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This report was researched and
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Indonesia's Energy Sector

Where Crisis Breeds Opportunity

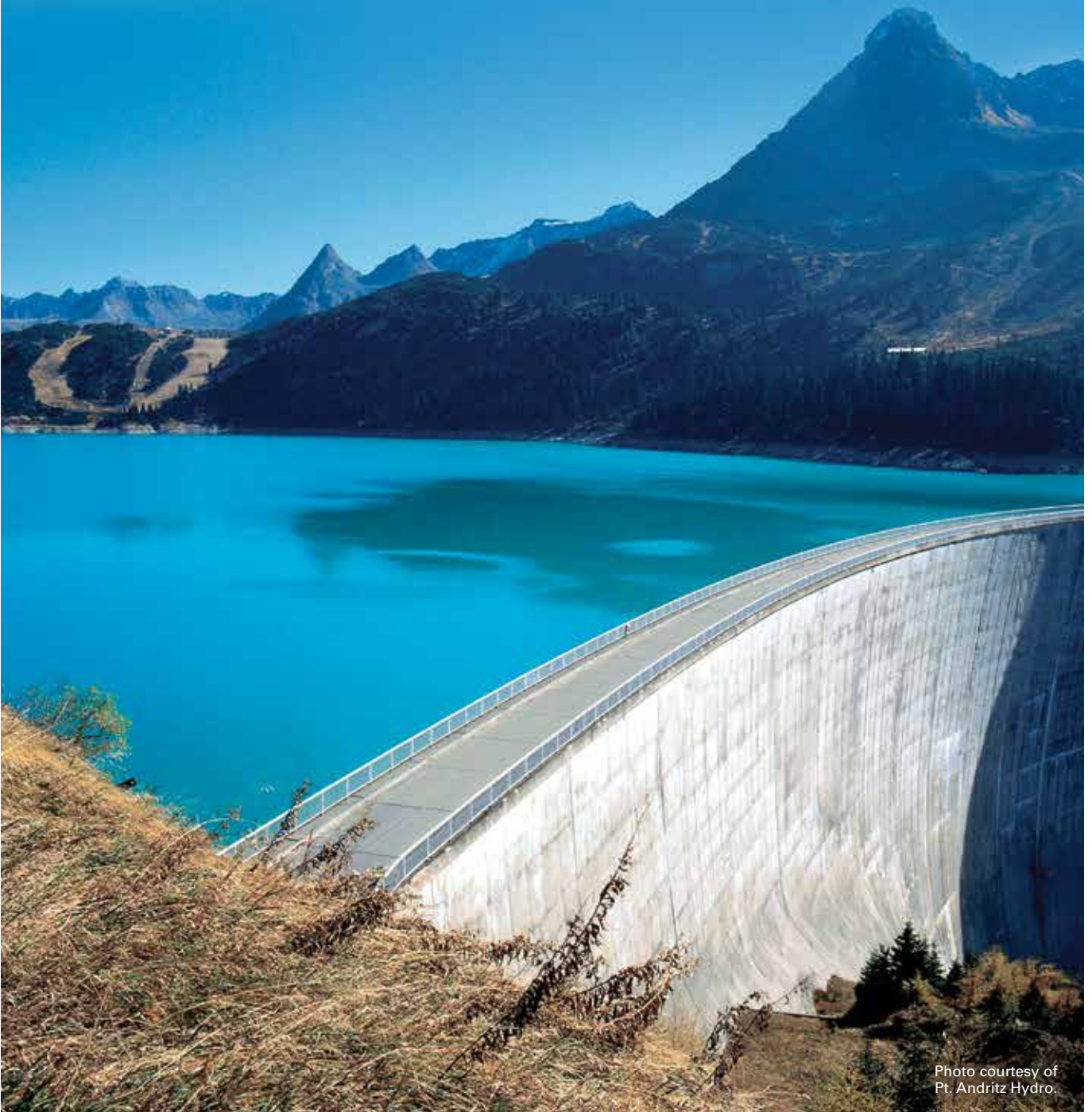


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Megamalls galore, roads teeming with vehicles, Starbucks stores found at every strategic location, to an outsider, Indonesia's capital of nearly 10 million people, Jakarta, shows every sign of a country well on its way to becoming an economic powerhouse. Years of GDP growth consistently in the 5 to 6% range have pulled Indonesia into the bracket of middle-income countries, but its ability to move up within that bracket or beyond is by no means guaranteed. Although endowed with a plethora of natural resources and favorable demographics, Indonesia's continued upward mobility could be hampered by several key factors. These include reforms to limit foreign participation in key resource sectors of the economy, such as mining and plantations, energy subsidies that chew up an unsustainable 20% of the national budget and a looming energy crisis that could hamstring industry and undermine urbanization. While the effect of the resource sector reforms to the country's economy will take years to understand and ending the energy subsidies, a thorny issue for any country to tackle, will take time to achieve, there is a near universal understanding that the government must act to address multiple issues related to the country's power situation. Indonesia must work to increase the 75% electrification ratio, one of the lowest in the region, to reach the entire population; boost generation capacities to keep up with a staggering energy demand increase of 7.4% per year; and alter the current energy mix to ensure energy security for the nation's future. Failure to achieve these goals could compromise the country's ability to continue to lift millions out of poverty and compete on both a regional and global level.



Guy Des Rosiers, senior foreign legal consultant, MAKARIM & TAIRA S.

Ambitious Plans, but Efficacy Mixed

As Kishore Dass, the president director of Pöyry Indonesia, the global Finish consulting and engineering firm, made clear, the energy challenge facing Indonesia is

great. "Power shortages are endemic in Indonesia. The country's total electricity generation touched 47 GW as of the end of last year. According to PLN's electricity procurement plan for the 2013 -2022 period, there needs to be an additional capacity of 31.5 GW for the Java-Bali grid. This amounts to about 3.2 GW per year. At the national level the power requirement translates to around 6 GW per year," he said.

Increasing the national generating capacity to 60 GW by 2022, as the government-owned Perusahaan Listrik Negara (PLN), which has a monopoly on electricity distribution and accounts for 80% of the country's generation capacity, has forecasted, is no small feat. While the government has done well by enacting regulation in 2009 for renewable power projects of 10 MW that stipulates feed-in tariffs for investors and that assigns to the PLN the obligation to buy this power, the government understands that it must encourage projects of a larger scale. To help achieve such a significant increase in power generation, in 2006, the Government introduced the fast-track program (FTPI) mandating the PLN to build 10,000 MW coal-fired power plants by 2011, a deadline that was later extended to 2014. In 2010, the government launched a second 10,000 MW fast-track program (FTPII), aimed at encouraging investment from Independent Power Producers (IPPs), which sell electricity to the PLN, and separately the development of renewable energy, focusing on geothermal and hydro power. The FTPII program was initially to be completed in 2014, but that target date has been pushed back until 2020.

To realize the construction and commissioning of the power plants under FTPI and FTPII and additional power plants that do not fall within the purview of these programs, the government has turned to the private sector, particularly toward foreign investors. Although recent regulations, bred from nationalist sentiment, negatively affect foreign investors' interests in other segments of the economy, the current

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Interview with Bambang PS Brodjonegoro

VICE MINISTER OF FINANCE, REPUBLIC OF INDONESIA

Can you provide us with an introduction to the role of the Ministry of Finance in relation to the energy sector?

BPSB: The Ministry of Finance performs many functions in respect to the energy sector, but the most important relates to the energy subsidy, which takes the form of an electricity subsidy to the national electricity company Perusahaan Listrik Negara (PLN) and also a retail fuel subsidy. For 2014, the government has allocated IDR 350 trillion, which is nearly 20% of total spending of the national budget for this purpose. It is very important that the Ministry of Finance manages this position carefully; otherwise, there are two very serious ramifications for the country. The first is that the Ministry of Finance runs out of money and cannot pay the energy subsidy for the remainder of the year. The second possibility is that the Ministry of Finance does not pay the electricity subsidy at the right time which would result in problems with energy delivery, namely blackouts. In the case of the fuel subsidy, people would line up at fuel stations just to receive the subsidized fuel. The second important role of the Ministry of Finance is the provision of guarantees for power plants. Whenever an investment is being made for a power plant, the Ministry of Finance will provide a limited government guarantee through the PLN. The PLN will sign a Power Purchase Agreement (PPA) with Independent Power Producers (IPPs) and the Ministry of Finance will make sure that the PLN fulfills this commitment to the private sector.

Discussions to reform the country's subsidies have been a part of the national discourse for several years, though there now seems to be more emphasis on tackling this issue. How does the government intend to alter the current system?

BPSB: A reform to the current system of subsidies must take place to make the budget more sustainable and also to

better target the people who need the support from the government. The current framework will be amended to move from a price subsidy to more of a people assistance mechanism. These reforms are taking place slowly and the electricity subsidy has a better chance of being reformed than the fuel subsidy as you can easily classify the customer based on energy consumption, e.g. targeting households, commercial enterprises or manufacturing and industry. This transformation will take time and is politically difficult, but it must be done. Another important outcome of these reforms is that they should encourage more private investment. By releasing the price subsidy and moving to targeted assistance, the price of electricity will be more attractive to investors.

The government is keen to alter its energy mix so that there is more of a focus on renewables. How will Indonesia achieve this?

BPSB: Indonesia is a collection of islands, many of which are remote and have difficulty generating power. In these areas, a coal-fired power plant cannot be built because it is not economical. Currently, the only way to generate power for these islands is through diesel fuel, which is costly not only because of the price of the diesel, but because it must be transported to the islands by plane. The government sees alternative or renewable energy, such as solar, as a solution to these off-grid islands because these options are at least competitive to diesel fuel.

For the larger islands, renewable fuel depends on pricing policy. If the price of electricity continues to be heavily reliant on the price subsidy, then coal will be the most viable option and gas will be a secondary choice if available. If the price is more relaxed, adjustable based on the energy cost, then geothermal will have a place, especially in Sumatra and Java, which are the main sources of geothermal.

For foreign investors considering the power sector in Indonesia, why is now a good time to invest?

BPSB: The potential of Indonesia lies in the fact that it is a growing emerging market with bright growth prospects: a large population base, a growing middle class, natural resources, and an effort to transform the economy from natural resource based reliance to a natural resource based economy. Indonesia still needs power and once the pricing policy becomes more flexible, the power sector should be attractive for investors interested not only in traditional power plants like coal, hydro or gas, but also renewable power solutions, such as wind, solar or even biomass.

The appetite of foreign investors is evident in the composition of the final bidders for the Central Java Coal-Fired Power Plant, which was awarded in 2011. Of the final bidders, there were two Chinese and two Japanese companies with the final winner being Japanese. The heightened interest of foreign investors is evident and it is not only from Asia, but from Europe and the United States as well.

When Global Business Reports Returns in two to three years, how will the power sector be different?

BPSB: The government is eager to increase the electrification ratio from its current level of 76% to hopefully 90%, if not more. The second change that will occur within this time period is that the pricing policy for electricity will be more flexible. The country also will see an improved energy mix: diesel and non-renewable consumption will be a bit lower and renewable energy usage will see an increase. Indonesia is still a potential market for the energy sector, particularly power, and we encourage any interested investors to consider the opportunities that this country has to offer. •



Black & Veatch helped deliver Tanjung Jati B Units 3 & 4, located near Jebara, Central Java, Indonesia. The plant is owned by Sumitomo Corporation and subsidiary PT Central Java Power, and is operated by PT PLN (Persero), Indonesia's state-owned power utility. Photo courtesy of Black & Veatch.

regulatory structure for the power industry is very favorable to foreign investors looking to enter, as Guy Des Rosiers, senior foreign legal consultant at the Indonesian law firm MAKARIM & TAIRA S., noted: "Overall, the current environment for foreign investors is positive thanks to a legal framework that allows bankable projects to come to the market, and a generally favorable attitude from PLN and relevant government stakeholders, all of whom share a strong incentive to ensure the smooth development of future power projects."

Noting a discernable change in how the market perceives the attractiveness of investing in the power sector in Indonesia, L. David Rimbo, managing partner within the Transaction Advisory Services group at Ernst & Young Indonesia, explained: "Within the last five to six years, there is greater understanding about the prescribed investment structure and operational set-up of an IPP project in Indonesia under the PPA scheme, primarily under a BOO (Build-Operate-Own) arrangement. With such a scheme, the returns will continue to accrue to the asset owners beyond the tenure of the initial PPA, with a renewal or extension of the PP; this has investors rethinking the value of their assets."

In addition to providing investors with an enhanced understanding of the IPP framework, the government has evidenced further commitment through the passage of a 2009/2010 Public Private Partnership (PPP) Law that creates a specific framework for a subset of investments to give legal certainty to investors. While the PPP framework has been touted as the proverbial winning ticket to solving Indonesia's various energy concerns, the uncertain outcome of the flagship PPP project, the 2,000 MW coal-fired Central Java Power Project (CJPP), renders the idea of relying on PPPs an inadequate solution for the present. Owned and operated by Bhimasena Power Indonesia (BPI), a joint venture between Japan's J-Power, trading house Itochu and Adaro Power (a subsidiary of Indonesia's coal mining giant Adaro Energy), the \$4 billion CJPP was initially scheduled for a 2016 commissioning, but construction has yet to begin as a result of land acquisition issues with the local governments and communities, a problem that plagues many large power projects in the country. These issues came to a head in July 2014 when Adaro Energy declared force majeure in light of the fact that after prolonged negotiations, the consortium was only able to acquire 85% of the land necessary.

Involved in outlining the processes and organizational structure for PPPs for the Government, Michael Crosetti, director at Castlerock Consulting explained: "As with many sectors in Indonesia, the problem lies in the inability of the various authorities to coordinate,

which is further compounded by issues at the regional level. Before Suharto [the country's second President who ruled for 31 years] stepped down, power was too centralized and in 1999, the first law devolving power to the regional level was passed. Successive laws followed and then sector specific laws were implemented. While it was a positive move for the country, the pendulum has perhaps swung too far. The regions lack the human resources to implement large-scale projects involving international investors and the risk of corruption and rent seeking is much higher at the regional level. This is a recognized issue, but the question then is how can the central government claw back some of this authority?" Whether the government will step in and save CJPP remains to be seen.

Moving Forward to Achieve Success

While CJPP serves as a cautionary tale, thankfully many power plant projects outside of the PPP scheme, both large and small, are moving forward and being completed by the PLN and those IPPs that know how to navigate Indonesia's complexities. Both foreign and domestic private investors have been helping to push these power projects ahead in part as a response to the PLN's multi-faceted approach to solving the energy issues, as Rimbo explained: "The PLN itself has implemented a firm long-term plan and strategy, with a very firm focus on rearranging the composition of primary energy sources away from dependence on oil and diesel fuel and more towards coal, gas and geothermal and renewables. This in and of itself creates opportunities for investment in the country." Even as the government looks to increase the electrification ratio and keep up with soaring demand, the country is also trying to diversify its energy mix, as evidenced by government incentives and initiatives such as the FTPII's focus on developing renewable energy. Most recently, in January 2014 Indonesia's legislature passed a National Energy Policy, formulated by the National Energy Board (Dewan Energi Nasional – DEN), that aims to end the energy and electricity subsidies, gradually reduce the exports of coal and gas, and increase the use of renewable energy as a primary source of energy.

Ultimately, the primary goal of the government is to move the country away from its costly reliance on diesel fuel to forms of energy that it has in abundance, namely coal and certain types of renewable energy. While coal-fired power plants have long been an important source of power in Indonesia with an estimated 23 GW of coal-fired power plants currently in operation, their presence will only become more prevalent in the years to come, particularly as

Renewable and clean Energy: A Small Output can Make a Big Difference

Indonesia may hold enormous potential for large hydro and geothermal projects, but these ventures are costly and cannot be completed in a short time-frame. In a country that must meet growing energy demands today, not only in the future, small renewable and clean energy projects can fill this need.

Wind

"Equatorial weather [as seen in Indonesia] is very constant. The lower, but predictable, winds in Indonesia allow the newer Class III wind turbines to get very high efficiency and productivity. Lastly, the lower winds are expected to bring about other benefits, such as leading to fewer high wind construction delays and less long-term maintenance for the turbines.

Wind power deploys quickly and can be less costly than other sources of renewable energy. In addition, wind turbines do not cause many social issues as only a small portion of land is used and they do not change the existing primary use and revenue stream from the land to land users.

At present, UPC Renewables Indonesia and Binatek Reka Energi are negotiating the Power Purchase Agreement (PPA) with the PLN [for the 50MW PT UPC Yogyakarta Bayu Energi, in Bantul regency in the Yogyakarta province on the island of Java]."

- Chris Caffyn, Senior Vice President, PT. UPC Renewables Indonesia

Agrowaste

"Given the level of Indonesia's agricultural output, agro waste, which can be used through a gasification combustion system to produce electricity, is a natural choice for renewable energy generation in the country. Electricity through agro waste has the potential to work anywhere in Indonesia as long as the logistics, amongst others, the feedstock is secured. In 2011, I approached the Bureau of Logistics (BULOG), the largest government institution for the distribution of food, such as rice, sugar and flour, to acquire the rice husk that is a byproduct of the rice milling process. Within just two weeks, SyRes Indonesia signed the contract with BULOG and later secured a grant through the Dutch government to build two rice husk power plants, one in Sulawesi and another in Java. By using rice husk as feedstock for the gasification, BULOG is able to reduce its operational cost by 70%."

- Hoedani Hadijono, President Director, PT SyRes Indonesia

Natural Gas

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In the near future, MAXpower Group will focus on developing a virtual pipeline, meaning shipping gas to islands in East Indonesia and then converting it to electricity... Where there is no coal or hydro available, shipping gas is the most practical and affordable alternative to diesel. MAXpower Group has already completed a CNG blueprint project in Bintan island which has reduced the cost of generation from 30 cents per kWh to 22 cents per kWh while cutting carbon emissions by half."

- Arno Hendriks, CEO, MAXpower Group

the market for Indonesian coal has shifted as Bill Park, technical manager of New Resource Mine Consulting (NRM) explained: "The Indonesian coal mining industry experienced an unprecedented boom between 2007 and 2012, but recently there has been a downturn in coal pricing due to an oversupply in the global market and a weakening of demand from China. In the near-future, Indonesia's ability to continue to export coal could be further compromised by the fact that much of the country's remaining coal is low grade, which is not desirable for export."

Some may argue that the variable price of coal could affect its cost-effectiveness as a primary source of energy generation, but Dass of Poyry Indonesia, which provides its services for both coal-fired and renewable energy power projects in the country, countered that assertion: "The priority for the government would be to facilitate the development and construction of coal fired power plants, may it be through legislation or incentives, until such time that certain national energy related goals are met... The decision to build coal-fired power plants based on a theorized future price of coal makes sense given certain market dynamics, such as a slowdown in the demand from China. Though the Chinese economy might be slowing down, Indian coal stocks are running low and recently Australian miners too are easing back on their exports. Thus, no one can predict the future price of coal and so it would be prudent for the government to utilize this natural resource for the domestic needs of today for the betterment of the overall electrification ratio nationwide."

Though coal is here to stay as an energy input for the short- to medium-term, the Government recognizes that it must do more to assure the country's long-term energy security, as Barid Manna, principal advisor of Air Quality and Climate Change of the consulting firm ENV Indonesia pointed out: "Renewable energy is important for the country to achieve sustainability, increasing green energy usage and the capacity of future generations. With half a million barrels of oil produced per year and only 10 million barrels of oil left, oil and gas may only last for another 20 years. Coal may last another 80 years at current production levels of 400



Fazil E. Alfritri, President
Director, Pt. Medco Power
Indonesia

million mt/y. Within two generations, these resources may be depleted."

Indonesia's Renewable Energy Success

While the country's projected reliance on renewable energy may seem overly ambitious, an understanding of the country's renewable energy resources does make it seem more attainable. Situated within the ring of fire, Indonesia holds 40% of the world's geothermal resources, equaling 29 GW of electricity across the archipelago. Evidence of geothermal's enormous potential in Indonesia lies in the Sarulla project being developed by Medco Power Indonesia, a joint venture owned by Medco Energi Internasional, the largest national oil and gas company in Indonesia, and Saratoga Power. A project under FTPII located in North Sumatra, Sarulla, on which construction began in June 2014, will be the world's largest geothermal power plant. Fazil Alfritri, president director of Medco Power Indonesia explained the project: "Sarulla is one of the most ambitious power projects currently being undertaken in Indonesia with total capital expenditure amounting to \$1.6 billion and total debt of \$1.2 billion. The power plant's operations will come on line in three phases: 110 MW in 2016, 220 MW in 2017 and additional capacity after that point. From the proven reserve perspective, in the next twenty to thirty years, Sarulla could very likely double or triple its output from the initial 330 MW."

Medco Power Indonesia is focusing on nine clean and renewable energy projects in addition to Sarulla, including a 75 MW natural gas power plant, a 30 MW combined cycle power plant, six 45 MW mini hydro projects scattered across Western Java and Sumatera

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Medco Power Indonesia owns and also operates 300 MW IPP in Batam and South Sumatra and 1500 MW Operation and Maintenance of Tanjung Jati B Power Plant in Jepara. Medco Power Indonesia expands its business by acquired 5 [five] mini hydro projects in West Java with total generating capacities of 35 MW and build 440 MW geothermal power plant.

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and will be adding another 110 MW geothermal power plant in Situbondo, Eastern Java which is scheduled to begin drilling in 2015. As great as the potential for geothermal is, even more promise lies in hydropower. Josef M Ullmer, the president director of global electro-mechanical equipment supplier for hydraulic power generation Andritz Hydro, revealed: "The potential for hydropower in Indonesia is tremendous: 75,000 MW have been confirmed and if we include run of the rivers and mega sites for Hydro Power Plants, the real potential could be above of 100,000 MW." Although dozens of mini hydro plants have been undertaken by the private sector, the majority of large hydro power plants are being developed by the PLN, including Indonesia's largest hydro power project, the West and East Java 1,040 MW Upper Cisokan Pumped Storage Hydro-Electrical Power Project, for which Andritz Hydro is in the process of prequalifying for the Hydraulic Steel Structure Lot as well as for the Pump Turbine and Motor Generator Lot. Noting the difficulties, Ullmer said: "The largest issue facing private sector investment into large hydro power projects is related to permits and land acquisition. For large hydro projects, over 25 different permits are required. The Asahan III [a 154 MW run-of-river hydroelectric power plant in North Sumatra] project has been delayed for three years, not because the prop-



Josef M. Ullmer,
President Director,
Pt. Andritz Hydro

er permits for the plants were not in place, but because permits and land titles for the access roads are not yet done. In most parts of the world, such an issue would have been resolved by a telephone conversation between two ministries; this is not the case in Indonesia."

Though this fact is not meant to discourage private sector investment in large hydropower projects, it underscores the importance of partnering with those who know the lay of the land.

Reaching the Smaller Islands

Large coal, geothermal and hydro projects are ideal for the larger islands where industrial development is concentrated, but as Indonesia becomes more prosperous, it must also work to expand access to electricity to its citizens sprinkled throughout many of the smaller remoter islands. The best way to achieve this is through smaller renewable energy projects, as Bambang PS Brodjonegoro, the Vice Minister of Finance, explained: "Indonesia is a collection of islands, many of which are remote and have difficulty generating power. In these areas, a coal-fired power plant cannot be built because it is not economical. Currently, the only way to generate power for these islands is through diesel fuel, which is costly not only because of the price of the diesel, but because it must be transported to the islands by plane. The government sees alternative or renewable energy, such as solar, as a solution to these off-grid islands because these options are at least competitive to diesel fuel."

The Government, NGOs and private sector companies have been working collectively to make renewable energy for the smaller islands a reality. This is best illustrated by the example of the island of Samba. Castlerock Consulting is one of the primary parties working on the project. Crosetti explained the initiative: "The government of Indonesia has identified Sumba as an iconic island that can serve as a model for other islands in Indonesia, and perhaps even for other countries. The idea is to move from a 30% electrification ratio and 15% reliance on renewables today to a 95% electrification ratio and 100% reliance on renewables by 2025. We are working with other stakeholders to identify, plan and implement both grid and off-grid solutions that utilize hydro, wind, solar and biomass resources."

Samba's success could dictate how access to electricity is developed for the millions that live in Indonesia's many isolated islands.

Conclusion

Whether the government of Indonesia will be able to achieve its ambitious targets remains to be seen, however, the dire need to address Indonesia's energy needs is real and investors are responding. Investors have every reason to be bullish on the country, as Alfritri elucidated: "From an investment perspective, Indonesia is a gem in the region: it is the largest democracy in Asia, providing a very stable operating environment and in terms of power demand, the country's current situation must be addressed for the country to remain competitive." •

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