INDONESIAN PARTICIPANTS REVIEW CALIFORNIA'S RENEWABLE ENERGY PLANS

CLEAN ENERGY DEVELOPMENT EXECUTIVE EXCHANGE

San Francisco, California – As part of the PT PLN – Clean Energy Development Program, the U.S. Energy Association (USEA) conducted an executive exchange to California with representatives of the Indonesian national utility, PT PLN (Persero), and the Ministry of Energy and Mineral Resources. The exchange was part of an ongoing partnership to explore best practices for integrating clean energy projects into Indonesia's energy portfolio.

Indonesian delegation visiting Pacific Gas and Electric's headquarters in San Francisco, CA.

This executive exchange provided the Indonesian delegation insight into California's aggressive renewable energy portfolio along with its clean energy initiatives. PLN held meetings during the exchange with the California Public Utility Commission (CAPUC), Pacific Gas and Electric (PG&E), the California Energy Commission (CEC), the California Independent System Operator (CAISO), and the Sacramento Municipal Utility District (SMUD).

BACKGROUND ON INDONESIA'S POWER SECTOR

PT PLN (Persero) PLN, Indonesia's National Electricity Company, has the responsibility to generate, transmit and distribute electricity throughout the country utilizing 174 power systems with an installed capacity of 54,986 MWs serving over 64.5 million customers. The majority of electricity generated in Indonesia is from coal, with the balance comprised of natural gas, oil, biofuels, hydro, and geothermal.

Meeting at the California Public Utility Commission in San Francisco, CA.

PLN implements relevant energy sector policies, rules and regulations, including: reducing use of diesel fuel for electricity generation, minimizing greenhouse gas emissions, encouraging the use of electricity from renewable energy resources, and promoting demand-side management initiatives and energy efficiency. In order to fulfill its responsibility and to implement the rules and regulations, PLN has developed an Electricity Supply Business Plan (RUPTL), which is regularly reviewed. This RUPTL serves to ensure development of power infrastructure meets electricity demand within PLN business areas.

On the island of Java, coal is the primary generation source, while the other islands rely on small diesel plants. There is considerable hydropower potential in Indonesia in areas such as Papua and South and Central Kalimantan, however, most potential capacity is found in areas that are not easily accessible and distant from sizeable markets. Due to the small size of the hydro plants located on the outer islands off Java, they tend to experience shortage of water flow. PLN's plans to develop all of its renewable resources will allow them to optimize their operations and meet Indonesia's increasing energy demand.

PRIMARY TOPICS OF THE EXCHANGE

These topics are relevant to Indonesia's plan for clean energy development and reducing reliance on diesel generation. Hence, the primary objectives for the Indonesian executives of the utility exchange were to:

Commissioner Clifford Rechtschaffen meets with the Indonesian delegation.

- Gain an understanding of the issues and challenges facing renewable energy and how energy storage technologies are utilized;
- Develop a familiarity with renewable energy technologies that have helped wind, solar, and geothermal integration into the power sector;
- Learn policy, incentive, and regulatory best practices for the promotion of renewable energy;
- Identify best practices of renewable energy project development & financing; and
- Discuss utility industry standards on interconnection of intermittent resources.

RENEWABLE ENERGY INTEGRATION IN CALIFORNIA

Indonesian delegates tour SMUD's Rancho SECO Solar Array in Sacramemto, CA, which generates almost 11 MW of solar power for the state capitol.

Renewable Energy Integration focuses on incorporating renewable energy, distributed generation, energy storage, thermally activated technologies, and demand response into the utility's electric distribution and transmission system. The goal of renewable energy integration is to advance system design, planning, and operation of the electric grid to:

- Reduce carbon emissions and emissions of other air pollutants through increased use of renewable energy and other clean distributed generation;
- Increase asset use through integration of distributed systems and customer loads that reduce peak load and lower the costs of electricity;
- Support achievement of renewable portfolio standards for renewable energy and energy efficiency;
- Enhance reliability, security, and resiliency from micro grid applications in critical infrastructure protection and highly constrained areas of the electric grid; and
- Support reductions in oil use by enabling plug-in electric vehicle (PHEV) operations within the grid.

California is on the path to generate 33 percent of its electricity from renewable power by 2020. The California System Operator (ISO) supports this important renewables portfolio standard and with a focus on the reliable integration of zero-emission resources such as solar and wind power. The ISO does a substantial amount of planning, balancing, and coordinating to power one of the largest electric grids in the world. They work to match energy supply with demand, dispatch the most efficient and cost-effective resources, and keep power flowing on high-voltage, long-distance power lines.

COMPANY PRESENTATIONS

The Indonesian delegation conducted in-depth discussions with the California Public Utilities Commission (CPUC), the California Energy Commission, Pacific Gas and Electric, the California Independent System Operator, and Sacramento Municipal Utility District. The discussions were centered on limiting greenhouse gas emissions, transitioning to a distributed energy future, and electric rate design reform. The CPUC reviewed how it serves the public interest by protecting consumers; making a commitment to environmental enhancement and reinforcing a

healthy California economy; and ensuring the provision of safe, reliable utility service and infrastructure at reasonable rates. With respect to electric rate design reform, the PUC highlighted how legislative action from the governor's office and the California State Legislature led to the adoption of a robust Renewable Portfolio Standard (RPS) program that calls for 50% of California's electricity to be generated by renewable resources. The PUC also discussed the RPS program's provisions, such as how utilities are to submit a Renewable Procurement Plan, a RPS compliance program, and a utility submission of a transmission line development forecast plan to ensure delivery of renewable power.

Additional discussions reviewed how the participating utilities are required to set up renewable energy contracts, which are primarily signed for in-state power vs. out-of-state power. Discussion also addressed how California's distributed solar programs were developed and implemented, namely the California Solar Initiative (CSI). This initiative was designed as a 10-year program and has featured declining rebates and compliance audits for energy efficiency, safety and reliability as an eligibility requirement. In addition, the program focuses on net energy metering, including customer compensation for excess generation based upon the retail price of electricity.

Additionally, California's distributed resource planning program intends to examine the available capacity and net benefits associated with deploying energy efficiency and energy storage devices,such as electric vehicles, demand response, and distributed solar systems at optimal locations on the grid. This program is intended to defer distribution infrastructure spending, reduce the need for transmission lines and central station power, and permit customers and third-party persons to engage in more efficient electricity service.

Through the course of this exchange, additional presentations highlighted some of the following best practices:

- Cost responsibilities of new transmission and distribution networks;
- Procedures and requirements for interconnecting renewable energy to the grid;
- Procurement and marketing mechanisms for renewable energy, such as market-based feed-in tariffs; and
- Expanding the choices for customers to include electric vehicles, distributed generation, demand response, solar integration, and micro grids.

The delegation's time with the Sacramento Municipal Utility District (SMUD) was spent touring its 11 MW solar array in Rancho Seco and its 102 MW Solano wind farm. Both of these visits provided information about site selection, project layout, projected power output, access to power lines, environmental management, construction issues, and maintenance.

RECOMMENDATIONS

Upon returning to Indonesia, PNL recommended the following topics areas for a follow-up activity in August in Jakarta and/or Bali.

- ***Bidding Mechanism*****:** *What is the relationship between the mechanism and the PPA that the IPP signed with the utility? What kind of PPA will be appropriate? What do US participants recommend for PLN if it would like to apply the same mechanism?*

- ***Net Metering:*** *How does the utility reconcile its use of rooftop PV with its profit loss? Are there advantages for the utility to adoptg rooftop PV?*

- **Smart Grid:** *How should PNL prepare to adopt smart grid technologies? What are the steps for smart grid implementation? What were obstacles to efficient smart grid integration?*

- **Quota for Renewable Energy Development:** *During the exit briefing, the Indonesian delegation set an incorporated renewable energy target of 23% by 2025 and 31% by 2050. To reach the 23% target, renewable energy generation should reach 31 GW from the total targeted electricity generation of 136 GW.*

- **System Planning and Interconnection:** *The interconnection of renewable energy to the grid.*

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