

UNELCO ENGIE

Vanuatu



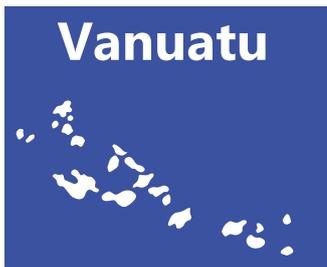
**Investment
Case study**

By Michael Pusinelli

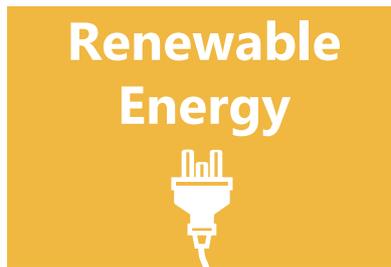
UNELCO ENGIE



Country



Sector



Type



Background

Unelco is a utility company that first started operating in Port Vila in 1940. French-owned from inception; it was part of a company that specialised in the provision of electricity in the former colonies of France. It is now a private-public company trading under the name Unelco Engie, with its local head office (behind the main generators) in Port Vila. It is owned 86% by its French parent, Engie and 14% by the Vanuatu National Provident Fund, which has one board member. Engie is a French multinational energy services provider, headquartered in La Défense, Courbevoie, which operates in the fields of electricity generation and distribution, natural gas and renewable energy. Engie is quoted on the Paris and Brussels stock exchanges. The present General Manager of the Vanuatu operation is originally from France, and is a fully qualified electrical engineer. He transferred from the power company in New Caledonia 3 years ago, and has been the General Manager for the last two years.

Business Activities

Unelco has the exclusive concession to provide electricity on the island of Efate. It has about 15,000 customers, with peak demand at around 12 megawatts. Unelco has to have a generating capacity in excess of this, to cover generator breakdowns, maintenance etc., as Vanuatu is a remote place and an island nation. In the Pacific, Unelco has the reputation for being one of the most stable and reliable suppliers of energy among all the power companies. It has the second fewest power blackouts of all the electricity companies. It also operates small electrical power grids on north Malekula and Tanna. In 1994, the Government of Vanuatu transferred its interests in the reticulated public water supply in Port Vila to Unelco, which now manages both the town supply and some neighbouring locations. Unelco's responsibility is to provide fully potable treated water, but there are no facilities for treating wastewater. The water operation, which serves about 8,200 customers, now accounts for about 10% of Unelco's overall business. Unelco regularly wins

the regional prize for being the best medium-sized water supply company among the eleven operating in the Pacific. Traditionally, Unelco has generated all its electricity using diesel-powered generators and bio-diesel made from coconut oil, but more recently it has branched out into renewable energy solar (2012) and wind generation (2010).

Funding of New Investment

Unelco uses a combination of its own resources and bank debt for new investment.

Government Assistance

Unelco is able to benefit from Public Works Act for public utilities in terms of getting easements and access across private land for both the power grid network and water reticulation. They do not have to purchase the sites for their power poles when located on the public domain, and even when they negotiate individual access in the rural areas with the local landowners, the Ministry of Lands facilitates this. In the aftermath of cyclone Pam, Unelco brought in additional manpower from all over the Pacific to assist in the recovery process, and the one area in which the Government was exceptionally efficient was the granting of work permits for the extra staff and volunteers who came to help. They also facilitated and expedited customs clearance for the materials and equipment that Unelco needed to bring in.

The Unelco Electricity Concession

Unelco's current electricity supply concession is a 40-year contract that runs through to 2032. The implementation of its concession is overseen by an independent Utilities Regulation Authority, set up in 2007 on the advice and recommendation of, and subsidised by, AusAid and the World Bank, and contracted by the Ministry of Finance. The authority has

three Commissioners, comprising a Chairman and two part-time Commissioners. Its main function is to determine the maximum rate of return on investment that Unelco is permitted to achieve, in order to regulate the price of power to the consumers.

The formulae for calculating the returns are extremely complex, and contained in an 80-page Concession Agreement document. The cap is currently set at 7.76% on the cost of investment. There are six different categories of customer, each with its own tariff structure. Under the concession, Unelco is obliged to maintain a cross-subsidy pricing structure between high users and low users, with around 60% of their customers being subsidised by large domestic customers, making the subsidised energy costs of the smaller users the second cheapest in the Pacific. The cross-subsidies extend to the customers on Malekula and Tanna, who obtain the same benefit. The business sector is also subsidised to the extent of between 13% and 30% of their costs in the same way by the domestic customers. Unelco break down their power bills to show the fuel cost component separately, which accounts for 50% of their total cost of supply. They are one of the only power companies in the Pacific to provide this breakdown.

A further 20% of their power bills are made up of taxes and contributions. Given their monopoly status, this is a unique business model, and represents a very tight fixed term concession. The electricity tariffs are calculated on the basis of the specifications set out in the Concession Agreement between the Government of Vanuatu and UNELCO. The Utilities Regulatory Authority is empowered to review electricity tariffs at regular intervals (every 5 years) or in certain other circumstances, which are also set out in the specifications. The latest tariff review undertaken in early 2010 came into force with effect from May 2011, following a ruling made by an Arbitration Tribunal based in Australia. Once the base rate has been determined in accordance with these provisions, the electricity rate is adjusted every month according to the actual changes

Renewable Energy

in economic parameters, such as diesel fuel prices, labour costs and cost of materials. The contractual updating formula is verified monthly by the Utilities Regulatory Authority, and Unelco is one of the few companies in the world to publish a new tariff sheet every month. Most companies maintain their tariffs for at least 6 months.

The involvement of the Regulator is one of the greatest challenges that Unelco have in their business activities, as there was no provision for such a role in their original concession. The Regulator's powers are considerably more far reaching than those of regulators in other Pacific Islands.

Employees

Unelco employs 125 staff in total, including their teams on Malekula and Tanna, and including 15 in the water division. Ninety five percent of the employees are ni-Vanuatu. They find it difficult to recruit senior and experienced staff, as the market is very small and there is not a great deal of choice. However, they have no problems with the competence or ability of their staff, many of whom have been trained in Australia, New Zealand, Fiji or New Caledonia. However, it is hard to find more senior technicians.

Local Supply Chains

Unelco buy all their diesel requirements locally from a local fuel company. Consumption of diesel last year was 14 million litres. Bio-diesel is sourced from coconut oil within Vanuatu, but the current availability and supply is still unreliable, so they are looking to address this by going into the production and manufacture themselves. All their technical equipment e.g. power poles, wiring, generators etc. is imported directly from overseas, mainly due to their more specialised nature. Lastly, resources in Vanuatu meet all of their legal and other business service requirements.

Eighty percent of Unelco's electricity output is from diesel-powered generators. Annual fuel consumption is approximately 14 million litres, which is purchased locally from one of the fuel companies. The balance is derived from a mix of three renewable sources, bio-diesel (4%), wind (14%) and solar (2%). There have been various studies undertaken in the past on the potential for hydro-electricity on Efate, but there is no catchment area large enough or suitable enough for the volume of water required for a stable and commercially viable supply. Nor is there the requisite degree of elevation in the right place to provide the drop necessary to drive the turbines.

Bio-Diesel

There are two problems with the bio-diesel. The first is ensuring reliability of supply, and the second is price, as it is currently more expensive per litre than regular diesel. Unelco's bio-diesel is derived from coconut oil (that it presently buys in), but Unelco are looking to start producing with a sister company Vanuatu Energy Services (VES). To this end, VES already owns two oil mills, one at Tagabe, outside Port Vila, and the other on Malekula. VES has also bought a 500-hectare plantation in Undine Bay on North Efate, where they have planted between 30 and 40,000 coconuts, and they expect to be producing their first bio-diesel from this plantation before the end of this year.

Wind

Unelco has built a wind-farm out on Devil's Point Road, developed in three stages between 2008, 2010 and 2014. Its maximum output is 3.5 megawatts. Unelco owns this operation 100%.



Unelco's wind farm on Devil's Point, Efate

Source: Image from <http://www.jgh.dk/News/Off-Grid-Solar-PV-Farm-at-Vanuatu>



PM Charlot Salwai visiting the Undine Bay Solar Farm with the Unelco GM

Source: Image from http://dailypost.vu/news/undine-bay-paunagisu-get-solar-electrification/article_4885d15f-88e2-5086-8d38-82b036c737d7.html

Solar

Unelco has four separate sources of Photo-Voltaic (PV) solar energy on Efate, two of which it owns outright, the other two being plants built by the United Arab Emirates and gifted to the Vanuatu Government, located close to the Parliament buildings and

the Meteorological department in Port Vila. It has had a small solar generation farm at Tagabe since 2012, with a maximum capacity of 90 kilowatts. It owns this operation 100%. Its second solar farm is at Undine Bay, also 100% owned by Unelco, with a capacity of 510 kilowatts. A company in New Caledonia supplied the materials and installed by a Vanuatu contractor. Unelco had no part in the installation of the two UAE-gifted solar plants, but has an agreement with the Government to buy the output and reticulate it into the grid. One of the solar farms has a capacity of 120 kilowatts and the other 660 kilowatts. Unelco is currently planning the construction of another 1 mega-watt solar farm at Devils Point next to the wind-farm, in a public-private partnership with the Government of Vanuatu and the European Union. Unelco's contribution is \$1 million euro, the Government's \$700,000 Euro and the EU \$2.5 million euro. The project is currently out to tender. Unelco also has small solar farms on Malekula and Tanna.

Challenges to Investment

Unelco's business model is rather specialised, so they do not necessarily face the same issues as most other businesses. Even though they are in a monopoly position, they have to operate in a highly regulated environment, and they do not have much latitude in terms of what they can do. They cannot even offer special discounts to particular clients. They have a formal process to go through if they have an issue with the Regulator, which, if it cannot be resolved amicably, culminates in their serving a Notice of Grievance. Past that point, they have to go to court for a resolution. Unelco insures its plant and equipment relatively economically, being able to take advantage of the global policies of its parent company. However, it is not able to insure the grid network (the poles and lines), which are vulnerable to damage from earthquakes or cyclones. It lost over 300 power poles during cyclone Pam, which it had to replace.

The Downside to Solar Energy

Intermittent energy poses one big technical problem for Unelco (namely stability of the grid), which is why it can never be, thus far, a major energy source for them. Under normal circumstances, few grids of their size, which is relatively small, can support more than about 30% of their energy coming from intermittent sources without running the risk of intermittent blackouts. Unelco is able to manage more than 50% of renewable energy penetration rate due to high speed generators that stabilize the supply. There is presently no means of storing the solar energy output. The panels can only operate in daylight, and if, for example, a large cloud formation drifts over the panels on a sunny day, there is an immediate and significant drop in output. In the event of prolonged overcast periods or heavy rain, there is an equally prolonged reduction in output.

The only way that Unelco can then maintain the grid network without any drop in voltage is to start the

high speed generators to compensate. However, the response time required to get the generators up to the necessary capacity output makes it quite difficult to maintain even production, and if they had to fire up a new generator from cold, a process that takes many minutes, then there could be a significant voltage fluctuation in the interim. Consequently, at some point, high speed generators have to be kept running during the day, even when the solar panels or wind turbines are at full production, so the energy cost savings are somewhat less than people imagine.

In time, with progress in battery technology, it will be possible to pass the solar electricity into large battery banks, which would then be able to provide sufficient storage and buffering capacity to deal with this problem. They are currently in discussion with suppliers in New Zealand, Australia and elsewhere, but initial indications are that the cost of installing an adequate buffering system would probably double the cost of the solar electricity.



Solar panels inside the Parliament grounds gifted by the UAE

Source: Image provided by Michael Pusinelli

There is also an issue for individuals within Port Vila who would otherwise like to install their own PV solar panels and sell any excess energy back to the Unelco grid. Because solar electricity production is intermittent (its production varying second by second depending on time of day, cloud cover, temperature, etc.) it cannot replace reliable grid-provided energy. For these people, PV solar must be seen as a complement to the electricity delivered from the grid, not as a substitution (except if disconnected from the grid with batteries). PV solar customers would still need to be connected to the grid in order to continue receiving the continuous electricity supply required to meet their energy needs. PV solar development must therefore be properly managed, as uncontrolled PV solar development would mean that solar generators would otherwise be free riding on the back of all the other customers by artificially transferring to them their share of the fixed costs of the grid system. These fixed costs typically represent roughly 50% of the average electricity bill.

Looking Forward

If the proposed income and corporate taxes are introduced, Unelco estimates that its energy retail prices will have to rise by between 5% and 10%. It is not for them to question the actions of a sovereign government on something like this – they would simply have to adapt to the extra imposition. They feel fairly confident about Vanuatu's future at the moment, given the scale of the substantial investment going on at present in roading, wharves, the airports and other infrastructure, not only on Efate and Santo, but also the outer islands.

Unelco's own objective is to complete the grid distribution network right around Efate by 2020, so that there is an electricity supply to every village, complete with street lighting. They already have the generating capacity in place to meet all the current and committed future development taking place on Efate. On both Malekula and Tanna they are already

working on extending the existing power grids significantly over the next few years. In terms of general investment, Unelco consider that Vanuatu would be a good place to invest. Their advice is to be conservative, plan to be there for the long term, go for lower risk activities and avoid activities subject to excessive regulation.