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SPECIAL ISSUE: 7th World Water Forum Daegu & Gyeongbuk, Rep of Korea

Volume Twenty Two, Issue 2, 2015

HYDRO AND DAMS IN ASIA ~TRANSBOUNDARY ISSUES ~ CLIMATE CHANGE MULTIPURPOSE WATER INFRASTRUCTURE ~ FRANCIS TURBINES

# The future of hydropower development in Timor Leste

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Timor Leste has been an independent nation since 2002. The country is underdeveloped and in need of improved basic infrastructure including roads, ports and power stations. A lack of legal framework and regulations continues to be a barrier to project financing. Hydropower could represent an excellent opportunity for Timor Leste and this paper examines the potential and challenges for developing this important resource.

Thimor Leste shares the island of Timor with Indonesia, east of Bali and Lombok. The country has an area of 14 609 km<sup>2</sup> and is mountainous with small valleys and a long coastline. The capital, Dili, has a population of around 200 000. Following colonization by the Portuguese, and rule by Indonesia and the UN, the country was declared an independent nation. Since 2002, the country has been a democracy, with opposition parties permitted. Oil, gas and agriculture are the main economic sectors, with tourism potential and electric power relatively undeveloped and mining remaining undeveloped. Timor Leste's roads, bridges and other infrastructure are generally in poor condition although the reconstruction of the Dili-Liquica highway is in progress.

# 1. The power generation and distribution sector

Electricidade de Timor Leste (EDTL) is the vertically integrated monopoly generator and distributor of electric power in areas served by its limited grid system, and in isolated areas served by EDTL diesel generators. EDTL faces serious financial constraints because of the chronic non-payment of electricity invoices. Commercial losses have recently run at 50 to 60 per cent of power generated. Donors, in particular Australia, Japan, Portugal and Norway, have been subsidizing EDTL's losses.

The primary power supply is from the 16 MW dieselfired Comoro power station in Dili and two recently installed Wartsila dual fuel fired facilities, Hera (120 MW) and Betano (135 MW). As no natural gas is at present available, both facilities run on heavy fuel oil. At petrol prices of US\$ 100/barrel, these facilities are very uneconomic, although new lower petrol prices improve the economics. The Secretary of State for Electricity and Water has announced plans for a new 17.3 MW Wartsila dual fuel (heavy fuel oil or natural gas) facility in Oecusse. A significant portion of the output from the Betano heavy fuel oil facility will be consumed by the Tusi Mane refinery/petrochemicals facility also planned for Betano.



Fig. 1. Map of Timor Leste, on the island of Timor. As a result of an insufficient grid, small diesel-fired generators are the main source of electric power in many localities.

Existing distribution facilities ensure adequate electric power supply in Dili (the capital) and Bacau (the second largest town). Transmission lines link Dili and Bacau (to the east) and Dili and Maubara and the West Timor (Indonesia) border (to the west). Elsewhere generation and distribution systems are inadequate or problematic, with many towns and rural areas lacking a 24-hour supply. Many villages lack electricity altogether; candle-light is commonly used.

As present power demand in Timor Leste is not huge. A Timor Leste large-scale hydropower project should consider the partial export of output to Indonesian-controlled West Timor. Kupang, the capital of the Indonesian Region of East Nusu Tenggara (which includes West Timor as well as the islands of Flores and Sumba), with a 2014 estimated population of 364 000 is considerably larger than Dili and has unserved demand for electric power.

PT PLN (the Indonesian state-owned electric utility) statistics indicate a 63 per cent increase in West Timor electric customers from 77 237 in 2011 to 125 917 in 2012 with 2012 sales of 98 399.19 MW (an increase of 15.8 per cent from the previous year).

The statistics also indicate that 44.56 per cent of West Timor households continue to lack access to an electric utility service, relying instead on oil lamps, torches, and so on, for lighting. Average per capita annual electric consumption for existing residential customers is quite low: 703 kWh compared with 3520 kWh in Jakarta. There is clearly room for increased consumption.

As of 2012, the installed capacity in the entire region of East Nusu Tenggara was 151 MW, rated at 103 MW. Nearly all of this capacity consists of diesel-fired generators. Three small hydro units and one geothermal unit supply just 3.5 MW.

The current PLN power supply plan calls for the construction of five additional power generating facilities in West Timor by 2020, with 197 MW of total installed capacity.

Four of the new facilities, ranging in size from 30 to 80 MW, will be near Kupang; the fifth is a 24 MW facility in Atambua not far from the Timor Leste frontier. These are all diesel or heavy fuel oil fired units.

A cross-island transmission line from Botok near Kupang to Atapupu on the coast not far from the Timor Leste border is under construction. This line could be interconnected with the Timor Leste transmission system through a relatively short extension.

On a long-term cost of production basis, imported hydropower from Timor Leste should be very competitive against the overwhelmingly diesel-based electric power supply existing in West Timor.

# 2. Hydropower potential

According to available studies, hydro facilities in Timor Leste are a possibility. Timor Leste is very mountainous and experiences heavy rainfall during the two wet seasons (which alternate with two dry seasons). At present, wet season rains rush in torrents down the mountains and through valleys in wide washes to the sea and are effectively wasted. Dams and reservoirs would be required to capture the wet season surplus. However, very steep topography in many parts of Timor Leste and porous karst mountains in other areas may render dams and reservoirs difficult to construct or inefficient. Further engineering studies are required.

A micro hydro (0.3 MW) generating facility has been constructed and was commissioned in 2008 at Guariui partially funded by Norway.

The Asian Development Bank has been promoting the construction of a 28 MW run-of-river hydropower facility at Iralalara. The project involves the diversion of water from the Iralalara river prior to the Mainina sinkhole into an underground tunnel, which will lead to a turbine and generator facility on the coast. A 190 km-long transmission line would be constructed connecting the facility to Dili. The cost estimate in 2004 was US\$ 42 million for the hydropower facility and US\$ 18 million for the transmission line.

Other run-of-river hydropower opportunities have been identified at Gleno, Belulic and Lacto.

# 3. The Timor Leste legal/tax framework 3.1 Basis of the legal system

The Constitution and the Civil Code are modelled after their Portuguese counterparts. Other laws and regulations consist of newly adopted laws and regulations and nonrepealed United Nations Transitional Administration (UNTAET) regulations as well as Indonesian laws that were in force prior to independence.

#### 3.2 Relevant ministries

The relevant ministeries for electric power investment are: Secretario de Estado para o Apoio e Promoçao do Setor Privado (Secretary of State for the Aid and Promotion of the Private Sector) (SEAPRI); Secretario do Estado para a Electricidade e Aguas (Secretary of State for Electricity and Water); and, Secretario do Estado dos Recursos Minerais e da Politica Energetica Interino (Secretary of State of Mineral Resources and Energy Policy).

#### 3.3 Electric power sector

The Basic Law for the National Power System sets general principles of electric power policy and favours the grant of concessions to private operators; however, such concessionary policy has not been implemented. A draft Basic Law for Renewable Energies was in place in 2011 but was not formally adopted by the legFig. 2. Map showing the location of five powerplants to be constructed in Timor Leste by 2020.



islature. Effectively, the Secretary of State of Mineral Resources and Energy Policy serves as the regulator.

#### 3.4 Company formation

SEAPRI provides 'one-stop' company formation services, which promises company formation in a matter of days rather than months.

#### 3.5 Corporate tax rate

The corporate tax rate is 10 per cent. Tax holidays of five to ten years are provided to projects qualifying under the Law of Private Investment depending on the location of the project.

#### 3.6 Investment incentives

The Law of Private Investment, adopted in 2011, provides a range of incentives for private investment in Timor Leste. Special zones are established outside the urban areas of Dili and Baucau. For foreign investors, the minimum qualifying investment is US\$ 1.5 million, with a minimum cash investment (versus investment in kind) equal to 50 per cent of the total investment. As mentioned in the previous section, corporate and service tax and customs duty holidays of five to ten years, depending on the location of the project, are provided, as well as exemption from sales tax on capital goods and equipment.

#### 3.7 Company ownership

Foreign ownership of companies is not an issue in Timor Leste.

#### 3.8 Land ownership

Foreigners are not permitted to own land, but leases or concessions of 50 to 100 years are permitted. Because of the lack of a Land Law and proper land registry, and many on-going title disputes, obtaining a valid lease to privately held land could prove problematic. SEAPRI will coordinate the grant of concessions of stateowned land for approved investment projects.

#### 3.9 Foreign labour restrictions

The use of local labour is encouraged but in practice the Government is fairly relaxed on this because of the shortage of qualified workers.

#### 3.10 Foreign arbitral award enforcement

Timor Leste has not acceded to the Convention on the Recognition and Enforcement of Foreign Arbitral Awards [New York, 1958<sup>1</sup>] (the 'New York Convention').

## 4. Legal challenges for electric power

## development and financing in Timor Leste

Project financing for a hydroelectric project in Timor Leste will present challenges:

• Lack of land law and proper land registry: land title disputes are numerous. It will probably be necessary for projects to obtain a concession for use of state-owned land rather than rely on the lease of private lands.

• *No secured transactions law or regime*: there is no current method of effectively ensuring the priority of conflicting pledges of assets.

• *No precedent or legal framework for private sector involvement in the electric power sector*: to date all electric power generation and distribution facilities are state-owned.

• *Project finance is untested in Timor Leste*: current bank loans require corporate or personal guarantees or bank letters of credit/guarantees.

• All contracts require notarization before a notary and must be in Portuguese: this will be a time-consuming and costly process for lengthy and complex projects and project finance documents.

• *Disputes resolution*: As Timor Leste is not a party to the New York Convention on enforcement of foreign arbitral awards and is not bound by treaty to recognize foreign court judgements, dispute resolution will fall to the undeveloped Timor Leste court system. This could be a serious issue for project lenders.

In addition, if a project plans to export a portion of the output to West Timor (Indonesian Timor), export related issues must be considered. Any such export would require the construction of a transmission line from the project to the nearest EDTL substation, a wheeling agreement with the grid operator (EDTL in Timor Leste) and, a new transmission line to interconnect with the PLN West Timor transmission line terminus at Atapupu. The project could construct, own and operate the new line to the West Timor border. PLN would probably insist on ownership and operation of the new line from the border to Atapupu, however, the project may be required to fund the construction of the line. The import of power into West Timor would require negotiation of a Power Purchase Agreement with PLN and relevant Indonesian approvals for such importation of electricity.

# 5. Lessons learned from hydropower

# development elsewhere in Southeast Asia

Hydropower development in Timor Leste can benefit from the examples set in other southeast Asian countries, in particular, Lao PDR. In Lao PDR, to date, more than 20 hydroelectric projects have reached the financing, construction or operation phases. Financing has come from multi-lateral agencies (including ADB, the World Bank and IFC), bi-lateral export and development finance agencies, Chinese banks, Thai banks, Vietnamese banks and international lender consortia including Japanese, French, Thai and Singaporean banks. While some of these lenders (in particular, the Chinese and Vietnamese banks) rely on sponsor and parent company guarantees, the other lenders have been willing to accept project risks and provide limited recourse financing. Some projects directly export a large portion of their output to the Electricity Generating Authority of Thailand (EGAT), which enjoys a strong credit rating. Other projects sell all of their output to the Lao Government-owned utility Electricité du Laos (EDL).

The cross-border export of electric power from hydropower projects in Lao PDR to EGAT has met with few legal barriers. What has been required is an executed Power Purchase Agreement with EGAT, construction of a transmission line at the project's expense to the Thai border, and an approval of the export tariff by the Prime Minister of Laos after review by the Ministry of Electricity and Mines. Recently, however, the Lao Government has insisted that new power projects must sell 100 per cent of their output to EDL, which in turn will export power to EGAT. It remains to be seen whether future Lao hydro projects that rely solely on EDL off-taker credit (rather than the stronger EGAT credit) will readily find limited recourse financing. Given the current weak financial status of EDTL, direct export by a Timor Leste power project to PLN in West Timor would be a preferred strategy, rather than an indirect sale through EDTL.

Project financing of Lao hydropower projects hasbeen facilitated by the adoption by Lao PDR of comprehensive laws and regulations relevant to the electric power sector and project financing, including: a contract law; a company law; an investment promotion law; an electricity law; a minerals law; a land law; a secured transactions law; a secured transactions decree; a document registration decree; a capital controls decree; a bankruptcy law; an environmental protection law; a forestry law; a water and water resources law; a tax law; and, a VAT law. Such a comprehensive legal regime allows project developers and lenders to know, with some measure of certainty, the parameters of permissible project development and finance.

Furthermore, in implementing the electricity law with respect to concessionary rights for hydroelectric projects, the government departments in charge have established recognized protocols and procedures for the negotiation process, involving an initial memorandum of understanding, a feasibility study, a project development agreement, environmental and social impact assessments and mitigation plans, a health impact assessment and action plan, and a comprehensive concession agreement and land lease. To the extent that the ministries involved lack legislative authority to grant the necessary approvals or any requested exemptions or incentives (such as tax incentives), a procedure has been established for final approval by the National Assembly Standing Committee. Such well established protocols and procedures, while in some cases causing unnecessary bureaucratic delays, do bring a level of certainty to the project development and financing process.

The situation in Lao PDR can be contrasted with that of Vietnam, where a less certain legal regime and a bureaucratic process even more cumbersome than the somewhat excessive Lao bureaucratic process has greatly slowed down the power project development process. The result has been that very few independent power projects have proceeded over the past ten years. By way of comparison, negotiation and execution of a concession/BOT (build-own-transfer) contract with the Lao Government may require 10 to 15 months. In Vietnam, the same negotiation process can take as long as three years. In both countries, the lack of cooperation and coordination between ministries, which may have differing priorities and objectives, is a cause of many of the delays.

The adoption by Timor Leste of similarly comprehensive electric power and financing laws, regulations and protocols would remove legal uncertainty and facilitate the development of hydropower projects in the country. If such laws and procedures can be implemented in Timor Leste without the addition of layers of bureaucracy, this would prove to be an additional impetus to development.

# **6.** Conclusion

Timor Leste remains a new frontier for hydropower development in Asia. The existing legal framework for independent power development is not well developed, the country's current power demand and grid capability are low and the credit-worthiness of EDTL is weak. However, a cross-border project selling output both in Timor Leste and into the larger demand market of West Timor (Indonesia) should be investigated. Such an export project would supplement the EDTL credit with a stronger PLN credit. The combined Timor Leste-West Timor demand for power may justify a larger scale project and the cost of the required transmission line. Hydropower developers, engineers, contractors and lenders should take notice of the opportunity.

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