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Promoting small and medium scale renewables in Indonesia

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Abstract

Small and medium scale renewable energy generation can have large economic, strategic, environmental and development benefits for Indonesia. Yet the sector has been slow to develop and faces a number of challenges. This briefing, the last in a series of three, recommends policy interventions and support that could overcome these barriers and create a much more active market for these projects. Previous briefings described in detail the rationale for pursuing small scale renewables in Indonesia as well as the specific barriers currently preventing their development.

It is clear that small scale renewables will be developed in Indonesia, however the key questions are around how quickly this will happen and at what public cost. The current approach of offering high feed-in tariffs to projects, such that large nominal returns will cover possible project risks, is not an efficient approach to public incentives. As an alternative, this briefing describes needed public interventions across three aspects: 1) improving capacity, skills and data, 2) financial assistance and support, and 3) overcoming other market barriers. It finds that de-risking projects through improved technical quality and providing financial incentives to bring lending practices in-line with ASEAN good practice could both have large economic benefits for the government of Indonesia in terms of lower required feed-in tariffs.

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Introduction and summary

The power sector in Indonesia is driven by a number of policy objectives and faces distinct but well documented challenges. Private sector independent power producers (IPPs) generating power from renewable sources can benefit these objectives and make important contributions to resolving the challenges (Cameron and van Tilburg, 2016a; Sri Martini 2015):

Capacity expansion and diversification: a key objective of the Government of Indonesia is to reduce dependence on oil by expanding the use of gas and renewable energy resources. Small-scale renewables developed by private intendent power producers (IPPs) can add significant capacity to the grid and help shift towards domestic renewable sources of energy.

Rational energy pricing: the Government of Indonesia recognizes that it can no longer sustain uniform pricing for electricity and petroleum products across the country, and has been working to reduce and remove subsidies. The power provided by IPPs can reduce subsidy costs for electricity, because the tariffs paid for small scale renewable energy are substantially lower than current generation costs in the majority of provinces.

Rural electrification: the Government of Indonesia wants to bring electricity to 90 percent of the population by 2020. Technologies for renewable electricity production such as solar PV, mini hydro, and biomass conversion are well suited to provide energy access in remote and rural areas. Such technologies can also provide power in provinces without local fossil fuel resources or where their small power needs would make fossil based generation impractical or economically unattractive.

Energy sector reform: the need to attract capital investment in the energy sector and the decentralization of government decision-making to give greater involvement to regional authorities, call for greater transparency to planning and decision-making. IPPs can develop and realise more than $2 billion worth of projects in the short term.

Climate change mitigation: renewable energy technologies can help to reduce greenhouse gas emissions, and contribute the Government of Indonesia's domestic climate policy objectives and its intended nationally determined contribution (INDC) submitted to the Paris climate negotiations in 2015.

This briefing explores what can be done to help unlock these benefits of small scale renewable energy projects in Indonesia, following the same broad structure as presented in the previous briefing on barriers. It concludes that domestic resources and international assistance can and should be used to provide support on a number of aspects (Table 1):

1. Improving capacity, skills and data
2. Financial assistance and support
3. Overcoming other market barriers

It further assesses the economic benefits of providing assistance to the sector and finds that:

- De-risking projects by improving their technical designs is an efficient way of allowing feed-in tariffs for the key technology of small-hydropower to be reverted to their lower 2014/2015 values. This would conservatively represent a saving to the Government of Indonesia of roughly 1.3 million USD per MW of installed capacity over the lifetime of a project.
- Providing financial incentives that shift commercial bank lending practices to be in-line with ASEAN good practice would allow feed-in tariffs to be reduced by a further 15%. This would conservatively lead to net savings to the government of roughly 550 thousand USD per MW over the lifetime of a project.

Type	Focus	Recommendations
Improving capacity, skills, and data	Project developers	Support facility and expert roster PLN engagement to review quality
	Financial institutions	Ongoing workshops and training Regional outreach and capacity building Introduce standard operating procedures Support facility with expert roster
	Public agencies	Build capacity on financing within government Promote local municipal involvement in projects Provide clear guidelines of procedures Improve data on renewable energy resources Revise and harmonise feed-in-tariffs
Financial assistance and support	Project development grants	Short term loan / contingent grant facility Work with experienced implementers Tied to capacity building and assistance Collect data from the programme
	Concessional lending	Push for improved environmental and social risk analysis Consider credit lines for smaller/motivated banks Plan for substantial (recoverable) support Share experiences from public financial institutions
	Risk mitigation and cover	Consider partial credit guarantees as an alternative to credit lines Plan for substantial (non-recoverable) support Implement through experienced institutions Reduce regulatory collateral requirements
Overcoming other market barriers	Grid access and availability	Look into the feasibility of 'take-or-pay' provisions Look into the feasibility of compensation Consider joint responsibility for IPP connection Improve grid planning processes and data
	Foreign ownership restrictions	Re-assess restrictions on foreign ownership of new projects
	Permitting and approvals	Monitor the performance of new licensing body Improve awareness of local governments Provide clear guidelines of procedures
	Land acquisition	Awareness building initiatives Promote local municipal involvement in projects Tie resource concessions to project development

Table 1: Summary of recommended interventions and assistance for small-scale renewables in Indonesia

Improving capacity, skills and data

Renewable energy generation projects are comparatively new to many private sector parties in Indonesia. While some technologies, such as small hydropower, have seen limited private development, others are novel. Only after the introduction of feed-in tariffs in 2009 has interest in small scale IPPs grown; until then the vast majority of small scale projects were designed, engineered, and financed by the public utility PLN. As a result, there is a lack of familiarity with non-government stakeholders on many of the technical and financial aspects of developing and financing small scale renewable energy projects in the country.

Project developers

For small project developers and new entrants, the process of securing the required technical expertise for specific tasks is clearly an issue. Evidence shows that nearly all projects experience time and cost overruns, which in some cases are significant and can critically impact on cash flows and liquidity. There is a clear lack of awareness of the importance of putting in place proper technical due diligence measures to assess and scrutinize project designs.

Project developers frequently overestimate the performance of projects, which results in lower financial rates of return than anticipated. Moreover, they tend to underestimate technical complexity and there is a tendency to "cut corners" in the construction phase, leading to problems and undermines performance. In many cases these mistakes are quite elementary and could be easily eliminated. To compound this situation, the reason for neglecting the step of technical due diligence is more due to lack of awareness than to economic considerations - the cost of a consultant to carry out this work is largely irrelevant in the context of the overall project cost (Hayton and Nugraha, 2013).

While developers do benefit from existing support programs made available through and by development partners such as USAID, GIZ or MCA, there is a need for further assistance on a larger scale.

Recommendations:

Support facility and expert roster: the Ministry of Energy and Mineral Resources (ESDM), together with appropriate external expertise and assistance, should provide an informal or semi-formal support facility offering the necessary technical know-how that IPPs could draw on. This would facilitate a relatively easy due diligence process for IPPs. It could comprise a network / pool of experts to be commissioned for specific value engineering tasks upon request, and paid for by the individual IPPs (Hayton and Nugraha, 2013). This facility could be complimented with the preparation of outreach material for dissemination amongst the IPP community, highlighting the most common mistakes. Such an approach, close to a matchmaking or directory of technical resources, would be a relatively straightforward to prepare and administer.

PLN engagement to review quality: the public utility PLN is familiar with the most common small scale renewable technologies (such as small-hydro) and is able to assess whether the proposed plans of IPPs are compatible with the existing PLN grid network. PLN should be involved more intensively and at earlier stages of project development such as technical due diligence and value engineering, to ensure that projects are implemented in accordance with specific PLN requirements to optimise resources (Hayton and Nugraha, 2013).

Financial institutions

Financial institutions in Indonesia, such as commercial banks, have limited experience with financing renewable energy projects or projects with similar characteristics. There is very limited capacity to accurately assess renewable energy business proposals and financial viability of proposed schemes. Donor agencies and Indonesian officials are well aware of the need for capacity building for renewable energy technologies within financial institutions and a number of efforts are currently being undertaken:

- The Indonesian banking regulator ('OJK') has organized and conducted several capacity building workshops on their sustainable finance roadmap, which was published in December 2014. While the details of the foreseen activities in the roadmap are currently quite general, the roadmap provides the starting point for a process that could significantly contribute to stimulating 'green' financing in Indonesia (Volz et al., 2015).
- OJK also worked with IFC and USAID on a Clean Energy Handbook for Financial Service Institutions, which was published in February 2015. The Handbook comprises lending manuals of five types of renewable energy investments: mini hydro, biogas, biomass, photovoltaic and wind (UNEP, 2015).
- In collaboration with USAID and KLHK, Bank Indonesia developed and shared Green Lending Model Guidelines for Mini Hydro Power Plant Projects for banks in 2013. These guidelines are voluntary in support of developing new lending practices by banks (UNEP, 2015).

While these are promising first steps, more needs to be done. Financial institutions are important catalysts to scaling up renewable energy investments and therefore need to be targeted specifically (Wolff et al., 2015).

Recommendations:

Ongoing workshops and training: continue to support workshops and trainings which apply practical and hands-on examples on how the risk of different renewable energy technologies can be assessed can help to build up human resources within banks (Wolff et al., 2015). Examples of successful projects developed with financing from major banks exist in several regions. Training and guidance materials are an opportunity to put more focus on disseminating these "success stories" to banks and other stakeholders (Wolff et al., 2015).

Regional outreach and capacity building: introductory activities and information dissemination need to be carried out, in particular for regional banks, to suite small scale projects. Although the larger banks are more familiar with legislation, this awareness is concentrated in the main branches in Jakarta and therefore 'socialization' to regional offices is needed (Hayton and Nugraha, 2013).

Standard operating procedures: standard operating procedures (SOPs) for the risk assessment of projects using specific renewable energy technologies are needed and could be provided by the regulator OJK. However, international experience shows that SOPs are only effective when introduced in combination with trainings on how to use them. Otherwise, they might just lead to increased bureaucracy and unwillingness among banks to engage in renewable energy projects (Wolff et al., 2015).

Support facility with expert roster: the expert directory mentioned above should not only target project developers, but can also offer a more comprehensive pool of suitable experts and consultants who are able to conduct the specialist tasks (on behalf of banks). Such a roster could be established as a shared effort by Indonesian financial institutions.

Public agencies

The Ministry of Energy and Mineral Resources ('ESDM') currently has limited engagement with developers and financiers of small scale renewable generation projects. It collaborated with development partners on a number of renewable energy support programs, but it does not have close connections with financial institutions (and its capacity to influence and participate in project finance related issues is currently very limited). Two ways in which closer involvement with private sector can be beneficial are: engaging in a dialogue on transparently setting and updating feed-in tariffs, and providing public resource data to project developers to avoid overreliance on inaccurate or outdated information.

This is even more pronounced at the regional level, where local government has limited knowledge of finance related aspects of renewable energy projects. The majority of existing projects have been (or are being) developed by Jakarta based IPPs and financing is arranged almost exclusively with banks in Jakarta.

Recommendations:

Build capacity on financing within government: ESDM needs to be adequately informed on financing programs offered by (local and international) banks and other financial institutions allowing ESDM to further disseminate this information. If ESDM would be more closely involved in trainings and workshops provided to the financial sector, this would initiate and strengthen ties with private sector stakeholders and improve understanding of their challenges.

Promote local municipal involvement in projects: Given that the nature of small scale renewable energy projects, in particular small hydropower, lends itself very favourably to involving municipalities as shareholders. This is however still an unexplored opportunity and our analysis shows only one example where local government has actively taken a stake (effectively as a shareholder) in a project rather than limiting their involvement to an administrator role. (Hayton and Nugraha, 2013). Through sharing successful examples of progressive and innovative ownership models, district governments and local authorities can be inspired to apply these in the development of future projects, presenting (Hayton and Nugraha, 2013).

Provide clear guidelines of procedures: This would provide IPPs, district governments, PLN and other involved institutions with a clear and transparent reference to follow. This is particularly important in those provinces and regions where experience exists with this type of project is limited.

Improve data on renewable energy resources: There is a need for a comprehensive study of location specific renewable energy potential across Indonesia, its economic feasibility, and understanding of macroeconomic impacts (IEA, 2015). Existing information is often outdated, inaccurate, unreferenced, or of insufficient geographic resolution to be useful to project developers (Cameron and van Tilburg, 2016b).

Revise and harmonise feed-in tariffs: feed-in tariffs are currently codified in a number of different regulations, described in different forms, paid in differing currencies, not transparently set, and not revised at regular/known intervals. It would be beneficial to develop one regulation for all renewable energy technologies with regard to tariffs with a more transparent and inclusive process for setting those tariffs in accordance with good practices elsewhere (IEA, 2015).

Financial assistance and support

As discussed in the previous briefing, small scale renewable IPPs in Indonesia face a number of challenges related to securing appropriate financing for projects (Cameron and van Tilburg, 2016b). Likewise, commercial banks, who are the primary lenders to such projects, experience cost overruns and underperformance on many of their loans.

- **Lack of project finance and available terms:** Indonesian banks are willing to finance small scale renewable energy projects, there is a tendency to apply the same procedures and requirements as for conventional projects. This means no 'project financing' available from commercial banks, accessible collateral of 100% or more of project value must be available, loan tenors are relatively short, and interest rates are not fixed.
- **Underperformance and cost overruns:** Attractive nominal rates of return are clearly possible for renewable energy projects in Indonesia, However, in reality cost overruns and underperformance of projects result in insufficient returns to service loan repayments.
- **Collateral requirements restrict growth and new entrants:** the stringent lending conditions applied by the banks, particularly in regards to collateral requirements, means that the only companies who can secure a long are those with strong financial support from larger parent or partner companies.
- **Project preparation:** bank loans, if secured, cannot be used for project preparation (feasibility study, etc.) activities and land acquisition means that significant up front equity is required by developers.

There are a number of possible ways in which assistance can be provided to the sector in order to achieve these outcomes. With limited public funds, interventions should be chosen carefully and in line with the wider institutional and financial context to ensure feasibility.

In answering the question of what can be done to provide appropriate financial assistance and support to the sector, this section introduces the different financial options, or so-called 'instruments,' that can be used to stimulate renewable energy projects (Table 2). There are many instruments available to the public sector and most of them could be classed as 'traditional' and familiar from other aspects of public policy. The key challenge is how to select and design these instruments to achieve the desired outcomes.

We observe in the precious briefing that small scale renewables in Indonesia generally provide sufficient return on investments, or even very high nominal returns on investment when we consider small hydropower, which could expect equity internal rates of return to be above 45% based on the revised feed-in tariff of late last year (Cameron and van Tilburg 2016b). This comes from a combination of favourable tariffs, accelerated depreciation and tax deductions that are available to smaller scale renewable energy facilities. The problem therefore is primarily not one of returns, but rather how to facilitate access to appropriate capital and mitigate/cover perceived risks. These challenges are identified in the second part of Table 2.

The rest of this section looks more closely at a sub-set of these instruments that are determined from interviews and independent assessment to be most appropriate in the Indonesian small scale renewables context, as well as recommendations for their implementation. Much has been written about these tools already and this chapter references extensively from those sources.

High level barrier	Type of financial support	Specific barriers	Instrument	Description	Type of public funding required	Financial market characteristics	Project size and type
Low or no return on investment	Contribution to investment and/or operational costs	Upfront costs are too high	**Capital grants and subsidies**	Provision of financing without costs for the project developer or end purchaser	Grant (non-recoverable)	Can be applied in most financial market contexts	All sectors and projects; often used for early stage project development (see below)
		Poorly capitalised developers; costly development process	**Project development grants**	used to cover costs during the highest risk development phase	Grant (non-recoverable)[1]	Can be applied in most financial market contexts	All sectors and projects
		Cash flow during operation is too low	**Results-based financing**	Pay grants or rebates against the delivery of a specified set of outputs.	Grant (non-recoverable)	Can be applied in most financial market contexts	Large and medium scale projects; Also for small scale with careful consideration of verification costs
			Tax deductions or tax credits and accelerated depreciation	increase the after□tax cash flow or reduce upfront costs	Grant (non-recoverable)	Can be applied in most financial market contexts	Large and medium scale projects
			Feed-in tariffs or other premiums for low-carbon services	Increase the revenues for a project	Grant or budget-neutral (non-recoverable / neutral)[2]	Can be applied in most financial market contexts	Large and medium scale projects; Also for small scale with careful consideration of verification costs
Cost of capital and access to capital	Facilitating access to affordable capital	Commercial financial institutions (CFIs) lack funds and/or have high interest rates	**Credit Line for Senior Debt**	Credit line provided to CFIs for on-lending to projects or corporations in the form of senior debt	Debt (recoverable)	Underdeveloped financial markets with lack of liquidity, particularly for long term lending, and high borrowing costs	Large and medium scale projects; typically more developed projects
		CFIs unable to address the sector	**Project Loan Facility**	Debt provided by public sources directly to projects	Debt (recoverable)	Able to enforce contracts and enabling laws for special purpose entity (or existing public financing agency)	Large and medium scale projects; typically more developed projects
		Debt-Equity gap, whereby project sponsors lack sufficient equity to secure senior debt	**Credit Line for subordinated debt**	Credit line to CFIs for on-lending to projects with subordinated repayment obligations	Debt (recoverable)	Lack of liquidity in both equity and debt markets	Medium and small scale projects
		Lack of risk capital; Restrictive debt-to-equity ratio	**Equity Facility**	Equity investments in companies or projects	Equity (recoverable)	Highly developed capital markets to allow equity investors to exit from the investee	Large scale grid-connected renewable energy; energy companies
		Lack of risk capital for new technology development	**Venture Capital Fund**	Equity investments in technology companies	Equity (recoverable)	Highly developed capital markets to allow eventual exits.	Any new technology
		Lack of CFI interest in lending to new sectors; limited knowledge of market demand; and/or high interest rates	**Loan softening programmes**	Grants to help CFIs begin lending their own capital to end-users initially on concessional terms.	Grant (non-recoverable)	Well-functioning local lending markets	Medium and small scale projects
High (perceived) risks	Risk mitigation and cover	Investment risk (e.g. political and regulatory)	**Political risk insurance (PRI) / partial risk guarantee (PRG)**	Guarantee of policy and regulatory commitments by host government.	Debt/grant (partially recoverable through user fees, rarely fully recoverable due to claims exceeding fees)	Existence of guarantee institutions & experience with credit enhancements	Large scale projects (project specific) typically more developed projects
		Specific technology and operational risk	**Individual guarantees**	Guarantee a part of the losses incurred by a project in the event of a specified event occurring.			Large scale projects (project specific) typically more developed projects
		Specific technology and operational risk, but small project sizes	**Portfolio guarantees**	Guarantee a part of the losses incurred by a portfolio of similar projects in the event of a specified event occurring			Large number of similar smaller projects is required to be effective typically more developed projects
		Operational risk	**Liquidity guarantees**	Guarantee ability to meet commitments on debt service/financing.			Large and medium scale projects; typically more developed projects

Table 2: Financial barriers for renewable energy and instruments to overcome them
(source: authors adapted from Wuertenberger 2011, Lindenberg 2014, Neuhoff et al. 2010, Maclean et al. 2008)

[1] These can also be contingent project development grants; i.e. they provide pre-investment funding as loans that turn to grants if projects are successful, or grants that turn to loans, which would make some portion of the public support recoverable.
[2] premiums paid from public budgets are generally non-recoverable, but premiums are often passed onto end consumers, avoiding public contributions

Project development grants[3]

It is observed that for the majority of small scale IPPs, bank loans, if secured, cannot be used for project preparation (feasibility study, etc.) activities and land acquisition. This means that significant up front equity is required by developers. This represents a disincentive for investors, but can also discourage more thorough project development processes that lead to high quality project proposals and design. This problem is not unique to Indonesia, but is exacerbated by the general lack of awareness from project developers about due diligence of their technical and financial proposals (as described in the previous chapter).

"Assistance is often needed to assist project preparation activities particularly with small developers who lack project development capital. Government support can play a role in helping developers make it to financial closure by cost-sharing some of the more costly and time intensive project development activities such as permitting, power purchase negotiations, grid interconnection and transmission contracting. This support can be on a grant, contingent grant, or soft loan basis and must be carefully structured to target the right projects and align interests on project development.

Contingent grants can be targeted at various preparatory activities and then repaid in part or in full when the project has reached the operation and revenue-generating stages. They can also be combined with loan instruments to shift the focus from early stage "prospecting" to later stage project engineering and development. The contingent grant (all or part) becomes a loan and must be repaid if the project succeeds, as determined by close of construction financing or other milestone, thus allowing the donor to replenish its funds and support further projects. If the project fails to proceed to implementation and financial closing, then the funding becomes a grant and does not have to be repaid. In some cases, the grant becomes a loan and must be repaid if project fails but the grant component is kept by the recipient if the project proceeds to implementation. This approach is designed to give the enterprise strong incentives for success.

The leverage potential of contingent grants is considered medium to high. By covering some of the costs during the highest-risk development stages, it increases investor confidence and, in so doing, leverage highly needed risk capital. Contingent grants are sometimes, however, criticized for lack of business discipline and creating disincentives for success by forgiving the funding in event of failure. These aspects need to be considered carefully in the design of such grants." (Maclean et al., 2008; p.34).

Recommendations:

Short term loan / contingent grant facility: upfront costs of FS are significant and interviews have shown that cost and lack of experience often leads to low quality FS and low confidence from the financial sector. There would be large benefits in project quality and volume that could be realised by providing partial grants / loans for feasibility studies (FS) and other early stage diligence activities.

Work with experienced implementers: this should be managed by a source that has experience with administering small grant programmes as well as the characteristics of small scale renewable projects. The public agency Indonesia Infrastructure Finance Company ('PT SMI') under the Ministry of Finance has this experience and is a strong candidate to play this role.

Tied to capacity building and assistance: it will be important that any assistance provided is closely tied to the capacity building activities proposed in the previous chapter, such as establishing guidelines and an expert roster.

Collect data from the programme: there is an opportunity for such a programme to centrally collect anonymised data from projects that seek to use the provided preparation grants. This could allow ESDM and the Ministry of Finance to much better understand the incentive requirements of firms in regards to setting feed-in tariffs, as well as the pipeline of projects.

[3] Directly from Maclean et al. (2008) p.34

CONCESSIONAL OR 'SOFT' LOANS

One of the most common ways to improve the availability of appropriate financing for private project developers is through the use of concessional, or soft, loans through a variety of instruments by public sponsors. This means that loans can be repaid with a lower than market-rate interest rate or with an extended repayment schedule. Providers of concessional loans are typically development banks, or similar financial agencies, on behalf of governments. National finance institutions provided almost 90% of their climate funding via soft loans in recent years (Buchner et al. 2012).

Such loans can signal government support for the targeted projects, but more practically can improve the financing costs/terms, and by this, increase the viability of a project. "In contrast to grants, loans can incentivise project viability due to the repayment obligation. For the public lender, an advantage of loans is that the repayment can be used to fund further projects. The mode of action of public loans is above all reducing project costs and providing long-term financing. The leverage ratio, however, is generally low." (Lindenberg 2014; p.16).

This section discusses a few options available to the Government of Indonesia that could be pursued with domestic resources and/or in cooperation with international development partners.

Direct loans and public loan facilities

A common practice in many countries is for government bodies and national finance institutions to directly provide loans to projects and firms for to stimulate new markets and sectors. For example, this approach may be adopted by national development banks, directed by the strategic interests of the state. This allows more control over the terms of debt provided and can directly stimulate investments that would not otherwise receive commercial financing.

As opposed to credit lines which operate within the conventional lending practices of commercial banks, loan facilities are created by governments or development finance institutions as special vehicles to provide debt financing directly to projects, typically on a project finance basis. Loan facilities are warranted in situations where there are large numbers of economic projects that are unable to make it to financial closure because local commercial banks lack the capacity or liquidity to provide the needed financing (Maclean et al. 2008; p.31).

However, there are some downsides of government bodies/agencies directly using loans to leverage private funds (Lindenberg 2014; p. 16):

- Due diligence is needed to verify the financial viability of the projects, which increases administration costs.
- It is hard to estimate the degree of concessionality that is needed to provide useful funding to the project without wasting public money through the unnecessary use of subsidies.
- Usually public donors, find it difficult not only to select adequate projects, but also to identify generally eligible projects.
- It generally suits only larger projects due to the high demands for project evaluation and associated transaction costs.
- There is a risk of creating market distortions through the selection of projects; for example, does a project need financing from a public source or could this have been found in the general lending market?

"Since the objective of public finance mechanisms is generally to engage commercial banks to finance low-carbon technologies and projects, it is important to assess whether the financing gap can be better and more quickly filled by credit lines and/or guarantee instruments before jumping into the creation of loan facilities. The goal of having commercial banks fund projects and using some of their own resources to do so is always the first priority. This analysis requires careful assessment of commercial bank capacities in the market to determine the most appropriate strategy" (Maclean et al. 2008; p.31).

Credit lines

Credit lines are a form of concessional lending that can offer a solution to the problems of identifying eligible projects and of encouraging commercial bank involvement in the sector (see Direct loans and public loan facilities above). "This is an instrument for the provision of loans through private sector financial intermediaries, i.e., debt is provided for on-lending to local banks that have the freedom to choose the interest rates and charges that will be applied to the customer. Credit lines are used for outreach and diversification and in order to develop local expertise in project finance.

Credit lines have several appealing strengths. Besides the advantages that also apply to direct loans, e.g., providing incentives for project viability, there are some additional ones: The first is that the public donor does not have to spend time and money on the selection of projects. Moreover, it can even be assumed that local banks should have significant advantages in doing this through their inside knowledge of the local business environment. Further, credit lines can increase the comfort and the awareness of the financial intermediary involved in the deal in lending to new sectors or project types. Moreover, the financial intermediary might even complement the funding provided with further own resources. Lastly, as opposed to the projects themselves, the financial intermediaries are fairly stable partners for the public donor as the working relation might last for several years. Credit lines are, thus, in various aspects a sustainable solution for providing project financing.

The weaknesses of credit lines are very much the same as those of direct loans, i.e., the need for due diligence, and the risk of favouring certain projects. Also, as the financial intermediary is free to choose the applied interest rates and charges, the project might not receive subsidised rates at all. It is possible that all subsidies only go directly to the intermediary. The related uncertainty is, thus, how much concessionality does the local bank need to engage in these lending activities? Moreover, the financial intermediary might take too many risks in lending or the public funds might be used for the commercial interests of the intermediary instead of the actual public policy objective.

The underlying mode of action of credit lines is not only the provision of funds for specific green projects, but also the further development of the financial system. The focus of the public donor when using credit lines is on enabling the partner bank to use a new financial product for a wide range of customers or to facilitate access to financing for certain target groups, such as low-income households or small and medium enterprises. The leverage potential is not very high; however, it is seen more as an investment in future private lending facilities.

Especially, due to the advantages of this instrument, credit lines can be applied quite broadly and they are often the preferred instrument by development banks. From the recipient side, the perception depends on the development phase of the project: at an early stage, a project developer would probably prefer to receive subsidised funding, while at a later stage the advantage of establishing business relations with a local bank might prevail." (Lindberg 2014) The nature of the credit line provided, for example whether it will be paid back before other source of financing, can change the way in which it is structured and what types of barriers it seeks to overcome.

Loan softening

These grant based programmes are similar to the concessional loan programmes described above but "only provide an incentive to commercial banks, not the financing itself which is expected to be provided by the commercial bank usually in the form of consumer loans or microfinance. Most typically the incentive comes in the form of an interest subsidy or can also be provided as a partial guarantee or a combination of the two. Either way, the benefit of the support is expected to be passed on to the commercial bank's customers in the form of lower interest rates, lower front end deposits and extended loan repayment periods" (Maclean et al. 2008 ; p.35).

BOX 1: Indonesian experiences with concessional support for renewables

"Several international development agencies have tried to establish partnerships and green credit facilities with Indonesian banks. The interest among Indonesian banks has been rather cautious. Examples of past and present credit facilities include a soft-loan program for Pollution Abatement Equipment that the Japan Bank for International Cooperation had with BNI; KfW's Industrial Efficiency and Pollution Control refinancing line over IDR10 billion with BNI and government-owned Eximbank (also known as the Indonesian Export Financing Agency); and two credit facilities (over US$100 million each) for 'Renewable and Energy Efficiency Projects' that Agence Française Développement (AFD) arranged with state owned PT Bank Mandiri, Indonesia's biggest bank by assets. Where an agreement to establish a green credit line with a local partner bank could be reached, disbursement of credit often proved difficult. For example, the Asian Development Bank developed a US$30 million Energy Efficiency Project Finance Program together with Eximbank in 2011 - the first loan under this program was not released until 2014. A major problem reducing the attractiveness of such schemes is apparently that both lender and debtor usually have to comply with comprehensive formal requirements in the credit approval process. For the Energy Efficiency Project Finance Program, Eximbank has been requested by the ADB to establish an environmental and social management system, a requirement many Indonesian banks would rather avoid" (Volz et al., 2015).

Experiences from existing schemes and interviews with the Indonesian banking sector show that the additional administrative burden of on-lending can make credit lines less attractive. A 2013 study of the Indonesian banking sector noted that "The currently favourable refinancing conditions of Indonesian banks reduce the attractiveness of such schemes if those eat into their usual profit margins or require a high administrative burden. Experience with soft loan schemes from international donors have shown that banks are hesitant to cooperate if this comes with smaller profit margins than their conventional business... Feedback from banks suggests that they are reluctant to accept soft loan facilities that provide individual loans which are tied on project loans, since these are associated with high transaction costs for rather low loan amounts. In addition, donor credit lines were rejected for requiring a too long planning horizon" (Volz et al., 2015).

In terms of public loan facilities, the Indonesia Investment Agency ('PIP') attempted to offer both a renewable energy loan facility. This was a revolving debt fund of roughly US $25 – 30 million for mini-hydropower projects. However, the risk profile of all submitted projects was found to be unacceptable to receive funding due the mandate of PIP to have zero defaults. In addition collateral requirements remained high under this ultimately inactive scheme (in excess of 100% of loan value) limiting eligible IPPs. As a result the scheme did not provide financing to any projects despite many tens of applications.

Recommendations:

Push for improved environmental and social risk analysis: continue to pursue regulatory and disclosure requirements for environmental and social risk analysis, as well as good corporate governance, within the Indonesian financial sector (also known as ESG). There is growing evidence that suggests that ESG factors, when integrated into investment analysis and decision making, may offer investors potential long-term performance advantages. Minimum ESG standards are also required of partner financial institutions by many public financial assistance programmes. Meeting those standards is currently seen as burdensome by many larger institutions in regards to receiving financial assistance, as they often not currently practiced. By moving financial institutions closer to the requirements of formal credit approval processes that much public funding will require, they can be made to look more favourably at offered assistance.

Consider credit lines for smaller/motivated banks: in the short term, subsidized credit lines may provide some incentive for smaller banks, or those more willing to engage, to develop their renewable energy lending business, but any such scheme should be linked to capacity building measures, and have a clearly defined runtime and criteria for success and failure (UNEP, 2015).

Plan for substantial (recoverable) support: it will require a substantial programme to build experience with multiple financial institutions, projects, technologies through the use of credit lines. A previous report estimated support requirements for a credit line (Cameron et al., 2014) consisting of guarantees for a pilot scale implementation (stimulating approximately 200 MW of capacity) would require a credit line facility in the order of 150 to 200 million USD depending on technology choice. In the absence of detailed designs and operational plans, this is an indicative estimate only.

Share experiences from public financial institutions: work with existing direct lending facilities and share lessons and experience wwith commercial banks through partnerships or trainings. PT SMI is, to the best of our knowledge, the only organisation in Indonesian providing true project finance with reduced collateral requirements. To date they have provided financing to 8 mini hydropower projects as well as advisory services to 6 other projects with a range of technologies together with UNDP (Sri Martini, 2015). As a publically owned organisation, with a mandate to stimulate strategic infrastructure development without competing with the commercial sector, they would be well placed to provide support to banks as well as any planned credit lines.

RISK MITIGATION AND COVER

Risk mitigation and cover can play an essential part in helping to ensure that a successful project financing structure is achieved by transferring risk away from borrowers, lenders, and equity investors. Various instruments provided by private insurers, and by means of public mechanisms, can help to partially or fully reduce the exposure of investors to political risk, exchange rate fluctuations, business interruption, shortfalls in output, delays or damage during fabrication, construction, and operational risk.

There is ample international experience with proven commercial and government supported risk mitigation products that can be instrumental in efficiently expanding low carbon investment. Although in many countries the private sector offers insurance products and guarantee products, public resources can be used to offer preferential rates and extend the scope of the coverage. Allocation and application requires a substantial level of expertise, experience, and resources – typically only available in specialised insurance companies, export credit agencies, and some commercial and development banks.

International development financial institutions may offer risk management instruments directly to projects and banks within a country. However preferential terms may only be available if matched by a counter-guarantee by a host government. Finally, national governments (typically development countries) frequently guarantee products for their exporters through export credit agencies (ECAs).

Most relevant for the Indonesian context are credit guarantees, explained further in the following section. Not described here but worth mentioning are a number of more specific risk management tools.

- **Political risk insurance (PRI) / partial risk guarantee (PRG):** cover against specific political or sovereign risks, which means that they are also normally provided by agencies outside of the control of the government (see box 2).
- **Local currency finance:** currency risk (also called 'exchange rate risk') arises when investments are made in one currency but the earnings from which they should be repaid are in another. Foreign ownership restrictions (see 'overcoming other market barriers below') in Indonesia mean that projects are usually locally financed. Even when feed-in tariffs are paid in US dollar equivalent, the majority of equipment is imported so more likely to remain stable with respect to the tariff.
- **Resource insurance:** for technologies which are inherently dependent on uncertain resources, wind and solar insurance can be used to provide coverage against unusually cloudy or still periods.
- **Geological risk insurance:** Offers guarantee facilities for geothermal resource exploration in a number of different ways.

Partial credit guarantees

Credit guarantees provide compensation to lenders for the non-payment of a loan by a borrower. They can therefore encourage lending in instances where a financial institution felt the risk of non-payment was too high or had set prohibitive collateral requirements; e.g. in newer areas of lending such as renewables.

The use of guarantees is appropriate when financial institutions have adequate medium to long-term liquidity, yet are unwilling to provide financing to clean energy or other climate projects because of high perceived credit risk (i.e. repayment risk). The role of a guarantee is therefore to mobilise domestic lending for such projects by sharing in the credit risk of project loans the financial institutions make with their own resources. Guarantees are generally only appropriate in financial markets where borrowing costs are at reasonable levels and where a good number of banks are interested in the targeted market segment. Typically guarantees are partial, that is they cover a portion of the outstanding loan principal with 50-80 percent being common. This ensures that the financial institutions remain at risk for a certain portion of their portfolio to ensure prudent lending (Maclean et al., 2008).

The guarantee scheme may be offered for individual project credit guarantees or portfolio guarantees. In individual guarantees, the guarantor is involved in each individual transaction; i.e. the guarantor typically examines the eligibility of firms, assesses the risk of credits on a case by case basis, and decides whether the guarantee will be granted. In order to be able to execute these tasks, guarantors in individual schemes require qualified personnel. This detailed checking of each transaction gives rise to high administration and due diligence costs and therefore restricts them to larger projects.

In a portfolio guarantee, the guarantor covers all loans by a financial institution to a class of borrowers (the portfolio); i.e. the decision to grant a guarantee is not assessed on an individual basis. Rather, the decision of whether a guarantee is granted is based on some common characteristics such as the volume of the loan, a minimum level of creditworthiness based on financial statistics, the intended use of the funds, and the geographic location of the firm or its industrial affiliation. This regime typically requires a lower expertise on the part of the guarantee provider and entails lower administrative costs. This makes them better suited to cases where there are many smaller similar loans to be guaranteed, for example in microfinance or lending to small and medium enterprises.

BOX 2: Indonesian experiences with guarantee mechanisms

Domestic portfolio credit guarantee: Kredit Usaha Rakyat (KUR) is a micro credit guarantee programme in Indonesia. KUR is part of the Jaminan Kredit Indonesia (JAMKRINDO) credit guarantee scheme and is 100% government-owned. KUR offers guarantees for loans given to micro-SMEs and therefore decreases the normally high interest rates for these loans. A key difference would be that the size of these KUR guarantees is modest compared to those required for the renewable energy sector, while the number of guarantees is immense. For example, a total of RP 29.2 trillion (approx. US $2.6 billion) was guaranteed in 2011 across more than 6,000,000 customers (JAMKRINDO 2012).

Political guarantee: the Indonesian Infrastructure Guarantee Fund (IIGF), which offers government guarantees to large PPP infrastructure projects against political risks, is often referred to in this context, but should be noted as being distinct from a credit guarantee. This type of political guarantee provides coverage against specifically defined political (or sovereign) risks; i.e. risks related primarily to government, as opposed to risks related to IPPs or relatively new fields of lending.

International credit guarantee: Supported by a partial credit guarantee from IFC, PT Ciputra Residence, a residential property developer who has committed to apply IFC's green building standards, issued an IDR500 billion (around US$40 million) bond at the IDX (UNEP 2015).

Recommendations:

Consider partial credit guarantees as an alternative to credit lines: Should credit lines continue to be viewed unfavourably by larger financial institutions, the Government of Indonesia should consider the establishment of a guarantee fund deposited with selected banks in the country to alleviate the risk level for those banks in lending to renewable energy projects. Through this facility, technical and financial assessment of proposals and assessment of the IPP would be the main lending criteria meaning that committed genuine companies having good project proposals, however, with limited collateral would still be able to qualify for lending.

Plan for substantial (non-recoverable) support: As mentioned above, (Cameron et al., 2014) estimates support requirements for such a credit guarantee scheme for pilot scale implementation (stimulating approximately 200 MW of capacity) would require a credit guarantee facility in the order of 20 million USD to be established, partially replenished through guarantee fees and backed by the government. In the absence of detailed designs and operational plans, this is an indicative estimate only.

Implement through experienced institutions: with the Indonesian Infrastructure Guarantee Fund (IIGF) and PT SMI there are already institutions that could possibly offer guarantees for construction risk. Public risk taking is especially important for the construction phase, as the public sector is able to accept a lower return on investment (ROI) if a longer time horizon is assumed with public policy goals. By taking on the riskier parts of debt packages, public institutions could draw in private actors; e.g. banks (Wolff et al., 2015).

Reduce regulatory collateral requirements: In parallel to the above measures, continue to explore additional measures including differentiated reserve requirements with lower required reserve rates on privileged green assets or differentiated capital requirements with different capital adequacy ratios according to the characteristics of the banking institute and the type of lending they provide. It has been reported that OJK is considering green weightings on capital requirements, which would represent a novel and potentially very effective stimulus for financial institutions (UNEP, 2015).

Justifying financial support

Having briefly examined the longer term impact of macro-economic changes on project viability, as well as considered how project risk can act to reduce returns, we now analyse what impact the specific financing terms available to renewable energy projects have on inflating Indonesian feed-in tariffs. We estimate this by taking the basic financial model developed earlier in this paper and varying certain aspects to be in line with lending practices more commonly found in the ASEAN region. A goal seek approach is then used to determine the equivalent (lower) feed-in tariff that would give the same EIRR as the nominal case. The assumptions and results are given in Table 3.

Incentive provided	Assumption	EIRR	Theoretical feed-in-tariff required (IDR/kWh)[4]	(Public) Cost of the incentive[5] (USDk)	Potential savings in feed-in-tariffs[6] (USDk)
Nominal project		27.4%	1,075	n/a	n/a
Remove/cover risk premium for renewable energy by softening	Reduce IPP debt rate by 1.5%	27.4%	1,055	50.8	88.8
Bring lending margins in line with ASEAN region by softening	Reduce IPP debt rate by 3%	27.4%	1,033	101.5	182.4
Increase debt tenor through credit line at market rates	Increase loan period to 15yrs	27.4%	989	n/a	375.5
Meets good ASEAN lending practices through concessional credit line	All three of the above measures / assumptions	27.4%	898	203.4	776.6

Table 3: Effect of different potential financial support measures on required feed-in tariffs, incentive costs and feed-in tariff savings (source: authors)

[4] This is the theoretical feed-in tariff that gives the same return on investment (27.4%) as the nominal case, but assuming the revised financing conditions described.
[5] Compares the NPV of total debt service over the life of the project versus the nominal case, assuming a government discount rate equal to the reserve bank rate of 7.75% (i.e. assuming that public funds are used to offset reduced debt service revenues from the hypothetical commercial lender through loan softening).
[6] Compares the NPV of total feed-in-tariff payments assuming a government discount rate equal the reserve bank rate of 7.75%. This is fair as tariffs are not passed onto customers, but effectively subsidized by the central government in their overall subsidy to the public utility PLN

Reducing debt rates by 1.5 and 3% reduces the feed-in tariff required to give the same EIRR by 2 and 4% respectively (Table 2; Figure 1). Similarly, the reduced interest payments to the bank (which could be compensated in a hypothetical loan softening programme) are almost half the savings gained from the reduced feed-in tariff payments. Increasing loan tenors to a more common 15 years has the largest impact and can decrease feed-in tariff payments by 8%. Combining all three measures could reduce feed-in tariff rates, from 2014/2015 levels, by more than 15% and would cost roughly 200k USD/MW installed as compared to a reduction in feed-in tariff payments of more than 750k USD/MW over the lifetime of a project, a net saving of 750k USD/MW of installed capacity stimulated through the feed-in tariff.

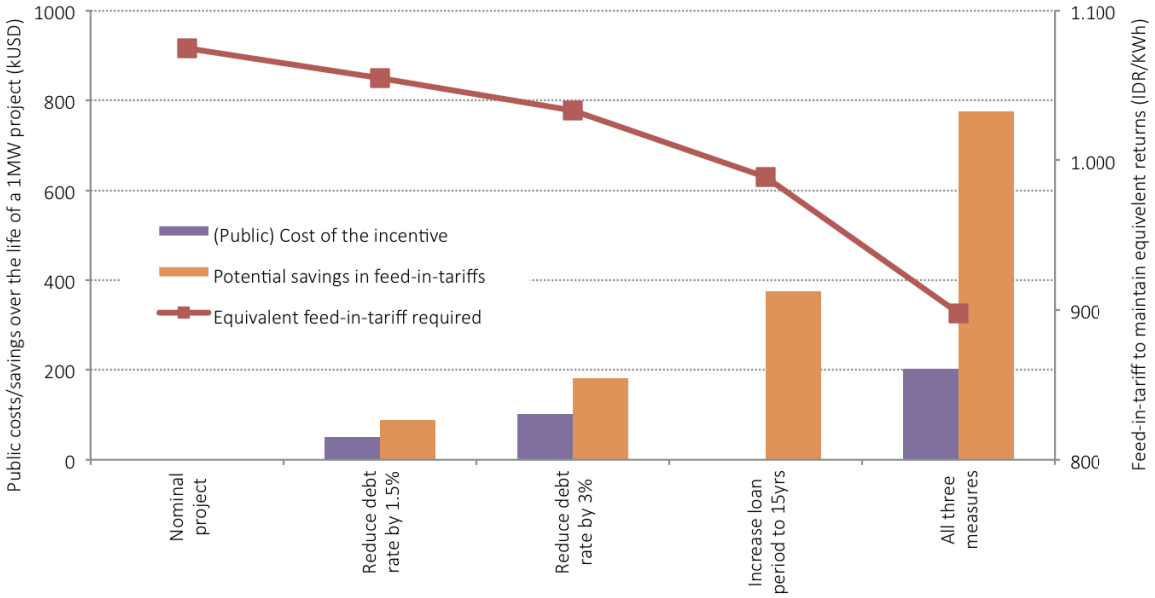

Figure 1: Effect of different potential financial support measures on required feed-in tariffs, incentive costs and feed-in tariff savings (source: authors)

In Indonesia feed-in tariff payments are directly made by the public utility, and not passed on to customers due to regulated electricity tariffs. This results in exposure of the public budget to fluctuations and clearly shows that it makes economic sense for the government to provide support to improve financing terms for project developers, assuming that the resulting reductions in feed-in tariff can be realised.

It is also relevant to consider the impact of the other measures discussed in this paper, which could improve the technical rigour of projects and greatly reduce their risk profile. In a similar fashion, the risk cover described above, proposed to be provided through credit guarantees to commercial banks, can also reduce the risk exposure of lenders and make projects more feasible as investments. The previous briefing note provided an analysis of how project risks, related to design parameters and grid connection, act to reduce expected returns of a nominal hydropower project (Cameron and van Tilburg, 2016b).

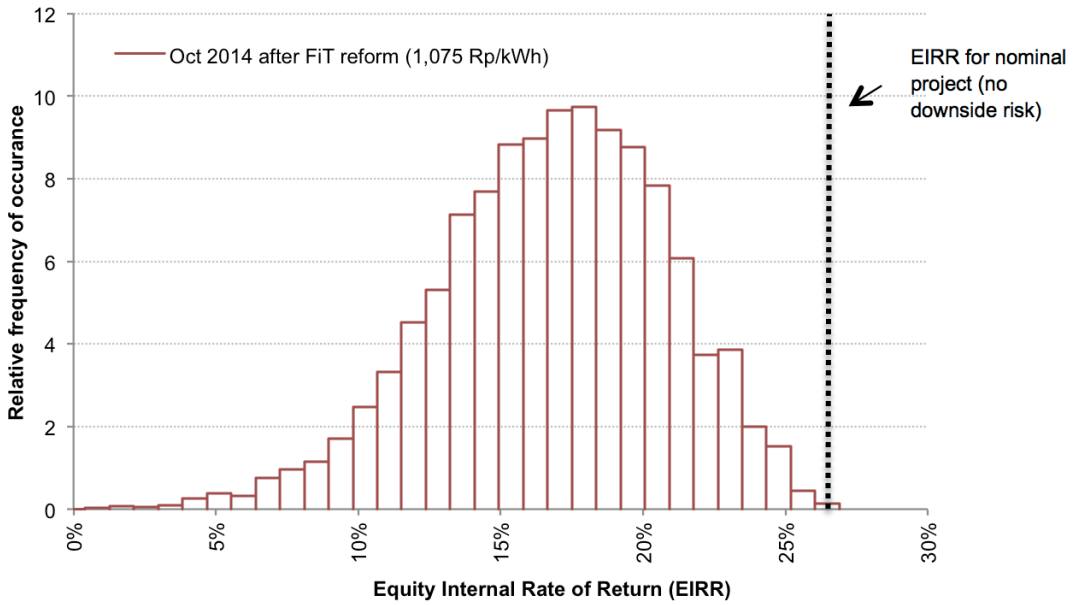

Figure 2: Expected equity IRR based on uncertainty in project costs, capacity factor and uptime (source: Cameron and van Tilburg 2016b)

That analysis shows how easily returns are impacted by uncertainty in key project assumptions. Varying those assumptions, using data observed in the field, revealed that a project that would have initially been considered viable in 2014/2015, in reality will have a below market return a majority of the time (Figure 2). This may explain the significant increase in feed-in tariffs for small hydropower projects in late 2015, which increased expected returns for the same nominal project from 27% to more than 48%.

Implicit in these results is the observation that the feed in tariff that was available for much of 2014 and 2015 is found to be perfectly adequate, even in the lower tariff regions such as Java, if projects can be de-risked or be provided with risk cover. Improving risk profiles of small hydropower projects would provide a strong argument to revert to the previous feed-in tariff levels of 2014/2015, a decrease of 25 to 30% versus current levels depending on exchange rates[7]. Reverting to the previous tariffs would save the Government of Indonesia approximately 1.3 million USD per MW of installed small hydropower capacity over its lifetime[8]. This is a conservative calculation in two regards: it uses the net present value of tariff payments instead of a simple addition, and second it uses Java tariffs, which are the lowest in Indonesia.

[7] Averaged over project lifetime to take into account the differing accelerated payment schedules of the two tariffs, one with a premium for the first 10 years, the more recent with a higher premium over the first 8 years.

[8] Compares the NPV of total feed-in tariff payments assuming a government discount rate equal the reserve bank rate of 7.75%. As noted earlier, this is a fair assumption as tariffs are not passed onto customers, but effectively subsidized by the central government in their overall subsidy to the public utility PLN

Overcoming other market barriers

Grid access and availability

Once operational, there can be a limited availability of the PLN grid to receive the power generated by the IPP, as well as periods of grid down time or low grid voltage which do not permit connection of generation. The nature of many renewable energy 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. Interviews with IPPs show that some projects in areas of poor grid stability are not able to export power for up to 20% of their generated power (Hayton and Nugraha, 2013). Such a loss in revenues can have with severe implications for their ongoing viability.

Recommendations:

Look into the feasibility of 'take-or-pay' provisions: large IPPs are often able to negotiate 'take-or-pay' provisions in their power purchase agreements (PPAs), effectively a type of minimum revenue guarantee. In this instance, if an IPP is generating electricity then PLN must be able to receive this electricity or pay some form of agreed compensation for lost revenues. However, this type of agreement is currently not available to small and medium scale installations. In practice, the mechanics of agreeing a take-or-pay provision for small and medium scale generation may be too complicated and would require quite sophisticated logging monitoring of actual power generation for many smaller facilities. Such detailed logging would be needed as it is possible, for example, that low output of a project is due to inefficiency of IPP operation.

Look into the feasibility of compensation: what may be more feasible is a (partial) compensation mechanism for 'grid down time' which can be formally recorded, monitored and is therefore accountable. In this formulation an agreed payment would be made to affected IPPs based on a more pragmatic measure of the availability of the facility to provide power, e.g. production over an agreed preceding period. Monitoring central grid interruptions or weakness – as opposed to connections to the grid provided by IPPs themselves – would still require strict controls on aspects such as data logging and calibration of logging equipment, but this may be more feasible. As with the point above, this would require the buy-in from PLN

Consider joint responsibility for IPP connection: associated with the design of FITs is the question of who should pay for the grid connection. In most cases it is the IPP who fully bears the cost for the grid connection from their facility to the nearest high-/medium-voltage PLN controlled access point. Another possibility is for PLN and the IPP to share the costs. An advantage of this approach is that both parties have incentives to actively engage in the project and contribute to its success (Wolff et al., 2015), as well as to more fully understand the needs of individual projects in terms of grid strength.

Improve grid planning processes and data: information on existing grid infrastructure is often difficult for IPPs to obtain and interrogate. It would be valuable to develop generation capacity plans and transmission forecasts in full consultation with all industry stakeholders, including potential investors in generation capacity. A distribution network plan will need to be developed for increased access to energy for all Indonesians (IEA, 2015) helping IPPs to better understand where to plan projects and manage expectations about grid availability and strength.

Foreign ownership restrictions

Foreign ownership restrictions for small scale power generation are a strong disincentive to international investment in the sector. For small scale IPPs (i.e. of less than 10 MW capacity), the limit on foreign ownership is 49% which means that local partners will always need to have a controlling share of projects. This has reportedly discouraged investment in these smaller facilities (UNEP, 2015)

Recommendations:

Re-assess restrictions on foreign ownership of new projects: the restriction on foreign ownership of small scale renewables is a relatively recent change in the last few years, reducing from 95% to 49%. There is a strong case to be made for reverting to the previous ruling, at least until the sector has grown and more fully developed local technical expertise and more success stories across different technologies.

Permitting and approvals

The general consensus among IPPs is that local governments are mostly constructive and supportive of their initiatives, but that the administrative process was sometimes overly cumbersome and time consuming – in particular when different levels of governance are involved (district, provincial and national agencies).

Recommendations:

Monitor the performance of new licensing body: a critical step to facilitate the licensing process has been taken by transferring the responsibility for the majority of licenses to the Indonesian Investment Coordinating Board ('BKPM') (Wolff et al. 2015). The institution serves as One Stop Shop for investors and is supposed to speed up the licensing process. The service will take approximately 160 permitting procedures across 22 ministries and agencies and bring them together under one roof (Indriani, 2016). It remains to be seen how this will function in practice and whether it offers benefits for IPPs. It will be important to monitor the performance of this service in terms of how long the process takes and make this information public in some format to assure project developers, who are interested but remain cautious about how it will be implemented.

Improve awareness of local governments: even where licensing is more centralised, local governments in general could be better informed about the most recent legislative developments and the importance of renewable energy projects as part of the countries national energy policy. There still remain numerous grey areas regarding responsibilities for the various approvals and standard procedures (example standardized process of calculating water rights payment for small hydropower projects). This leads to misunderstandings between developers and local authorities.

Provide clear guidelines of procedures: to be followed by IPPs and PLN. As discussed earlier, this would give IPPs, district governments, PLN and other involved institutions a clear and transparent reference to follow, particularly in regions with little experience exists on this type of project.

Land acquisition

Land acquisition can be complex and unpredictable, particularly where it involves individuals rather than formal institutions (such as government). At the same time, local governments are not very familiar with small scale renewable technologies and do not always appreciate that these projects are developed based on a long-term perspective of up to 20 years. This can sometimes lead to unrealistic expectations from local governments when negotiating issues such as land acquisition with IPPs.

Recommendations:

Awareness building initiatives: targeting local governments should be conducted aimed at familiarizing them with the specific nature of small scale renewable energy projects. In particular their dependency on a sustainable and well-functioning natural environment and the relatively long lifespan of a project and the implications this has on aspects such as investment payback and need for secure land tenure.

Promote local municipal involvement in projects: as discussed earlier in the chapter on capacity building, small scale renewable energy projects often lend themselves to involving municipalities as shareholders. There is an opportunity to provide examples and references for district governments and local authorities to apply in the development of future projects, presenting examples of progressive and innovative ownership models (Hayton and Nugraha, 2013).

Tie resource concessions to project development: there is sometime the possibility to require concession holders to proceed to project implementation within a certain timeframe. This can help to prevent concession holders or land-owners from intentionally extracting undue benefits from the control of project sites, without firm plans to implement project themselves. There is a precedent for this in the awarding of projects to successful tenderers of renewable energy projects in other countries, as well in the feed-in tariff regulation for solar power that was enacted in Indonesia.

Conclusions

Small scale renewable power generation from IPPs has enormous potential to help Indonesia move forward on its strategic objectives: capacity expansion and diversification, rational energy pricing, rural electrification, energy sector reform, and climate change mitigation can benefit from it. Although renewable energy technologies will inevitably be used in Indonesia, the key questions are around how quickly this will happen and at what public cost.

Offering high feed-in tariffs to projects, with large nominal returns covering possible project risks, is not a very efficient approach to public support. As an alternative, this briefing has described a toolbox of possible interventions across three aspects that would help to catalyse the needed growth in the sector and at lower cost to government.

1. Improving capacity, skills and data
2. Financial assistance and support
3. Overcoming other market barriers

As calculated earlier, the feed-in tariff that was available for much of 2014 and 2015 is found to be perfectly adequate, even in the lower tariff regions such as Java, if projects can be de-risked. This de-risking could allow a reversion to 2014/2015 tariffs, from the current tariffs that were increased in late 2015, and would conservatively represent a saving to the Government of Indonesia of roughly 1.3 million USD per MW of installed capacity over the lifetime of a project. In addition, providing financial incentives that shift commercial bank lending practices to be in-line with ASEAN good practice could allow feed-in tariffs to be further reduced by up to 15%. This would conservatively be an additional net saving to the government of roughly 550 thousand USD per MW over the lifetime of a project.

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