulatory period is to ensure that customers receive the service that they pay for. This is to be achieved through identifying and measuring the level of service that is expected to be provided, and outlining clear reporting requirements, and by providing financial rewards and penalties for the service outcomes delivered.

Reporting on the service delivered plays an important role in service provision. It provides:

- Information to customers on UNELCO's performance against the level of service that customers should expect;
- A focus on the performance standards to be met; and
- Information to enable further service measures to be incorporated into an incentive arrangement over time.

This section provides the URA's decision on the service levels customers should receive and the reporting requirements in respect of those services.

3.4 Final Decision

3.4.1 Reliability Measures

The URA's assessment of UNELCO's performance across the three benchmarks demonstrates that UNELCO is delivering a level of service to its consumers that is reasonable when compared to comparable industry benchmarks.

While in this tariff review customers have emphasised the importance that they place on a reliable electricity supply, the URA has received little indication that customers value further improvements in average reliability levels.

UNELCO will continue to report against the following average reliability measures, by network type: annual duration of unplanned interruptions (unplanned SAIDI), annual frequency of unplanned interruptions (unplanned SAIFI), annual duration of planned interruptions (planned SAIDI), annual frequency of planned interruptions (planned SAIFI), and frequency of momentary interruptions (MAIFI).

The URA will issue Electricity Reliability Standards in relation to regulated services. The targeted levels for these reliability measures during the 2010 – 2014 regulatory periods will be provided in the standards. Targeted levels of reliability are required for reporting and monitoring purposes. They reflect the reliability that customers should expect to experience over the 2010 – 2014 regulatory period, based on historical performance and the prices paid.

Additionally the URA seeks to publish reports on UNELCO's performance. These reports should include measures of reliability, quality of supply and customer service.

4 Growth Forecasts

Energy consumption, peak energy demand and customer numbers are important inputs into the derivation of the new tariff level. Future expenditure requirements are driven partly by expected growth in peak demand and customer numbers while the translation of the revenue requirement into the tariff level relies on forecasts of energy consumption, customer numbers and contract demand.

UNELCO have an incentive to understate the prospects for future growth since out-turn growth above that forecast will result in higher revenue than anticipated in setting prices.

The URA has therefore undertaken an assessment of UNELCO's growth forecasts so as to ensure that prices reflect a best estimate of those necessary to deliver UNELO's revenue requirements.

This Chapter sets out the Final Decision on the growth forecasts that have been used to determine UNELCO's revenue requirements and tariff level, and the reason for that decision.

4.1 Demand Forecast

Forecasts of growth in customer numbers, energy consumption and peak demand are central to setting the tariff level as they determine the amount of energy required, and how the utility will earn revenue. They are also used in establishing estimates of load-related capital expenditure.

The Demand Forecast set out in the URA's Electricity Tariff Review Position Paper March 2010 was derived based on the Government of Vanuatu's overall GDP forecast for the next five years.

The URA has taken a top-down approach to estimating future electricity demand. This means that the demand is estimated at an overall level, rather than for individual groups of customers. Electricity demand in Vanuatu is affected by several factors, such as:

- Overall GDP growth
- Industry and service sector performance
- Tourism arrivals
- Urban population growth

Each of these factors were assessed by the URA and set out in this section.

The URA received no submissions providing any further evidence to suggest an alternative position.

However, in UNELCO's submission to the URA's Electricity Tariff Review Position Paper March 2010, UNELCO requested that safeguards be put in place to ensure that it is possible to review the tariff level should demand move at a significantly different rate than is forecast.

In its submission, UNELCO was concerned that the structure of demand may change with the possibility of a substantial increase in "Small Domestic Customer" numbers given the reduction in tariff for the "Small Domestic Customer" up to 120kWh consumption, the resumption of extension work of the grid in the poorer areas on the outskirts of town, the discussion of a GPOBA (Global Partnership on Output-Based Aid) grant to subsidise the service connections and the possible network extensions of concession assets in the rural areas.

UNELCO has expressed concern that the structure of demand may change with the possibility of an increase in the numbers of "Small Domestic Customers".

However, the URA considers the risk of very large connection growth in small domestic consumers to be low and the financial risk to UNELCO to be minor

In response to these concerns, the URA accepts that a revised addendum to the concession agreement should provide for either the Government or UNELCO to request a tariff review if a change in the economic conditions of the electricity industry, including demand, causes a significant variation in the costs to the concessionaire.

4.2 Final Decision

The URA assessed the overall GDP growth, industry and service sector performance, tourism arrivals and urban population growth.

The URA considers the overall electricity demand growth to be in line with overall real GDP growth forecasts for Vanuatu, as shown in Table 4.2.1.

Table 4.2.1 – URA forecast of electricity demand annual growth

2010	2011	2012	2013	2014
4.6%	4.0%	4.0%	4.0%	4.0%

The kilowatt-hour (kWh) and kilovolt ampere (kVA) demand forecasts are illustrated in table 4.2.2 and 4.2.3.

Table 4.2.2 – URA forecast of electricity demand in kWh

2010	2011	2012	2013	2014
59,538,318	61,919,851	64,396,645	66,972,510	69,651,411

Table 4.2.3 – URA forecast of electricity demand in kVA

2010	2011	2012	2013	2014
652,415	678,511	705,652	733,878	763,233

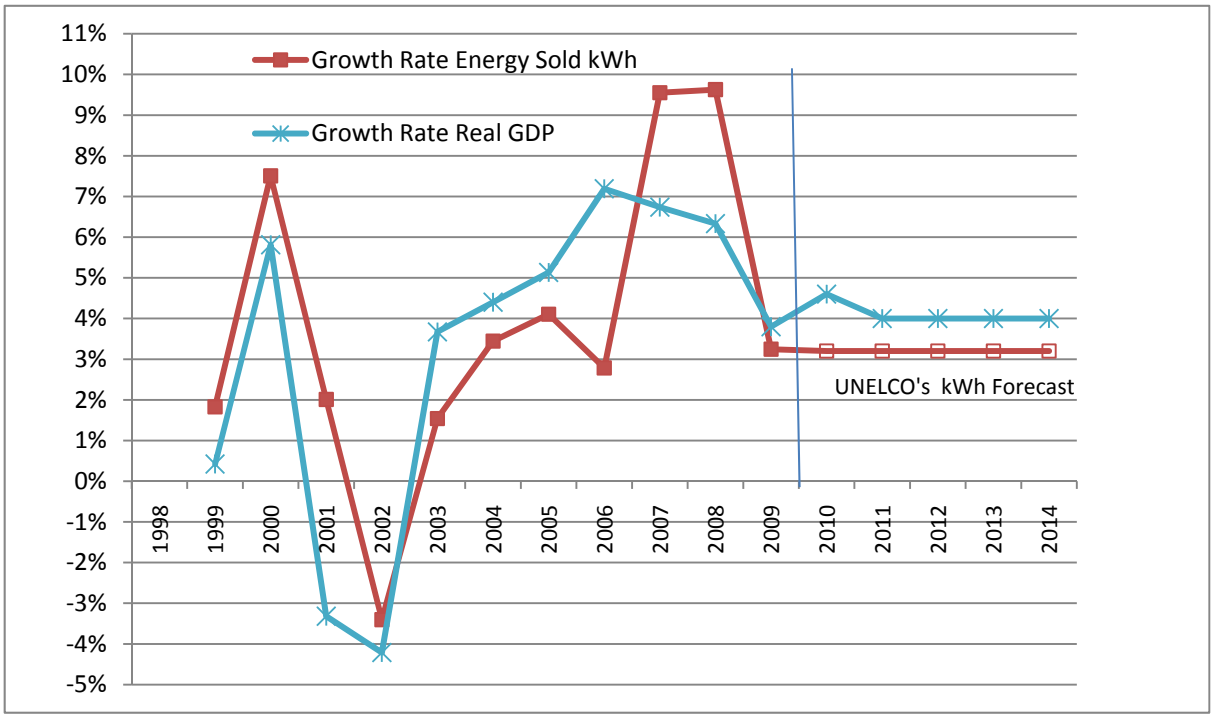
4.3 Reasons for the Decision

4.3.1 Demand Forecast

GDP Growth

Historic growth in real GDP shows a high correlation with growth in electricity demand as shown in Figure 4.2.1.1 below. The correlation between real GDP and kWh sold from 1995 to 2009 is 0.98. From 1995 to 2009, real GDP grew 66.9% while kWh sold grew 65.8%.

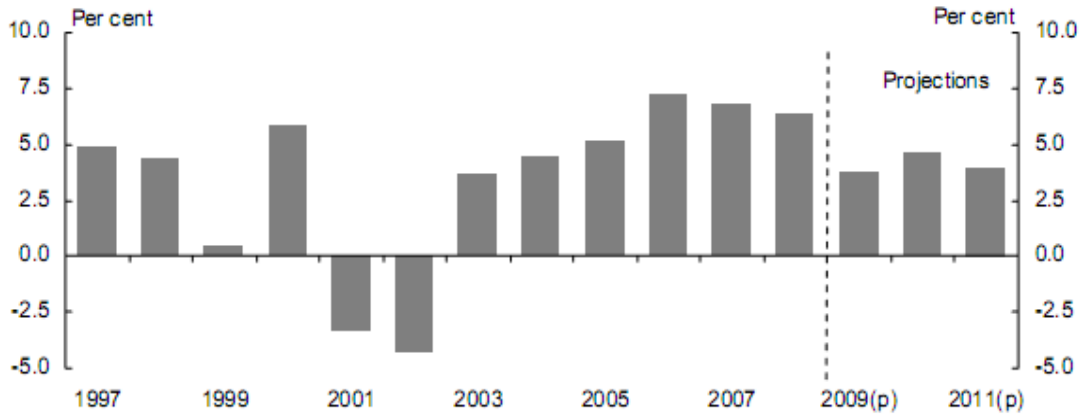
Figure 4.2.1.1 – GDP growth and electricity demand growth



Source: National Statistics Office and UNELCO

The 2010 Budget Papers forecast GDP growth of 4.6% for 2010 and 4.0% for 2011 shown below. The ANZ forecasts 4.5% and 4.5% respectively. The Asian Development Bank in the February 2010 'Pacific Economic Monitor' expects "Vanuatu to remain the best-performing Pacific Island economy"

Figure 4.2.1.2 – GDP growth, historic and forecast



Source: National Statistics Office and Ministry of Finance. 2010

Industry and service sector performance

Although overall GDP growth is slowing, this is not uniform across all sectors. Agriculture is slowing dramatically while the more electricity-intensive sectors of Industry and Services are expected to remain robust, according to official forecasts, as shown in Table 5.2.1.3 below.

Table 4.2.1.3 – Growth forecasts by industry sector

	Actual	Estimate	Projections		
	2007	2008	2009	2010	2011
Agriculture, fishing & forestry	2.0	5.0	1.7	2.2	2.1
Industry	7.7	13.1	6.9	9.2	4.9
Services	5.2	4.3	3.8	4.4	4.2
Real GDP	**6.8**	**6.3**	**3.8**	**4.6**	**4.0**
Nominal GDP	12.1	12.3	9.1	7.9	6.9
Consumer price index (b)	4.1	5.8	4.5	3.0	3.0
Current account balance (c)	-4.4	-6.9	-3.7	-4.1	-4.3

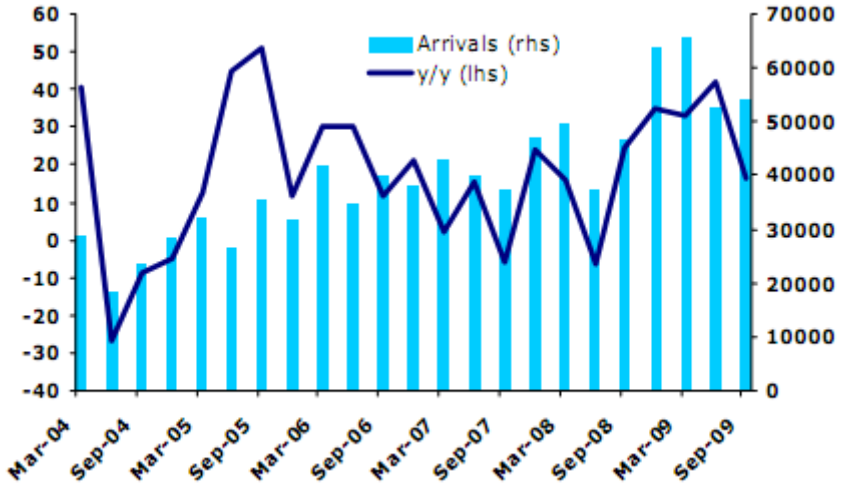
(a) Annual percentage change.
(b) Year-ended percentage change, 2008 figure is an actual outcome.
(c) Expressed as a per cent of nominal GDP.

Source: Budget Papers 2010

Tourism Arrivals

An import driver of electricity demand is Tourism Arrivals with an annual correlation with kWh demand being 0.97. The RBV Quarterly report stated that the quarter September to December 2009 saw "a rise of 39 percent increase arrivals on the quarter and 12 percent over the year to 31,030 visitors. Historically, this is a record-high quarter for air visitor arrivals". Holiday visitors, which accounted for 87 percent of air visitors, rose 54 percent on the quarter and 23 percent over the year 2009.

Figure 4.2.1.4 – Tourism arrivals



Source: ANZ –Pacific Quarterly Feb 2010

Urban population growth

Preliminary population counts from the Census of 16 Nov 2009 give the populations numbers shown below:

Table 4.2.1.5 – Urban population growth

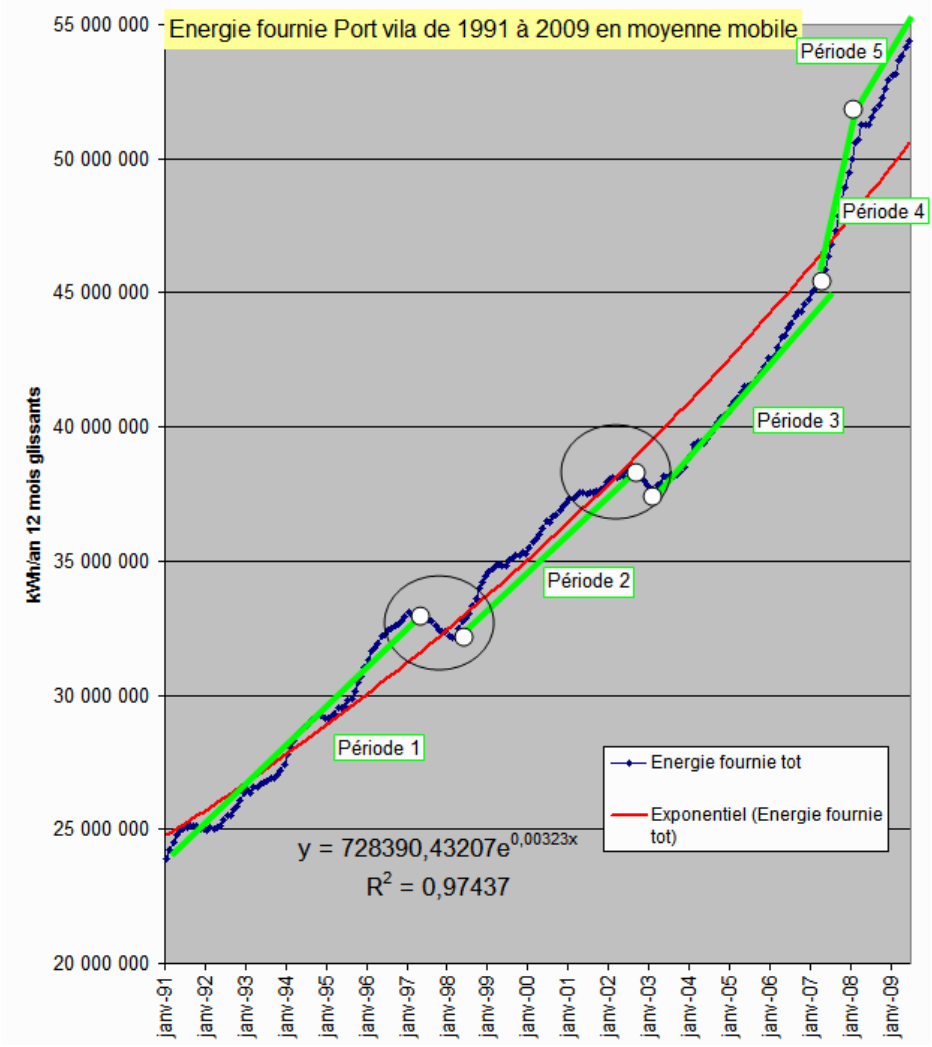
Location	Population 2009	Households 2009	Av Annual Pop Growth, 1999-2009
Port Vila	45,694	8637	4.70%
Luganville	13,484	2505	2.40%

Source: National Statistics Office, 2010

Port Vila's population has been growing at 4.7% annually since the last census of 1999. The Household Income and Expenditure Survey of 2006 estimated Port Vila population at 33,150 – that is a 12.6% annual population growth rate between 2006 and 2009.

These forecasts are consistent with long- and medium-term trends in electricity demand growth, and illustrated in Figure 4.2.1.6 below. The long term growth rate in kWh demand for the 18 years to June 2009 has been 3.9% per annum. The medium term growth from June 2003 to June 2009 has been 6.0% per annum. A significant increase was recorded over the period 2007/2008, where demand grew by 12% in one year. This was despite base tariffs increasing by 18.8% over the same period. This suggests that growth in electricity is not dampened by price increases.

Figure 4.2.1.6 – Historic trends in electricity demand



Source: UNELCO Electricity Generation Master Plan, 2009

4.3.2 Kilowatt-hour (kWh) Demand

The URA forecast electricity demand across Vanuatu to be in line with forecast overall demand for electricity as described above.

The URA has used the same growth rate across all concessions and customer groups.

4.3.3 Kilovolt-amp (kVA) Demand

Every electricity connection has a rating in kVA. For customers in the Industrial, Commercial, and Low Voltage (Other) categories, the monthly fixed charge is proportional to the rating of their connection in kVA. Demand growth in kVA is forecast the same way as for kWh.

The URA considers that kVA demand will be in line with forecast overall demand for electricity as described above.

4.3.4 Power Factor (Cos Phi) Charges

The 'cos phi' charges are penalties for industrial customers who achieve a power factor of less than 80 percent.

The incentive for UNELCO to work with customers to improve their power factors should remain. UNELCO have assumed that the revenue from these fines will remain constant for the next five years.

The URA considers this assumption from UNELCO as reasonable.

4.3.5 Prime de transfo

Prime de transfo is revenue paid by high voltage customers to rent a transformer from UNELCO, rather than have their own transformer.

UNELCO assumed the growth in Prime de transfo to be in line with the 10 year average growth, which is 0.36% for Port Vila, and 2.07% in Luganville. There is no Prime de transfo revenue in Malekula or Tanna.

The URA considers this assumption from UNELCO as reasonable.

4.4 Generation Forecast

The Generation Forecast predicts how power will be generated to meet the estimated demand for each concession area.

Diseconomies of scale have an impact on the cost of generating power on small islands. Remoteness and lack of indigenous resources are also factors: the high cost of importing fuels adds to the cost of generating electricity.

Generation capacity throughout the concession areas comprises primarily diesel plant with additional capacity in the form of hydro, wind and copra generation. In formulating its decision on generation forecasts the URA has considered the Government's energy development policy objective of ensuring that adequate and reliable energy supplies are available at a reasonable cost in order to meet demand.

This section sets out the Final decision on the generation forecasts that have been used to determine UNELCO's revenue requirements and tariff level, and the reason for that decision.

4.5 Final Decision

The URA's kilowatt-hour (kWh) generation forecast for the regulatory period 2010 to 2014 is shown in Table 4.5.1.

Table 4.5.1 – URA Generation Forecast - Total Gross Energy in kWh

2010	2011	2012	2013	2014
67,610,684	70,315,111	73,127,716	76,052,824	79,094,937

4.6 Reasons for the Decision

The generation forecast relies on the assumptions used in UNELCO's tariff application. These are based on a reasonable model of electricity generation in each of the concession areas, and include plans to expand the use of copra oil and wind generation.

In their submission to the position paper, UNELCO have included fuel efficiencies taking into account future investment and improvements. The URA has decided to use these assumptions, rather than the historical average figures estimated in the position paper. In the context of the tariff-setting methodology, this means that the fuel efficiencies are included as efficiency savings in the Cost Forecast (as described in Section 4.7), rather than in the Generation Forecast. The Generation Forecast therefore uses the same assumptions as stated in UNELCO's tariff application.

4.6.1 Port Vila

Generation capacity in Port Vila comprises diesel/copra plant at Tagabe, diesel plant in Port Vila, and the wind farm at Devil's Point. UNELCO have estimated the amount of power generated by the wind farm, and have estimated the amount of copra oil that will be used in the Tagabe generator. UNELCO have submitted that power generated by diesel will make up the difference between total gross power required (total demand plus forecast losses) and power generated by wind and copra oil.

The amount of power generated by the wind farm was assumed to be 4,600,000 kWh per annum. The URA considers UNELCO's assumptions as described in Appendix B of the Electricity Tariff Application Report March 2010 to be reasonable.

The diesel fuel efficiency across the Tagabe and Port Vila generators was assumed to be 0.259 litres per kWh.

For the purposes of the forecast, the cost of diesel is considered to be constant at 85 vatu per litre from 2010 to 2014. The impact on costs of variations of fuel prices will be dealt with in more detail in the design of the Indexation Formula in Chapter 7.

The URA notes that copra oil is used in the Tagabe generator. The forecast use of copra oil in Port Vila is shown in Table 4.3.1.1 below:

Table 4.3.1.1 Forecast copra oil consumption in Port Vila

Year	Copra consumption, litres
2010	750,000
2011	1,400,000
2012 to 2014	2,500,000

The URA considers the efficiency of copra in the Tagabe generator to be 0.294 litres per kWh.

For the purposes of the forecast model, the URA considers the cost of copra oil to be constant at 100 vatu per litre from 2010 to 2014. The actual cost variations of fuel prices is dealt with through the Indexation Formula described in Chapter 7.

Losses are calculated as the difference between the electricity generated (gross energy) and the amount of electricity invoiced to customers. UNELCO have included un-invoiced energy in their losses amount. Losses are forecast to be at the same level as 2009 at twelve percent.

Following an assessment of UNELCO's assumptions and stakeholder submissions the URA considers these assumptions to be reasonable.

4.6.2 Luganville

Generation capacity in Luganville comprises the diesel generator at Luganville, and the Sarakata hydroelectric plant. In its submission, UNELCO have estimated the power generated by the Sarakata hydro plant. Further, UNELCO assumed that power generated by fuel will make up the difference between total gross power required (total demand plus forecast losses) and power generated by the Sarakata hydro plant.

The Sarakata hydroelectric power station consists of 2 x 300kW and 1 x 600kW generators. These are supplemented by diesel generation capacity made up of 2.4MW, located at the Luganville power station. Peak demand is considered to be 1.2MW during the day and 650kW during the night. During periods, when the peak demand exceeds 800kW of load, the demand is supplemented by diesel generation.

The estimated amount of power generated by the Sarakata hydro plant is considered be 5,614,000 kWh per annum from 2010 to 2014.

As set out in the Addendum to the Contract of Concession for the Generation of Public Supply of Electric Power in Luganville relating the handing over of the Sarakata Hydroelectric Power Station, UNELCO must set aside the fuel savings from running the hydro plant. The method of calculating these savings is set out in the Addendum to the Luganville Concession Agreement.

For the purposes of calculating the Sarakata savings, the price of diesel is assumed to be 85 vatu per litre, and the price of lubricant oil is assumed to be 256.40 vatu per litre.

The diesel fuel efficiency for the Luganville diesel generators is considered to be 0.286 litres per kWh.

For the purposes of the forecast, the URA considers the cost of diesel to be constant at 85 vatu per litre from 2010 to 2014. The impact on costs of variations of fuel prices is dealt with in more detail in the design of the Indexation Formula in Chapter 7.

Losses are calculated as the difference between the electricity generated (gross energy) and the amount of electricity invoiced to customers. UNELCO have included un-invoiced energy in their losses amount. Losses are forecast to be at the same level as 2009 at nine percent.

Following an assessment of UNELCO's assumptions and stakeholder submissions the URA considers these assumptions to be reasonable.

4.6.3 Malekula

Generation capacity in Malekula comprises the diesel/copra generator. UNELCO have converted the generator to be able to run on 100% copra oil. The forecast of power generated is calculated as total demand plus losses.

The copra oil fuel efficiency for the Malekula generator is assumed to be 0.414 litres per kWh. In case any diesel is used in Malekula, the diesel fuel efficiency is considered to be 0.357 litres per kWh.

For the purposes of the forecast, the cost of copra oil is assumed to be constant at 100 vatu per litre from 2010 to 2014. The impact on costs of variations of fuel prices will be dealt with in more detail in the design of the Indexation Formula in Section 7.

Losses are calculated as the difference between the electricity generated (gross energy) and the amount of electricity invoiced to customers. UNELCO have included un-invoiced energy in their losses amount. Losses are forecast to be at the same level as 2009 at seventeen and a half percent.

Following an assessment of UNELCO's assumptions and stakeholder submissions the URA considers these assumptions to be reasonable.

4.6.4 Tanna

Generation capacity in Tanna comprises the diesel generator. The forecast of power generated is calculated as total demand plus losses.

The diesel fuel efficiency for the Tanna generator is assumed to be 0.364 litres per kWh.

For the purposes of the forecast, the cost of diesel is assumed to the constant at 85 vatu per litre plus a freight charge of 20.5 vatu per litre from 2010 to 2014. The impact on costs of variations of fuel prices will be dealt with in more detail in the design of the Indexation Formula in Section 7.

Losses are calculated as the difference between the electricity generated (gross energy) and the amount of electricity invoiced to customers. UNELCO have included un-invoiced energy in their losses amount. Losses are forecast to be at the same level as 2009 at fifteen percent.

Following an assessment of UNELCO's assumptions and stakeholder submissions the URA considers these assumptions to be reasonable.

4.7 Cost Forecast

The Cost Forecast consists of several categories of costs: Fuel Costs, Staff Costs, Other Costs, and Depreciation. In their tariff application, UNELCO split the cost forecast into two areas: a base scenario of costs, and a level of efficiencies that could be achieved against the base scenario.

4.8 Final Decision

The URA's final decision on costs are calculated in terms of a base scenario shown in Table 4.8.1 and Efficiency Gains to be achieved by UNELCO over the period 2010 to 2014 as shown in Table 4.8.2 Table.

Table 4.8.1 – URA Reasonable Costs Base in Vatu

2010	2011	2012	2013	2014
2,747,489,669	2,877,907,390	2,939,938,988	3,111,379,408	3,233,481,570

Table 4.8.2 – URA Accepted Efficiency Gains in Vatu

2010	2011	2012	2013	2014
-116,849,424	-162,180,369	-188,271,784	-238,722,048	-254,773,664

4.9 Reasons for the Decision

4.9.1 Fuel Costs

The cost of fuel is determined by the Generation Forecast and a forecast of the prices of diesel and copra oil. The fuel cost is calculated from the Generation Forecast described in Section 4.4 above and assumptions of fuel prices. As the price of diesel is unpredictable and potentially volatile, the tariff indexation formula is designed to pass the impact on costs through to electricity customers. Table 9.9.1 sets out the URA's forecasts of fuel prices.

Table 4.9.1 – Fuel price assumptions used in the Base Scenario

Fuel type / Concession	Assumed fuel price per litre, vatu
Diesel / Port Vila & Luganville	85
Diesel / Malekula	85 plus 14.5 transport and fees
Diesel / Tanna	85 plus 20.5 transport and fees
Copra / All	100

These base forecasts of fuel costs are adjusted by an assumption of savings due to efficiency improvements. These are described in Section 4.12.

Concerns have been raised by several submissions as to the high cost of copra relative to diesel. In response to these UNELCO has responded:

"Regarding the purchase price of processed coconut oil, UNELCO further confirms that it will make every effort to ensure that the average price remains below or at the most equal to the substitution cost of imported diesel."

As noted in section 1.4.8 above, the URA will review whether to take into account the price charged or the underlying costs and further consider three fundamental questions:

- Is there a competitive market for the service?
- Is there an incentive for UNELCO to enter into the arrangements "at arm's length"?
- Was a competitive tender process conducted to establish the price for the services?

4.9.2 Staff Costs

Staff costs are the wage and salary costs of staff, and the labour related on-costs directly incurred in the provision of electricity. UNELCO have provided forecasts of staff costs from 2010 to 2014 for each electricity concession. The average annual change from 2009 levels to 2014 in forecast staff costs is shown in Table 4.9.2.1.

Table 4.9.2.1 – Average forecast annual change in staff costs 2009-2014

Concession	Average annual staff cost change 2009-2014, %
Port Vila	+2.4%
Luganville	+3.6%
Malekula	-1.7%
Tanna	+3.1%
Total	+2.6%

These base forecasts of staff costs are adjusted by an assumption of savings due to efficiency improvements. These are described in Section 4.12.

4.9.3 Goods and other Costs

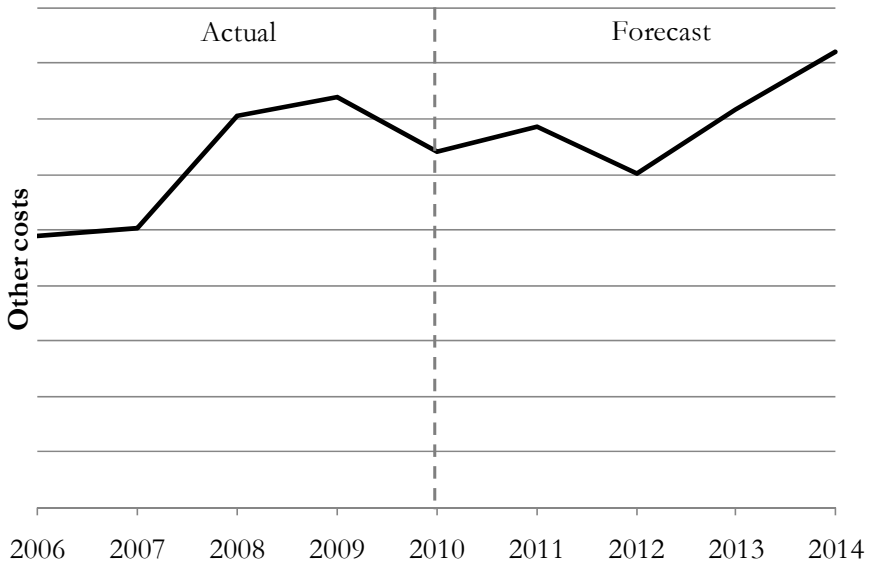
Other costs included in UNELCO's Tariff Application are:

- Goods & materials purchased
- Purchases non-stocked (e.g. sub-contracting)
- Taxes

A detailed description of these costs is given in Section 3.4 of the Electricity Tariff Application Report March 2010.

The forecast level of these costs is shown in Figure 4.9.3.1.

Figure 4.9.3.1 – Forecast trend in other costs



Source: UNELCO

These base forecasts of other operating costs are adjusted by an assumption of savings due to efficiency improvements. These are described in Section 4.7.

4.9.4 Depreciation

The method for calculating depreciation for concession assets is set out in the concession contracts. UNELCO have applied this method, and as such the URA accepts UNELCO's assumptions of depreciation.

4.9.5 Efficiency Gains

In sections 4.9.1 to 4.9.4 the URA set out the base scenario of costs which comprised Fuel Costs, Staff Costs, Goods and Other Costs, and Depreciation.

In its position paper, the URA used external benchmarks to estimate the scale of efficiency gains that could be achieved by UNELCO in comparison to the base scenario.

In response to the benchmarking study, UNELCO provided a revised estimate of efficiency gains, and the URA has considered these as reasonable. The level of efficiencies is described in Table 4.8.2 above.

This amount includes efficiencies expected to be achieved through improved fuel efficiency, and cost reductions in the areas of staff and other operating costs, when compared to the base scenario.

In future tariff reviews, the URA will seek to gain a clearer understanding of the UNELCO's level of efficiency, and will continue to create incentives for UNELCO to continue to improve their operational efficiency level.

Full details of the benchmarking study conducted by the URA are provided in section 5.7 of the Electricity Tariff Review Position Paper March 2010.

In addition the URA further considered UNELCO's submission in response to the position paper in formulating its decision.

4.10 Regulated Asset Base

The Regulated Asset Base represents the level of investment held by the operator in assets required to provide electricity generation, transmission, distribution and supply. This is calculated as the Net Book Value of all concessionaire-funded concession assets, plus any private assets owned by the operator that are necessary for the provision of electricity. It does not include any intangible assets, assets funded by third parties, financial assets or works in progress.

Section 8 of the concession agreements specify that the assets be re-valued annually for concession valuation purposes according to the index of "Matériel" published in the "Journal Officiel" (New Caledonia Gazette) in the series of costs of construction materials (reference 28IM). This revaluation of assets means that a real, rather than a nominal, rate of return will be applied to calculate the Reasonable Return.

4.11 Final Decision

UNELCO have provided forecasts of the value of the Regulated Asset Base, consisting of the current Regulated Asset Base values and a plan for investment from 2010 to 2014.

The URA's Final Decision on the Regulated Asset Base for 2010 to 2014 is shown in Table 4.11.1.

Table 4.11.1 – URA Regulated Asset Base in Vatu

2010	2011	2012	2013	2014
3,715,319,573	3,820,263,421	4,566,940,590	4,805,171,096	4,922,255,050

The URA is concerned as to the lack of detail provide by UNELCO in describing their Regulated Asset Base and the method of valuation.

The URA anticipates that any future tariff review will more closely evaluate the reasonableness of existing assets and the method of their valuation.

4.12 Reasons for the Decision

4.12.1 Capital expenditure

A reasonable level of capital expenditure is required for the purposes of:

- augmenting the capacity of the network to meet demand growth;
- replacing aged or obsolete assets;
- improving the quality and reliability of supply;
- meeting other legislative requirements; and
- purchasing non-network assets (for example, buildings and vehicles) for normal business purposes.

The URA notes that the current network capacity is much higher than peak demand, and the plan includes further investment to increase capacity. There are also separate plans under discussion around the addition of solar and geothermal capacity into the network. There is therefore a risk of an inefficient level of assets in Port Vila.

In assessing the reasonable level of capital expenditure, the URA must have regard to its objective under the *Utilities Regulatory Authority Act No. 11 of 2007*, particularly its primary objective to ensure the provision of safe, reliable and affordable regulated services and maximise access to regulated services throughout Vanuatu. It must also have regard to facilitating efficiency in the electricity utility and the incentive for efficient long term investment, and to facilitate the financial viability of the utility. On the basis of the information provided to the URA by UNELCO, the URA accepts the suggested investment plan included in the tariff application, and the resulting forecast level of the RAB.

The URA considered UNELCO's submission where it proposed to:

'*I: Carry out its investment plan and contractual duties.*

II: Finance an electrification fund which will be earmarked in priority for the funding for the extensions of our concession mainly in the rural area, as well as the funding for the maintenance of Port Vila City street lighting network. A sum of Forty Million Vatu (Vt 40, 000,000) deducted from UNELCO's profits will be allocated to this fund which will be jointly managed by UNELCO and the Government pursuant to a policy to be drawn up.'

and its proposed addendum submitted to the URA which stated:

'*A rural electrification support fund (TER)_ is set up, in order to encourage energy access in the non electrified areas of the Concessions of Port Vila, Luganville, Tanna and Malekula.*

This fund will be allocated to the financing of the maintenance costs of the Port Vila street lighting, HV and LV extensions from the existing networks of the concessions of Port Vila, Luganville, Malekula and Tanna, as well as service connections.

For the next five years from the signing of the this addendum, the Concessionaire shall each year allocate an amount, as defined below which will constitute an operation cost of financial year. This cost will be credited to the TER fund.

The original amount allocated by the Concessionaire to this fund will be forty million vatu (40,000,000 vatu) based on the price "P" applicable at the date on the signature of the present addendum, which is 48.50 vatu. The amount of this allocation will be indexed to the price "P" applicable on the 31st of December of the financial year for which such allocation shall be made"

The URA considers that, at this stage, the proposals put forward by UNELCO do not fall within the clearly defined tariff review methodology that was agreed to between UNELCO and the URA. Importantly, the URA acknowledges that it is neither practical nor possible for the regulator to assess the scope of these proposals or to evaluate their costs and benefits.

The URA notes that UNELCO's investment plans have been fully incorporated into the final tariff, including increasing the regulated asset base and increased depreciation. The URA is of the view that UNELCO's submission that a Weighted Average Cost of Capital (WACC) below their ability to invest in the future is ambiguous.

The URA is of the view that sufficient funding is available from other sources for rural electrification projects.

Additionally, the URA notes that any reluctance to invest is contrary to the intent of the *Utilities Regulatory Authority Act No. 11 of 2007* and the existing concession agreements between UNELCO and the Government of Vanuatu.

Further, the URA anticipates that any future tariff review will evaluate the actual investment level completed in comparison to the plan, and adjust the future tariff to account for any excess benefits from investment planned but not completed. In order to facilitate this, the URA will seek to perform a detailed analysis on the level and value of UNELCO's assets to ensure the infrastructure is used and useful, and also to put in place a detailed reporting system for investment, the regulated asset register and asset values.

4.13 Reasonable Return

To provide an incentive for investors to invest, the rate of return should reflect the opportunity cost of their capital – that is, the return should be commensurate with the returns that an investor could expect to earn from other investment opportunities, after adjusting for the different levels of risk. The appropriate cost of capital cannot be directly observed so must be estimated from available data.

The tariff should allow the operator to earn a reasonable return on investment. This creates an incentive for further investment in expanding the electricity supply. This reasonable return is set at the reasonable cost of capital for the concession. This also incentivises the operator to raise and use capital efficiently, as there is a financial benefit in minimising capital costs.

4.14 Final Decision

Following an assessment of the Cost of Capital decisions - globally and in neighbouring Pacific countries, and including further consideration of stakeholder submissions, the URA considers a reasonable rate of return for this concession calculated as a Real Weighted Average Cost of Capital (WACC) of 5.95 percent.

4.15 Reasons for the Decision

The generally accepted method of estimating the WACC is the Capital Asset Pricing Model (CAPM). A description of the different elements of the CAPM is given in Section 3.6 of the Electricity Tariff Application Report March 2010.

Identifying the reasonable value for each of the inputs into the CAPM model poses a challenge in the Vanuatu context; as there is limited data on business risks and thinly or non-traded financial markets. Consequently, the URA has emphasized the need to have primary regard to objective market evidence when estimating the cost of capital, as well as the consistent application of models drawn from finance theory and established regulatory practice.

The objective of this methodology is to arrive at a reasonable Weighted Average Cost of Capital for an efficient and competitive firm operating the concession. The aim is not to replicate UNELCO's current cost of capital.

The **Nominal Risk Free Rate** (RFR) is the average real yield over February 2010 of 5 year United States Treasuries[3] of 0.42 percent. This is grossed up using the Vanuatu inflation estimate described below to give a Vanuatu Nominal Risk Free rate of 3.43 percent. This is equivalent to UNELCO's estimate.

[3] Source: http://www.ustreas.gov/offices/domestic-finance/debt-management/interest-rate/real_yield_historical.shtml

The **Market Risk Premium** (MRP) is estimated at 5.00 percent which is consistent with the long term historical MRP and the same as UNELCO's estimate.

The **Country Risk Premium** (CRP) is considered to be 3.0 percent. The CRP was calculated in the position paper as the difference between the real yield of 5 year United States Treasuries (1.02 percent at April 2009) and Vanuatu Government bonds (2.07 percent) at the time of the last Vanuatu Government bond tender (April 2009). The CRP was thus calculated at 1.05 percent. This is low compared to similar countries risk premium so initially an upward adjustment was made to a more conservative 2.0 percent in line with similar countries. UNELCO's original CRP was 6 percent and in their latest submission it is lower to 5.25 percent, based on a comparison with Fiji and Papua New Guinea. Following UNELCO's submission the URA conducted further analysis of the Country Risk Premium described below.

Comparable Countries

Though Fiji and PNG are geographically close to Vanuatu they have very different economies and associated risks. Different enough that with no common traded financial markets it is difficult to quantify the relative CRP's except to state, as UNELCO does, that the risk premium is less in Vanuatu than in PNG and Fiji. The URA considers it to be considerably less.

In Fiji the military has been either ruling directly, or heavily influencing governments since 1987 with four coups to date. In September 2009, Fiji became only the second country to be suspended from the Commonwealth of Nations. Self-appointed prime minister Commodore Frank Bainimarama has overturned the constitution, fired all judges, imposed widespread media censorship, expelled foreign journalists and arrested people that oppose him. Australia, the EU and others have place sanctions on Fiji.

PNG has very rich mineral and oil deposits and a volatile economy and crime[4] that comes with their development. The neighbouring Indonesian province of Papua has undergone a separatist conflict since the mid-1980s with the flight of thousands of Papuans into Papua New Guinea. The 1990's saw the Bougainville conflict with the shutting of the copper mine and up to 20,000 people killed. HIV/Aids is on the rise. Some experts fear that Papua New Guinea is heading for a crisis similar to that in sub-Saharan Africa. Chronic law and order issues remain a major problem in PNG. The Economist magazine, in ranking of Worlds Most Liveable Cities ranked Port Moresby the lowest in the world. Transparency International Corruption Perception Index[5] ranked PNG 154th out of 180 countries, worse than Nigeria and Zimbabwe.

Vanuatu by contrast was ranked[6] the Happiest Country on Earth. This is despite the high cost of electricity. Vanuatu also ranked 95th on Transparency's Corruption Index.

Despite the relatively high risks described in PNG, the Independent Consumer and Competition Commission of PNG has been handing down detailed Cost of Capital decisions since 2004 with PNG's Country Risk Premium determined to be 3.0%. This included the 2009 Final Report 'Review into Water and Sewerage Pricing Arrangement' and the recent January 2010 Final Report 'Review of PNG Harbours Regulatory Contract'.[7]

[4] http://www.alertnet.org/thenews/newsdesk/SGE60O0AJ.htm

[5] www.transparency.org (higher ranking is more corrupt)

[6] http://news.bbc.co.uk/2/hi/uk_news/magazine/5172254.stm

[7] www.iccc.gov.pg

Ducroire-Delcredere Country Risk Data

ONDD[8] country risk data, recommended in UNELCO's submission, has some anomalies but can be used to gain a clearer picture of an appropriate country risk premium for Vanuatu. Rather than comparing similar geographical countries as UNELCO does, the URA compares countries with similar risk rankings to Vanuatu according to the ONDD data.

Table 4.15.1 – ONDD Country Risk Analysis

		Political risk			Commercial Risk	Direct Investments			Country Risk Premium[1]
Country	GDP/ Capita[2]	Short Term	Long Term	Special Transaction		War risk	Expropriation	Transfer Risk	
Vanuatu	4,334	2	4	3	B	3	n.a.	4	?
Guatemala	4,882	2	5	3	C	4	3	4	3.75%
Jordan	5,662	3	5	3	B	2	2	4	3.00%
Kazakhstan	11,369	3	5	4	C	2	4	5	2.70%
Croatia	17,876	3	5	3	C	1	1	4	3.00%
PNG	2,175	2	5	3	B	3	3	4	6.75%
Fiji	4,121	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Source: www.ondd.be

1: Country Risk Premium estimated by Damodaran 2: GDP Data from IMF 2009

Risk assessments that are equal to or worse than Vanuatu's; a higher number indicates higher risk.

Outside of War Risk all the countries at the top of the table have equivalent or worse risk measures to Vanuatu in all areas. All of these comparison countries have Country Risk Premiums that average around 3 percent. The URA considers this a stronger comparison methodology than UNELCO's comparison against a single neighbouring but higher risk country of PNG.

On the balance of evidence presented above the URA's final decision on a reasonable CRP for Vanuatu is 3.0 percent.

The **Gearing ratio** is estimated to be 50 percent. The URA's original position of 60 percent gearing was formulated on the basis of the recent decision of the Australian Energy Regulator on WACC parameters as being the efficient capital structure for a regulated Australian electricity or gas distribution or transmission businesses.

[8] www.ondd.be

Table 4.15.2 below shows reported gearing levels for Australian utilities:

Table 4.15.2 – Reported average gearing levels

Year	Bloomberg (market)	Bloomberg (adjusted)	Standard & Poor's	Average
2002	66.3	67.4	61.6	**65.1**
2003	63.9	63.7	66.7	**64.8**
2004	62.2	58.2	64.7	**61.7**
2005	62.8	63.3	67.8	**64.6**
2006	60.3	62.1	66.4	**63.0**
2007	58.7	57.8	65.1	**60.5**
Average	**62.4**	**62.1**	**65.4**	**63.3**

Source: Australian Energy Regulator (2009), Electricity Transmission and Distribution Network Service Providers – Statement of the Revised WACC Parameters (Transmission), Statement of Regulatory Intent on the Revised WACC Parameters (Distribution), May, p.113.

The URA accepts UNELCO's view in its submission that access to funds through the usual financing sources is more difficult in a less developed country and may expose them to increased exchange rate risk, thus applying the gearing level applied by Australian regulators may not be appropriate. Balancing this, however, the URA notes that:

1. UNELCO has access to its parent group to act as guarantor for loans[9] and to source it capital.
2. Operating in a less developed country has given UNELCO generous access to highly subsidized debt such as the EUR 4.3 million for the wind farm at well below market rates. UNELCO is currently negotiating further subsidized funding for a solar plant from the EU. Other future sources include the World Bank administered GPOBA grant.
3. UNELCO's effective interest paid on its total portfolio of debt is 3.21 percent for 2008 to 2014[10]. This is well below their WACC debt cost estimate of 9.42 percent.

The URA agrees with UNELCO that one advantage of leverage is the tax savings of deducting interest and that this is not relevant for Vanuatu. Despite this the, cost of debt is still below the cost of equity and this should encourage gearing if capital were being used efficiently. UNELCO's suggested gearing of 40 percent is too low to be efficient given the low risk of a government-guaranteed electricity monopoly with the ability to pass through most external cost changes.

On the balance of evidence the URA's final decision is that a gearing ratio of 50 percent is appropriate for a competitive and efficient firm operating the concession. In additional correspondences with UNELCO they agreed with our gearing level of 50 percent.[11]

The **Inflation Rate** is the forecast annual increase in the Consumer Price Index. The URA's original position was a inflation rate of 4.7 percent based on an annualised average of the last eight quarters of reported data. UNELCO's submission references the forecast in the 2010

[9] Data supplied by UNELCO

[10] Data supplied by UNELCO

[11] See Appendix B.2: UNELCO's Additional Correspondence

Budget of Vanuatu papers. The URA accepts UNELCO's inflation forecast of 3.0 percent as it is consistent with the forward looking nature of the CAPM model and with using government forecasts for key data points where available. This leads to a Nominal Risk Free Rate for the WACC of 3.43 percent (see position paper for calculation method).

The **Corporate Tax Rate** is zero in Vanuatu as there is no corporate tax, and other taxes such as business license fees are accounted for in operating expenses. This is consistent with the assumption provided by UNELCO.

The **Equity Beta** is assessed to be 0.80. The URA's original position was an Equity Beta of 1. The Equity beta of a company reflects only its systematic risk and not its total risk. Regulated electricity companies are considered to be less risky than the market as a whole.

Given all other factors that affect a firm's risk, higher financial leverage increases the firm's risk profile. Thus, higher financial leverage (gearing) increases the beta of the equity of the firm. Asset beta reflects the systematic business risk in the markets where the company operates before gearing. Equity beta reflects the combined effects of business and financial risk (gearing) that the shareholders of a company are faced with.

The URA's assumption of an equity beta of 1 was based on the gearing level of 60 percent. Where an equity beta of 1 is valid for a gearing level of 60 percent this translates[12] to an Equity Beta of 0.8 given the new determined gearing of 50 percent. This is equivalent to an asset beta of 0.4.

This Asset Beta is consistent with a combined distribution and generation business where:

1. It is a natural monopoly supplying an essential service
2. The monopoly is protected by legislation
3. Tariffs are set subject to 'rate of return' regulation
4. There are long-term concession agreements
5. Contractually-guaranteed tariffs pass through cost variations, significantly reducing the risk of generation
6. The concession agreements offers full protection for any new taxes or tax increases
7. There is inelastic demand
8. A component of revenue is not dependent on demand (fixed charges)
9. There is a long history of profitability
10. There is government price regulation that reduce the impact of market risk on the company's equity returns
11. The concession agreement allows for a review of tariffs if there is significant economic change.

This level of Asset Beta is also consistent with Martin's analysis[13] and Damadoran's[14] data shown in Table 4.15.3.

[12] The Hamada equation is used for converting an asset beta to equity betas see Hamada, R. 1972, 'The Effect of the Firm's Capital Structure on the Systematic Risk of Common Stocks', The Journal of Finance, vol. 27, pp. 435-52.

[13] See Martin, L 2005," The Equity Beta for ETSA Utilities" for an explanation of the factors leading to a low asset beta. http://www.escosa.sa.gov.au/library/050506-DrLallyEquityBetaETSAUtilities.pdf

[14] http://pages.stern.nyu.edu/~adamodar/

Table 4.15.3 – Asset betas of utility companies

Country	Industry Group	No. of Firms	Unlevered Beta
United States	Electric Util. (Central)	n.a	0.4676
United States	Electric Utility (East)	n.a	0.4870
United States	Electric Utility (West)	n.a	0.4687
Europe	Utility (General)	18	0.3800
Global Average*	Utility (General)	66	0.3000

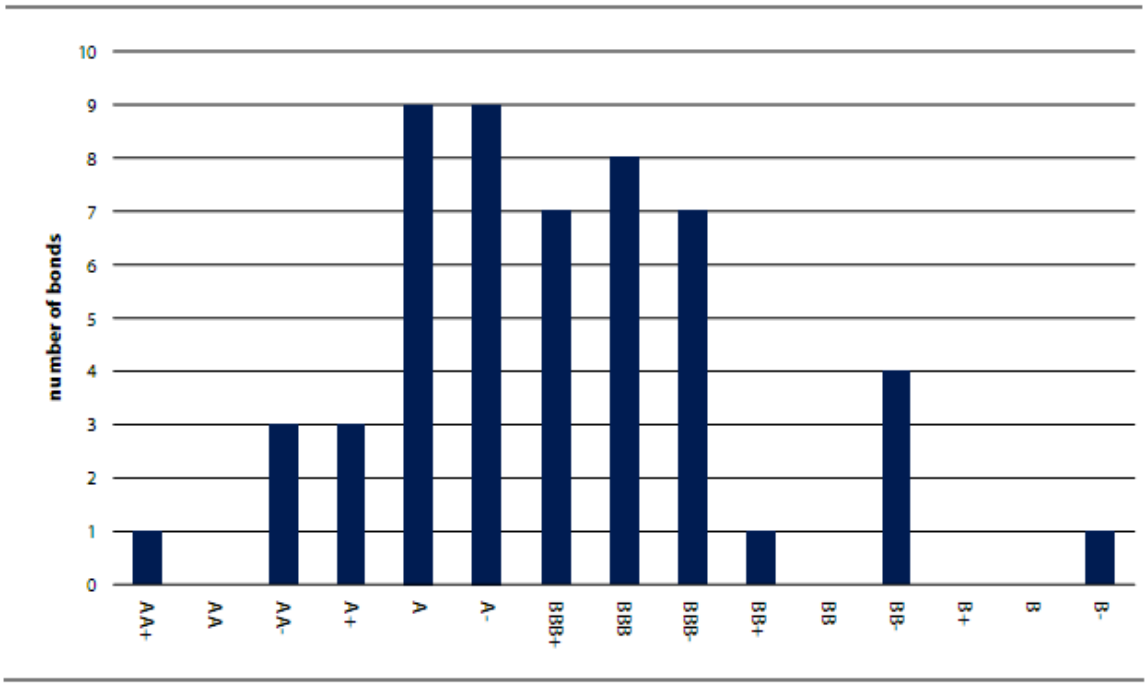
*5 year average of monthly values

The **Debt Risk Premium** (DRP) is assessed to be 2.0 percent. With the addition of the CRP the total DRP is calculated at 5 percent.

The DRP is the margin the regulated business must pay to borrow over the nominal risk free rate. The total debt risk premium consists of the appropriate premium for the benchmark rating of the firm plus the country risk premium.

Given UNELCO's long history as a profitable government-protected monopoly with the ability to pass through a large proportion of input costs and strong balance sheet it is estimated to have an A- credit rating. The rating also falls well with the distribution of credit ratings for utilities across Asia Pacific as shown in Table 4.15.4. Given UNELCO's current balance sheet and the lower gearing of 50 percent, an A rating is supported by Moody's ratio analysis shown in Table 4.15.5.

Table 4.15.4 – Distribution of credit ratings for Utilities – Asia Pacific region



Source: Standard &Poor's

Table 4.15.5 – Expected financial ratio for a utility company

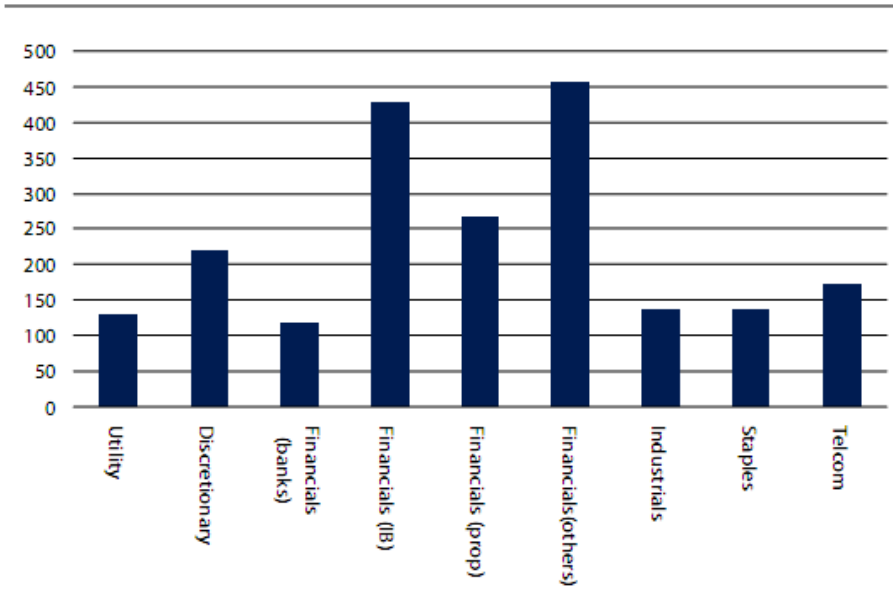
Moody's rating	Aa2	Aa1	A2	A1
Business risk	Medium	Low	Medium	Low
S&P equivalent	AA	AA+	A	A+
FFO interest cover (x)	>6	>5	3.5-6.0	3.0-5.7
FFO/Debt (%)	>30	>22	22-30	12-22
RCF/Debt (%)	>25	>20	13-25	9-20
Debt/Capital	<40	<50	40-60	50-75

Source: www.moodys.com

From Australian Reserve Bank Data[15] A-rated corporate debt as at February 2010 is trading at a margin of 2.34 percent over Australian Government bonds. A-rated debt spreads in the US and for utilities are trading at less than this margin over US Treasuries. After including the country risk premium of 3.0 percent the URA thus estimates the total debt risk premium at 5.0 percent.

This is supported by the average debt margins for utilities shown in Table 4.15.6.

Table 4.15.6 – Debt margins by industry group March 2009



Source: Bloomberg and 'Estimating the debt margin for the weighted average cost of capital', Independent Pricing and Regulatory Tribunal, NSW, May 2009

[15] http://www.rba.gov.au/publications/smp/2010/feb/pdf/0210.pdf

UNELCO's submissions regarding the Debt Risk Premium have varied widely.

In their initial submission the total DRP was 6 percent while their CRP was 6 percent, that is, an effective risk premium of zero on debt. In UNELCO's subsequent submission DRP fell to 4 percent and its CRP was lowered to 5.25 percent, giving a negative nominal debt premium.
In UNELCO's final submission total DRP was 6 percent with CRP at 5.25 percent, giving a debt premium of 0.75 percent. No evidence was given supporting the calculation of this number or why it varied significantly.

The URA notes that UNELCO has borrowed at highly discounted rates from development banks and that this has provided it a cost of debt well below what the CAPM model would predict.

Despite this the URA is not attempting to replicate UNELCO's cost of debt but to model an efficient and competitive firm operating the concession. The URA therefore considers a market based debt premium of 2.0 percent, though significantly higher than UNELCO's, to be more appropriate.

Table 4.15.7 below summarises the URA's WACC calculation and compares the tariff application, position paper, and UNELCO's multiple revisions to its WACC to the URA's Final Decision.

Table 4.15.7 – URA's WACC Calculation

WACC Components	UNELCO Orig	URA Orig	UNELCO Revision 1	UNELCO Revision 2	URA Final
Nominal risk free rate	4.00%	5.14%	3.42%	3.42%	3.43%
Market risk premium	5.00%	5.00%	5.00%	5.00%	5.00%
Country risk premium	6.00%	2.00%	5.25%	5.25%	3.00%
Market rate of return	15.00%	12.14%	13.67%	13.67%	11.43%
Corporate tax rate	0.00%	0.00%	0.00%	0.00%	0.00%
Gearing	40%	60%	40%	50%	50%
Equity proportion	60%	40%	60%	50%	50%
Rate of imputation credit utilisation	0.00%	0.00%	0.00%	0.00%	0.00%
Inflation rate	4.70%	4.70%	3.00%	3.00%	3.00%
Return on equity calculations					
Nominal risk free rate	4.00%	5.14%	3.42%	3.42%	3.43%
Market risk premium	5.00%	5.00%	5.00%	5.00%	5.00%
Country risk premium	6.00%	2.00%	5.25%	5.25%	3.00%
Market rate of return	15.00%	12.14%	13.67%	13.67%	11.43%
Asset beta	0.6	0.4	0.6	0.45	0.4
Debt Beta	0	0	0	0	0
Equity beta	1.00	1.00	1.00	0.90	0.80
Return on equity (before imputation)	***15.00%***	***12.14%***	***13.67%***	***12.65%***	***9.83%***
Return on debt calculations					
Risk premium	6.00%	4.00%	4.00%	6.00%	5.00%
Return on debt (pre-tax)	***10.00%***	***9.14%***	***7.42%***	***9.42%***	***8.43%***
Post-tax nominal WACC	***13.00%***	***10.34%***	***11.17%***	***11.03%***	***9.13%***
Post tax real	***7.93%***	***5.39%***	***7.93%***	***7.80%***	***5.95%***
Pre-tax nominal	***13.00%***	***10.34%***	***11.17%***	***11.03%***	***9.13%***
Pre-tax real	***7.93%***	***5.39%***	***7.93%***	***7.80%***	***5.95%***

4.16 Impact of Wind Farm savings

The Addendum to the Port Vila Concession Contract 1998 specifies that one of the acceptable reasons for reviewing the tariff level is:

- *If some new event should cause a major variation in the costs to the Concessionaire such that a review of tariffs appears necessary to pass on the variation in cost due to the new conditions of power generation and distribution in an equitable manner on to the price of electricity.*

The construction of the Wind Farm at Devil's Point constitutes such a variation to the conditions of power generation. Therefore, in this tariff review, the URA has set out what it considers to be an appropriate method of passing on this variation into the tariff.

4.17 Final Decision

The URA considers that the level of benefit passed into the tariff is calculated to be 24,411,996 vatu. This benefit is to be spread over the regulatory period of 2010 – 2014.

4.18 Reasons for the Decision

The method of calculation for the fuel savings described in section 5.8 of the position paper does not result in an equitable pass-through of variation of cost of the operation of the wind farm. By calculating the savings using the theoretical difference in revenue, this includes all efficiency savings that UNELCO have achieved since the last tariff reset in 1997.

The data to calculate the actual fuel savings from the wind farm is already included in the Generation Forecast. The fuel saving is calculated as:

$$Fuel\ saving = avg\ fuel\ cost\ per\ kWh \times kWh\ generated\ by\ wind$$

Or

$$Fuel\ saving = \left(\frac{cost\ of\ diesel + cost\ of\ copra\ oil}{diesel\ kWh + copra\ kWh}\right) \times wind\ kWh$$

Based on this method, the total savings from wind are:

Table 4.18.1 – Adjustment for Wind Farm savings

2007 fuel saving	7,962,253
2008 fuel saving	17,383,235
2009 fuel saving	95,656,662
2010 (to date) fuel saving	17,131,459
Total fuel saving	138,133,609

In addition, UNELCO have submitted their actual costs of running the wind farm. The change in ongoing operational costs are off-set against the fuel saving. The incremental ongoing costs of operating the wind farm from 2007 to 2009 have been:

Table 4.18.2 – Incremental ongoing costs of the Wind Farm

2007	4,805,979
2008	37,327,667
2009	71,587,967
Total	113,721,613

Based on this estimate of the fuel savings and these costs, the net variation in costs is a benefit to UNELCO of 24,411,996 Vatu, which will be spread over the tariff for the five years from 2010 to 2014. Going forward the impact of the wind farm has been incorporated into the tariff.

4.19 Base Price

The base price Po used for the setting the maximum billing price of electricity per kWh and fixed charges in kVA. It is applied via the tariff structure and indexation formula to determine the charges for individual customers.

4.20 Final Decision

The URA has determined that the base price Po is to be set at 47.17 vatu. This results in the annual total revenue shown in Table 4.20.1:

Table 4.20.1 – UNELCO's Total Revenue in Vatu with Po = 47.17

2010	2011	2012	2013	2014
2,843,444,883	**2,934,756,013**	**3,015,112,763**	**3,150,259,237**	**3,263,255,842**

4.21 Reasons for the Decision

Based on the Demand Forecast, Generation Forecast, Cost Forecast, Regulated Asset Base and the Reasonable Return, the base P_0 to be used in the formula for setting the monthly electricity price is 47.17 vatu.

Each month, P_0 is used to calculate the monthly price of electricity (P) through the indexation formula in order to take into account certain factors including changing input costs, and the amount of electricity generated from renewable sources.

The formula is described in detail in Chapter 6.

The price (P) is then used to set the amount customers pay for their electricity bills, as set out in Chapter 5.

5 Tariff structure

The Tariff Structure defines the prices charged to different customer groups, based on the monthly price P.

5.1 Final Decision

The URA has set out the new tariff structure for the various customer groups.

Table 5.1 – New Tariff Structure

Customer group	Price per kWh	Monthly fixed charge	Security deposit
Small Domestic Customers	Up to 60 kWh = 0.34 x P 61 to 120 kWh = 1.21 x P Over 120 kWh = 3.00 x P	None	70 x P
Other Low Voltage Customers	1.21 x P	5 x P per subscribed kVA	150 x P per subscribed kVA
Business Licence Holders – Low Voltage	0.87 x P	20 x P per subscribed kVA	150 x P per subscribed kVA
Sports Fields	1.00 x P	None	None
Public Lighting	0.54 x P	None	None
High Voltage Users	0.70 x P	25 x P per subscribed kVA	150 x P per subscribed kVA

The following table shows the current tariff structure.

Table 5.2 – Current Tariff Structure

Customer group	Price per kWh	Monthly fixed charge	Security deposit
Small Domestic Customers	Up to 60 kWh = 0.62 x P 61 to 120 kWh = 0.93 x P Over 120 kWh = 1.70 x P	None	70 x P
Other Domestic Customers	0.96 x P	19 x P per subscribed kVA	150 x P per subscribed kVA
Business Licence Holders – Low Voltage	0.87 x P	20 x P per subscribed kVA	150 x P per subscribed kVA
Sports Fields	1.00 x P	None	None
Public Lighting	0.54 x P	None	None
High Voltage Users	0.70 x P	25 x P per subscribed kVA	150 x P per subscribed kVA

This tariff structure is set out in Section 5 of the Specifications (1986) and Section 7 of the 1997 Addendum of the Port Vila concession agreement.

As part of its tariff application, UNELCO has put forward an adjustment to the "Small Domestic Customer" tariff structure shown in Table 5.3 below. In UNELCOs second submission they have updated the tariff for "Small Domestic Customers" over 120kWh to 3.0 x P.

The new tariff structure contains a lower tariff for "Small Domestic Customers" whose usage is between 0-60 kWh per month and a higher tariff for customers whose usage ranges between 60-120 kWh per month.

Table 5.3: UNELCO's proposed changes to the Small Domestic Customer tariff

Consumption	Old Tariff	New Tariff
<60 kWh	0.62 x P	0.34 x P
60 to 120 kWh	0.93 x P	1.21 x P
>120 kWh	1.7 x P	3.0 x P

The URA considers UNELCO's submission regarding the changes to the rates paid by "Small Domestic Customers" to be acceptable.

However, the URA is concerned with the sharp difference between the "Small Domestic Customer" tariff and the "Other Domestic User" tariff. If a customer increases their electricity usage above 120kWh per month, they will automatically switch to the "Other Domestic User" tariff as set out in section 18 of the concession agreement.

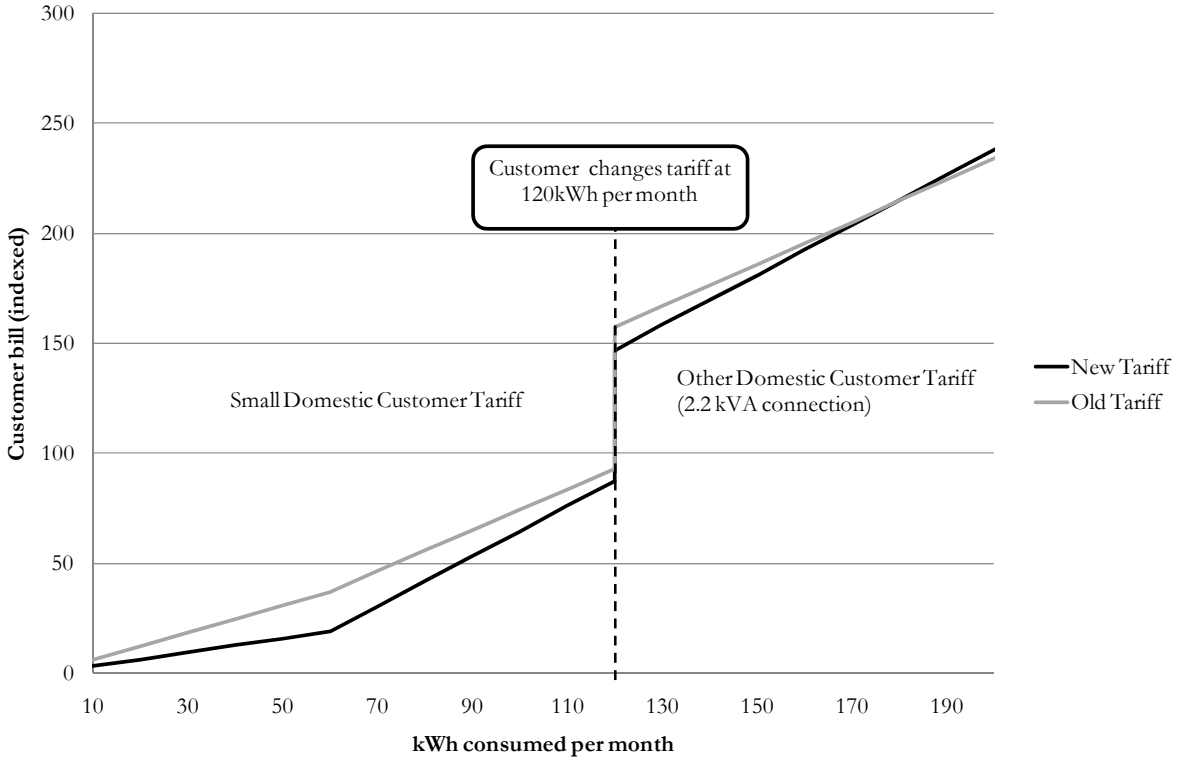
With the current tariff structure, at the point where customers switch tariff, their bills approximately double (depending on exact usage and the kVA rating of their connection).

The URA is concerned that this creates a barrier to customers expanding their domestic electricity consumption beyond 120kWh per month.

The URA's new tariff structure allows for a smooth transition between the "Small Domestic Customer" tariff and the "Other Domestic Customer" tariff. This is achieved by reducing the monthly fixed charge for Other Domestic Customers, but increasing the charge per kWh.

Figure 5.4 below illustrates the evolution of bills as domestic customers increase consumption from the "Small Domestic Customer" tariff and the "Other Domestic Customer" tariff.

Figure 5.4: Comparison of bill evolution for existing tariff structure and URA position



6 Indexation formula

The purpose of the indexation formula is to allow for fluctuations in certain input prices beyond UNELCO's control (fuel, wages and materials) to be passed through to electricity customers.

This allows UNELCO to collect sufficient revenue to supply electricity services should input prices increase, and allow customers to benefit when input prices fall.

A detailed description of the current tariff formula is provided in section 3 of the Electricity Review Tariff Application Report March 2010.

The assumptions described in Section 4 above set the level of the base index price P_0. The base index price P_0 is then used with an indexation formula to calculate the monthly electricity price P.

6.1 Final Decision

The new formula to calculate the monthly base price (P) is:

$$P = P_0 \times \left[\left(0.51 \times \frac{G}{G_0} \times \frac{N}{N_0}\right) + \left(0.11 \times \frac{M}{M_0}\right) + \left(0.09 \times \frac{IM}{IM_0} \times \left[0.60 + \left(0.40 \times \frac{C}{C_0}\right)\right]\right) + 0.29\right]$$

Where

$P_0 = 47.17$

$G_0 = 88.54$

N0 = 0.92

$M_0 = 1216$

$IM_0 = 126.91$

$C_0 = 1.2026$

Whereas

G = is the weighted average price of a litre of diesel fuel and coconut oil purchased in Port Vila, Luganville, Malekula and Tanna, expressed in Vatu/litre, and calculated according to the current concession contract.

N = is the average proportion of power generated by diesel, hydro and copra oil. (After the concession contract for Luganville expires, N will only include diesel and copra oil) for the previous twelve months.

M = is the average of the daily wage for a single male not receiving board or lodging in Port Vila at Ifira Wharf and Stevedoring, classified as an "inexperienced labourer" and the classification "P02" with the Public Service Commission of the Vanuatu Government for the previous month.

IM = is the average of the indices "Matériel" (equipment) published by the "Journel Officiel" (New Caledonia Gazette) for the first of the two months preceding the tariff adjustment.

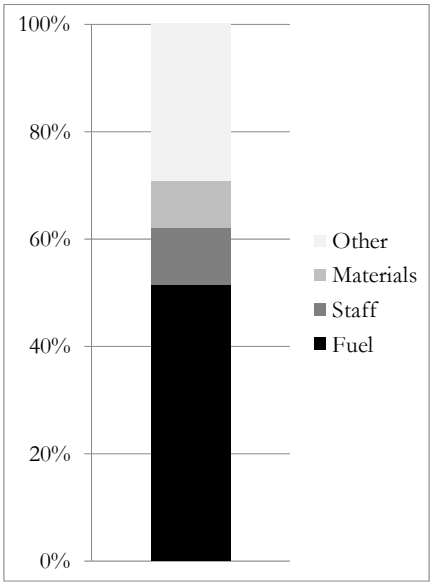
C = is the average of the daily currency exchange rates for the month preceding the date of adjustment of tariffs, as published by the Banque d'Hawaii in the column "selling rate" for the Pacific Franc (XPF or CFP) to Vatu (expressed in Vatu/XPF)

6.2 Reasons for the Decision

6.2.1 Formula structure

The tariff is made up of several components, which represent the reasonable costs of providing electricity in Vanuatu, and a reasonable return for the operator. The methodology for setting the tariff level is described in detail in section 3 of the Electricity Tariff Application Report March 2010.

Figure 6.2.1 – Illustration of components of formula



Cost components strongly influenced by external price variations include:

- Fuel costs are influenced by the fuel price;
- Staff costs are influenced by general wage inflation in Vanuatu, and the minimum wage;
- Materials costs are influenced by the price of goods, and currency rates if the goods are purchased overseas.

UNELCO does not have control over the price charged to customers; rather it is specified in the concession agreement. If external input costs increase and the price is not adjusted, UNELCO are at risk of not generating sufficient revenue to continue supplying electricity. If input prices decrease and the price is not adjusted, then electricity customers are missing out on potentially lower prices.

The aim, therefore, is to link each component to an index that will reasonably accurately reflect the impact of input price changes on costs.

The proportion of the tariff that each component represents is referred to as the coefficient of that component. For example, if fuel costs make up 50% of the tariff revenue, then the coefficient of fuel costs (X_{FUEL}) will be 0.50. The coefficients are set based on the forecasts of the different areas of costs, with assumed constant input prices. The assumed constant input price forms the starting value for each index.

6.2.2 Fuel component

The first variable that has a major impact on the fuel costs faced by UNELCO is the fuel price. UNELCO do not control the price they pay for imported diesel, so it is reasonable for the impact on costs of fuel price fluctuations to be passed through to electricity customers. This does, however, remove the direct financial incentive for UNELCO to negotiate down the fuel

price as much as possible. For the purpose of this tariff review, it is assumed that UNELCO will act in good faith and strive to get the best price for customers when negotiating fuel prices.

The current mechanism for passing through fuel prices, allows UNELCO to calculate the weighted average fuel price per litre paid for diesel and copra across all concessions (G), compare this value to the base fuel price (G_0) and adjust the fuel component accordingly.

The second major external variable that impacts the fuel cost is the amount of power that is generated by non-fuel based power (e.g. hydro, wind, solar PV, geothermal). Currently, the hydro savings are added in to the tariff through the Sarakata savings method, and so for the purposes of the formula, power generated by the Sarakata hydro plant is treated as if it was generated by diesel fuel. Power generated by the wind farm in Port Vila, however, is fuel free, as would any further investment in new non-fuel generation. The total cost of fuel for UNELCO is reduced as more is produced by wind/solar/etc., and vice versa. The fuel component of the formula should be adjusted by the proportion of power generated by fuel (N), where

$$N = Average\ for\ previous\ twelve\ months\ of \left(\frac{Energy\ produced\ by\ diesel\ and\ copra}{Total\ energy\ produced}\right)$$

N_0 should be set according to the five-year average forecast level of N.

The formula for calculating the fuel component of the price is:

$$X_{FUEL} \times \frac{G}{G_0} \times \frac{N}{N_0}$$

In UNELCO's second submission they requested that in the event of a cyclone or earthquake that caused major damage to a renewable supply that N be changed immediately to reflect the new conditions. The URA considers that there exists sufficient flexibility in under section 7.5 of the concession agreement to allow for a tariff review in the event of major damage to a supply source.

6.2.3 Wages component

UNELCO operates in a reasonably competitive labour market. Therefore, staff costs are influenced by the market rate for wages in Vanuatu. The method of calculating the wages component is:

$$X_{STAFF} \times \frac{M}{M_0}$$

Where M is an index of average wage costs in Vanuatu

Currently, this index is based on an average of the daily wage for a single male not receiving board or lodging in Port Vila at Ifira Wharf and Stevedoring classified as an "inexperienced labourer"; and the classification "GRT" of the Public Service of the Vanuatu Government.

It has been noted that there has been very little change in either of these indicators for more than twelve months, suggesting that they may not be an accurate measure of average wages in Vanuatu. In UNELCO's second submission they suggested that due to the weakness in this index that it be replaced with a flat 1% p.a. increase.

Rather than a flat yearly increase the URA considers it reasonable to stay with current index until a more suitable alternative index has been created. Should a suitable alternative be found, then it is suggested that it should be used to calculate M.

6.2.4 Materials component

UNELCO must purchase materials in order to operate, maintain and upgrade equipment for electricity supply. The price of these materials is determined by the market for such materials in Vanuatu and abroad. The Materials component currently used in the formula is:

$$X_{MATERIALS} \times \frac{IM}{IM_0} \times \left[0.60 + \left(0.40 \times \frac{C}{C_0}\right)\right]$$

Where IM is an index of materials prices, and C is an index of the relative strength of the Vatu. IM is based on the index of "Matériel" published in the "Journal Officiel" (New Caledonia Gazette) and C is the exchange rate between the Vatu and the Pacific Franc.

In an ideal model, the Materials component should take into account price and currency fluctuations for the mix of currencies in which materials are purchased. Given the practical impossibilities of creating such an ideal model, the URA suggests that the existing mechanism is retained.

6.2.5 Other component

The remaining component comprises of tariff revenue that will not be adjusted according to an external index. This comprises depreciation, returns, and "other" operating costs.

The indexation formula does not make any adjustments for economies of scale. This means that UNELCO has an incentive to drive demand through a high quality of service and increasing connections.

The Other component is represented in the indexation formula by a constant X_{OTHER}.

6.2.6 Complete formula

The overall tariff indexation formula calculates the price P based on a base price P_0, adjusted for each of the components listed above.

The overall structure of the tariff indexation formula is:

$$P = P_0 \times \left(\left[X_{FUEL} \times \frac{G}{G_0} \times \frac{N}{N_0}\right] + \left[X_{STAFF} \times \frac{M}{M_0}\right] + \left[X_{MATERIALS} \times \frac{IM}{IM_0} \times \left[0.60 + \left(0.40 \times \frac{C}{C_0}\right)\right]\right] + X_{OTHER}\right)$$

7 Addendum to the Concession Agreement

The URA is empowered under the Act to determine the maximum price which may be charged in relation to any aspect of a regulated service.

Further, section 20 of the Act sets out that the rights exercisable by the Government in the concession contracts described in Part B of Schedule 1 are assigned to the URA, but may only be exercised by the Authority upon receiving written approval of the relevant Minister.

Following consultation on the URA's Electricity Tariff Review Position Paper March 2010, the URA has formulated and published its Final Decision.

The new tariff is to be included in a new addendum to the existing concession contracts between the Government and UNELCO.

Following agreement on the new tariff level, structure, and formula, the new tariff will take effect upon signing of an addendum to the concession contracts by the Government and UNELCO.

In this section the URA has set out the Draft Addendum to the concession contract that contains provisions aligned with the Final Decision of this tariff review.

The Draft Addendum includes provisions for:

- The new base tariff level Po = 47.17 vatu
- Addition of the wind farm into the pricing formula
- Addition of UNELCO's commitments regarding the pricing of coconut oil
- Addition of a clause allowing a new tariff review if demand changes significantly
- The new tariff structure with the reduction for less than "Small Domestic Customers"

This addendum forms part of the URA's Final Decision and its recommendation to the Government of Vanuatu.

The addendum requires the endorsement of the Council of Ministers, signoff by the relevant Minister on behalf of the Government and signoff by UNELCO.

Addendum to the Concession Agreement

ADDENDUM VARYING THE TARIFFS OF THE CONTRACT FOR THE GENERATION AND PUBLIC SUPPLY OF ELECTRIC POWER IN THE CONCESSIONS OF PORT VILA (2007), LUGANVILLE (2006), MALAKULA (2000) and TANNA (2000) ("the Concession Agreements")

[draft]

THIS AGREEMENT: Is made one the ___ day of _____ 2010

BETWEEN	**THE GOVERNMENT OF** THE **REPUBLIC OF VANUATU** (the "Government") of the first part
A N D	**THE HONOURABLE** Paul Telukluk Minister of Lands Geology Mines and Water Resources and also being the Minister responsible for Power for the purposes of the Electricity Supply Act (Cap 65) (the "Grantor") of the second part
A N D	**UNION ELECTRIQUE DU VANUATU LIMITED** a local Vanuatu Company having its registered office situate at C/o Second Floor, Law House. Kumul Highway, Port Vila, Efate in the Republic of Vanuatu (the "Concessionaire') of the third part

WHEREAS

A. More than the required five years has lapsed since the previous review of the electricity tariffs in accordance with clause 7.5 of the Concession Agreements.

B. At the request of the Government a full and detailed electricity tariff review has now been conducted by the Utilities Regulatory Authority of Vanuatu in consultation with the Concessionaire and The Government.

C. Electricity generated by the wind farm installed at the Kawena plateau has significantly affected the cost of generating the Port Vila electricity supply.

D. The Government desires to encourage an increase in the number of new connections to the electricity grid.

SECTION 1 - VARIATION OF THE CONCESSION

The terms and conditions of the Concession (being the documents described in the Schedule hereto) are hereby varied as follows:

SECTION 2 – PRICE ADJUSTMENT FORMULA

(Replaces the whole of clause 2, 2007)

The base price P used for the maximum billing of electricity and fixed charges, advance on consumption, penalties applicable to the Concessionaire, and the reconnection fee after interruption to supply shall be calculated on the 1st of each month and for the first time on the 1 of May *2010* through the application of the price adjustment formula below:

$$P = P_0 \times \left[\left(0.51 \times \frac{G}{G_0} \times \frac{N}{N_0}\right) + \left(0.11 \times \frac{M}{M_0}\right) + \left(0.09 \times \frac{IM}{IM_0} \times \left[0.60 + \left(0.40 \times \frac{C}{C_0}\right)\right]\right) + 0.29\right]$$

Where

$P_0 = 47.17$

$G_0 = 88.54$

N0 = 0.92

$M_0 = 1216$

$IM_0 = 126.91$

$C_0 = 1.2026$

Where

G Is the weighted average price of a litre of diesel fuel and coconut oil purchased in Port Vila, Luganville, Malekula and Tanna expressed in Vatu/litre and calculated as follows:

$$G = \frac{G_V L_V + G_L L_L + G_M L_M + G_T L_T + G_c L_c}{L_V + L_L + L_M + L_T + (L_C \text{ x } Kpci)}$$

Where:

Gv is the average price of a litre of diesel fuel delivered to the Port Vila power stations net of any deductions, rebates or discounts whatsoever, calculated by dividing the total amount of invoices received by the Concessionaire by the corresponding amount of diesel fuel delivered during the month preceding the date of adjustment of tariffs.

Lv is the number of litres of diesel fuel consumed by the Port Vila diesel power stations during the month preceding the date of adjustment of tariffs.

G_L is the average price of a litre of diesel fuel delivered to the Luganville diesel power stations net of any deductions, rebates or discounts whatsoever, calculated by dividing the total amount of invoices received by the Concessionaire by the corresponding amount of diesel fuel delivered during the month preceding the date of adjustment of tariffs.

L_L is the number of litres of diesel fuel which would have been consumed by the Luganville diesel power station during the month preceding the date of adjustment of tariffs if the power generation had been entirely produced by diesel generators, calculated as follows:

$$L_L = (Csg/MVg) \times (Eh + Ed)$$

Where:

Csg and Mvg represent the specific consumption of diesel oil (in grams/ kWh) and the density of diesel fuel (in grams/litre) respectively as defined in section 18 of the addendum date the 03rd March 1995 to the Concession Contract of Luganville.

Eh is the energy produced by the hydroelectric power station (in kWh) as defined in the same section 18, during the month preceding the date of adjustment of tariffs.

Ed is the energy produced by the diesel power station in Luganville (in kWh) during the month preceding the date of adjustment of tariffs.

Gm is the average price of a litre of diesel fuel delivered to the Malakula power station net of any deductions, rebates or discounts whatsoever, calculated by dividing the total amount of invoices received by the Concessionaire by the corresponding amount of diesel fuel delivered during the month preceding the date of adjustment of tariffs.

Lm is the number of litres of diesel fuel consumed by the Malakula diesel power station during the month preceding the date of adjustment of tariffs.

Gt is the average price of diesel fuel delivered to the Tanna power station net of any deductions, rebates or discounts whatsoever, calculated by dividing the total amount of invoices received by the Concessionaire by the corresponding amount of diesel delivered during the month preceding the date of adjustment of tariffs.

Lt is the number of litres of diesel fuel consumed by the Tanna diesel power station during the month preceding the date of adjustment of tariffs.

Gc is the average price of a litre of coconut oil delivered to the Concessionaire power stations net of any deductions, rebates or discounts whatsoever, calculated by dividing the total amount of invoices, as defined in Section 3, receive by the Concessionaire by the corresponding amount of coconut oil delivered during the month preceding the date of adjustment of tariffs.

Lc is the number of litres of coconut oil consumed by the Port Vila diesel power station during the month preceding the date of adjustment of tariffs.

Kpci represents the ratio of calorific value between diesel oil coconut oil and is used to convert the number of litres of coconut oil into equivalent litres of diesel oil.

In the event the Gv, G_L, Gm, Gt or Gc should be zero, the value for the previous month shall be used.

N = is the average proportion of power generated by diesel, hydro and coconut oil. (After the concession contract for Luganville expires at the end of 2010, N will only include diesel and coconut oil) for the previous twelve months.

Where

$$N = \textit{Average for previous twelve months of } \left(\frac{\textit{Energy produced by diesel and copra}}{\textit{Total energy produced}}\right)$$

N_0 is set according to the five-year average forecast level of N.

Following a natural disaster that causes significant damage to a renewable electricity generation source the Government and the Concessionaire may agree temporarily to adjust N for a specified period of time, depending on the impact on generation capability.

M = is the average of the daily wage for a single male not receiving board or lodging in Port Vila at Ifira Wharf and Stevedoring, classified as an "inexperienced labourer" and the classification "P02" with the Public Service Commission of the Vanuatu Government for the previous month.

IM = is the average of the indices "Matériel" (equipment) published by the "Journel Officiel" (Official Gazette) for the first of the two months preceding the tariff adjustment.

C = is the average of the daily currency exchange rates for the month preceding the date of adjustment of tariffs, as published by the Banque d'Hawaii in the column "selling rate" for the Pacific Franc (XPF or CFP) to Vatu (expressed in Vatu/XPF)

In the event that a certain indices should no longer be published or available, or no longer be representative of variations in economic conditions for which there are used, the Concessionaire and the Grantor shall define replacement indices by common accord.

In calculating the base price P, each variable shall be rounded off to the fourth decimal and the price **P** thus calculated shall be rounded off to 2 decimals.

SECTION 3 – COCONUT OIL PRICE

The price of coconut oil for the purposes of Section 2 shall be deemed to be the lesser of:

a) The Actual Price paid by the Concessionaire therefor; or

b) Gv as defined above converted to the equivalent volume of coconut oil in accordance with Kpci

The Actual Price shall be:

a) the net price after all deductions, rebates and discounts whatsoever; or

b) when the coconut oil is purchased from a person who:

   i. has not produced the coconut oil; and

   ii. is a person in whom the Concessionaire has a direct or indirect financial interest,

   the net price after deductions, rebates and discounts whatsoever as paid by that person; or

c) when the coconut oil is purchased from a person who:

   i. has produced the coconut oil; and

   ii. is a person in whom the Concessionaire has a direct or indirect financial interest,

such CIF price as may reasonably have been obtained from an alternative supplier.

SECTION 4 – REVISION OF THE REFERENCE PRICE AND PRICE ADJUSTMENT FORMULA

(added to Section 7.5)

- If some new event should cause a major variation in the costs to the Concessionaire such that a review of tariffs appears necessary to pass on the variation in cost due to changes in demand in an equitable manner on to the price of electricity.

SECTION 5 - TARIFF STRUCTURE

(Replaces the whole of Sept 1997 clause 7.4 and 1986 clause 5 paragraph 17amd 28)

As from 1 May 2010 the maximum tariffs applicable to the below groups are as follows:

Customer Group	Customer Description	Price per kWh	Monthly fixed charge	Security deposit
Domestic	Small Domestic Customers	Up to 60 kWh = 0.34 x P 61 to 120 kWh = 1.21 x P Over 120 kWh = 3 x P	None	70 P
A- Low Voltage	Other Low Voltage Customers	1.21 x P	5 x P per subscribed kVA	150 x P per subscribed kVA
A - Low Voltage	Business Licence Holders – Low Voltage	0.87 x P	20 x P per subscribed kVA	150 x P per subscribed kVA
A - Low Voltage	Sports Fields	1.00 x P	None	None
B -Public Lighting	Public Lighting	0.54 x P	None	None
C – High Voltage	High Voltage Users	0.70 x P	25 x P per subscribed kVA	150 x P per subscribed kVA

SECTION 6 – Uniform Tariff

In accord with section 7 clause 7.1 of the Specification to the Agreement Varying the concession between the Government of the Republic of Vanuatu and the Honorable Minister of Lands Geology Mines Energy and Rural Water Supply and Union Electrique du Vanuatu Ltd, uniform tariffs must be applied to all users in the Port Vila and Luganville concessions.

SECTION 7 – General Conditions

Notwithstanding anything elsewhere contained in this agreement or the concession, this agreement shall be translated into French, but should a dispute arise only the English text of this agreement and of the Concession shall apply as evidence.

SECTION 7 - COMMENCEMENT

This Agreement shall take effect on the day of 2010

IN WITNESS WHEREOF the parties have hereunto set their hands and affixed their seals at Port Vila this day of 2010.

SIGNED SEALED AND DELIVERED for and on behalf of the GOVERNMENT OF THE REPUBLIC OF VANUATU by its PRIME MINISTER THE HONOURABLE Edward NIPAKE NATAPEI acting in accordance with the previous GOVERNMENT resolution of the Council of Ministers:

…….. in the presence of: ……

PRIME MINISTER WITNESS:

SIGNED SEALED AND DELIVERED by the HONOURABLE Paul TELUKLUK, Minister of Lands Geology Mines and Water Resources and also being the Minister responsible for Power:

…….. in the presence of: ……

THE GRANTOR WITNESS:

SIGNED SEALED AND DELIVERED for and on behalf of UNION ELECTRIQUE DU VANUATU LIMITED by its duly authorized Managing Director Mr Philippe MEHRENBERGER:

…… in the presence of: ……..

THE CONCESSIONAIRE WITNESS:

Appendix A: Summary of assumptions in URA's decision

Type	Concession	Metric	Assumption
Demand Forecast			
Demand Forecast	All	kWh demand growth annual growth rate	2010 = 4.6% 2011-2014 = 4.0%
Demand Forecast	All	kVA demand annual growth rate 2010 to 2014	Same as kWh growth rate
Demand Forecast	All	Revenue growth from COS PHI 2010 to 2014	0%
Demand Forecast	All	Revenue from Prime de Transfo annual growth rate 2010 to 2014	Port Vila = 0.36% Luganville = 2.07%
Generation Forecast			
Generation Forecast	Port Vila	Wind generation 2010-2011	4,600,000 kWh
Generation Forecast	Port Vila	Wind generation 2012-2014	6,600,000 kWh
Generation Forecast	Port Vila	Diesel plant fuel efficiency	0.259 litres per kWh.
Generation Forecast	Port Vila	Diesel price 2010 - 2014	85 VUV per litre
Generation Forecast	Port Vila	Port Vila Annual Coprah consumption 2010 to 2014	2010 : 750 000 litres 2011 : 1 400 000 litres 2012 : 2,500,000 litres
Generation Forecast	Port Vila	Copra fuel efficiency	0.294 litres per kWh.
Generation Forecast	Port Vila	Copra price 2010 - 2014	100 VUV per litre
Generation Forecast	Port Vila	Monthly system losses (kWh sold / kWh produced)	Same as 2009
Generation Forecast	Luganville	Annual hydro generation 2010 to 2014	5,614,000 kWh per annum
Generation Forecast	Luganville	Price of lubricant oil (used in Sarakata fund savings calculation)	256.40 VUV per litre
Generation Forecast	Luganville	Diesel plant fuel efficiency	0.286 litres per kWh

Generation Forecast	Luganville	Diesel price 2010 - 2014	85 VUV per litre
Generation Forecast	Luganville	Monthly system losses (kWh sold / kWh produced)	Same as 2009
Generation Forecast	Malekula	Copra plant fuel efficiency	0.414 litres per kWh
Generation Forecast	Malekula	Copra consumption	2010: 215,000 litres 2011: 224,000 litres 2012: 235,002 litres 2013: 238,500 litres 2014: 246,500 litres
Generation Forecast	Malekula	Copra price 2010 - 2014	100 VUV per litre
Generation Forecast	Malekula	Monthly system losses (kWh sold / kWh produced)	Same as 2009
Generation Forecast - Tanna	Tanna	Diesel plant fuel efficiency	0.364 litres per kWh.
Generation Forecast - Tanna	Tanna	Diesel price	Port Vila price plus 20.5 VUV per litre
Generation Forecast - Tanna	Tanna	Monthly system losses (kWh sold / kWh produced)	Same as 2009
Cost Forecast			
Cost Forecasts	Port Vila	Staff Cost 2010- 2014	Increase 2.4% over this period
Cost Forecasts	Luganville	Staff Cost 2010- 2014	Increase 3.6%
Cost Forecasts	Luganville	Sarakata savings calculation	Theoretical diesel & lubricant cost based on Sarakata savings formula added to fuel cost for Luganville. 10m removed from staff cost for Luganville. 6m + 4m removed from Goods & Other costs for Luganville
Cost Forecasts	Malekula	Staff Cost 2010- 2014	Decrease 1.7%
Cost Forecasts	Tanna	Staff Cost 2010- 2014	Increase 3.1%
Cost Forecasts	All	Other Costs 2010- 2014	Change in average cost per kWh, 2006-2009 to 2010-2014

Global Efficiencies	All	Cost savings per year	2010 116,849,424 2011 162,180,369 2012 188,271,784 2013 238,722,048 2014 254,773,664 Total 960,797,289
Adjustment for Wind Farm savings	All	Annual adjustment for Wind Farm savings, to be applied 2010-2014	4,882,399
Reasonable Return			
Reasonable Return	All	Nominal risk free rate	3.43%
Reasonable Return	All	Market risk premium	5.00%
Reasonable Return	All	Country Risk Premium	3.00%
Reasonable Return	All	Gearing	50%
Reasonable Return	All	Equity proportion	50%
Reasonable Return	All	Inflation rate	3.00%
Reasonable Return	All	Equity beta	0.8
Reasonable Return	All	Debt risk premium	5.0%

Appendix B: List of Submissions

B.1 UNELCO's Submission

ELECTRICITY DEMAND

UNELCO accept the URA assumptions on overall electricity demand growth whereas the proposed rates are higher than its own forecasts around 3.2 % over the next period of 5 years.

As it can be assessed from the last ten years figures, the rates of growth are very volatile in Vanuatu (from –3.4% in 2001 to +9.63% in 2008), and are highly dependent on the economic health of the countries in the region, in particular Australian and New Zealand, aid donors inflows, political stability, without mentioning natural disasters such as cyclones, earthquakes.

UNELCO requests that through an addendum, the article 7.5 of the variation contract of Concession of Port-Vila dated 27th December 1997 by modified so that limits in the rate of growth be set above and under which a tariff review might be requested by the Concessionaire.

REASONABLE RETURN

I- The Inflation Rate

Having regard to the following factors:

1 - Indicators published by UNICEF (as shown on the table below) which clearly indicates that an average inflation rate between 1990 and 2008 was 3 per cent.

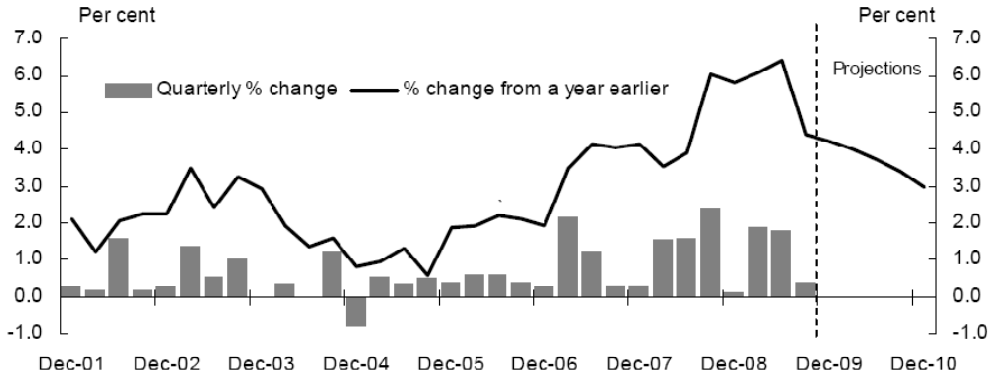
Indicateurs Economiques	Haut de la page
RNB par habitant (dollars É.-U.), 2008	2330
Taux annuel moyen de croissance du PIB (%), 1970–1990	1.1
Taux annuel moyen de croissance du PIB (%), 1990–2008	-0.2
Taux annuel moyen d'inflation (%), 1990–2008	3

2 - On the 2010 Budget of Vanuatu, on Volume 1 of the «Fiscal Strategy Report», it is clearly specified that the expected inflation rate for 2010 is 3 per cent.

"As a consequence of the world economic recession, global oil and food prices are forecast to remain well below their highs that occurred around the middle of 2008. As a result, inflation is expected to ease over the projection period from 5.8 per cent in 2008 to 4.5 per cent in 2009 and to 3.0 per cent in 2010."

On page 19 of the same document, there is a statistical chart of the inflation rate since 2001 which shows the exceptionality of the inflation rate from 2008 to 2009 and the expected Government rate of 3 per cent.

Chart 4: Inflation



Source: National Statistics Office, Reserve Bank of Vanuatu.

The increase rate of the demand of energy of 4.6 per cent proposed by the URA is also to be considered. This rate is based on the GDP historical development as well as the expected reduction of energy tariffs which will result from this tariff review. Those are the factors which contribute to the reduction of inflation, as indicated by the report on the Budget of Vanuatu.

The position of UNELCO as to the inflation rate to be adopted for the calculation of the "reasonable return" by the method of the Weighted Average Cost of Capital (WACC) is 3 per cent

II- The Gearing

The actual Gearing of UNELCO is 40 per cent. This is calculated according to the following method: net debt / (net debt + equity).

It is not coherent to impose a GEARING of a company situated in a LAC (Least Advanced Countries) with a GEARING of utility companies of a country such as Australia:

- On the one hand, UNELCO on its own could not bear a GEARING of 60 per cent (therefore, for the funding of the windmill alone by the EIB, no funding would be possible without the guarantee granted by the group).
- On the other hand, though it is possible, being a member of the group, to borrow (subject to obtaining a guarantee), UNELCO must seek external funding. So the higher is the gearing, the higher is the risk of the exchange rate to service the loan (therefore, VATU remains a volatile currency)
- Finally, one of the prime importance to use debt leverage is the tax savings that results from the debt leverage, which is not relevant in Vanuatu.

Therefore, we consider that it is hazardous to adopt a gearing of 60 per cent which is more risky than favourable.

GEARING	2010	2011	2012	2013	2014
Capitaux (*)	1 496 481 731	1 504 805 918	1 564 032 641	1 582 929 177	1 592 216 322
Emprunts	1 157 103 796	1 081 546 171	1 005 988 546	930 430 921	854 873 296
Total	**2 653 585 527**	**2 586 352 089**	**2 570 021 187**	**2 513 360 098**	**2 447 089 618**

% Emprunts	**43,61%**	**41,82%**	**39,14%**	**37,02%**	**34,93%**

Moyenne sur les 5 années	**39,30%**
Unelco Proposal	**40%**

(*) Capitaux = Capital + Report à nouveau + Résultat
Le résultat retenu a été calculé sur la base d'un Wacc à 7,93%

The position of UNELCO remains a "Gearing" of 40 per cent.

III- Le Country Risk Premium (CRP)

With regards to the CRP calculation method, though the method used on page 24 of the "Position Paper" is in fact a recognized method, it implies however that a number of requirements must be complied with to be able to make a comparison. The « Bonds » must:

- Be denominated in the same currency (in our case in USD)
- Have the same maturity
- Have a similar liquidity to avoid trading problems
- Go through a reasonable swap on the market to prove its return reliability
- Be subject to a swap within the same markets, for example, the Eurobond Market is different to the Yankee Market which is itself different to the US 144 A Registered Market.
- Finally, the US Bonds compared must not be a Brady Bonds (Par Value of the Bonds guaranteed by the US Government).

Based on our knowledge of the current funding of Vanuatu, it appears that international aide is the main source of funding and that Vanuatu does not have an Official Rating as "Standards & Poors" or "Moodys". Moreover, it was impossible for us to find « Vanuatu Bonds » on the markets. The use of the method referred to previously leaves too many questions unsolved for the method to be reliable.

In other respects, the result obtained by this method is 1.05 per cent which corresponds to a rate of a country like Cayman Islands (43 000 $ per capita) or Macau (24 300 $ per capita) or Saudi Arabia (13 800 $ per capita), those are countries with a high rating and an economy of abundance.

Therefore, we think that an analogy approach of the Vanuatu CRP with either that neighbouring countries or countries having closest analyses to Vanuatu is the appropriate approach.

According to the latest published lists of CRP (Source: Damodaran), the « neighbouring » countries of Vanuatu in the Pacific have the following CRP:

- Fiji Islands: 6.75 per cent,
- Papua New Guinea: 6.75 per cent.

After reviewing the different risks studies, whether published by ONDD (ratings available on www.ondd.be) or extract from Global Insight (analysis below), it appears that Fiji Islands seem to be more risky than Vanuatu; Papua new Guinea seems to be closest to Vanuatu in terms of risks :

Six-Factor Country Risk - Vanuatu		
Risk	**Score**	**Description**
Political	3.25	Significant
Economic	3.75	High
Legal	2.75	Medium
Tax	3.00	Significant
Operational	3.50	High
Security	2.25	Moderate
Overall	**3.22**	**Significant**
12-Month Rating Trend		**Stable Trend**

Note: 1 = minimum risk, 5 = maximum risk. Ratings form part of enhanced Country Analysis & Forecast suite of services. Subscribers can access full table and methodology here.

Six-Factor Country Risk - Fiji		
Risk	**Score**	**Description**
Political	4.00	Very High
Economic	4.00	Very High
Legal	4.00	Very High
Tax	3.25	Significant
Operational	3.50	High
Security	3.00	Significant
Overall	**3.76**	**High**
12-Month Rating Trend		**Negative Trend**

Note: 1 = minimum risk, 5 = maximum risk. Ratings form part of enhanced Country Analysis & Forecast suite of services. Subscribers can access full table and methodology here.

Six-Factor Country Risk - Papua New Guinea		
Risk	**Score**	**Description**
Political	3.50	High
Economic	3.50	High
Legal	2.75	Medium
Tax	3.00	Significant
Operational	3.50	High
Security	3.75	High
Overall	**3.35**	**Significant**
12-Month Rating Trend		**Stable Trend**

Note: 1 = minimum risk, 5 = maximum risk. Ratings form part of enhanced Country Analysis & Forecast suite of services. Subscribers can access full table and methodology here.

As a complementary approach, and as Vanuatu does not have any sovereign ratings, BRED VANUATU for example, is relying on ONDD - the Belgian Export credit agency also used by the World Bank.

This system appreciates the country risk based on 7 criterions for which you will find below the ratings for Vanuatu

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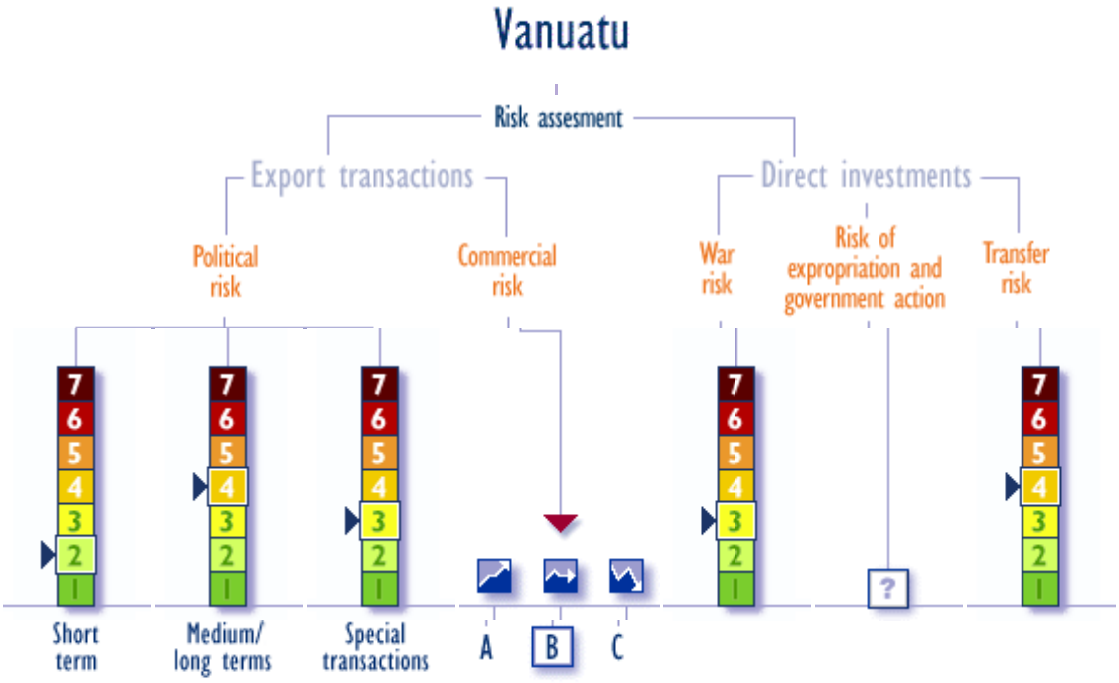


We have then correlated these criterions with those of other countries with a country risk rating.
The results are summarised as enclosed:

	political risk			com. Risk	Direct investments		Country risk
	short term	long term	special transaction		War risk	transfert	
Vanuatu	2	4	3	B	3	4	NA
Papua New Guinea	2	5	3	B	3	4	5,25%
Philippines	1	4	2	B	2	4	5,25%
Turkey	3	4	3	C	2	4	5,25%
Uruguay	3	4	3	B	2	3	5,25%

Risk assessment equal or inferior

This table confirms that the country risk of Vanuatu is closer to 5-6 per cent than to 2 per cent as proposed by the URA which corresponds to countries such as: Bahrain, Oman (1.58%), Greece (1.58%), Poland (1.58%), South Africa (1.80%) Thailand (2.40%), Hungary (2.40%), Lithuania (2.40%), Mexico (2.40%) etc…

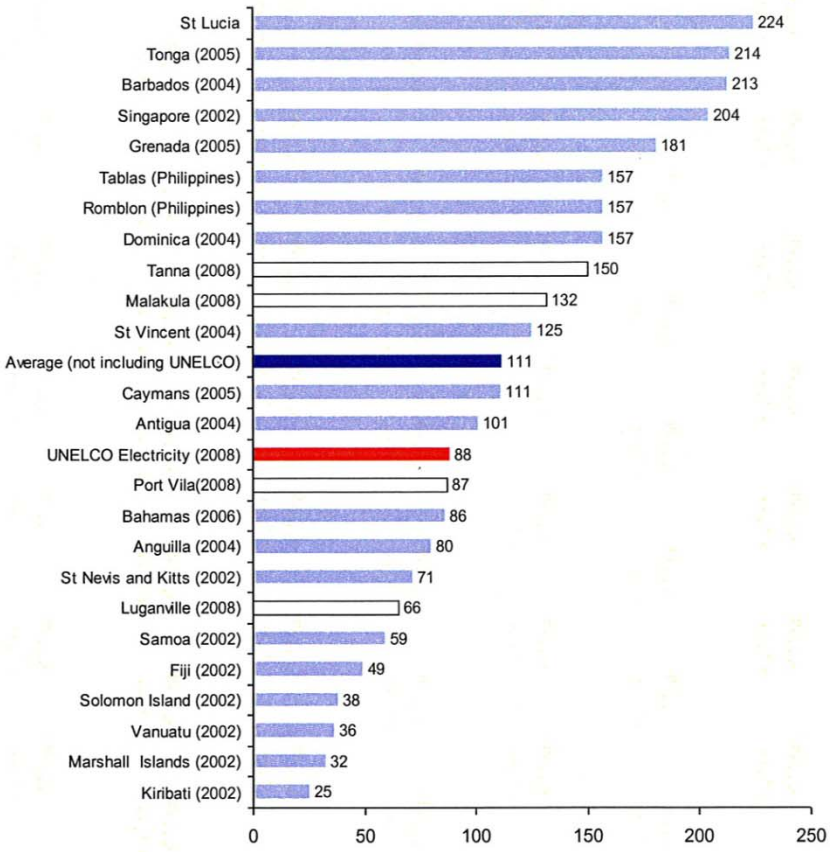
Our position is that a Country Risk Premium of 5.25 per cent covers well the risks inherent to Vanuatu and is coherent to neighbouring countries

Summary of the URA's and UNELCO's positions:

	URA		**UNELCO**
Nominal risk free rate	5,14%		3,42%
Market risk premium	5,00%		5,00%
Country risk premium	2,00%		5,25%
Market rate of return	12,14%		13,67%
Corporate tax rate	0,00%		0,00%
Gearing	60,00%		40,00%
Equity proportion	40,00%		60,00%
Rate of imputation credit utilization			
Inflation rate	4,70%		3,00%
Return on equity calculations			
Nominal risk free rate	5,14%		3,42%
Market risk premium	5,00%		5,00%
Country risk premium	2,00%		5,25%
Market rate of return	12,14%		13,67%
Asset beta	0		0
Debt Beta	0		0
Equity beta	1,00		1,00
Return on equity (before imputation)	***12,14%***		***13,67%***
Return on debt calculations			
Risk premium	4,00%		4,00%
Return on debt (pre-tax)	***9,14%***		***7,42%***
Post-tax nominal WACC	***10,34%***		***11,17%***
Post tax real	***5,39%***		***7,93%***
Pre-tax nominal	***10,34%***		***11,17%***
Pre-tax real	***5,39%***		***7,93%***

STAFF COSTS

Figure 5.7.1.1: Connection per Staff Benchmarking



Source: Data from UNELCO and audited financial reports for other utilities

The average indicator "Connection per staff benchmarking" used in the URA position to evaluate UNELCO's labour productivity in figure 5-7-1-1 is not relevant for the following reasons:

- Most of the ratios used are between years 2002 and 2005, excepted for the Bahamas (2006), and the average ratio is compared with the UNELCO's ratio of 2008.

- For some of the indicators among the highest which raises up, no years are indicated for St Lucia, Tablas and Romblon in the Philippines.

- Concerning the indicators for Tablas, Romblon and Dominica, they are identical, UNELCO is entitled to consider that these indicators are doubtful, and have a drawback effect on the calculation of the average.

- Using data from the Singapore system is not relevant neither, because of the size of the system it self which is more like huge Asian city like Hong Kong or Taipei, this will be demonstrated later.

- UNELCO considers that the systems, St Lucia, Singapore, Tablas, and Romblon should not be used for the calculation of the average value, and then the calculated average value to be considered by the URA should be 99 instead of 111.

UNELCO does not agree on the indicator 88 connections per staff, for the year 2008, this number have to be corrected of the water activities.

UNELCO considers that the staff required for the electricity operations is the total staff for 2008, 155, less the technical staff for the water operations, and less an estimation of the commercial, accountant, and electricity shared staff, like the engineering department or the electrical and automation department.

UNELCO proposes the following method to calculate the sharing of staff between the two activities:

- For the overhead staff, General Management, all the staff is considered to be dedicated to the electricity activity.

- For each activity the direct staff is taken into account.

- For the sharing of the administrative staff, we consider a corrective factor based on the ratio of each respective number of connections, for water and for electricity, on the total connections, water plus electricity.

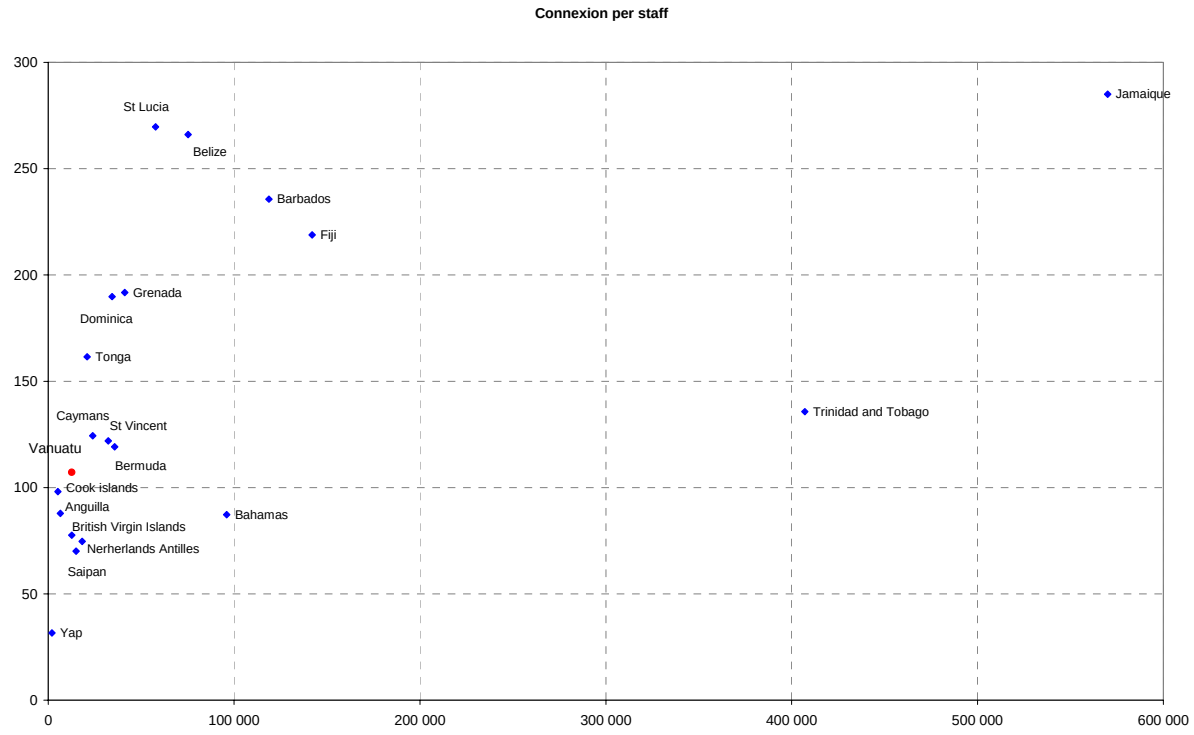
UNELCO	2009	2008
Electricity connection	12 645	12149
Water connection	6 416	4538
Ratio Electricity	0.66	0.73
Ratio Water	0.34	0.27
(1) Electricity staff	78	81
Water staff	14	15
Administrative staff	51	53
(2) Adm Electricity	34	39
(3) General Mgt	6	5
Staff to electricity (1+2+3)	118	125
Connection per staff electricity	**107**	**96**

UNELCO does not agree either on the URA position which tries to demonstrate that there is no scale effect on the connection per staff indicator.

Most of the systems considered in the benchmark are quite larger than Vanuatu and with a higher density of connections per km of grid, St Lucia, Singapore.

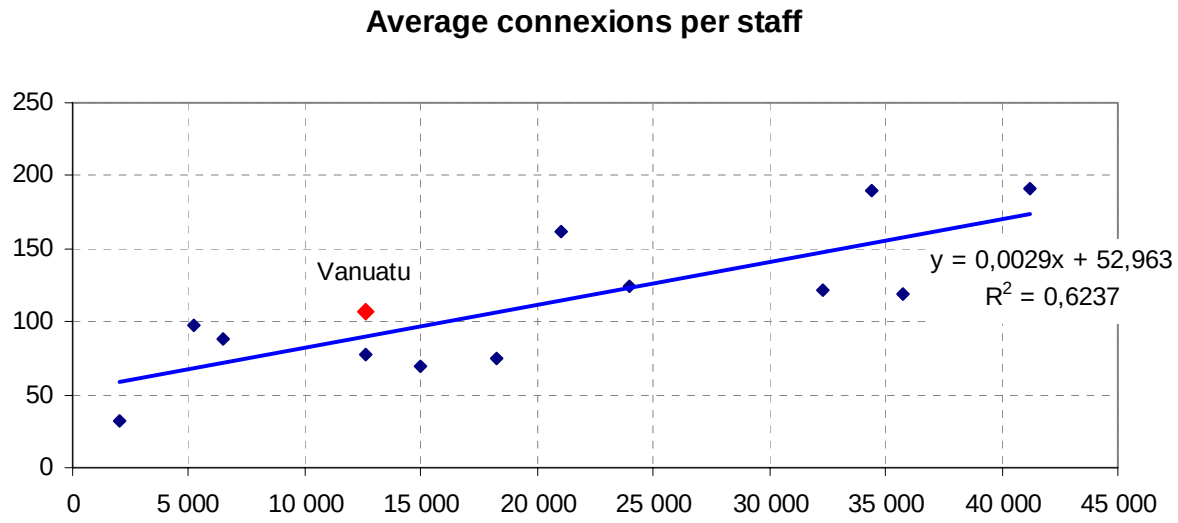
UNELCO, based on the 2008 annual reports of the systems used for the URA benchmark, demonstrates that there is a very strong correlation between the connection per staff indicator and the scale of the system.

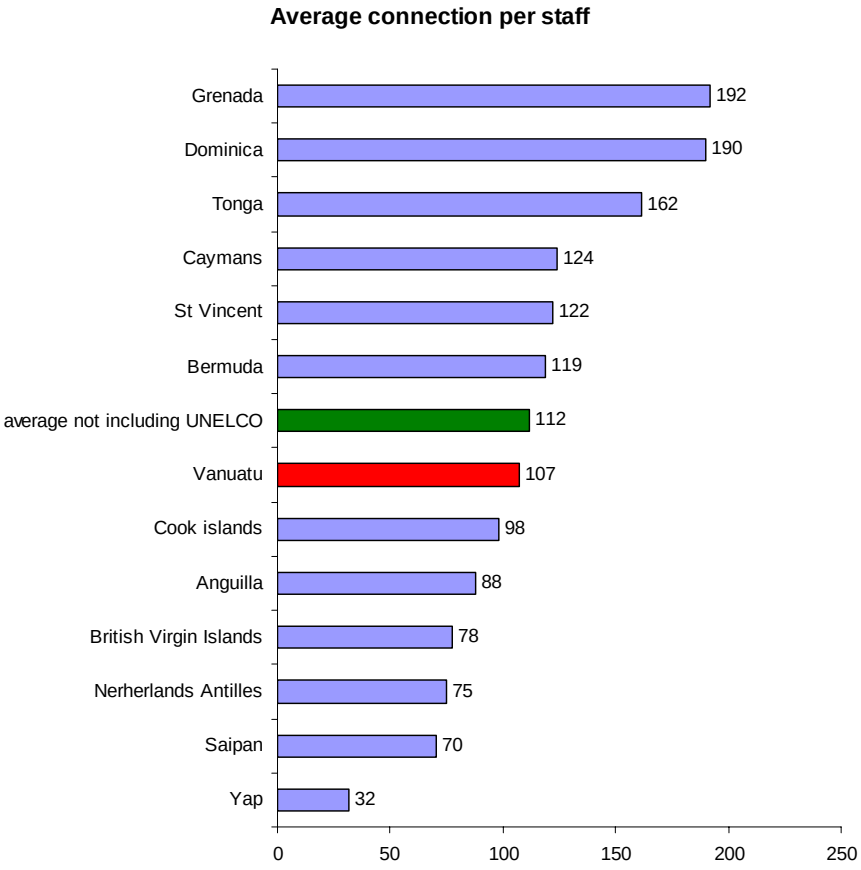
2008 Data



Pays	Nb clients	Connexions per staff
Yap	2 054	32
Cook islands	5 200	98
Anguilla	6 500	88
British Virgin Islands	12 645	78
Vanuatu	12 645	107
Saipan	15 000	70
Netherlands Antilles	18 289	75
Tonga	21 000	162
Caymans	24 000	124
St Vincent	32 320	122
Dominica	34 361	190
Bermuda	35 755	119
Grenada	41 222	192

Considering the "off scale" systems like Trinidad, Tobago, Jamaica and the Bahamas, the correlation curve is quite different than the figure 5.7.1.2 used by the URA.


Average connexions per staff
250
200
150
100
50
0
0
5 000
10 000
15 000
20 000
25 000
30 000
35 000
40 000
45 000
Vanuatu
y = 0,0029x + 52,963
R2 = 0,6237


Average connection per staff
Grenada 192
Dominica 190
Tonga 162
Caymans 124
St Vincent 122
Bermuda 119
average not including UNELCO 112
Vanuatu 107
Cook islands 98
Anguilla 88
British Virgin Islands 78
Nerherlands Antilles 75
Saipan 70
Yap 32
0
50
100
150
200
250

In conclusion on this point and considering what has been develop and stated above, UNELCO does not agree with the position of the URA.

The conclusions of the URA on UNELCO productivity are not coherent with the size of the Vanuatu electrical system that needs to be compared with similar systems.

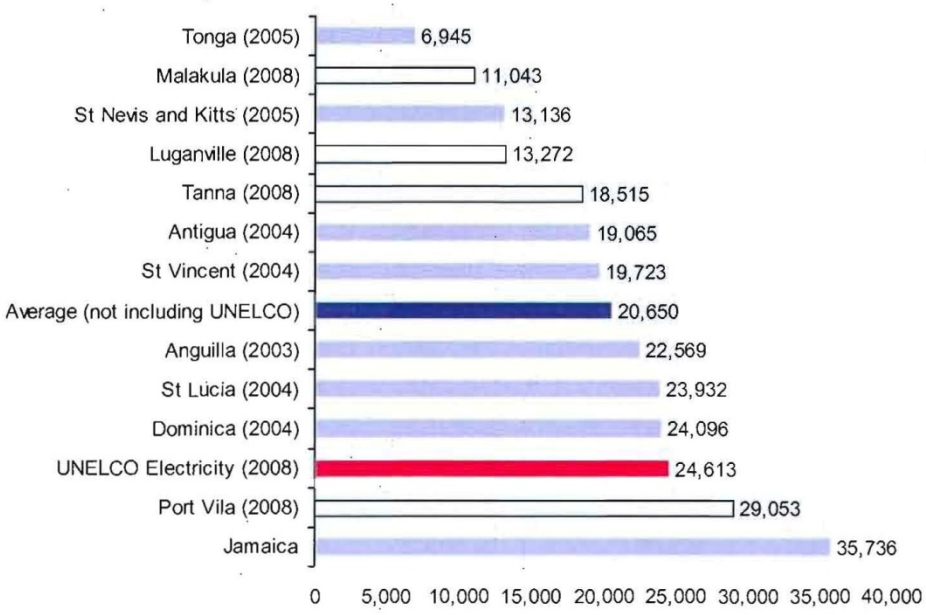
The UNELCO's productivity is good and in line with other comparable systems.

This productivity is even recognized in the Vanuatu Economic Report made in 2009 by the Asian Development Bank and AUSAID which mentioned in page 106, *"UNELCO scores well on quality of service indicators, labour productivity, and levels of system loss compared with other Pacific-based utilities".*

AVERAGE STAFF COST

The following figure is used by the URA to demonstrate that the UNELCO's average staff cost are high.

Figure 5.7.1.3: Average Cost per staff benchmarking



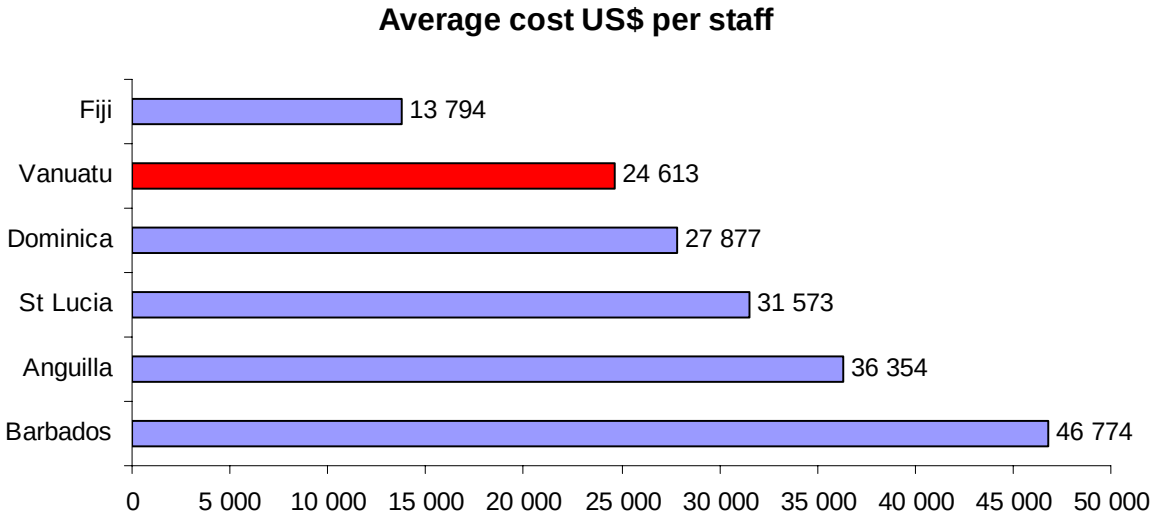
Source: Data from UNELCO and audited financial reports for other utilities

As above stated, the average indicator "Cost per staff benchmarking" used by the URA to evaluate UNELCO's costs in figure 5-7-1-3 is not relevant.

In fact most of the ratios used in the figure are taken from the period between years 2003 and 2005, excepted for Jamaica for which no year is specified, and this average is compared with the UNELCO's figure for 2008.

In 2004 the UNELCO cost per staff was 18.760 US$, with an exchange rate of 109 vatu = 1 US $, which is inferior to the average of the benchmark.

Based on available ratios from 2008 annual reports of some of the systems referenced in the URA benchmark UNELCO updated the chart, which shows that UNELCO's average cost per staff is inferior to the average of the other systems.



In conclusion on this point, considering all the arguments developed before, UNELCO cannot accept the position which consists in comparing data which are not from the same year.

UNELCO considers that the position of the URA, asking for a global efficiency of 30 % on the staff costs in three years, is not justified.

UNELCO would like to make additional comments on the URA position:

The position of the URA requesting a 30 % staff costs reduction over the next three years, linked with an average growth of the demand of 4%, is absolutely not realistic.

According to the Employment Act of the Republic Of Vanuatu, to achieve such target, UNELCO will have to dismiss 46 staff (4 managers and 42 agents) in three years and keep the rest of the staff at the same wages, or dismiss all the staff and re-employ them at a lower salary to reach 30 % of gain.

The wages policy of UNELCO is in direct relation with the GDF-SUEZ standards for the quality of service, the customer service, the safety policy and the level of competences required to operate the existing installations and develop the renewable energy, bio fuel, hydroelectricity and wind energy.

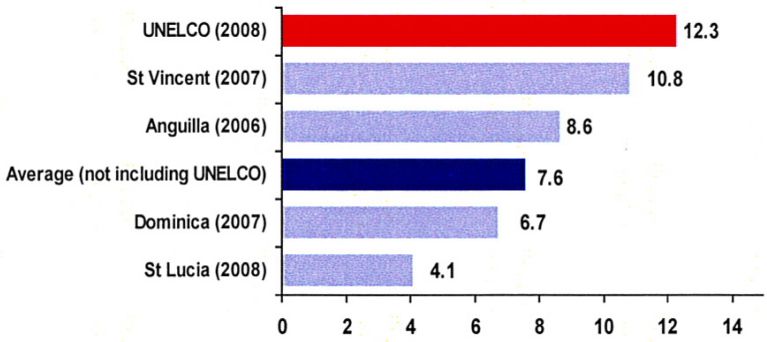
In 2005, in relationship with the Labour Department of the Government of Vanuatu, UNELCO launched a program to develop the competences of the Ni-Vanuatu staff, in operation and management.

From year 2008 to 2009 the outcome of this program starts to show some result, like the staff reduction, 155 in 2008 to 149 in 2009.

For the next five year, UNELCO intends to pursue this policy and the expected gains will be integrated in UNELCO's proposal of global efficiency.

OTHER OPERATING COSTS

Figure 5.7.2.1: Other Operating Expenses Benchmarking (US cents/kWh)



Source: Data from UNELCO and audited financial reports for other utilities

The URA position for calculating the "other operating costs" efficiency gain is to compare UNELCO figures for year 2008 with a benchmarking of systems located in the Caribbean, with years 2006 and 2007, Figure 5.7.2.1.

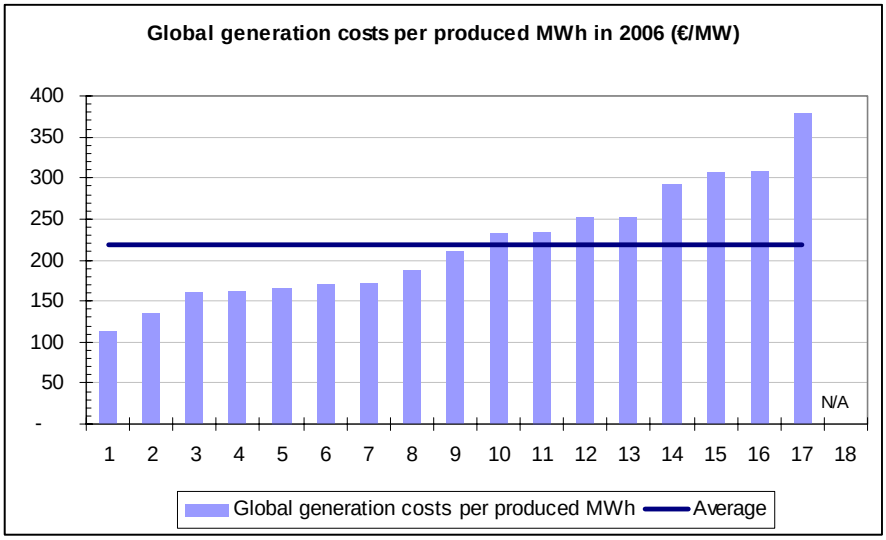
As indicated for the previous figures, the benchmarking between UNELCO and other much bigger systems essentially from the Caribbean Sea, on productivity and cost efficiency, with ratios from different years is not relevant.

We tried to obtain ratios from the other systems' annual reports, but the figures we found were significantly different from those of the benchmarking. For St Lucia, for example, in 2008 it is 10.2 US cents/kWh instead of 4.1 in the figure 5.7.2.1.

Based on this benchmarking, the URA estimates that the reasonable efficiency gains on the "Other Operating Costs" should be of 38.4% over the next three years. According to all the points developed before, UNELCO considers that the position of the URA, asking for a global efficiency of 38.4 % on the other operating costs in three years, is not justified.

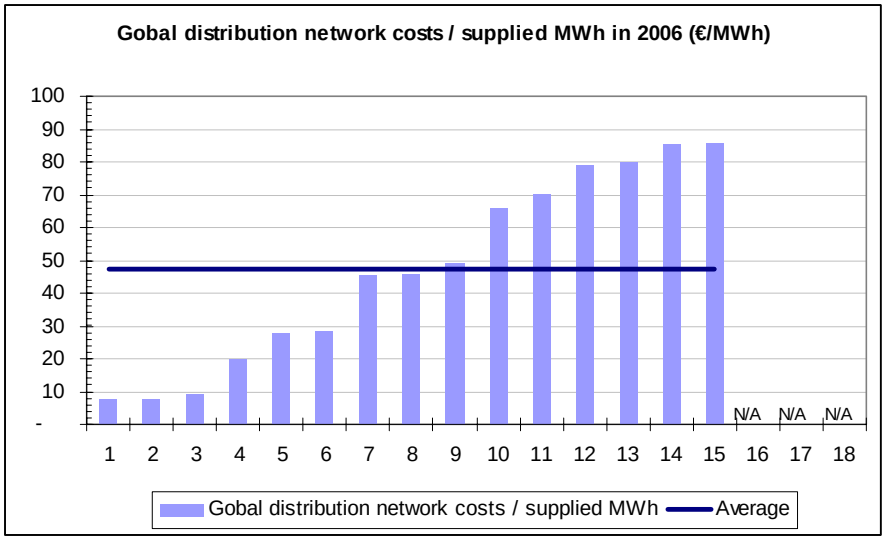
From the NESIS benchmark (Network of Expert of Small Islands System) realised in 2006, specifically launched to compare isolated systems of similar sizes, and over the world, the average total cost for the energy was determined at 32.68 US cents/kWh. Bases on 2006 UNELCO's financial statements, the cost of energy for 2006 was 33.75 US cents/kWh which remains very close to the average of the NESIS benchmark.

Benchmarked islands	Geographical area covered (km²)	Population of the area (2006 data)	Density (inhab./km²)	Largest city
Efate	628	45 000	72	Port-Vila
Rodrigues	109	40 000	367	Port Mathurin
La Gomera	370	21 952	59	San Sebastian
Faial	170	15 063	89	Horta
Pico	451	14 806	33	Madalena
Moorea	132	14 164	107	N/A
Lifou	1 207	10 320	9	Wé
Wallis	78	10 071	129	Mata-Utu
Sao Jorge	246	9 674	39	Velas
St Barthélemy	24	8 700	363	Gustavia
BoraBora	38	7 395	195	BoraBora
Santa Maria	97	5 578	58	Vila do Porto
St Pierre	26	5 509	212	N/A
Graciosa	61	4 780	78	Santa Cruz Da Graciosa
Favignana	19	4 560	240	Favignana
PortoSanto	42	4 474	107	Vila Baleira
Flores	142	3 995	28	Santa Cruz
Isola del Giglio	24	1 413	59	N/A



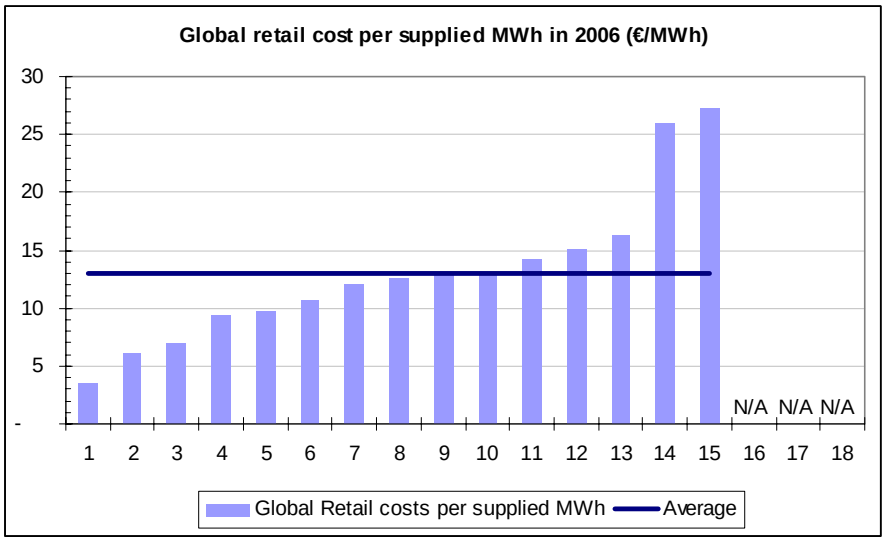
2006 Statistics

Criteria	Value (€/MWh)
Min	113.2
Avg	219.5
Max	378.2



2006 Statistics

Criteria	Value (€/MWh)
Min	7.6
Avg	47.2
Max	86.0



2006 Statistics

Criteria	Value (€/MWh)
Min	3.5
Avg	13.1
Max	27.2

UNELCO would like to make an additional comment on the URA position:

The stock of goods, which is an important component of the "Other Operating Costs", for 2009 is 271 millions vatu's and the average over the last five years, is 265 millions vatu's.

This stock is essentially from imported goods, because nothing is manufactured in Vanuatu for the UNELCO activity, with equipments for the grid, imported from New Zealand, Europe or Australia, and spare parts for the production from USA, England, Australia and Germany etc.

This stock, compared to the other systems of the benchmarking, mainly located in the Caribbean Sea, close to United States, is proportionally more expensive due mainly to the cost of freight and the shipping delays.

Another point which makes the cost of imported goods higher is the cost of stevedoring which is pointed out in the Asian Development Bank and AUSAID report of 2009 which says:

"Vanuatu's business environment and competitiveness is influenced by a range of other factors, such as following:

° *The port of Port-Vila is highly inefficient. Stevedoring is provided under a 50-year monopoly arrangement. The cost of clearing a 20-foot container is $1.000, the highest in the Pacific and five times the price in Port-Moresby, Papua New Guinea (footnote 22). Port-Vila also has the slowest turnaround time in the Pacific, at 17 days."*

According to all these factors, even if we suppose that the cost of imported goods will remain stable over the next three years, UNELCO will have to maintain electrical networks, power plants, cars and heavy equipment in its four concessions, with a stock of goods of only 168 millions vatu. This is not realistic.

However UNELCO is working on the reduction of his operating costs. Among the actions launched, development of long term partnership with local subcontractors for example for the grid maintenance and rely more on the capacity of the Group GDF-SUEZ for provide goods and services etc.

For the next five year, UNELCO intend to pursue this policy of cost cutting and the expected gains will be integrated in UNELCO's proposal of global efficiency.

IMPACT OF WINDFARM SAVINGS

The calculation by the URA of the Wind farm savings shows a total net benefit of 228.2 millions vatu, which should be integrated into the tariffs for the next five years through an annual reduction of 45.6 millions vatu.

During the last meeting, both parties analysed the method of calculation for these savings and found that the savings were calculated based on the estimated turnover of the wind farm production and not on the fuel avoided cost.

URA and UNELCO agreed to review the calculation on the fuel costs savings, the result, calculated by URA is 121 millions vatu's over the last three years.

WIND FUEL SAVINGS

2007	7.962.253
2008	17.383.235
2009	95.656.662
Total	**121.002.150**

UNELCO made a summary of all its operation costs since the beginning of the project, including the field surveys in 2003 and 2005. (Preliminaries studies made by EEC and Vergnet Pacific between 2003 and 2007 are not included in these costs).

Operating costs

2003	552 407
2004	0
2005	531.810
2006	0
2007	12.464.554
2008	80.839.425
2009	111.384.245
Total	**205.772.441**

In order to include in the tariffs the extra costs bared by UNELCO over the last 7 years to implement this renewable project, a total increase of 84.770.291 is requested over the next 5 years period, which means an annual increase for the period 2010-2014 of 16.954.058 VUV.

UNELCO GLOBAL EFFICIENCY SAVING

UNELCO's proposed gains compared to the base scenario (with a 3.2 % average demand forecast) summarized as follows:

GLOBAL SAVINGS UNELCO	2010	2011	2012	2013	2014	Total
FUEL EFFICENCY	-10 865 424	-33 179 365	-33 043 067	-34 206 846	-35 407 864	**-146 702 566**
OTHERS COST	- 105 836 601	- 128 246 050	- 153 767 915	- 202 080 845	- 216 312 240	**- 806 243 651**
WIND COST	16 954 058	16 954 058	16 954 058	16 954 058	16 954 058	**84 770 290**
Savings Unelco	**-99 747 967**	**-144 471 357**	**-169 856 924**	**-219 333 633**	**-234 766 046**	**-868 175 927**

UNELCO's proposed global savings at the URA estimated demand 4.6/4 % growth forecast.

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GLOBAL SAVINGS UNELCO	2010	2011	2012	2013	2014	Total
GLOBAL EFFICIENCY	-116 849 424	-162 180 369	-188 271 784	-238 722 048	-254 773 664	**-960 797 288**
WIND COST	16 954 058	16 954 058	16 954 058	16 954 058	16 954 058	**84 770 290**
TOTAL	**-99 895 366**	**-145 226 311**	**-171 317 726**	**-221 767 990**	**-237 819 606**	**-876 026 998**

The split of efficiencies are as follows

	UNELCO proposal
FUEL	154 553 637
STAFF	154 707 344
OTHER	651 536 307
WIND COST	- 84 770 290
	876 026 998

B.2 UNELCO's Additional Submission

Addition to our submission paper dated 25th march 2010, réf: n°278:10/U/PME/aw.

PRICE STRUCTURE

In addition to our proposed reduction in rates for the first 60 kWh bracket, we must take advantage of the price review to, on the one hand, ease the burden of passing from the Small Domestic Customer (SDC) category to the Other Domestic Customer (ODC) category for consumption in excess of 120 kWh per month, and on the other hand naturally encourage the transition to ODC usage for those customers who use in excess of 120 kWh per month and who therefore have no reason to benefit from the low-cost bracket.

This can be achieved on the one hand by reducing the fixed premium per kVA and increasing the kWh unit price for ODC, on the other by discouraging consumption in the 3rd bracket of kWh for SDC.

UNELCO proposes to invoice this 3rd bracket at the rate of 3P.

These major changes are likely to have marked consequences on the choice of the type of consumer contract, our existing customers' consumption habits and also on the distribution by type of category of our future customers. It should be noted that in our assumptions for simulation purposes, we have taken into account a steady development in terms of demand irrespective of the category of customer.

In particular, the substantial drop in price for the first low-cost bracket, the resumption of extension work of the grid in the poorer areas on the outskirts of town, the establishment of a GPOBA (Global Partnership on Output-Based Aid) program to subsidise the service connections, the possible extension of Concessions in the rural areas, all these factors are likely to lead to a substantial increase in the number of LHC customers, upsetting the economic balance of the concession.

UNELCO would like to request that any marked increase, in number or in consumption profile, in the SDC category should give rise to a Tariff review.

INDEXATION FORMULA

UNELCO has provided the breakdown of its global savings between fuel, staff and other.

As discussed with James, the figures provided by UNELCO will be deducted from the various costs agreed upon in the base scenario with a growth of 4.6/4 %, and will be used to work out the weighting of each component of the formula in accordance with the method proposed by the URA.

With regard to developmental trends in staffing costs, and in absence of any reliable and up-dated index (the IFIRA index has not changed since July 2002), we suggest updating the staffing index by +1% in the updating formula, waiting for the Statistic office to release a pertinent index.

INTEGRATION OF WIND FARM

The URA proposal seems to go hand in hand with the UNELCO proposal, in the terms and conditions of integrating the renewable energy costs into the pricing formula.

Spreading it over a 12 month period will mean that our customers will not suffer so much from the price fluctuations associated with seasonal variations which can be quite substantial for the wind farm power generation.

Nevertheless UNELCO would like to request that in the event of a cyclone, an earthquake or major damage to one of the sections of the SARAKATA for example, the value of N be

changed immediately to reflect the suddenly deteriorating conditions of production of renewable energy.

UNELCO would also like to see a performance-based incentive scheme introduced for the promotion of renewable energy in the form of a bonus which would be calculated at the end of every year based on potential production (producible) and rated availability of the power station.

The producible and the availability would be determined by the manufacturer of the turbines on the basis of average wind conditions as measured on site and standard levels of availability. The incentive granted to UNELCO at the end of Year N could be 50% for every kilowatt hour generated over and above the rated producible and would be reflected in the rate for the following year by reducing the monthly generation levels of the Year N+1 by one twelfth.

Example:

Rated producible	: 4 600 000 kWh.
Producible in year N	: 5 240 000 kWh.
Difference	: 640 000 kWh
Incentive for Unelco in year N+1	: 320 000 kWh
Monthly impact N+1	: -26 666 kWh per month

COMMENCEMENT OF NEW PRICING

It is agreed that the new rate will become applicable with effect from the date of execution of a new Addendum, for a period of 5 years, depending on the current economic parameters at the time of execution, without retrospective effect.

COCONUT OIL AS SUBSITUTE OF DIESEL

In 2007, in partnership with the Government of Vanuatu, UNELCO undertook to modify and adapt the Tagabé power station to run on a mixture of diesel and processed coconut oil. The alteration of the machinery and setting the specifications for the processing of the oil, with assistance from the engine manufacturer M.A.N, took two years during which UNELCO encountered some serious problems in terms of oil supply.

In 2007 the initial suppliers were the Santo oil mills COPV and VCPL. Soon thereafter, compounding the quality problems, one of the oil mills ceased production. The other one raised its price from 65 vatu to over 160 vatu per litre ex-Luganville. Faced with this shortage and lack of security in terms of supply, UNELCO, still in partnership with the Government, started a pilot programme for the manufacturing of oil on site at Tagabé, using copra purchased from producers on Efate and outlying islands, such as Shepherds, Epi and Malakula. The purpose of this programme was to prove the economic viability and feasibility of an oil mill with sufficient output to satisfy a maximum of 50% of the requirements of the Tagabé power station, i.e. 15% of the consumption in the Port Vila concession. And also to prove that there was definitely a market for copra from these islands.

The results of the pilot project were found to be satisfactory in 2009 and the actual oil mill project was launched at the end of 2009 with a view to commencing production in the second half of 2010.

With regard to additional sources of supply, it was always understood that oil would come from other oil mills operating on Santo or other islands.

Regarding the purchase price of processed coconut oil, UNELCO further confirms that it will make every effort to ensure that the average price remains below or at the most equal to the substitution cost of imported diesel.

Furthermore, UNELCO would like to recall that the 30% substitution goal for the Port Vila concession continues to be a provisional objective and studies are already underway with M.A.N. to set up a generator unit running 100% on coconut oil by 2014/2015, an investment which should represent in excess of 50% substitution.

Finally, UNELCO would like to remind the Regulatory Authority that in this area, as with the wind farm, the company has taken huge risks, at the request of the Vanuatu Government, through the Minister responsible for energy at the time, the Hon. Maxime Carlot Korman, to set up a long term strategy to improve the energy self-sufficiency of the country and develop a new market for copra.

B.3 UNELCO's Additional Correspondence

Email submission to URA from Mr Philippe Mehrenberger, UNELCO (summarized) dated 16 April 2010

UNELCO updated their WACC numbers after reviewing a draft of the URA's decision.

Country Risk Premium

I will not discuss further on the Country Risk Premium – CRP -
Stating on one side state that comparison of Vanuatu to neighbour countries such as Fiji and PNG is not relevant, and on the other hand comparing Vanuatu with countries such as Kazakhstan and Croatia is baseless.

Equity Beta

On the Beta, we agree that in another environment in particular within a continent, his analysis is the right one. A relation with a public body would deserve a lesser Beta. However, Vanuatu being an archipelago with different islands and having regards to the related risks (Climatic risks such as tsunami, earthquake, cyclone and Geographic remoteness risks with regards to the supply of spare parts and raw material), we maintain that a minimum Beta of 0.9 must apply.

With regards to the correlation between the Beta and the Gearing, again, though the method may be workable within an advanced economy, the method would have no implication within an emerging economy. Further, this method takes into consideration tax savings raised from the Gearing; this is inapplicable in our case.

Gearing and Foreign Exchange

On the Gearing, we have had no reply as to the fact that the higher is the Gearing, the higher is the risk of the exchange rate.

Debt Risk Premium

Lastly, on the guarantee provided by the Group to its companies, these guarantees are limited. Further, it is to be reminded that these guarantees have a cost which comes in addition to the debt's costs. If we take the cost of the guarantee of the wind farm, we must add 1.27 percent of the risk premium of the debt's cost. If we take 6.0 percent, we obtain the following WACC:

Cost of Capital estimates	FINAL URA	FINAL UNELCO
Nominal risk free rate	3,42%	3,42%
Market risk premium	5,00%	5,00%
Country risk premium	3,00%	5,25%
Market rate of return	11,42%	13,67%
Corporate tax rate	0,00%	0,00%
Gearing	50,00%	50,00%
Equity proportion	50,00%	50,00%
Rate of imputation credit utilisation	50,00%	50,00%
Inflation rate	3,00%	3,00%
Return on equity calculations		
Nominal risk free rate	3,42%	3,42%
Market risk premium	5,00%	5,00%
Country risk premium	3,00%	5,25%
Market rate of return	11,42%	13,67%
Asset beta	0	0
Debt Beta	0	0
Equity beta	0,80	0,90
Return on equity (before imputation)	9,82%	12,65%
Return on debt calculations		
Risk premium	5,00%	6,00%
Return on debt (pre-tax)	8,42%	9,42%
Post-tax nominal WACC	9,12%	11,03%
Post tax real	5,94%	7,80%
Pre-tax nominal	9,12%	11,03%
Pre-tax real	5,94%	7,80%

Letter to Johnson Naviti, Chairperson Utilities Regulatory Authority from UNELCO dated 19 April 2010

Our ref: N° 368/10/U/YM/AC

Dear Sir,

As agreed during our last meeting, UNELCO's Board of Directors meeting today has discussed the status of the current negotiations on the tariff review between the Utilities Regulatory Authorities (URA) and UNELCO and in particular, the fact that the URA has given UNELCO no other choice but to sign the contract amendment on this tariff review.

The Board of Directors considers that the URA's demand is contrary to the terms and spirit of the Concession Agreement. Therefore, the Board would like to hereby submit a proposition to the Government which could avoid the two parties to have recourse to arbitration.

As you may be aware of, the URA and UNELCO have come on a common position regarding the operation costs. However, the reasonable return remains the point upon which there is disagreement. In particular we could not reach an agreement on the calculation of the Weighted Average Cost of Capital's (WACC).

We wish not to be controversial and we will not comment further on the WACC of a country or another. Should there be any arbitration; this issue will then be resolved accordingly.

Our proposition to you is a proposition from a long term partner of the country and a proposition from a company who has the expertise of the power generation and supply and its related constraints within Vanuatu.

Firstly, pursuant to the Concession Contracts between the Government and UNELCO, the company is responsible to invest in power generation and supply in order to guarantee a continuity of service. To be able to carry out these investments, UNELCO must have a strong financial capability because UNELCO has no grants and has no access to international aid.

UNELCO's financial capacity is only made up of the company's profit and its depreciation costs or what is called the cash flow. Having regard to the level of investments required to meet the economical growth within the next years, in particular for the renewable energies, the level of profits which the URA would like to impose on us, will not enable us to carry out these investments. Thus we will no longer be in a position to fully carry out our duties whether with regards to thermal generation or renewable energies.

Further, the other issue we have discussed during our meeting is the electrification ratio of Vanuatu. In 1980, at independence, 22.0 percent of the population had access to electricity. In 2010, only 19.0 percent has electricity.

Now this is our proposition that has been approved this morning by the Board of Directors. UNELCO considers that a WACC of 7.80 percent is justified and reasonable with regards to financial studies conducted on this remuneration ratio which highlighted higher rates.

Having regards to the good relations between us and in a spirit of partnership, UNELCO undertakes to:

I: Carry out its investment plan and contractual duties.

II: Finance an electrification fund which will be earmarked in priority for the funding for the extensions of our concession mainly in the rural area, as well as the funding for the maintenance of Port Vila City street lighting network. A sum of Forty Million Vatu (V140, 000,000) deducted from UNELCO's profits will be allocated to this fund which will be jointly managed by UNELCO and the Government pursuant to a policy to be drawn up.

Lastly, as shown of the chart attached, the impact of the difference between our proposition and the URA proposition on the tariff would be marginal, in particular for the small consumers for which UNELCO has proposed an important reduction.

We would like know what is the Government's position regarding the proposition of the Board of Directors of UNELCO as soon as possible.

We remain at your disposal for any other query.

Yours faithfully,

CC:
His Excellency Edward NATAPEI, Prime Minister of the Republic of Vanuatu.
Mr. Paul TELUKLUK, Minister of Lands, Energy and Natural Resources.
Mr. Sela MOLISA, Minister of Finance and Economic Development.
Mr. Rialuth Serge VOHOR, Minister of Infrastructures and Public Utilities.
Mr. Moana CARVASSES, Minister of Internal Affairs.
Mr. Pakoa KALTONGA, Minister of Justice.

Letter to Johnson Naviti, Chairperson Utilities Regulatory Authority from UNELCO dated 21 April 2010

Our ref. N° 377/10/U/PME/aw

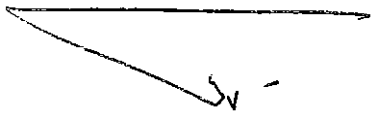
Dear Chairperson,

Subject: TARIFF REVIEW - ADDENDUM PROJECT

Further to the Ministry of Lands and Natural Resources request and in accordance with the tariff review process, please find enclosed the Addendum Project to the concessions of Port Vila, Luganville, Tanna and Malekula in regard to the tariff review.

This proposition is established from a reasonable return at 7.80, based on the calculation of the WACC and the operation costs calculated with URA.
We remain at your disposal for any other query.

Yours faithfully,



Philippe MEHRENBERGER
Managing Director

Cc
o His Excellency Edward NIPAKE NATAPEI, Prime Minister, Republic of Vanuatu
o Honorable Sato KILMAN, Minister of Trade
o Honorable Sela MOLISA, Minister of Finances and Economic Development
o Honorable Rialuth Serge VOHOR, Minister of Infrastructure and Public Utilities
o Honorable Moana KALOSIL CARCASSES, Minister of Internal Affairs
o Honorable Baggoa KALTONGA, Minister of Justice

Attached: Addendum varying the tariffs of Concessions

THIS AGREEMENT: Is made one the 22 April 2010

BETWEEN **THE GOVERNMENT OF** THE **REPUBLIC OF VANUATU** (the "Government") of the first part

A N D **THE HONOURABLE** Paul Telukluk Minister of Lands and **Natural Resources** and also being **the Minister responsible** for Power for the purposes of the Electricity Supply Act (Cap 65) (the "Grantor") of the second part

A N D **UNION ELECTRIQUE DU VANUATU LIMITED** a local Vanuatu Company having its registered office situate at C/o Second Floor, Law House. Kumul Highway, Port Vila, Efate in the Republic of Vanuatu (the "Concessionaire') of the third part

WHEREAS

A. At the request of the Government a full and detailed electricity tariff review has now been conducted by the Utilities Regulatory Authority of Vanuatu in consultation with the Concessionaire and The Government.

B. The Government desires to encourage UNELCO to develop the renewable energies, including but not limited to the bio-fuel, the wind energy, the hydroelectricity and the photovoltaic.

C. The Government desires to encourage an increase in the number of new connections to the electricity grid.

SECTION 1 - VARIATION OF THE CONCESSION

The terms and conditions of the Concession (being the documents described in the Schedule hereto) are hereby varied as follows:

SECTION 2 – PRICE ADJUSTMENT FORMULA

(Replaces the whole of clause 2, 2007)

The base price P used for the maximum billing of electricity and fixed charges, advance on consumption, penalties applicable to the Concessionaire, and the reconnection fee after interruption to supply, shall be calculated on the 1st of each month and for the first time on the 1 of May 2010 through the application of the price adjustment formula below:

$$P = P_0 \times \left[\left(0.51 \times \frac{G}{G_0} \times \frac{N}{N_0}\right) + \left(0.11 \times \frac{M}{M_0}\right) + \left(0.09 \times \frac{IM}{IM_0} \times \left[0.60 + \left(0.40 \times \frac{C}{C_0}\right)\right]\right) + 0.29\right]$$

Where

P_0 = 48.50

G_0 = 86.83

N0 = 0.92

M_0 = 1216

IM_0 = 126.91

C_0 = 1.2026

Where

G Is the weighted average price of a litre of diesel fuel and coconut oil purchased in Port Vila, Luganville, Malekula and Tanna expressed in Vatu/litre and calculated as follows:

$$G = \frac{G_V L_V + G_L L_L + G_M L_M + G_T L_T + G_c L_c}{L_V + L_L + L_M + L_T + (L_C \times Kpci)}$$

Where:

Gv is the average price of a litre of diesel fuel delivered to the Port Vila power stations, calculated by dividing the total amount of invoices receives by the Concessionaire by the corresponding amount of diesel fuel delivered during the month preceding the date of adjustment of tariffs.

Lv is the number of litres of diesel fuel consumed by the Port Vila diesel power stations during the month preceding the date of adjustment of tariffs.

G_L is the average price of a litre of diesel fuel delivered to the Luganville diesel power stations, calculated by dividing the total amount of invoices received by the Concessionaire by the corresponding amount of diesel fuel delivered during the month preceding the date of adjustment of tariffs.

L_L is the number of litres of diesel fuel which would have been consumed by the Luganville diesel power station during the month preceding the date of adjustment of tariffs if the power generation had been entirely produced by diesel generators, calculated as follows:

$$L_L = (Csg\ MVg) \times (Eh + Ed)$$

Where:

Csg and Mvg represent the specific consumption of diesel oil (in grams/ kWh) and the density of diesel fuel (in grams/litre) respectively

as defined in section 18 of the addendum date the 03rd March 1995 to the Concession Contract of Luganville.

Eh — is the energy produced by the hydroelectric power station (in kWh) as defined in the same section 18, during the month preceding the date of adjustment of tariffs.

Ed — is the energy produced by the diesel power station in Luganville (in kWh) during the month preceding the date of adjustment of tariffs.

GM — is the average price of a litre of diesel fuel delivered to the Malakula power station, calculated by dividing the total amount of invoices received by the Concessionaire by the corresponding amount of diesel fuel delivered during the month preceding the date of adjustment of tariffs.

Lv — is the number of litres of diesel fuel consumed by the Malakula diesel power station during the month preceding the date of adjustment of tariffs.

GT — is the average price of diesel fuel delivered to the Tanna power station, calculated by dividing the total amount of invoices received by the Concessionaire by the corresponding amount of diesel delivered during the month preceding the date of adjustment of tariffs.

LT — is the number of litres of diesel fuel consumed by the Tanna diesel power station during the month preceding the date of adjustment of tariffs.

Gc — is the average price of a litre of coconut oil delivered to the Concessionaire power stations, calculated by dividing the total amount of invoices, received by the Concessionaire by the corresponding amount of coconut oil delivered during the month preceding the date of adjustment of tariffs.

Lc — is the number of litres of coconut oil consumed by the different power stations during the month preceding the date of adjustment of tariffs.

Kpci — represents the ratio of calorific value between diesel oil coconut oil and is used to convert the number of litres of coconut oil into equivalent litres of diesel oil.

In the event the Gv, G_L, Gm, Gt or Gc should be zero, the value for the previous month shall be used.

N — is the average proportion of power generated by diesel, equivalent hydro and coconut oil for the previous twelve months.

Where

$$N = Average\ for\ previous\ twelve\ months\ of\ \left(\frac{Energy\ produced\ by\ diesel\ and\ copra}{Total\ energy\ produced}\right)$$

N_0 is set according to the five-year average forecasted level of N.

Following a natural disaster that causes significant damage to a renewable electricity generation source the Government and the Concessionaire may agree temporarily to adjust N for a specified period of time, depending on the impact on generation and distribution capabilities.

M While waiting for an appropriate and suitable index be produced be the Statistic Office of the Government of Vanuatu to reflect the evolution of the cost of labour of the Concessionaire, M/M0 will be increased of 1% at each new year period.

IM is the average of the indices "Matériel" (equipment) published by the "Journel Officiel" (New Caledonia Gazette) for the first of the two months preceding the date of adjustment of tariff.

C is the average of the daily currency exchange rates for the month preceding the date of adjustment of tariffs, as published by the ANZ Bank (Vanuatu) in the column "selling rate" for the Pacific Franc (XPF or CFP) to Vatu (expressed in Vatu/XPF)

In the event that a certain indices should no longer be published or available, or no longer be representative of variations in economic conditions for which there are used, the Concessionaire and the Grantor shall define replacement indices by common accord.

In calculating the base price P, each variable shall be rounded off to she fourth decimal and the price **P** thus calculated shall be rounded off to 2 decimals.

SECTION 3 – REVISION OF THE REFERENCE PRICE AND RGE PRICE ADJUSTMENT FORMULA

(added conditions to Section 7.5)

- If growth of the demand, habits of consumption of customers, breakdown per tariff group of customers as well as the future number of customers per group would vary significantly from the forecasted rate of growth used for the calculation of the new base price of this tariff review.

SECTION 4 - TARIFF STRUCTURE

(Replaces the whole of Sept 1997 clause 7.4 and 1986 clause 5 paragraph 17 and 18)

As from 1 May 2010 the maximum tariffs applicable to the below groups are as follows:

Customer Group	Customer Description	Price per kWh	Monthly fixed charge	Security deposit
Domestic	Small Domestic Customers	Up to 60 kWh = 0.34 x P 61 to 120 kWh = 1.21 x P Over 120 kWh = 3 x P	None	70 x P
A-Low Voltage	Other Low Voltage Customers	1.21 x P	5 x P per subscribed kVA	150 x P per subscribed kVA
A - Low Voltage	Business Licence Holders – Low Voltage	0.87 x P	20 x P per subscribed kVA	150 x P per subscribed kVA
A - Low Voltage	Sports Fields	1.00 x P	None	None
B -Public Lighting	Public Lighting	0.54 x P	None	None
C – High Voltage	High Voltage Users	0.70 x P	25 x P per subscribed kVA	150 x P per subscribed kVA

In line with the introduction of this new tariff bracket between 0 and 60 kWh, which is quite heavily subsidised, and in response to the wish of this low-income customer group to be able to improve the management of its consumption, not to have to pay any security deposit nor pay any reconnection fees, the Concessionaire undertakes to replace the whole of the existing electromechanical metering devices with pre-payment meters over a period of 3 years.

The cost of replacing all of these metering units will be borne by the Concessionaire, without any further cost to the clients concerned.

SECTION 5 - AGREEMENT BETWEEN THE GOVERNMENT AND THE CONCESSIONNAIRE FOR THE DEVELOPMENT OF RENEWABLE ENERGIES.

The two parties confirm their firm intention to further pursue the sustainable development strategy agreed to by the Government and the GDF SUEZ Group in 2007 through the utilisation of renewable energy resources available in Vanuatu to support the economic development of rural areas, reduce the volume of imported petroleum products, reduce the production of greenhouse gases and stabilise the price of electricity.

Whereas no provision has been made in the current concession agreements for the framework terms and conditions of such development, either in terms of investment incentives, production incentives or technical and administrative regulations.

The parties hereto agree to prepare a convention which will set out the overall terms and conditions and incentive measures, which will be included as an addendum to the existing concession agreements entered into between the Government of Vanuatu and the Concessionaire, which addendum will need to be executed and become effective on or before 31 December 2010.

SECTION 6 – RURAL ELECTRIFICATION SUPPORT FUND (TER)

A rural electrification support fund (TER) is set up, in order to encourage energy access in the non electrified areas of the Concessions of Port Vila, Luganville, Tanna and Malekula.

This fund will be allocated to the financing of the maintenance costs of the Port Vila street lighting, HV and LV extensions from the existing networks of the concessions of Port vila, Luganville, Malekula and Tanna, as well as service connections.

For the next five years from the signing of the this addendum, the Concessionaire shall each year allocate an amount, as defined below which will constitute an operation cost of financial year. This cost will be credited to the TER fund.

The original amount allocated by the Concessionaire to this fund will be forty millions vatu (40 000 000 vatu), based on the price "P" applicable at the date of the signature of the present addendum, which is 48.50 vatu. The amount of this allocation will be indexed to the price P applicable on the 31th of December of the financial year for which such allocation shall be made.

It is expressly stipulated that the amount shown on the credit of the investment fund support, is at all time owned by the Grantor.

The Concessionaire shall submit to the Grantor, for opinion and approval, its annual investment program of works and extensions to be withdrawn from this fund, before the 30th of September of the year for the next year.

The Grantor, depending on status and progress of the works, must order or approve, upon presentation by the Concessionaire of the works financial status, each withdrawal from the TER fund.

The withdrawals ordered or approved by the Grantor shall be debited from the TER fund.

The net value of this fund, at the end of the financial year, whether positive or negative, will be carried forward to the next financial year.

The extension works financed by this fund shall not be subject to asset transfer depreciation. They shall be subject to replacement provision.

At the end of the Concession whether such Concession ends by purchase, expiry or for any other reason whatsoever, a sum equal to the net amount of the investment support fund will be paid to the Vanuatu Government.

For the year 2010, the Concessionaire and the Grantor agree to allocate the annual amount of forty millions vatu (40 000 000 vatu), after deduction of Port Vila street lighting maintenance costs, to the network extension of the North part of the Concession of Malekula.

SECTION 7 - COMMENCEMENT

This Agreement shall take effect on 1 May 2010.

IN WITNESS WHEREOF the parties have hereunto set their hands and affixed their seals at Port Vila this 22th of April 2010.

SIGNED SEALED AND DELIVERED for and on behalf of THE GOVERNMENT OF THE REPUBLIC OF VANUATU by its PRIME MINISTER THE HONOURABLE Edward NIPAKE NATAPEI acting in accordance with the previous GOVERNMENT resolution of the Council of Ministers:

..... in the presence of: .....

PRIME MINISTER WITNESS:

SIGNED SEALED AND DELIVERED by THE HONOURABLE Paul TELUKLUK, Minister of Lands and Natural Resources and also being the Minister responsible for Power :

..... in the presence of: .....

THE GRANTOR WITNESS:

SIGNED SEALED AND DELIVERED for and on behalf of UNION ELECTRIQUE DU VANUATU LIMITED by its duly authorised Managing Director Mr Philippe MEHRENBERGER:

..... in the presence of: .....

THE CONCESSIONAIRE WITNESS:

B.4 Submission by VANREPA

Vanuatu Renewable Energy and Power Association (VANREPA)

Submission Re: URA's Position Paper

Thank you for the opportunity to respond to this Position Paper.

I'm a bit confused with regard to the use of copra oil as fuel in the Tagabe Plant. As diesel fuel is less expensive than copra oil (85 vatu/litre for diesel as compared to 100 vatu/litre for copra oil) and diesel fuel is a more efficient fuel than copra oil (.2536 litres/kWh for diesel as compared to .294 litres/kWh for copra oil) it is **not** cost effective to burn copra oil at all in the Tagabe Plant, yet the amount of copra oil consumed in the plant is forecast to increase. Are the secondary benefits of burning copra oil as a fuel really so compelling as to justify this? If there are compelling reasons to burn copra oil as fuel in the Tagabe plant, should the oil be purchased from a related entity?

Thank you,

David Stein

David Stein
Team Leader
Vanuatu Renewable Energy and Power Association (VANREPA)
PO Box 246
Port Vila, Vanuatu
(678) 7749598
www.vanrepa.org

B.5 Submission by Nikhil Desai

Nikhil Desai

ndesai@alum.mit.edu

12 April 2010

Carmine Piantedosi

Utilities Regulatory Authority

Port Vila

VANUATU

Dear Carmine:

Thank you for inviting me to comment. These comments are entirely in my private capacity, and independent of the institutional entities I have been associated with in the past or am currently associated with. They rely on information in the public domain and are limited to the URA Electricity Tariff Review Position Paper (ETRPP).

I have avoided directly commenting on Unelco's Tariff Application, a meaningless document since they were not requested to justify the base tariff or the indexation formula or submit revised weights. There is no basis in demonstrated costs or assumptions (e.g., the 85 V/litre diesel cost for Vila, surely higher than the average for the last year, or the 100 V/litre copra oil cost for Vila or Malekula). There is no investment or financing plan, no income statement or balance sheet.

I have provided detailed comments in a separate document along with selected text from the Position Paper. This is a summary critique with some suggestions for improvements.

In brief, URA has exceeded its jurisdiction; it has based many of its positions on questionable or absent data/analyses; it has ignored the most critical issues relating to the concessions' ownership structure and financing options; and, its opinions regarding the treatment of renewable energy are not only untenable but risk degenerating into perverse incentives. Instead of promoting cost reductions in partnership with the government, external donors, and independent investors, URA's positions promise more of the same or worse.

1. **Policy authority:** The URA lacks the authority to make policy choices regarding uniform national tariffs; besides, this choice is damaging. It seriously undermines the prospect for a competitive re-tender of the Luganville concession, and guarantees continuing opacity of tariffs. Claims such as "Every customer in all the concessions areas will thus benefit from the reduction of costs due to the use of renewable energy instead of gas oil, whatever the source and location (Hydro in Luganville, wind in Port Vila, geothermal in Efate for example)" are deceptive; nobody will know whether the reduction in cost was most that could be achieved with proper planning and efficient procurement. If at all, every customer in all the concession areas is condemned to the high-price regime of Unelco Vila operations. URA also lacks the authority to determine the policies for the use of Sarakata "savings". True, URA's mandate is "to ensure the provision of safe, reliable and affordable regulated services and maximise access to regulated services". However, the law provides no guidance as to the basic principles of safety, reliability, affordability, and access that are to guide

URA's regulatory authority. Regulation in the absence of explicit authority for guiding principles is jurisdictional overreach.

2. **Inadequate or irrelevant data and analyses:** The PP takes positions on tariff levels and structure that lack any evidentiary and analytical basis. Almost no technical and financial data have been provided. Questionable comparisons of selected – and marginally relevant – indicators have been made across selected island-based utilities for selected years to render dubious opinions on the reasonableness of Unelco performance or prospects of improvement. In many cases, Unelco's assumptions (e.g., diesel price) and demands (e.g., copra oil price) have been simply rubber-stamped without analysis. In some cases, URA has accepted Unelco demands without even reporting – e.g., in the most important cases of "Regulated Asset Base", "Depreciation", and "Return on Capital." Instead of loading the report with marginally relevant data on connections per staff or GDP/tourism growth rates, URA could have provided comparison with other utilities' unit costs and tariffs, unit depreciation rates, financing costs, profit margins, and efforts to reduce costs. URA has also failed to provide analytical basis for its preferred policies – a 'balancing fund' for tariff equalization and a slight change in the small domestic user tariff. Sometimes it appears that URA is withholding information that should be in the public domain – e.g., Unelco's "Electricity Generation Master Plan" and associated investment and financing plans, or a financing model on which 'revenue requirements' can be determined. This is simply regulation by assertion.

3. **Neglect of ownership structure and financing options**: The URA position about "return on investments" ignores the fact that a significant (and unreported) share of the investments is that of the government, either directly or at the end of allowed depreciation period. Unelco has been a concessionaire for decades, and it is using public assets – including the Sarakata hydro plant, and publicly financed network expansion – as well as its own for its business; it is not a licensee that has financed its entire asset base. As such, Unelco is entitled to a "reasonable return" only on its own equity, not on the publicly owned assets. (Or, the return on public portion of the assets should be paid to the government every year.) Instead, Unelco uses government funds – from Sarakata savings and other sources – to finance system expansion and associated customer base (as pointed out in the Trembath/PWC report that is a public document). What can beat zero-cost, zero-risk financing with a blank check for diesel and copra oil prices – and no requirement to report costs and performance except that demanded by the parent company auditors? (See note 1).

4. **No incentives for cost minimization:** Arguably the prime concerns in Vanuatu electricity concessions are diesel dependence and unreasonably high non-generation costs and/or profits. Yet, URA take no position on least-cost supply planning by Unelco, nor does it demand transparency in Unelco decision-making or tariff applications. Where URA does take a position, there is no rational basis and ends up undermining the consumer's interest or Unelco's. The treatment of copra oil and wind generation demonstrates this. On the former, URA accepts Unelco's choice of copra oil blending in Vila and on 100% copra oil reliance in Malekula even though it is patently more expensive than the diesel alternative (and presumably much more so than non-diesel alternatives which have not been examined). On the other hand, for Vila wind, URA arbitrarily limits generation costs to 30 million Vatu per year (at least

> up to now); while Unelco haven't given any numbers, it is quite likely that the capital and operating costs for Vila wind are in the range of about 50-70 million Vatus per year, at least for the first few years. (Unelco's financiers – the European Investment Bank – most likely have the cost data URA should obtain as a matter of due diligence.) The broader point is that Unelco has no incentive for minimizing its costs – or help limit the demand for this extremely high-priced electricity by promoting demand side management options – and URA does not seem to care. If at all, by proposing that Sarakata savings be passed on for tariff reduction, it takes away the one source of funds for the government to invest in independent (non-Unelco) low-cost renewables-based generation as it did in the case of Sarakata. (There's a bit of flip-flop by URA here; in one place it seems to support a fund for access expansion, but in another place seems to reject it.)

In sum, there is no evidence whatsoever that tariff-setting – the determination of a base price Po or its periodic adjustment or its link to customer-specific price structure – historically or in the future has any demonstrable link to actual costs, or reasonable forecasts, or that these are efficient costs. There is no reporting of data and assumptions by concession. There is no showing that the tariff review has been done to satisfy the principles declared by URA (note 2). One may take comfort in the fact that URA does not have the authority to negotiate tariffs on behalf of the government, and hope that its recommended tariff radically deviate from the positions taken here.

Moving away from this exercise in partial obfuscation and rubber-stamping would require URA to take on some policy challenges. Even if it doesn't have the authority for policy decisions, it could open up the policy process by undertaking "issues and options" exercises and presenting the results to the government, the concessionaire(s), and the public.

These should begin with a financial and performance audit of current concessions, preparation of financial and tariff models that all parties can agree on and made public, and could include the following recommendations: 1) that subject to technical requirements for safety and reliability (to be determined by URA), all concessionaires are required to prepare a least-cost supply plan, including power purchases from independent suppliers properly licensed and regulated by URA; and, 2) that each concession will have a commercially viable tariff based on individual least-cost supply plans, with some possibility of explicit cross-subsidies for access expansion or investment support for cost reductions.

Indeed, URA could now open a door to Unelco, "Look, show your investment plans and financing plans and let us determine if some investments can be financed at a lower cost and risk to the customer, whether by you or the government or someone else. We assure you of reasonable debt service and reasonable rate of return." However, such an opportunity can only be offered with transparent data and analyses; this has not yet happened.

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