



INSIDE STORIES

on climate compatible development

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Key messages

- Mainstreaming energy security in climate compatible development calls for delicate policy and institutional reforms, which in turn call for a PPPP approach: Public–Private–People Partnership.
- Sound policy-making at the provincial government level calls for continual capacity building. Also needed are multi-stakeholder approaches and advocacy on the part of civil society.
- Effective enabling policies and strategic coordination on key issues can provide incentives for local power generation. A key issue in West Nusa Tenggara is the balance between on-grid and off-grid electricity.
- Community-level producers are vital and need to be motivated differently from commercial ones.
- Mini-hydro electricity generation cannot be separated from forest conservation, so an approach to spatial planning that integrates these two objectives is critical.

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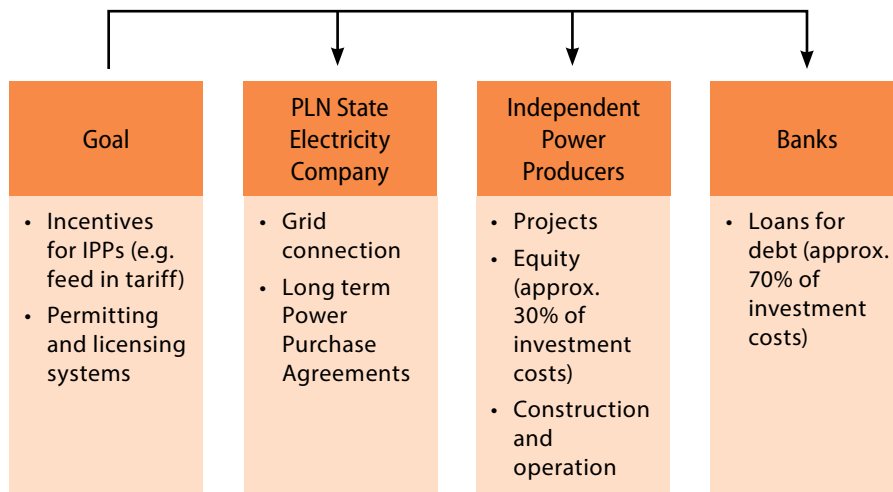
Supporting the subnational development of renewable energy: Lessons from West Nusa Tenggara, Indonesia

West Nusa Tenggara is a major tourism destination in Indonesia because of its rich seascapes and landscapes as well as its unique culture, but it faces severe energy shortages. Across the province's 10 districts and municipalities, electricity supply is lacking because of limitations in grid connections imposed by difficult geography and high costs. There is great potential for renewable energy: more than 96.5 MW could be made available from mini-hydro schemes alone. That compares with an existing total capacity (on-grid and off-grid) from renewable energy of only 14 MW, according to 2015 data.

The Government of Indonesia has gradually reformed its energy policy to incentivise local power generation in areas beyond the reach of large-scale fossil fuel companies. Specifically, the Ministry of Energy and Mineral Resources has since 2002 issued a succession of regulations on feed-in tariffs to encourage investment in renewables.¹ Combined with the rising demand for renewable energy on the part of the state electricity company (Perusahaan Listrik Negara, PLN), this policy has led to an increasing number of independent power producers (IPPs) keen to operate in the provinces. Key stakeholders for subnational power generation thus include government, PLN, IPP, and financing institutions (see *Figure 1*).

This Inside Story tracks issues that arose with regard to decentralised renewable energy planning in West Nusa Tenggara in order to inform subnational and national energy policies and strategies in the future. The story looks not only at technical aspects, which are often a priority for policy-makers, but also at policy and institutional matters, which tend to be downplayed. Both are important and care must be taken to integrate the two. This is all the more so because the national government's new decentralisation policy (Law No. 23/2014 regarding regional government) rules that decentralised authority resides more in the provinces, the next level up from districts and municipalities – the levels to which it had penetrated previously.^{2,3} The reform does not alter the challenge of coordination between different levels, which has never been easy in Indonesia.

Figure 1. Main stakeholders for subnational power generation in Indonesia



Source: Mitigation Momentum

Context

The starting point for the story is the Mitigation Momentum project,^{4,5} an international project funded by the Dutch and German governments to support the development of Nationally Appropriate Mitigation Action (NAMA) plans – a climate mitigation instrument promoted under the United Nations Framework Convention on Climate Change (UNFCCC). In Indonesia, the project set out to design a set of policy measures that would support the emergence of IPPs and specifically promote IPP investment in small- and medium-sized (< 10 MW) electricity generation schemes that would feed into the national grid. The project focused on the most promising renewable technology, namely micro- and mini-hydro schemes.

This project dealt primarily with national stakeholders. However, it also launched pilots in the provinces of West Nusa Tenggara and North Sumatra in order to collect more detailed data on governance and other subnational issues that

might affect uptake, either in individual provinces or, in some cases, across Indonesia. The data were collected through interviews with IPP representatives and other stakeholders.

In West Nusa Tenggara, a few private IPPs were already operating by the time the project began. Recently these have been joined by a number of community IPPs. For instance, three micro-hydro schemes are run by civil society organisations in West Lombok, the province’s most populous district. As in other provinces, both on- and off-grid renewable energy schemes are possible, but the former are more attractive to private investors because PLN buys electricity at the premium price set out in the feed-in tariffs mentioned earlier.

What can be seen across the country is that IPPs encounter multiple barriers to entry into the energy sector. The main problems revolve around two areas: producers’ access to finance, technical capacity and skills; and local permitting regulations imposed by government.

The project gave rise to three proposals for government support to IPPs. First was a form of clearing house, to provide them with technical expertise, coordinate their activities, and offer them pre-financing for feasibility studies. Second was a mechanism for grid compensation. This aimed to maintain producers’ incomes when the grid was not stable enough to allow adequate ‘off-take’, in some cases because demand would not be high enough (as happened in communal solar photovoltaic [PV] in Sumbawa Island). It could also be that the supply became unstable – often a problem in small scale hydro; this happened in Lombok Island in 2014, when prolonged drought seriously decreased flow rate to a quarter of its normal capacity. Third was a selection of financial instruments to improve access to capital, such as direct public loans, credit lines and partial risk guarantees for banks, and equity and mezzanine debt for developers.

This project contributed greatly to improved understanding of the role of IPPs in generating renewable energy and hence in contributing to mitigation under NAMA plans. However, since the Ministry of Energy and Mineral Resources – the key player at national level – has yet to fully commit to reform of the IPP sector, the uptake of mini-hydro schemes at the provincial level has remained limited.

Challenges to project design and implementation

The project revealed the potential of IPPs to develop across all districts of West Nusa Tenggara. However, as we have seen, this potential has yet to be

widely realised. Through interviews and discussions, we explored the perceptions of stakeholders on the ground. Their basic message to policy-makers is that mini-hydro development is frustrated by a mix of technical and governance aspects, not by technical aspects alone. The issues range from land acquisition and tenure, through the transfer of assets, to the balance between off-grid and on-grid generation. We now turn our attention to these issues:

- **Land acquisition is subject to local dynamics.** Volatile at the best of times, the price of land may rise astronomically when local communities learn that a project is or may be coming their way.^{6,7} Remedies are either not to disclose potential project sites (or at least not to pinpoint them in spatial

plans), or to involve communities proactively at the earliest planning stages. Recently, PLN has been careful not to mention geographical coordinates.

- **Accurate information on land type.** Land designation is not always clear, especially between protected areas and community forests. Accurate maps and participatory mapping exercises are both needed if conflicts over tenure and consequent delays to the acquisition process are to be avoided.
- **Asset transfer takes too long.** Projects cannot go live before the assets they use have been transferred. In one instance, a communal solar PV installation at Labangka, in Sumbawa District, could not become operational because the building infrastructure, the panes and pertinent electrical equipment had not been transferred from the Directorate General of Electricity Power – part of the Ministry of Energy and Mineral Resources – to the Sumbawa District Government. The latter has already contributed the land that the building and panel stood on, and will manage the project jointly with a company owned by the provincial government. Asset transfer especially involving land is far from straightforward, since detailed appraisal by the Ministry of Finance is needed before the Ministry of Energy and Mineral Resources can transfer to the district/ municipality government.
- **Lack of coordination between on- and off-grid supply.** There were instances of the state electricity company unwittingly developing grid infrastructure to connect a remote area at the expense of a recent or planned off-

grid facility, which will eventually fall into disuse and disrepair.

People prefer supplies from PLN rather than off-grid sources because PLN offer a more reliable service (although there may still be blackouts). PLN are permitted to expand their service to off-grid areas in response to demand from local villagers. However, if appropriate subnational guidelines or regulations were in place, then the role of PLN could be better coordinated with that of small-scale cooperatives and IPPs, avoiding overlaps.⁸

- **Permit application process is not user-friendly.** There are several aspects to this. First, the process should be made more sensitive to the needs of small-scale IPPs, which must keep costs and time scales reasonable if they are to remain viable.⁹ The process – and its costs – should reflect the difference between truly commercial schemes and power generation for local self-sufficiency, which may carry net costs for the investing community. Further, easier permitting could be combined with outreach and training for local communities to encourage uptake. Incentives can take many forms, including the ‘one roof’ system (=one stop service, where various permits can be efficiently processed in one single office, namely the local Planning Agency) for mini-hydro, which streamlines the entire process from permit application to switching on the power.

Despite the difficulties associated with these issues, the project revealed a number of enabling factors, including a gradual improvement in the design and implementation of the regulatory framework. For instance,

Glossary

- **Mezzanine debt:** Mezzanine financing is debt capital that gives the lender the rights to convert to an ownership or equity interest in the company if the loan is not paid back in time and in full. It is generally subordinated to debt provided by senior lenders such as banks and venture capital companies. [source: *Investopedia*]
- **Micro hydro:** Micro hydro is a term used for hydroelectric power installations that typically produce up to 100 KW of power. [source: *REEEP*]
- **Mini hydro:** Mini Hydro is a term used for hydroelectric power installations that typically produce from 100 kW to 1000 kW. [source: *REEEP*]

the provincial Governor's Regulation No. 12/2015 regarding protocols for licensing in the fields of new and renewable energy and electricity helped clarify the procedures for IPPs, and at the same time improved coordination between provinces and districts and/or municipalities.

Implications for decision-makers

A diverse set of factors including policy issues, institutional arrangements, stakeholder engagement, and financing interact to influence renewable energy development, often negatively at present.

Policy considerations

We identified the following policy issues:

- **Identifying the right level for intervention.** This has changed in recent years. Since 2014 the provincial level is the appropriate starting point.¹⁰ All stakeholders will need to keep abreast of future legislative changes resulting from Indonesia's complex national dialogue on decentralisation.
- **Ensuring harmonisation of plans.** Cross-sectoral coordination could be made more effective, for example by harmonising the law relating to land tenure in the energy sector with that relating to watershed management. This could be done under the spatial planning umbrella.¹¹
- **Ensuring consistency in targeting.** Whereas provincial action plans for greenhouse gas mitigation and provincial energy plans¹² each have clear targets, the provincial plans for electricity should state power generation targets that comply with targets

for emission reduction. It helps that the provincial electricity plans are set at three ambition levels: baseline, medium and optimistic. However, enabling districts and municipalities to achieve these targets presents a further set of challenges. Because regional autonomy has now shifted to the provinces, the districts and municipalities lack the budgets they once had for surveys and infrastructure, the money for these now being allocated at the provincial level.

- **Resolving regulatory contradictions.** Central to this challenge are the varying individual capacities of legislators and staff in executing agencies, which give rise to differing policies and interpretations. This calls for continued capacity building by relevant agencies and advocacy on the part of civil society, including academia and media, as well as institutionalised multi-stakeholder approaches.

Institutional arrangements

Among the many institutional issues that need addressing, we saw the most urgent to be:

- **Ensuring buy-in at all levels.** Even when there is high awareness and commitment to a local action plan at the provincial level, buy-in from districts and/or municipalities is still necessary. West Nusa Tenggara's ten districts and municipalities scarcely had their own version of the local action plan, detailing action at their level. The most enthusiastic ones, namely Lombok Island's west, central, north,¹³ and east districts, wanted to be recognised as green energy districts; in 2015 north Lombok was recognised by

the central government (Ministry of Energy of Mineral Resources) with an 'energy award' since the district managed to allocate a good portion of its budget for renewable energy, and established public-private-people-partnership for biogas. However, they will need technical assistance and facilitation, as well as a mandate to take on this role. These are all lacking at present.

- **Strong and continuous support from heads of provinces.**¹⁴ Leadership from the top is essential for the success of mini-hydro, but it must encourage broad participation. Heads of provinces should continue to mobilise multi-stakeholder approaches and the involvement of local communities. A provincial Multi-stakeholder Energy Forum was effective from 2005 to 2013, but the much needed local budget support assigned to the provincial office of energy and mineral resources from the provincial planning board was withdrawn, due to shifting priorities in the central government. Such institutionalised mechanisms at the provincial level would be worth revitalising.
- **Capacity building in IPPs.** IPPs need to develop capacities to design projects that meet the technical and financial standards required by PLN and the banks. Training centres are an underused resource in this respect.¹⁵ A more targeted approach is needed whereby each IPP proactively seeks to develop its own capacities, instead of relying on support from elsewhere.

Financing

We noted the following points with regard to improved financing:

- **Subnational entities won't necessarily lack finance.** Indonesia's recent move away from fossil fuel subsidies means more funds should become available for renewables.¹⁶ Furthermore, beginning with the Yearly Budget Plans 2015, the country's new village governance law¹⁷ bestows top-up funds of close to US\$750,000 per village to each of Indonesia's 72,000 villages. This means that many provinces will have the financial resources needed to support climate compatible development, alongside infrastructure as the main competing demand. In central Lombok, for instance, Sisik village managed to develop 11 units of biogas using village funds, with the assistance of Hivos, an international non-governmental organisation. Nevertheless, ways of harnessing subnational funds efficiently and effectively will still be needed – which again calls for capacity building.
- **Coordinating budgets and plans across villages will increase feasibility.** Neighbouring villages could put their heads together and set aside, say, 5% of the funds allocated in their Yearly Budget

Plans for renewable energy infrastructure. For example, Lombok Barat District alone has 122 villages and not all of these will need their own renewable energy projects. Indeed, the need for economies of scale will dictate collaboration across locations. However, there are certain financial standards and mechanisms governing the use of village funds that must be adhered to, and establishment of equipment standards which may be applied to power generation, such as those applicable to biogas digesters, material mixes and piping systems, would help unlock funds.

- **Regional banks could deploy additional resources.** Provincial development banks often hold funds that need to be disbursed. For example, Regulation No. 5/2007 of the Ministry of State Owned Enterprises requires private companies to set aside 2% of their profits for environmental management and community development activities. This money could be used to build the capacity of local businesses and communities to support and develop local technological solutions. There is an example from neighbouring East Nusa

Tenggara province, where the provincial bank is engaging with local innovators to fund the development of locally adapted biogas technology.¹⁸

Other measures to ease financing could include the reduction of import duties on spare parts **such as turbines and generators**,¹⁹ and waiver of the tax on surface water use for electricity generation.

Conclusion

IPPs can contribute to overcoming West Nusa Tenggara's chronic shortage of electricity, but the challenges – which include policy and institutional problems alongside the technical difficulties – must be systematically addressed. Civil society must take the lead in advocacy, the development of multi-stakeholder approaches and effective partnering with government and private-sector organisations, especially banks.

For further reading

Khan, Dina (2016) Financing Nationally Appropriate Mitigation Actions: Insights from CDKN's Experience. London: CDKN.

Endnotes

- 1 For example, Ministerial Decree No. 119 of 2015, which regulated power purchase tariffs from small- to medium-sized (up to 10 MW) hydro power plants.
- 2 Pepinsky, T. B. and Wihardja, M. M. (2011) 'Decentralization and economic performance in Indonesia.' *Journal of East Asian Studies* 11(3): 337.
- 3 Pisani, E. (2014) 'Indonesia in pieces: the downside of decentralization.' *Foreign Affairs* July/ August 2014:142-152.
- 4 'The Mitigation Momentum Project' www.mitigationmomentum.org
- 5 This project was led by the Energy Research Centre of the Netherlands (ECN), in cooperation with the provincial government of NTB, and implemented in partnership with Universitas Mataram, the largest technical university in the province, and with the support of CDKN.
- 6 Regional Regulations for Spatial Planning at the district/municipality and provincial levels clearly plotted the proposed locations of IPPs in villages and sub-
- 7 Prices are more likely to increase on IPP concessions. In contrast, with government concessions, communities are known to share their land more willingly.
- 8 A recent proposal is that the provincial energy office should write to PLN before developing an off-grid facility, to obtain a guarantee that PLN will not enter the area concerned within the next 5–10 years, a grace period in which the off-grid facility will operate without competition.

- 9 As a cautionary note, even lending support to the small-scale suppliers may not always work. Consider, for instance, India's solar mission where small-scale suppliers were incentivised to bid, but the lowest bids were simply allowed to win. To discourage unrealistically low bids, developers may be required to establish bonds in proportion to their offered tariff discount, and fined for every day the project is delayed beyond the pre-agreed date. Source: Saito, Y. (2011) *'Transforming India into a solar power.'* London: CDKN.'
- 10 The Indonesian national action plan for greenhouse gas mitigation (so-called RAN GRK, mandated by Presidential Regulation No. 61/ 2011), stipulated that provinces should each develop their own regional plans (or RAD-GRKs). Until 2014, and during the delivery of the project, the laws ruled that regional autonomy (and budgets) rested with districts and municipalities – the most disaggregated level of the political structure. The new decentralisation law of 2014 specifically outlines each task and responsibility of government at three levels (national, provincial, and district and/or municipality), and stipulates that provincial governments are responsible for local matters such as developing renewable energy, issuing licences and establishing off-grid tariffs. West Nusa Tenggara's Regional Regulation No. 2/ 2015, establishing the role and responsibilities of provinces in energy management and governance, followed.
- 11 Further problems in alignment have arisen between the provincial action plan for greenhouse gas mitigation (RAD GRK) and the existing provincial energy planning process (so-called RUED). A province's mitigation plan covers every sector, so in theory the provincial energy plan would need to be adapted to and planned around the time horizons and revision cycles used by other sectors. Again in theory, the energy plan is revised every year; in practice, the latest for NTB is for 2014 and is only currently being legislated. In a similar vein, horizontal coordination has yet to harmonise policies from central government. For instance, the Ministry of Environment (now Ministry of Environment and Forestry) in 2012 issued the policy for Climate-smart Villages, whereas the Ministry of Energy and Mineral Resources in 2007 came out with a policy on Energy Self-sufficient Villages. Both policies envisaged the provision of technical support for mitigation and adaptation, including support for new and renewable energy sources. Provided any overlaps and/ or contradictions are sorted out, these policies may guide the implementation of locally devised plans.
- 12 Capacity Development and Strengthening for Energy Policy Formulation and Implementation of Sustainable Energy Projects in Indonesia (CASINDO). 2011. Action plan for renewable energy for West Nusa Tenggara province (in Indonesian).
- 13 North Lombok District has already formulated its regional budget for new and renewable energy, thereby substantiating the business case for climate compatible development.
- 14 West Nusa Tenggara Governor Decree No. 110/ 2007 was very optimistic, setting a target of 38% for 2020. These ambitious targets have not been followed up by strong action on the ground. The draft regional regulation for the provincial general plan for energy (RUED 2015) is still being prepared for legislation. Nonetheless, the islands north of Lombok are gradually transitioning to solar PV.
- 15 The need for training centres often becomes apparent at the feasibility study stage (banks use these studies as the primary indicator of project and loan viability). Training centres are an opportunity that has often been overlooked by government and IPPs. For example, solar PV providers have asked PLN for training facilities especially regarding O&M (operations and maintenance) for solar projects. The standard answer from PLN is that IPPs should learn from one another. This answer does not recognise the difficulties private firms face in collaborating in this way and in sharing information on good practices. A better solution might be to include provisions for training and other resources to assist developers at the early planning stages. Existing facilities at local universities and in the research centres of R&D agencies and relevant ministries should be used.
- 16 With close to US\$ 20 billion freed up by early 2015, <http://cdkn.org/2015/04/escaping-fuel-subsidy-trap-indonesia/>
- 17 Law No. 6/ 2014 regarding Village Governance Law, with implementing regulations outlined by Government Regulation No. 43 and, further, GR 60/2014 regarding Village Funds Originating from National Yearly Budget.
- 18 Paramita, E. 2014. Geng Motor iMuT (Changing Perceptions and Raising Inspiration). (In Bahasa Indonesia). <http://www.worldagroforestry.org/news/geng-motor-imut-mengubah-persepsi-membangkitkan-inspirasi>
- 19 In 2010 there was a Finance Ministry regulation stating that import duties for renewable energy should be waived. However, this has not been implemented.



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