



# CASE STUDY

## Weaning a country from oil dependence *Indonesia's renewable energy policy*

### Key point

- **Setting targets for renewable energy and percentage ceilings for coal, natural gas and oil can cut the share of energy from oil.**

### There was a shortcoming...

Indonesia has seen its oil production stagnate, and withdrew its membership from OPEC as it became a net importer of oil.<sup>1</sup> To reduce the need to increase energy subsidies due to the unstable price of oil, the Government decided to reduce its heavy reliance on power production from oil.<sup>2</sup>

Based on a 2006 presidential decree, the Indonesian Government committed itself to increasing the share of renewable energy to cover 15 per cent of the primary energy supply by 2025, up from 4.3 per cent in 2005.<sup>3</sup> The targets from the decree were translated into the Energy Law of 2007. As of 2010, renewable energy, including hydropower, still made up less than 5 per cent of Indonesia's primary energy mix.<sup>4</sup>

### What was done?

Because of its resource richness, the Indonesian Government in the 2006 decree placed prominence on developing biofuels and geothermal energy. Specifically, 5 per cent of the total primary energy supply should come from geothermal and 5 per cent from biofuels by 2025.

The targets include quotas for renewable energy and percentage ceilings for coal, natural gas and oil in the energy mix – most notably to cut the share of energy from oil by more than 60 per cent.

In addition to developing renewable resources and moving away from oil dependency, the Indonesian energy policy also has an eye on increasing electrification, from 64 per cent of households in 2009 to 95 per cent by 2025.<sup>5</sup>

<sup>1</sup> United States of America, *Renewable Energy Market Assessment Report: Indonesia* (Washington, D.C., International Trade Administration, 2010). Available from [http://ita.doc.gov/td/energy/Indonesia%20Renewable%20Energy%20Assessment%20\(FINAL\).pdf](http://ita.doc.gov/td/energy/Indonesia%20Renewable%20Energy%20Assessment%20(FINAL).pdf) (accessed 9 November 2011)

<sup>2</sup> *Asian Legal Business*, "A Closer Look at the Power Sector in Indonesia: The Latest Initiatives", May 6, 2010. Available from <http://asia.legalbusinessonline.com/industryupdates/indonesia-soemadipradja-taher/a-closer-look-at-the-power-sector-in-indonesia-the-latest-initiatives/45834> (accessed 9 November 2011).

<sup>3</sup> International Energy Agency, *Electricity/Heat in Indonesia in 2008* (Paris, 2011). Available from [www.iea.org/stats/electricitydata.asp?COUNTRY\\_CODE=ID](http://www.iea.org/stats/electricitydata.asp?COUNTRY_CODE=ID) (accessed 7 November 2011); and International Energy Agency, *Renewables and Waste in Indonesia in 2008* (Paris, 2011). Available from [www.iea.org/stats/renewdata.asp?COUNTRY\\_CODE=ID](http://www.iea.org/stats/renewdata.asp?COUNTRY_CODE=ID) (accessed 7 November 2011).

<sup>4</sup> Director General of New and Renewable Energy and Energy Conservation, "Towards sustainable energy supply: Indonesia's energy vision 25/25". Power point presentation presented at the Renewable Energy Conference: Green Supply for Growing Demand, Jakarta, 24 October 2011. Available from [http://indonesien.ahk.de/fileadmin/ahk\\_indonesien/PAST\\_EVENTS/REENERGY2011/MONDAY/1\\_-\\_Ministry\\_of\\_energy\\_and\\_mineral\\_resources.pdf](http://indonesien.ahk.de/fileadmin/ahk_indonesien/PAST_EVENTS/REENERGY2011/MONDAY/1_-_Ministry_of_energy_and_mineral_resources.pdf) (accessed 9 November 2011).

<sup>5</sup> Montty Girianna, "Renewable energy and energy efficiency in Indonesia", paper presented at ADB Workshop on Climate Change and Energy, Bangkok, Thailand, 26–27 March, 2009. Available from [www.adb.org/documents/events/2009/Climate-Change-Energy-Workshop/Renewable-Energy-Girianna.pdf](http://www.adb.org/documents/events/2009/Climate-Change-Energy-Workshop/Renewable-Energy-Girianna.pdf) (accessed 9 November 2011).

### ***Institutions and energy market governance***

The Indonesian electricity sector is undergoing a slow liberalizing process. Generation, transmission and distribution of electricity have primarily been handled by a single state-owned limited liability company, PLN (Perusahaan Listrik Negara). With reforms that began in 1992 and until 2009, independent power producers and cooperatives were also involved in generation; but PLN was the sole buyer and seller of electricity on the grid. In September 2009, Indonesia's new Electricity Law opened up an opportunity for regional and local governments, cooperatives and private entities to generate and sell power to PLN and also to receive licenses to distribute electricity directly to end users – although PLN maintains a “right of first priority” in the market.<sup>6</sup>

The Government sets the retail price of power, which is only about half the cost of PLN production. The difference is subsidized by the Government.<sup>7</sup> Energy regulatory policies, including electricity tariffs, are set by the Directorate-General of Electricity and Energy Utilisation within the Ministry of Energy and Mineral Resources. The Ministry of Finance must allocate subsidies and loans, and the Ministry of State-Owned Enterprises must approve the PLN budget and management.

The Government's National Development Planning Agency (BAPPENAS) inputs a broader planning perspective to energy development.<sup>8</sup> In relation to the development of renewable energy resources, above all geothermal and biomass resources, the Ministry of Forests and the Ministry of Agriculture hold respective roles in formulating policies supportive of renewable energy resource development. In 2007, a National Energy Council was established to create a new national energy policy and master plan and coordinate policies between the two ministries.<sup>9</sup>

In 2010, the Directorate-General for New and Renewable Energy and Energy Conservation was established under the Ministry of Energy and Mineral Resources to promote demand-side energy management (conservation) and sustainable supply-side energy management (diversification away from fossil fuel sources).

Local and regional governments are also increasingly involved in the energy market as suppliers and regulators.

### ***Pricing and required energy purchase from small community plants***

**Renewable energy pricing:** Ministerial decrees from the Ministry of Energy and Mineral Resources set pricing for electricity generation from renewable sources, including hydropower, biomass, municipal waste and geothermal. Tariffs are specific to: 1) source of power; 2) geographical location, with more remote islands having higher tariffs and 3) voltage levels, with low voltage (less than 10 kV) grid power receiving higher tariffs than medium voltage.

**Fast-track Crash Programme:** To stimulate the expansion of electricity generating capacity in the near-term to meet the growing demand and to shift from the use of fossil fuel, the Government set up a two-phase Crash Programme. The first track programme (2006 to 2013) is focusing on coal and natural gas power plant development, and the second track programme (2009 to 2014) has emphasized geothermal and hydropower projects. Of the 10,147 MW of allocated projects in the second track, over 60 per cent will be renewable energy projects, with geothermal projects accounting for 3,977 MW and hydro for 1,198 MW.<sup>10</sup>

<sup>6</sup> Renewable Energy and Energy Efficiency Partnership website “Policy DB Details: Indonesia (2010)”. Available from [www.reeep.org/index.php?id=9353&text=policy&special=viewitem&cid=32](http://www.reeep.org/index.php?id=9353&text=policy&special=viewitem&cid=32) (accessed 8 November 2011).

<sup>7</sup> Montty Girianna, “Renewable energy and energy efficiency in Indonesia”, paper presented at ADB Workshop on Climate Change and Energy, Bangkok, Thailand, 26–27 March, 2009. Available from [www.adb.org/documents/events/2009/Climate-Change-Energy-Workshop/Renewable-Energy-Girianna.pdf](http://www.adb.org/documents/events/2009/Climate-Change-Energy-Workshop/Renewable-Energy-Girianna.pdf) (accessed 9 November 2011).

<sup>8</sup> For information, refer to the case study, “Indonesia's National Development Planning Agency”.

<sup>9</sup> Renewable Energy and Energy Efficiency Partnership website “Policy DB Details: Indonesia (2010)”. Available from [www.reeep.org/index.php?id=9353&text=policy&special=viewitem&cid=32](http://www.reeep.org/index.php?id=9353&text=policy&special=viewitem&cid=32) (accessed 8 November 2011).

<sup>10</sup> *ibid.*

**Power purchase obligation:** Since 2009, PLN is required to offtake electricity from small-scale (up to 10 MW capacity) renewable energy power plants developed by independent power producers, including cooperatives or local communities and private businesses.<sup>11</sup> In addition to the power purchase requirement for small renewable energy plants, there is a stipulated offtake requirement for geothermal energy.

**Energy self-sufficient villages:** Since 2005, the Government has shifted support away from diesel generator sets for rural electrification. The goal of the Energy Self-Sufficient Villages programme, launched in 2007, is to release villages from dependency on oil imports for energy by using local renewable resources. From 2007 to 2009, 2,000 villages were selected to be part of the programme; half were to be electrified by biomass and the other half by other renewable energy sources. Given the focus on biomass resources, the Ministry of Agriculture had an important role in the programme, alongside the Ministry of Energy and Natural Resources. By presidential decree, the Ministry of Manpower and Transmigration, the Ministry of Home Affairs, the State Ministry of Less Developed Regions, the State Ministry of State Enterprises and the Ministry of Fisheries and Marine Affairs are also involved.<sup>12</sup>

### Financing

The lack of available financing is one of the biggest barriers to renewable energy development in Indonesia. The following touches on options to cope with the financing difficulties:

- **Subsidy reform:** High subsidies for fossil fuel production and for electricity consumption have distorted the Indonesian energy market. In 2011, energy subsidies were raised to over US\$22 billion to help cover increases in oil prices. However, less than 2 per cent of energy subsidies were targeted at promoting renewable energies, leaving a large chunk of the government budget that could be shifted gradually towards renewable energy development.<sup>13</sup>

Development of geothermal energy is expected to create cost savings to the Government by offsetting fossil fuel generation and thereby reducing required subsidy levels. In the majority of regional grids, the power purchase cost for geothermal electricity is lower than current electricity production costs – in many cases, the cost of geothermal is less than half.<sup>14</sup>

- **Private capital:** The lack of capital is the primary motive for opening up the energy market to regional and local governments, cooperatives and private entities. More than 75 per cent of the geothermal projects listed in phase two of the Crash Programme will be developed by independent power producers. Policies such as renewable energy pricing and power purchase obligations are intended to make a lucrative market for private developers and private equity; however, other regulatory policies must make financial incentives more robust and reliable.
- **Foreign and international development aid:** Many projects are developed with the support of foreign governments and international organizations. For instance, the Dutch Government provides a financing mechanism and technical assistance to the programme on biogas. Another example is the Integrated Micro-hydro Development Programme, which is funded by the Global Environment Fund (through UNDP)

<sup>11</sup> Director General of New and Renewable Energy and Energy Conservation, "Towards sustainable energy supply: Indonesia's energy vision 25/25", Power point presentation presented at the Renewable Energy Conference: Green Supply for Growing Demand, Jakarta, 24 October 2011. Available from [http://indonesien.ahk.de/fileadmin/ahk\\_indonesien/PAST\\_EVENTS/RENERGY2011/MONDAY/1\\_-\\_Ministry\\_of\\_energy\\_and\\_mineral\\_resources.pdf](http://indonesien.ahk.de/fileadmin/ahk_indonesien/PAST_EVENTS/RENERGY2011/MONDAY/1_-_Ministry_of_energy_and_mineral_resources.pdf) (accessed 9 November 2011).

<sup>12</sup> Indonesian Center for Agriculture Socio Economic and Policy Studies website "Energy Self-Sufficiency Village". Available from [http://pse.litbang.deptan.go.id/eng/index.php?option=com\\_content&task=view&id=236&Itemid=157](http://pse.litbang.deptan.go.id/eng/index.php?option=com_content&task=view&id=236&Itemid=157) (accessed 9 November 2011).

<sup>13</sup> R. D. Fadillah, "Govt Considers New Renewable Energy Policy", *The Jakarta Post*, October 18, 2011. Available from [www.thejakartapost.com/news/2011/10/18/govt-considers-new-renewable-energy-policy.html](http://www.thejakartapost.com/news/2011/10/18/govt-considers-new-renewable-energy-policy.html) (accessed 10 November 2011).

<sup>14</sup> Director General of New and Renewable Energy and Energy Conservation, "Towards sustainable energy supply: Indonesia's energy vision 25/25", Power point presentation presented at the Renewable Energy Conference: Green Supply for Growing Demand, Jakarta, 24 October 2011. Available from [http://indonesien.ahk.de/fileadmin/ahk\\_indonesien/PAST\\_EVENTS/RENERGY2011/MONDAY/1\\_-\\_Ministry\\_of\\_energy\\_and\\_mineral\\_resources.pdf](http://indonesien.ahk.de/fileadmin/ahk_indonesien/PAST_EVENTS/RENERGY2011/MONDAY/1_-_Ministry_of_energy_and_mineral_resources.pdf) (accessed 9 November 2011).

and aims to remove barriers to micro-hydropower use.<sup>15</sup> On a broader scale, the World Bank announced in 2010 that it would channel US\$400 million from its Climate Investment Funds to support geothermal energy development in Indonesia.<sup>16</sup> The Clean Development Mechanism under the Kyoto Protocol provides another important financing mechanism for renewable energy project development.

## Lesson learned

Renewable energy policies can secure benefits far beyond the energy and environment scope: The initial intent of the Indonesian Government for promoting renewable energies was to reduce the dependency on oil imports. However, the policies and programmes put in place for that purpose led to many other benefits for the Indonesian population. The liberalizing of the energy market enabled independent producers to enter the market, rural residents were given the chance to switch to self-sufficient local power generation and the Government could alter its burden from fossil fuel subsidies.

## Considerations for replicating

The Indonesian example shows that in addition to setting a national target and a competitive price for renewable energy there is much more to consider when initiating a sensible shift towards clean energies that can reap benefits for businesses, the people and the environment. Other governments that want to achieve this shift will have to restructure their energy market, mobilize ministries beyond the usual environment and energy scope, pay special attention to the impacts of the policies on rural and poor residents, ensure that the programmes do not exceed domestic fiscal capacities and make use of foreign and international funds that support renewable energy projects.

<sup>15</sup> Republic of Indonesia, Ministry of Energy and Mineral Resources, "Updates on renewable energy development program in Indonesia", PowerPoint presentation at Expert Group Meeting on New Renewable Energy Technology, Honolulu, 30 March – 3 April 2009. Available from [www.egnret.ewg.apec.org/meetings/egnret32/Indonesia%20RE%20priorities.pdf](http://www.egnret.ewg.apec.org/meetings/egnret32/Indonesia%20RE%20priorities.pdf) (accessed 9 November 2011).

<sup>16</sup> United States of America, *Renewable Energy Market Assessment Report: Indonesia* (Washington, D.C., International Trade Administration, Department of Commerce, 2010). Available from [www.ita.doc.gov/td/energy/Indonesia%20Renewable%20Energy%20Assessment%20\(FINAL\).pdf](http://www.ita.doc.gov/td/energy/Indonesia%20Renewable%20Energy%20Assessment%20(FINAL).pdf) (accessed 8 November 2011).