

“The Role of Renewable Energy and Energy Efficiency in Addressing Climate Change in Indonesia”

An Open Forum with

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On September 15, two leading experts on energy policy in Indonesia, Dr. Josef Leitmann, Lead Environmental Specialist, East Asia-Pacific Region at the World Bank, and Professor Saifur Rahman, Director of the Advanced Research Institute at of Virginia Tech University, gave a talk at USINDO on the role of renewable energy and energy efficiency in Indonesia.

Dr. Leitmann began the talk by noting that the debate over how to address climate change has led to a new opportunity for Indonesia to discuss how best to promote greater use of renewable energy and energy efficiency. Moreover, recently the Minister of Finance has led the effort to mainstream climate change as a development issue among finance ministers worldwide.

He continued by stating that Indonesia needs to pursue a strategy of low-carbon growth, which means decreasing emissions while increasing economic growth and development. This requires a move toward more renewable energy

and a focus on energy efficiency, increasing energy security, and addressing deforestation, and can be achieved through access to new sources of financing offered by the World Bank and others.

Indonesia's historic carbon dioxide emissions ranked only 27th globally from 1850-2002. However, overall emissions have increased dramatically in recent years, placing Indonesia among the top five emitters today, and will continue to do so in the future. While the majority of Indonesia's emissions are caused by deforestation and peat land conversion, energy-based emissions are growing the most rapidly, and will increase in importance as the country takes steps to address emissions caused by deforestation and land degradation. Indonesia's emissions are unique because they are growing faster than GDP and faster than energy consumption rates. Emissions are likely to quadruple in the next 20-25 years, primarily because of a shift to coal-based

power generation, even as emissions per person remain relatively modest.

Cheap electricity and fuel, subsidized by the government, are primarily responsible for the high emissions, particularly within the industrial and transportation sectors. Moreover, Dr. Leitmann noted that energy subsidies hurt the economy, benefit the rich, cost the government a substantial amount, and make it difficult for renewable energies to increase their share of the market.

Indonesia has significant potential to move towards a softer energy path, but this has yet to be developed. While the country has over 75 Gigawatts of potential hydropower and 27 Gigawatts of potential geothermal energy, only 4200 Megawatts and 807 Megawatts of installed capacity have been developed, respectively. Currently, Pertamina Geothermal Energy (PGE) controls the largest share of geothermal resources with the best scale-up potential. Thus, in order to scale-up investment in geothermal energy resources, public-private partnerships will be needed.

Indonesia also has a lot to gain by investing in energy efficiency. Specific policies can be targeted to different sectors: *regulatory approach* in increasing efficiency standards and promoting best practices, *fiscal measures* including subsidy and tax incentives and promoting a better investment climate, as well as *voluntary measures* that focus on outreach and raising awareness of win-win choices. Energy labeling also has the potential to

increase efficiency; as subsidies are gradually eliminated, consumers will demand more efficient appliances.

While Indonesia has not yet taken full advantage of its renewable energy and energy efficiency potential, new programs are working to change this. First, there is now the added incentive of financing through clean technology funds geared towards ushering in a softer energy path. Additionally, technology transfer funds made available through climate change negotiations can also be used for technologies that decrease greenhouse gas emissions. Other countries have accessed these new financing mechanisms already. The World Bank offers several climate finance opportunities for clean and/or renewable energy, including the Clean Technology Fund and the Carbon Partnership Facility. Additional funds are being mobilized through private direct investment, bilateral donor programs, and voluntary carbon markets. It also offers policy advice and technical assistance.

Dr. Leitmann concluded by saying that ultimately, clean and renewable energy must be a part of Indonesia's low carbon strategy. As the management of the forest sector improves and emissions from land use conversion decline, Indonesia should leverage investment in energy infrastructure towards renewables, avoid the long-term liability of high-carbon infrastructure, and use international climate financing mechanisms for a lower carbon development pathway.

Following Dr. Leitmann's presentation, **Professor Saifur Rahman**, Director of the Advanced Research Institute at Virginia Tech University, presented on the opportunities and challenges of sustainably electrifying Indonesia.

He began by noting that Indonesia faces a huge challenge in electrifying the country; by definition there can be no national grid. Previous plans to electrify off-grid and rural areas of the country through solar panels failed. Only about 60 percent of the country is electrified, and while the focus of the remaining 40 percent not connected to the grid has been on solar photovoltaic panels, Indonesia has not had success with these kinds of programs.

Indonesia is currently responsible for only one percent of global coal consumption, but coal has the highest carbon dioxide emissions of all the fossil fuels, and is anticipated to increase from 37 percent to 66 percent of the country's energy mix within 10 years. Moreover, other coal-dependent countries are focusing on reducing their use of the fuel, China, for example is expecting to decrease its coal usage from 80 percent down to 60 percent by 2025. Thus Indonesia will be responsible for an increasing percentage of greenhouse gas emissions from coal in the future.

The current focus on coal as a source of energy is not sustainable, environmentally or economically, yet there is currently no plan to increase the percentage of geothermal or hydropower used, while wind and solar are completely absent from the mix.

Professor Rahman believes the absence of renewables in the energy plan is simply because PLN does not have experience with wind or solar power systems, and thus does not have the mindset to incorporate these systems into their energy planning. Thus, if Indonesia wants to significantly increase the use of renewable energy, the job must be given to a group with a mindset and value system to promote renewable energy. In Bangladesh, for example, the job of promoting renewable energy was given to NGOs, rather than to the utility company.

What then, is Indonesia doing to promote renewable energy? Several Ministerial Decrees have focused on small, medium and large-scale distributed power generation using renewable energy resources. Under the current system, power utilities are obligated to purchase the renewable power at between 0.6 and 0.8 times the PLN local production cost, regardless of the actual generation cost. Thus, if renewable energy can be generated more cheaply than the local non-renewable electricity source, producers will make a profit. However, this rate pales in comparison to India and Thailand, which offer 6 to 8 times the utility production cost for renewable energy. These so-called Feed-In Tariffs, which pay producers for investing in renewable energy generation by obligating utility companies to purchase the electricity generated, can significantly stimulate investment if set at a high enough rate.

Following the presentations, Dr. Leitmann and Professor Rahman took several questions from the audience.

Q: Indonesia has a lot of natural gas, why are they not using it domestically?

A: Lots of the proven natural gas reserves are tied up in long-term contracts. Additionally, it can be exported at attractive prices. Moreover, those in control of coal and oil markets have a vested interest in maintaining the dominance of these energy sources in the domestic market and would prefer not to see a policy shift that promotes renewable energy sources.

Q: What is the level of interest and/or activity on adaptation to climate change?

A: Overall, the interest is still on mitigation efforts, although interest in adaptation does go up when a disaster related to climate change happens. It also depends on the political clout of the regions affected by climate change. For example, in Jakarta there has been an increased interest in adaptation because a third of northern Jakarta is at risk to sea level rising. However, Eastern Indonesia is getting drier and currently facing a serious drought, but the region does not have the political clout to get attention for adaptation programs.

Q: What is your opinion of coal bed methane, carbon capture and storage, or other clean technologies such as biofuels, which have lower carbon emissions than the status quo and are

within reach, financially and technically?

A: Coal bed methane and carbon storage do not qualify for financing under the World Bank's Clean Technology Fund, where the focus is more on less expensive and more proven technologies. SBY had a plan to increase biofuel production, but any biofuel plan has implicit and explicit implications for deforestation and food security. Thus, although, for example, the governor of Papua was initially supportive of a major biofuel plantation, only about 10,000 hectares were cultivated, instead of the proposed 1-2 million hectares.

Q: What will the Clean Technology Fund started by the Ministry of Finance be used for?

A: The Indonesian Clean Technology Fund was established as an investment vehicle for the private sector, but has not gone very far. Bappenas manages the Indonesian Climate Change Trust Fund, which was established accept donations for mitigation and adaptation programs. The National Council on Climate Change has also started a Low Carbon Fund, however none of the three Funds have much in the way of financial resources, and are instead hoping to mobilize external resources, both international and domestic.

Q: What will Indonesia's position be at Copenhagen?

A: Negotiating positions are still being put together, and will crystallize closer

to December. However, Indonesia is likely to take an aggressive line on REDD, and be looking for grant transfers for adaptation programs from the North.

Q: There is lots of interest from U.S. companies in developing renewable energy projects, but Indonesia has not sent in proposals to the Clean Technology Fund, and pricing, subsidy and investment barriers exist for most U.S. companies. Thus, many of the firms that participated in the recent Clean Energy Policy Roundtable sponsored by the Commerce Department said that there needs to be a mandate from SBY for a percent of renewables to make up Indonesia's energy mix. What is the likelihood of this happening with the new government?

A: Indonesia did submit a formal request to join the Clean Technology Fund after the July meetings, but it has not yet made any proposals for funding. Indonesia does have a policy in place to quadruple renewable energy, but these are just words, and there has not yet been a strong interest in putting the words into action. There needs to be a roadmap for how to quadruple renewable energy, so that it does not just look good on paper.

Q: Geothermal has high up-front costs, which cases problems for developers, particularly given Indonesia's climate for international investors. What is the World Bank doing about this?

A: The World Bank is working with the Global Environment Facility to decrease the barriers to investment in Indonesia. Ultimately, a serious barrier to investment in geothermal has been inconsistencies in determining who controls the land where the geothermal energy resources are located, which, under decentralization, is a somewhat contentious issue. As a result, the World Bank has been working with Pertamina, since it already has established control over several of the most viable geothermal reserve sites.

Q: Will grant money be available for geothermal?

A: The World Bank offers International Development Association (IDA) loans for geothermal projects, which, given their terms, come very close to being grants.

Q: The political reality of energy subsidies in Indonesia is hard to ignore; with market pricing for electricity unlikely in the near future, is renewable energy development really feasible under the status quo?

A: Indonesia did raise fuel prices twice in the past year. Because over 70 percent of the subsidies are captured by the rich it is not really a pro-poor policy, but eliminating subsidies still has a real impact on the poor. Thus, the government put in place a cash transfer program to compensate for the increased fuel price.

Q: The USTDA provided a grant for a geothermal plant in Aceh with

Pertamina, but in over the past three years it has yet to be developed because of a lack of clarity over Pertamina's development rights in the area. What is being done to develop the political infrastructure needed for renewable energy development?

A: This remains a significant challenge. Aceh has a special autonomy for control of natural resources. Thus, developers need to decide where to direct their efforts. However, if developers work with the province, they will have issues with the central government, which may view work at the provincial level as undermining their authority. Yet if developers work with the central government, they will have similar issues at the provincial level.

Q: What is the significance of greenhouse gas emissions from the energy sector versus emissions from the forest and agriculture sectors?

A: Currently, emissions from energy are about 20 to 25 percent of the country's overall emissions profile. However, emissions from the forest and agriculture sector will hopefully fall as better management practices are introduced along with REDD financing. At the same time, the emissions from the energy sector will continue to grow. Thus, it is important to focus on energy, especially looking ahead to the next few decades.