

# Policy Brief

## Small-scale IPPs in Indonesia

IPPs (Independent Power Producers) will be a vital part of Indonesia's energy system in the future. They provide an effective way to grow the electricity infrastructure using private investment, not public budgets, and are a central component of Indonesia's power planning. This brief summarises the benefits of IPPs, their planned role for Indonesia, the challenges they face and makes the case for government action to assist this sector.

### Benefits of IPPs in the electricity system

Indonesia faces multiple large challenges in its electricity system. Economic growth and increasing energy access is projected to increase power demand by more than 8% annually until 2020, and significant capacity additions will be needed for production to keep up with demand (PLN, 2012). Indonesia also needs new capacity to reduce its dependence on oil based (diesel) power generation, because of rising fuel and subsidy costs. Furthermore, Indonesia has communicated ambitions with regard to reducing greenhouse gas emissions and increasing the share of new and renewable energy technologies (GoI, 2006; 2011). These developments in the power system require large investments in new generation capacity in the coming years, with important consequences for the state budget.

#### What are IPPs?

An IPP is a non-government producer of electricity. IPPs can be private enterprises (businesses) that produce power as a commercial activity, or collective organizations (e.g. communities) that may engage in energy production for other reasons, such as improved energy access. This brief focuses on grid connected IPPs, who produce electricity and feed (part of) this into a centralized electricity grid to be used by consumers elsewhere. Nonetheless, in rural and more remote parts of Indonesia, off-grid IPPs can also offer significant improvements to the energy system.

IPPs producing power from renewable sources can make important contributions to resolving each of these challenges.

1. IPPs can alleviate the pressure on the state budget. Historically, most investments in the power system have been made by the Indonesian government, through the state-owned utility PLN and its subsidiaries. IPPs, however, use private sector money for their investments and carrying the risks.
2. IPPs build and operate generation capacity, which helps to meet increasing demand.
3. Technologies for renewable electricity production such as solar PV, mini hydro, and biomass conversion can also provide energy access in remote or rural areas.



4. Using domestic renewable energy resources can improve energy independence.
5. Renewable energy technologies help to reduce greenhouse gas emissions in line with the Government of Indonesia's policy objectives.

## Planned role for renewable energy IPPs in Indonesia

Indonesia has one of the world's largest potentials of renewable energy resources. Hydropower, geothermal, solar and biomass each have estimated potentials over 10 Gigawatt (Azahari, 2012). However, much of this potential is currently unexploited. Presidential regulation Perpres No.5/2006 (Gol 2006) aims to achieve a 17% contribution of new and renewable energy sources in the energy mix in 2025.

Projects exploiting renewable resources can be divided into large scale and small scale projects\*. It is expected that IPPs have an important role at all scales of project, but experience has shown that the small scale 'sector' has particular challenges in expanding. PLN anticipates additions of small scale renewable capacity adding up to over 3,000 MW by 2020 (PLN, 2012), which is more than 25% of the 11.7 GW total renewable capacity anticipated in the PLN capacity plan. However, this will require a significant expansion of projects, private sector investment and skills.

### The business case for IPPs

The engineering, procurement and construction (EPC) of the generation plant and connection to the grid requires initial financing. This generally comes from a mixture of investors (equity) and banks (debt). IPPs sell the electricity they produce to the state utility (PLN) through power purchase agreements (PPAs) that describe delivery and payment conditions. For electricity from most small-scale renewable sources a feed-in-tariff (FIT) is set by the Ministry of Energy and Mineral Resources (ESDM), that pays a premium rate for electricity and makes the project feasible; i.e. creates the business case. The FIT is differentiated per technology and per region.

However, the FiT is only part of the picture. Investors and banks will only risk their money if they are confident that their investment will actually pay off. For example, confidence in the design/EPC, experience in assessing these and a suitable business case based on the required equity and debt returns

Table 1 provides a breakdown of planned and proposed capacity by various small scale sources, for Indonesia and the two pilot provinces of the MitigationMomentum project; North Sumatra and West Nusa Tenggara.

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\* Small- and medium-scale facilities are defined as those with capacities of less than or equal to 10 MWe



Table 1 Planned and known capacities for small scale renewables

		Indonesia capacity plan [MW]	North Sumatra pipeline [MW]	NTB pipeline [MW]
<b>Mini/micro hydro</b>	1488	680	29	
<b>Solar PV</b>	855	2	17	
<b>Wind</b>	230	-	-	
<b>Biomass</b>	447	48	1.7	
<b>Total</b>	3020	730	47.7	

Source: PLN (2012), PLN (2013), Himsar (2013), PLN NTB (2013)

## Challenges for successful operation

Successfully operating a small scale renewable energy installation requires the IPP to overcome a variety of technical, financial and administrative challenges. An obvious requirement for successful operation of IPPs is a solid business case (see text box). In recent years, the government has implemented a feed-in-tariff (FIT) scheme for several renewable energy technologies, which makes profitable operation for IPPs possible, but there are still many barriers for IPPs, and only a limited number are able to be successful. For Indonesia to reach its renewable energy and climate targets there is a clear and important role for the government to play in helping the sector to grow.

Discussions and interviews with stakeholders have identified three main challenges:

**Finance;** the majority of IPPs have difficulties getting the necessary loans from banks. This is due to a number of reasons: i) banks report that project proposals often have inadequate feasibility studies, ii) there is a lack of good practice cases for business models, which makes banks reluctant to loan, and iii) banks ask for prohibitively high collateral from IPPs due to the perceived risks, or reject the proposal altogether. IPPs and banks would both profit from the availability of professional technical support that could improve feasibility studies and reduce risks. Additionally, a financial mechanism to encourage banks to give loans, or provide support directly to IPPs, could help to bring down risk premiums and therefore project costs.

**Permitting;** renewable energy projects often cross multiple government authorities, both in level (national, provincial and district) and area (e.g. energy, water and forestry). A lack of coordination between government officials and having so many authorities involved often leads to delays. Insufficient technical understanding of issues related to RE projects at the permitting authority is also reported to lead to barriers in permitting. At the same time, the IPP is not always aware of the procedures and technical guidelines to follow. A combination of technical and legal support could improve this situation.

**Operation;** once operational, there can be a limited availability of the PLN grid to receive the power generated by the IPP. The nature of many RE schemes means that they are often located in remote locations. Exactly this type of location is normally where the PLN grid tends to experience problems and



the frequency of grid down time is at its highest (Hayton and Nugraha, 2013). Some form of compensation for affected IPPs could help them maintain profitability. IPPs also report a shortage of suitable technical personnel for operation and maintenance during the operation phase renewable energy projects. Organizing training and specific education for local technicians could help to overcome this challenge.

## Next steps

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Small scale IPPs will be an important part of the Indonesian power system, but only if they are given the necessary support to expand in the coming years. The government has a clear role in creating the enabling environment for IPPs to successfully operate and build on the feed-in-tariffs for renewable energy that have been implemented. The next step is to identify a package of policies that can address the remaining challenges. This package should first focus on providing technical, financial and procedural support to each of the stakeholders involved (IPPs, banks, government). Second, a financial mechanism that helps to provide project finance for IPPs will be critical for the growth of the sector. In the longer term, these actions also help to bring down project costs by reducing risks and could lead to Indonesia meeting its energy and climate targets at lower cost.

## References

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## Author/contact

Michiel Hekkenberg ([hekkenberg@ecn.nl](mailto:hekkenberg@ecn.nl))  
Lachlan Cameron ([cameron@ecn.nl](mailto:cameron@ecn.nl))

[www.mitigationmomentum.org](http://www.mitigationmomentum.org)

