

The great energy question

Cambodia looks to an uncertain power future



Written by Steve Finch
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The sun sets behind power lines in Phnom Penh last October. **Photo by: Uy Nouseimony**

There is a risk of electricity shortages if the power industry cannot deliver adequate new capacity as demand soars.

ENERGY stats

Coverage Alliance for Rural Electrification says rural supply in Cambodia is just 12.5 percent of the population. Energy demand MIME estimates domestic demand may reach 500MW in 2011, 625MW in 2012 and and 780MW by 2013. LOCATED in a small office close to Phnom Penh's Olympic Market, SME Renewable Energy Ltd in many ways illustrates the problems associated with generating and distributing energy in Cambodia.

The company – which imports biomass gassifiers from India that produce electricity at less than half the price of diesel generators – exists partly through necessity because the national grid is still almost nonaccessible in rural Cambodia.

Generating power by semi-combusting matter including rice husks into combustible gas, the most versatile gassifiers can switch between biomass and diesel, says Managing Director Rin Seyha. These machines therefore make an ideal upgrade from classic diesel generators.

“It's a perfect replacement,” he says.

However, as with the Kingdom's nascent power sector, the initial investment required is

significant.

A 1.1-megawatt gassifier costs about US\$450,000, the main reason SME Renewable Energy has imported only 33 machines in its six years of operation, he said, despite the backing of United States financiers that offer loans so farmers can afford the investment.

Cambodia's rural economy is therefore caught in an energy trap. The lack of grid electricity means an expensive alternative is required if farmers are to process crops for greater profit - which usually requires milling machines and crop driers.

But with few financing options and opportunities to add value, the necessary capital cannot be generated, so too the required electricity.

Rural shortfall

Rural Cambodia therefore needs an energy boost from somewhere.

According to Belgium-based non-profit organisation Alliance for Rural Electrification, at just 12.5 percent population coverage, Cambodia's rural electricity supply was greater only than that of Myanmar within ASEAN in 2008. Otherwise in Asia, only North Korea, Afghanistan and East Timor fared worse than Cambodia, whose national grid was all but destroyed during the Khmer Rouge era and subsequent civil war.

In terms of electricity tariffs, Cambodia charges among the highest prices in the world, according to the World Bank. Given that most generation is small-scale, decentralised and in short supply, that is hardly surprising. Biomass – wood, charcoal and biological waste – remains “the main source of energy ... for rural enterprises”, says Chailotte Nicollet, programme officer at GERES, a France-based renewable energy NGO.

Meanwhile, the country's energy demand continues to accelerate. This year total demand reached 400MW, 50 percent more than supply, according to a March forecast by the Ministry of Industry, Mines and Energy.

Over the next few years, Cambodia's appetite for electricity will rise 25 percent annually according to the most sober government estimates, but supply solutions remain limited.

“In the short-to-medium term, Cambodia's options are to import energy from its neighbours, particularly Thailand and Vietnam,” said Anthony Jude, director of the Asia Development Bank's Energy and Water Division for Southeast Asia.

Main supplier Vietnam has remained reluctant to raise exports, however, due to power shortages of its own. Despite an agreement dating back to 2000 stating that Cambodia's neighbour would supply 200 megawatts from 2009, Hanoi only permitted 100-megawatt supply capacity by March prompting Prime Minister Hun Sen to write to the Vietnamese government to demand more.

But total domestic electricity demand in Cambodia will reach at least 500 megawatts in 2011,

625 in 2012 and over 780 by 2013, according to MIME. What happens then?

Hydropower debate

“The key challenge for Cambodia is developing its own power generation source – based on coal, gas and hydropower – coupled with the development of a national transmission and distribution system that would evacuate electricity generated from based load power plants to load centres in major cities, as well as to rural areas,” says Jude.

The first of two 100-megawatt coal plants being built in Sihanoukville was due to come online next year, said an OSK appraisal of Malaysian operator Leader Universal, with the second installment due the following year. But much bigger questions exist over power generation in the longer term.

The government has put United States energy firm Chevron under pressure to produce fossil fuels by 2012. But the real onus is on hydropower in the medium term, say analysts, and just how many of the more than 20 dams under consideration will be built?

“There is ... a risk of electricity shortages if the power industry cannot deliver adequate new capacity as demand soars,” said the latest appraisal of Cambodia’s power sector by Research and Markets last month.

Last week, the World Bank became the latest organisation to express concerns over hydropower in the region by stating it would not fund more dams on the Mekong River after a report this month by the Mekong River Commission expressed grave concerns about the social and environmental impact caused by such projects.

The MRC’s recommendation of a 10-year hiatus on the construction of all Mekong dams to allow for further studies would, in Cambodia’s case, mean a huge reduction in government projections of energy production by 2020, the year the Kingdom is aiming for 100 percent electricity coverage. Its study identifies two dams in Stung Treng province and Sambor, Kratie province, which together are scheduled to produce close to 3,600 megawatts by 2020, or around the total energy demand in Cambodia for the same year.

Essentially, MRC has suggested that these projects be put on hold. Yet all projections that Cambodia will start to export electricity in about five years are based on the best-case scenario – demand rising at just 25 percent per year and the completion of all scheduled dams on time.

“In terms of least-cost power supply, mainstream projects are most critical for the Cambodian power sector, particularly in the long term when plants are transferred to national authorities,” said the MRC report.

The next few months will see the completion of two more critical reports on Cambodian hydropower that could determine future government energy policy, say analysts.

The MRC is set to unveil its follow-up River Basin Development Plan “which will articulate the organisation’s views on the optimal development of the Mekong river basin”, the World Bank

said last week.

Meanwhile, MIME is finalising a survey of hydropower potential for the Kingdom on as yet unscheduled sites following a long-term study by the Japan International Cooperation Society, the organisation's Phnom Penh-based hydro-specialist Takanobu Shinodu said.

"There is much potential for hydropower generation in Cambodia including micro-hydro power," he said, declining to reveal key details of the study ahead of MIME approval.

"In order to achieve sustainable development, it is important to consider the social and environmental impact in the potential sites."

The MRC warns that more than 29,000 people would have to be resettled at the Stung Treng and Sambor sites if the dams are built, and that fish stocks would be impacted.

It therefore remains to be seen how the Cambodian government plans to balance electricity production with environmental and social concerns.

Energy Minister Suy Sem has not replied to a written request submitted in mid-September to outline Cambodia's energy policy. This month, MIME Secretary of State Ith Praing said he was too busy to discuss the issue.

The nuclear option

Other energy options remain even less certain. Although Cambodia rejoined the International Atomic Energy Agency in November last year and this month took part in its first IAEA international meeting, participant Heng Kunleang, the director of MIME's Energy Development Department, said on Tuesday that the Kingdom's nuclear ambitions remain years away.

Vietnam announced plans for its own atomic programme back in 2002, but is not planning to bring its first reactor online until 2022, according to Hanoi's energy master plan.

Vietnam – with assistance from atomic expert and long-term ally Russia – will take at least 30 years to connect atomic energy to the national grid, which makes Cambodia's stated plans for 2020 look optimistic given a possible programme was first suggested in late 2008.

"Any country considering the development of a nuclear energy programme needs to address a number of issues," says Jude, citing the need for technical skills in-country, a power plant blueprint, a suitable location, signing of an international nonproliferation treaty, agreements with the International Atomic Energy Association, national safety laws along with a waste-disposal plan, fuel supply, selection of appropriate technology.

"Furthermore, if a country is looking at nuclear energy to meet its demand, the national power grid would need to be strengthened to ensure reliability."

The alternatives

In the meantime, Cambodia's renewable energy is still in its infancy.

The country unveiled its first wind turbine in Sihanoukville as recently as January, while a \$300 million solar project announced last November has made little progress since then, proposed Dutch investor Frans Marchand confirmed this month, as discussions with the government continue. He declined to offer further details.

“Renewable energy is still a new thing in Cambodia,” says Rin Seyha.

Studies have suggested the government will need as much revenue as possible to meet the cost of supplying power nationwide. An ADB report conducted three years ago found Cambodia would require \$1.5 billion to gradually expand the country’s generation, transmission and distribution system, says Jude. And this “would need to be reviewed in light of cost increases over the years”, he added.

Investment analysts warn that energy supply is one of the most important challenges facing the Kingdom’s economy.

“To gain competitiveness and attract a broader range of industries Cambodia must reduce its power costs,” says Douglas Clayton, CEO of investment fund Leopard Capital.