



# Leveraging Private Investment to Clean Energy Projects:

A Guidance Note for  
Norwegian Development Assistance

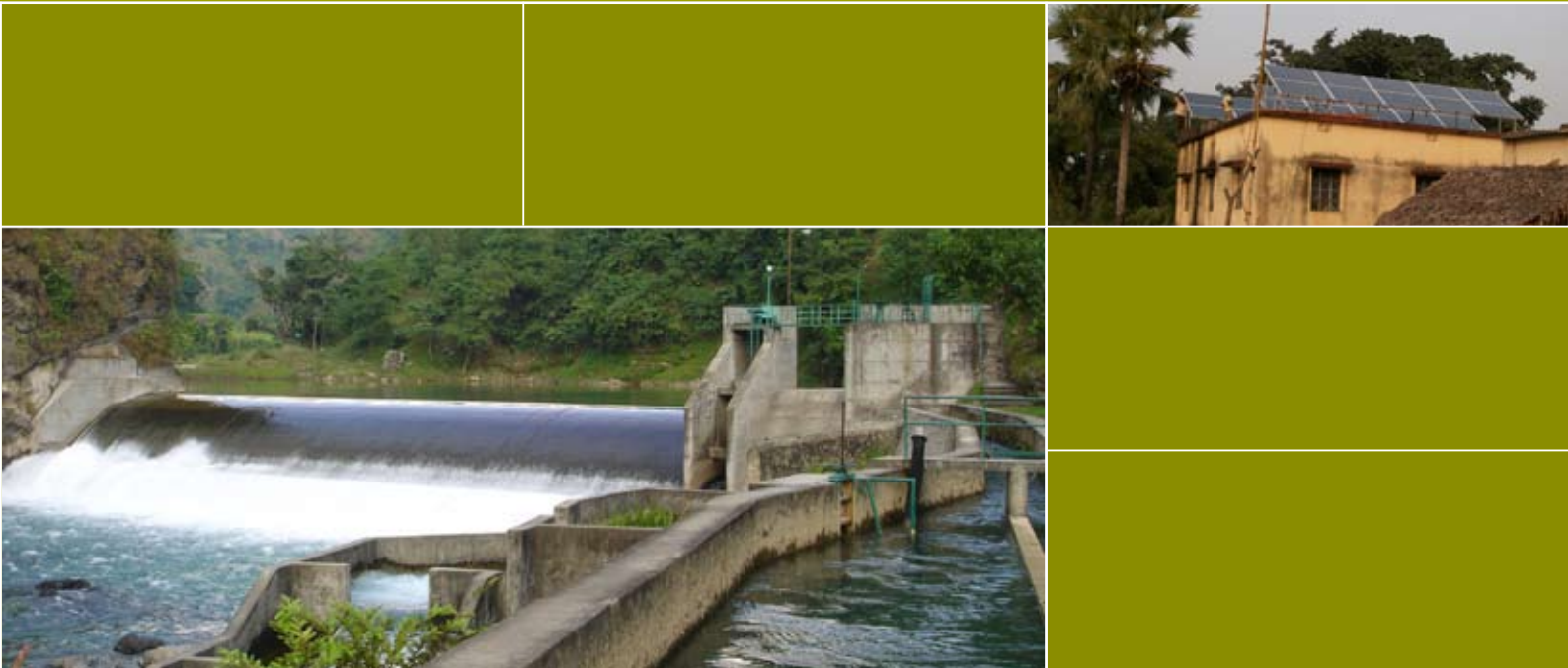


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Responsibility for the contents and presentation of findings and recommendations rests with the study team.  
The views and opinions expressed in the report do not necessarily correspond with those of Norad.

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Norwegian Development Assistance

Oslo August 2010

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## FORWARD

This report is meant to serve three purposes; i) serve as a basis for an ongoing dialogue with stakeholders regarding the potential implementation by Norway of new clean energy Public Financing Mechanisms (PFMs), ii) serve as a documentation of the process, approach and findings of the team in arriving at a set of proposals regarding the future of Norwegian efforts to mobilize private investment in clean energy in developing countries, and iii) serve as guidance to Norad and MFA staff in navigating the complexities of supporting PPPs in clean energy.

The primary author of the report is Ryan Anderson, Energy Advisor, Norad. Additionally, Econ Pöyry has provided assistance in reviewing the literature, carrying out analysis and conducting interviews. The Energy, Water and Infrastructure (EVI) department at Norad has also provided key inputs along the way.

The report is meant to be operational and up-to-date, rather than fully comprehensive in its coverage of literature and/or PFMs or academic. The authors have relied on key literature and interviews and have not carried out any full evaluation of any of the proposed PFMs. Instead, the authors have listened to investors and embassy personnel regarding what is needed and what is realistic.

Norad hereby submits its proposals for public discussion and debate. The authors remain open to constructive debate regarding its proposals and hopes to stimulate engagement whereby the effectiveness of Norwegian assistance to clean energy is ultimately improved. We of course have the ambition that the enclosed proposals and subsequent dialogue makes a contribution to this end.

## EXECUTIVE SUMMARY

*“Development agencies need to change the way they do business. They need to have access, individually or collectively, to an appropriate range of aid instruments. Their internal systems should not work against staff pursuing longer-term and riskier interventions.”*

*– OECD on the role of ODA in promoting private investment*

### *Mandate and Objectives*

As a follow up to the above policy guidelines, Norad, in its capacity as the secretariat for the Clean Energy for Development Initiative has taken on the task of “carrying out an analytical study, in close contact with the private sector, which evaluates various PFM proposals and considers the potential for developing them for deployment and implementation in Norway.” The Mandate developed for this work specified the following objectives;

- i. Identify and analyze the key bottlenecks currently hindering the scaling up of investment in clean energy projects in developing countries and determine a productive, sustainable and responsible role for innovative public contributions, principally development assistance, in alleviating these bottlenecks.
- ii. Provide Norwegian policy makers with the analytical basis, as well as a proposed organizational set-up and partnership structure, to allow for implementation of key recommendations from (i).

To fulfill these objectives, the team relied on the review of key literature and interviews with investors, the MFA, and key Embassies, carried out a seminar targeted at the identification of key barriers to investment. It was agreed that the team was to focus on innovative project-level PFMs targeted at helping clean energy projects reach financial closure.

### *Key Conclusions*

***Financing Needs.*** Current projections indicate that future investment needs in the power sector far outstrip what is currently being delivered, before one considers the estimated \$80-140 billion required annually for mitigation purposes in developing countries. Official Development Assistance (ODA) directed at mitigating climate change will have a minuscule effect unless it is effectively targeted at leveraging additional funds, particularly private investment. Indeed, of the nearly USD 150 billion invested in renewable energy globally in 2007, 94 percent came from the private sector (UNEP, 2008), and it is fully expected that the private sector will continue to provide the lion’s share of financing in the global effort to expand access and mitigate climate change.

***Analysis of barriers to investment.*** The general principle for guiding public intervention should be to assist developing countries realize economic and social benefits from clean energy projects by enabling these benefits to be monetized in the form of upfront (private) financing. Thus, if PFMs are to directly leverage significant amounts of private investment in renewable energy, it should be targeted at key barriers that are currently preventing the realization of projects. Accordingly, a framework for analyzing the various barriers to investment is established and the key focus areas/roles for scaled up PFMs are identified as; i) improving the status-quo which places clean energy solutions at a cost disadvantage compared with fossil fuel solutions, ii) contributing to improve both the ability pay and the credit worthiness of the off-taker(s) in both urban and rural markets, and iii) contribute to improve the capacity, focus and professionalism of local public sector as a counterpart in bringing projects (PPPs) through the pipeline.

***Review of the Norwegian tool-box.*** Norway currently supports clean energy investments by means of a number of existing PFMs, including; Embassy-level ODA, Norad Private Sector assistance, Norfund, Eksportfinans and Giek, Finance Department (CER purchases). A high level review of these mechanisms reveals that while Norway is a relatively small donor, it is generally perceived as flexible

and responsive and willing to take some risks. Norway has a clear comparative advantage in providing support to the development of hydropower. Current ODA mechanisms and approaches however are not likely delivering the competencies, long-term commitment or level of resources required to see PPPs through to financial closure.

**A paradigm shift.** This report is meant to stimulate/mark a paradigm shift in the way development assistance is provided to clean energy. First, increased focus on results of ODA, combined with the ‘climate finance – ODA nexus’, implies a need to relentlessly target (and measure) the leverage effect of public contributions in new renewable energy. Second, the growing importance of complex PPP structures carries with it both a need to adapt ODA instruments to make them more accessible and user-friendly for the private sector, and ensure a high level of professional competence exists at donor organizations and partner countries so as to act as credible counterparts to private investors. Finally, the climate change agenda implies a need to establish delivery mechanisms which can both leverage significant private investment and be rapidly scaled up on a global scale. The recommendations below represent Norad’s proposed initial responses/contributions to this paradigm shift.

### *Key Recommendations*

- 1. Clean Energy for Development Initiative (CEI) – towards a more coordinated and results-based initiative.** In the absence of a *global* clean energy program in the Norwegian development portfolio, the CEI should become more focused on pursuing and coordinating actual results in Embassies’ clean energy programs. That is, CEI should establish specific measurable goals for all additional funds earmarked for clean energy. These should be simple in terms of measuring and communicating – e.g. i) new MW installed (also due to leveraging), ii) new MWh produced, iii) HHs provided with modern energy services, and iv) reduction in GHG emissions. By explicitly targeting these outcomes, the CEI will; be more focused and clear regarding the target outcomes; have increased incentive in sharing and applying good practices across embassies and; gain increased influence with respect to Embassies in targeting outcomes. Finally, this will allow for a structure/organization of new funds which is largely consistent with immediate (reporting) challenges concerning climate finance delivery. A results-based CEI and associated governance structure (including some decision-making/prioritization powers) should be launched in 2011 and be the focus of the CEI Annual Report 2011.
- 2. Renewable Energy Financing Group (REF) at Norad.** Norad hereby launches a Group meant to provide targeted assistance to embassies in contributing to the realization of priority clean energy projects that have a public-private partnership (PPP) profile. The group will have the target objective of; “in partnership with public and private stakeholders, achieve financial closure for 1-3 medium-to-large scale hydropower projects in LDC(s) within 18 months and thereby leverage significant additional funding to clean energy projects”. REF will remain focused on 3-4 projects at any given time and will evaluate priority/candidate projects at the various embassies on a continuous basis. Full embassy support for REF’s involvement will be a pre-requisite and REF will maintain a limited budget for project-targeted consultancy at its disposal.
- 3. Norwegian Clean Energy Partnership.** The CEI and Norfund hereby propose the establishment of the Norwegian Clean Energy Partnership between Norfund-Norad-Embassies. Norad views this as the best candidate mechanism for significantly and rapidly scaling up bilateral clean energy support and maximizing the leverage effect of this support. It also offers an opportunity for a genuine PPP, including an opportunity for an innovative role for ODA/Norad by means of the proposed first-loss mechanism. A potential strategic/scaled-up partnership between ICH and Norad should also be considered under this umbrella partnership.
- 4. Supporting Government as a counterpart.** In relevant countries, technical assistance and institutional cooperation programs should be structured around the overall goal of *realizing* hydropower projects. Assistance should be provided/timed so as to address critical barriers and thereby help move projects up the financing pyramid. Broadly speaking, this involves providing international expertise and capacity building to help realize the project(s) as well as maximize the benefits to the country. According to investors and Norad’s own experience, this is a particularly relevant bottleneck on large projects. CEI should be provided some NOK30-50m per year and a

mandate to target specific project opportunities (PPPs) in partner countries with scaled up and targeted assistance tied to the implementation of large-scale projects, including cross-border power export projects. This should be a Norad facility, in cooperation with International Center for Hydropower, specific multilateral initiatives including PPIAF and ESMAP, and leading international expertise, by means of a framework agreement.

5. **Financial contributions to large scale (hydro) projects.** Embassies should diligently carry out an ‘investment barriers analysis’, in consultation with the private investor, and ask critical questions which cover each of the elements presented in the pyramid framework introduced in this report. Ensure that contributions are aimed at realizing economic benefits for the country into up-front financing – typically in the form of civil works. Alleviating up-front capital costs and providing enabling risk coverage will likely continue to be more relevant than OBA-type contributions for these types of projects.
6. **From (pre-) feasibility studies to PPP programs.** Embassies must take a commercial perspective when offering support to feasibility studies, river master plans, etc. Likewise, Norad should be critical and demand that i) Embassies or implementing partners demonstrate/document that the given project is among the most attractive sites/ivers for investors, and ii) the study is the natural next step in a defined program to bring the project forward towards financial closure. In many cases, if these elements are not present, support is better directed to either multilateral activities (e.g. CTF) or other donor supported projects.
7. **Rural energy.** Carry out support activities only in the frame of country-wide rural energy programs, either in the form of support to a ‘franchise program’ (e.g. telecom proposal) or OBA support mechanisms. Discourage ad-hoc, opportunistic support to rural electrification projects. More generally, the embassies and Norad must collaborate to ensure that consecutive projects share lessons learned and Norwegian support should maintain an unwavering focus on *business model* innovation in rural energy solutions and progressing towards commercial viability – i.e. leveraging more and more private investment.
8. **First-loss financing.** Norad views the proposed first-loss facility concept as particularly interesting in terms of leveraging finance and innovation, as it allows for both risk mitigation while also providing up-front financing (instead of loss-reserves for a guarantee). This facility can be employed in a strategic partnership with **IFC** and/or **Norfund**, and should be channelled through Norad on a project-by-project basis. Additionally, it could be included as a component of a PPP competition hosted by a NUMI/ENA (Norad) cooperation.
9. **Multilateral.** It is noted that the CTF administrators claim a public:private investment ratio of about 1:3 – this should thus be the benchmark for bilateral initiatives. Based on the analysis in this report and a review of potential multilateral channels, increased contributions to **SREP** should be considered. SREP targets many of the most critical barriers discussed in this report and explicitly targets leveraging of private investment. Norad is positive to the approach of SREP to focus on a few countries, which also implies a direct link between additional funding and additional countries. SREP has a clear potential to absorb significant additional capitalization and a substantial (additional) contribution could award Norway significant weight in the determination of priorities and modalities of the program. Providing first-loss capital to **IFCs Renewable Energy Mezzanine Finance facility** is also a highly attractive program in terms of leveraging private investment to rather advanced project concepts/proposals.
10. **Energy+.** A real partnership which involves a significant, rapid and coordinated scaling up of public contributions to clean energy will almost surely require a shift from project-by-project support (push mechanisms) to market development mechanisms (pull mechanisms – OBA). This will likely require that donors and multilaterals concede control on which projects/developers receive the support, but is likely the only way of overcoming the institutional/fundamental challenges that plague cooperation between donors and private investors. As long as increasing energy access is a major goal of Energy+, both higher costs of renewable energy and off-take risks will likely have to be addressed. A potential starting point for Energy+ may be to identify the (many) barriers which are not easily addressed by ODA, rather than seeing Energy+



in light of the existing/traditional governing structures of ODA. Any global mechanism that is successful in making a significant contribution to scaling up access to modern and clean energy will be simple, predictable and easily accessible to private investors.

# 1 MOTIVATION AND POLICY PLATFORM FOR SCALING UP RENEWABLE ENERGY SUPPORT

Recent Norwegian development assistance policy builds a consistent framework which emphasizes the importance of both strategically utilizing public finance to stimulate private investment in clean energy and scaling up assistance to this sector.

In **White Paper No. 13 (2008-2009): *Climate, Conflict and Capital*** (Klima, konflikt og Kapital), the Norwegian government identifies clean energy as one of the primary sectors to which Norway will continue to focus its assistance, reflecting its specific recognized expertise in this space. The White Paper cites the International Energy Agency in emphasizing that "promoting renewable energy sources and energy efficiency to be one of the most cost-effective ways of increasing access to energy and at the same time reducing greenhouse gas emissions. The White Paper notes that as an energy nation, Norway is well placed to assist developing countries in their efforts to address energy-related challenges.

Particularly relevant for the present topic is the White Papers guidance on strategically applying public funding so as to stimulate private investment to clean energy;

*"Conditions for energy investments have improved considerably in a number of poor countries in recent years, and many developing countries can now provide a stable political climate for investors. Profitability has also improved because economic growth is creating a growing demand for energy, and because efforts to promote reform in a range of sectors, strengthen legislation and build up institutions have given results in a number of countries. However, energy projects in developing countries are complex, and the level of risk is still higher than in richer countries. Substantial public funding is needed to encourage private investment. Public funding reduces some of the risk factors for private investors."*

Indeed, one of the three overarching commitments assigned to clean energy in the White Paper is to "use aid and other public funding catalytically to trigger private investments in clean energy."

Likewise, one of the key messages in the **2010 Norwegian State Budget** is the importance of leveraging private capital to climate change mitigation, and especially to clean energy projects, since official development assistance (ODA) is limited. A viable private sector is generally seen as important in poverty reduction. The Norwegian government aims at stimulating the involvement of Norwegian enterprise in developing countries in order to create synergies between different financiers and to prioritize suitable projects for public-private partnership. This is especially important in sectors where Norwegian competence is requested, such as in clean energy. Several Norwegian power companies are interested in clean energy investments in developing countries, and to strengthen such cooperation and partnership is seen as an advantageous way of using foreign aid strategically in order to increase commercial investments.

These documents represent important pieces of the backdrop to Norway's Clean Energy for Development initiative, which is intended to provide a framework for all Norwegian aid in this field. The initiative aims to channel Norwegian support in a manner which facilitates the development of clean energy solutions and thereby promote development and poverty reduction. This includes capacity building, policy and sector reform, regional power markets, and both large on-grid and small off-grid renewable energy generation.

Specifically, the **Policy Platform for the Clean Energy for Development Initiative** (11/2007) states; *"There is broad agreement that without private sector involvement, it is not possible to mobilize sufficient capital to finance required investment in Africa. A condition for increasing clean energy production, particularly in Africa, will therefore require that public authorities and/or development partners contribute to construction costs...."* *"The Norwegian contributions will be relatively small*

*compared with energy sector investment requirements. It will therefore be of critical importance to utilize Norwegian resources in a catalytic manner and ensure synergies with other initiatives.”<sup>1</sup>*

Internationally, it is worth noting OECD’s “Promoting Private Investment for Development; The Role of ODA”, which notes; “Development agencies also need to change the way they do business. They need to have access, individually or collectively, to an appropriate range of aid instruments. Their internal systems should not work against staff pursuing longer-term and riskier intervention. Staff working on the range of subjects relevant for promoting investment should be well co-ordinated... Finally, public sector partners in developing countries can be encouraged to engage more with the private sector, such as through public-private partnerships.”

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<sup>1</sup> See: [http://www.regjeringen.no/nb/dep/ud/dok/rapporter\\_planer/planer/2007/ren\\_energi\\_utviklingsarbeidet.html?id=489316](http://www.regjeringen.no/nb/dep/ud/dok/rapporter_planer/planer/2007/ren_energi_utviklingsarbeidet.html?id=489316).  
Translated by author.

## 2 OBJECTIVES AND APPROACH

As a follow up to the above policy guidelines, Norad, in its capacity as the secretariat for the Clean Energy for Development Initiative has taken on the task of “carrying out an analytical study, in close contact with the private sector, which evaluates various PFM proposals and considers the potential for developing them for deployment and implementation in Norway.”<sup>2</sup> The Mandate developed for this work specified the following objectives;

- i. Identify and analyze the key bottlenecks currently hindering the scaling up of investment in clean energy projects in developing countries and determine a productive, sustainable and responsible role for innovative public contributions, principally development assistance, in alleviating these bottlenecks.
- ii. Provide Norwegian policy makers with the analytical basis, as well as a proposed organizational set-up and partnership structure, to allow for implementation of key recommendations from (i).

It is recognized that to arrive at a set of clean energy PFMs which hold good promise for mobilizing private investment is a complex and difficult task. This requires the balancing of development goals, international ODA policy commitments, addressing investment barriers and ensuring an amenable existing organizational set-up. Ideally, this work would involve a full evaluation of each PFM considered. However, given the vast range of both existing and potential new PFMs, this has not been possible. Thus, the team has relied on a more high level consideration (instead of evaluation) of the range of candidate PFMs, by means of reviewing literature and carrying out interviews. The team has made extensive use of matrices in this report in order to present summary comparisons.

The authors of this report have relied on reports produced by United Nations Environment Programme – Sustainable Energy Finance Initiative (UNEP-SEFI) as primary sources. Following a brief review of other reports available from different sources regarding clean energy and financing issues, the UNEP reports were found to be most relevant, up to date and comprehensive. Four key documents were reviewed for the purpose of this report.

The *Public Finance Mechanisms to Mobilise Investments in Climate Change Mitigation* (2008) report provides a comprehensive overview of the need and role for public finance mechanisms in clean energy projects. Specifically, the first part of the report gives the rationale and overall framework for PFMs in terms of (i) the financing challenge; (ii) what are the key objectives of PFMs; (iii) how PFMs can be used to leverage commercial funding; and (iv) what type of PFMs that can be applied depending on context, such as level of technology maturity, market segment and country conditions. The second part of the report describes and discusses the different forms of PFMs available ranging from credit lines, guarantees to equity and grants. The overall conclusion is that if investment needs are to be met, private investment will have to make up the lion’s share of the required increase. Public instruments will then have to be deployed in a smart manner so as to crowd in private capital.

The report *Catalysing Low-carbon Growth in Developing Economies* (2009) builds on the 2008 report and focuses on the kind of PFMs that are needed to mobilize and scale up private sector capital. The first section of the report outlines the need for PFMs and the role for institutional investors. The report argues that public funds are key elements to reduce risk, increase returns and to mobilize institutional investor capital. The second and final part of the report discusses five key constraints on private sector engagement and how these can be solved via a set of packages of PFMs for institutional investors. The constraints they highlight include: (i) country risk; (ii) low-carbon policy risk; (iii) currency risk; (iv) shortage of ‘deal flow’; and (v) multiple risk assessment. These five constraints are also covered in the three contexts discussed in the UNEP 2008 report. The 2009 report put forward a number of suggestions based on case studies. A key conclusion is that there will be no blue print solution but projects will face multiple and varied barriers and constraints and hence will need multiple solutions on a case by case basis.

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<sup>2</sup> According to minutes from meeting distributed on December 14th, 2010. Translation by author.

While the two above mentioned reports focused on the barriers and the available public finance mechanisms, the third report reviewed focus on the investment trends within the sustainable energy field. *Global Trends in Sustainable Energy Investments 2009* provides an all-inclusive overview of the investment trends from a technological perspective as well as geographical perspective. The main part of the report reviews the usage and magnitude of a number of PFMs, how they have been used, and trends during the period from 2002 to 2008.

The fourth report, *Why Clean Energy Public Investment Makes Economic Sense – the Evidence Base*, puts forward a number of arguments as to why ‘green’ spending programs act as economic stimulus in addition to reducing greenhouses gases. The report first review some common barriers, discusses incentives and the relationship between investments in clean energy and economic indicators. The main part of the report analyses how economic indicators are impacted by ‘green’ stimulus packages. Some concluding remarks include: (i) clean energy investments results in GDP increases, increased incomes, and jobs, while also reducing pollution, and reduce energy costs; (ii) green stimulus packages create more jobs, per dollar, than other public instruments, such as tax cuts; and (iii) growth in green energy is being hindered by conventional energy subsidies.

The UNFCC report *Investment and Financial Flows to address climate change* (2007) together with the 2008 update, reviews and analyses the existing and projected investment flows and financing required for an international response to the climate change challenge. The analysis covers sectors from transportation, agriculture, and waste to industry and energy sector and looks at mitigation and adaptation measures separately.

Finally, this report comes in the wake of increasing focus on how PFMs can best support both technological development and transfer, and the mobilization of new private investment in mitigating projects and activities. A key source here has been the *Little Climate Finance Book* by the Global Canopy Programme, which provides a useful summary of all major proposals and negotiations regarding the generation, delivery mechanisms and institutional arrangements for climate change finance. Thus, this work has been carried out on the back of current climate change mitigation and renewable energy initiatives, and acknowledges the current global political agenda, including e.g. the Climate Convention, the Kyoto Protocol and the MDGs. The analysis and recommendations should be seen in the light of this context.

As is often the case, the World Bank and IFC maintain a central and leading role with their Clean Technology Fund (CTF), Strategic Climate Fund (CIF) and Scaling up Renewable Energy in Low Income Countries (SREP). These documents, together with dialogue with the IFC have provided both a precedent for targeting private investment and critical input and suggestions regarding specific proposals. Additionally, the most recent initiatives by various donors have been considered, including Sida and DFID.

### *Outline of Report*

The report first provides an overview of the current scale of the challenge, regarding the estimated amount of finance needed to both meet power sector investment needs and achieve the mitigation required to ensure a sustainable emission path. Section 4 presents the concept and context for so-called public financing mechanisms (PFMs) for clean energy. In section 5, a framework is established which has guided the team in isolating the various barriers to investment and begin identifying a role for Norwegian PFMs, primarily financed through ODA. In section 6, the team then proposes a set of guiding principles to be applied both when evaluating candidate PFMs and when staff are looking how best to provide support to a PPP in energy. Section 7 then provides a high-level evaluation of the current range of Norwegian bilateral project-level support mechanisms against the barrier framework and guiding principles. Finally, Sections 8 and 9 present the conclusions and recommendations regarding the various PFMs considered and three alternative approaches to scaling up Norwegian support to PPPs in clean energy.

### 3 FINANCING NEEDS

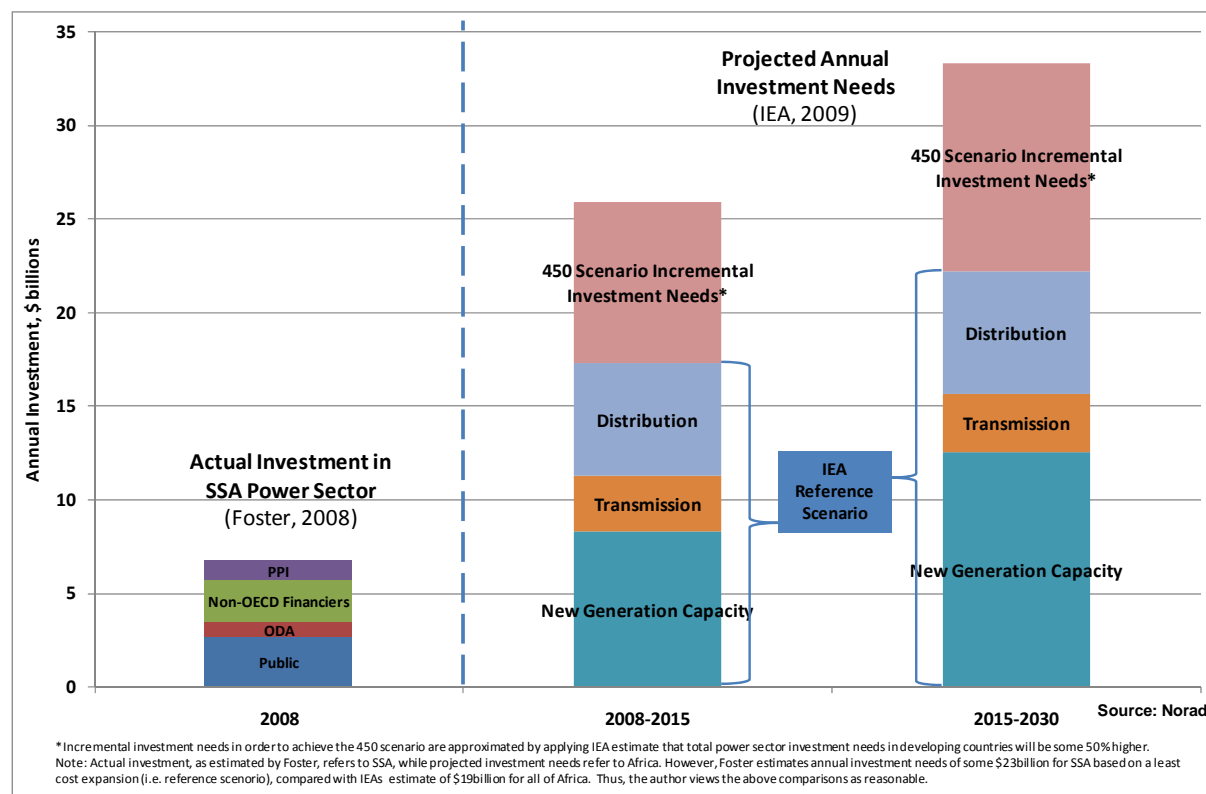
Developing countries already require substantial investments in their energy sectors to maintain and/or contribute to economic growth and poverty alleviation, before one considers the additional investment required for mitigation. Indeed, a great deal of focus is now placed on estimating the financing needs and availability for achieving the required mitigation. The World Bank's WDR 2010 and the Global Canopy Programme's The Little Climate Finance Book both provide the most up to date summary of current estimates regarding mitigation. Both present a range of requirements in the range of \$80-140 billion per year, compared with an estimated \$8billion currently available for BOTH mitigation and adaptation.

However, these estimates neglect the fact that most experts predict significant shortfalls in mobilizing sufficient up-front investment to allow developing countries to meet anticipated electricity demand growth. In the Reference Scenario, non-OECD countries will require some \$347 billion per year in investment in generation, transmission and distribution. As a percentage of GDP, Africa is on top with required investments totaling nearly 3.5% of GDP at \$19billion per year. This compares with current estimated power investments in Africa of approximately \$6.8 billion per year, as presented in Foster (2008),<sup>3</sup> of which about \$0.8 billion is ODA. In the IEA's so-called 450 Scenario, the power investment requirements in developing countries increase by about 50% compared with the reference scenario (\$190billion per year). The figure below is an attempt by Norad to gather the most relevant and up-to-date estimates regarding current investments and investment needs, to arrive at an illustration of the so-called "investment gap".

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<sup>3</sup> Foster V. (2008): Africa Infrastructure Country Diagnostic.  
[http://siteresources.worldbank.org/INTAFRICA/Resources/AICD\\_exec\\_summ\\_9-30-08a.pdf](http://siteresources.worldbank.org/INTAFRICA/Resources/AICD_exec_summ_9-30-08a.pdf)

Figure 3.1 Magnitude of the investment gap in Africa's power sector



\* Incremental investment needs in order to achieve the 450 scenario are approximated by applying IEA estimate that total power sector investment needs in developing countries will be some 50% higher.

Note: Actual investment, as estimated by Foster, refers to SSA, while projected investment needs refer to Africa. However, Foster estimates annual investment needs of some \$23billion for SSA based on a least cost expansion (i.e. reference scenario), compared with IEAs estimate of \$19billion for all of Africa. Thus, the author views the above comparisons as reasonable.

Source: Norad

Clearly, all sources of funding will be required if investments are to be scaled up as rapidly as is required. These will span from basic technology research to full commercialization of new technologies to identifying suitable projects and taking them to financial closure. Financing sources have historically included (i) nationally generated private and public sector funding; (ii) Foreign Direct Investments (FDI); (iii) the carbon market; and (iv) ODA. All of these sources will continue to play important roles, while a range of other mechanisms designed to ensure financial and technology transfers from developed to developing countries are being considered under the COP. One of them, the Copenhagen Green Climate Fund, is presented in a box below.

Of the nearly USD 150 billion invested in renewable energy in 2007, 94 percent came from the private sector (UNEP, 2008), and it is fully expected that the private sector will continue to provide the lion's share of financing in the global effort to mitigate climate change. The implied rapid increase in private financing, however, will not materialize in the current policy environment. It is thus essential that public authorities design policy schemes and target public investments in a manner which mobilizes private investment. Indeed, with the right public incentives, instruments and mechanisms, private capital can effectively be mobilized. Public funding mechanisms (PFMs) can contribute to bring down market barriers, close financial gaps and share the risk with the private sector. (UNEP, 2008) Recent research has shown that one dollar spent of public funds can leverage in the range of three to fifteen dollars of private capital (UNEP, 2009).

Today, ODA is only at an average of 0.3 percent of donor countries' GDP and ODA dedicated to energy is only a mere 4.7 percent of all ODA, thus totaling some \$4 billion per year. **Thus, ODA directed at mitigating climate change will have a minuscule effect unless it is effectively targeted**

**at leveraging additional funds, particularly private investment.** There is no denying that this task will be particularly challenging in least developed countries, but the pay-off is also larger; achieving increased access to modern and clean energy while stimulating sustainable development.



## 4 PUBLIC FINANCE MECHANISMS FOR CLEAN ENERGY: A PRIMER

As already noted, there exists a wide consensus that the lion's share of the financing required to achieve ambitious climate targets in developing countries will come from private sources. Thus, given that there is now a common objective to scale up transfers of financing from developed to developing countries, it is critical that public institutions continuously identify and implement PFMs which are effective in mobilizing private investments, either directly or indirectly.

As noted by UNEP, PFMs used for climate mitigation purposes should have a two-fold objective<sup>4</sup>;

- i. directly mobilize commercial investment by addressing key financing gaps where the private sector is unable or unwilling to provide capital on a purely commercial basis, and;
- ii. scale up sustainable markets by helping key actors up the experience curve and technologies down the cost curve.

Any PFM which is ultimately effective in leveraging private capital flows should fill a critical gap/weakness in the chain of finance available for renewable energy projects. While Development Finance Institutions, such as Norfund, are the typical vehicles for such financing/support in developing countries, a wide range of other approaches are currently being discussed and implemented, such as national investment authorities, public-private investment companies, carbon finance schemes, guarantee instruments, etc. Additionally, most successful PFMs will target technologies and/or business models which, with relatively limited public financing, hold the promise of unleashing large scale investments – e.g. demonstration projects in countries perceived as 'high risk'. Finally, PFMs must fit the local context and reflect the fact that in most cases, there will be a trade-off between targeting the poorest segments and leveraging private investment (all else equal).

Typically, the spectrum of financing sources is made up of debt (e.g. senior, subordinated and guarantees), equity, carbon finance and innovative grants.<sup>5</sup> However, in order to establish a context within which one could expect PFMs to play an important role, it is worth considering both the stage of technology development and the comparative advantage of public and commercial financing, respectively. Accordingly, Figure 4.1 provides a useful illustration of the financing space within which any PFM in renewable energy will be designated to play a role. The space of specific interest in this report and the PFMs considered here within are squared in orange. It is in this space that UNEP (2008:19) notes that;

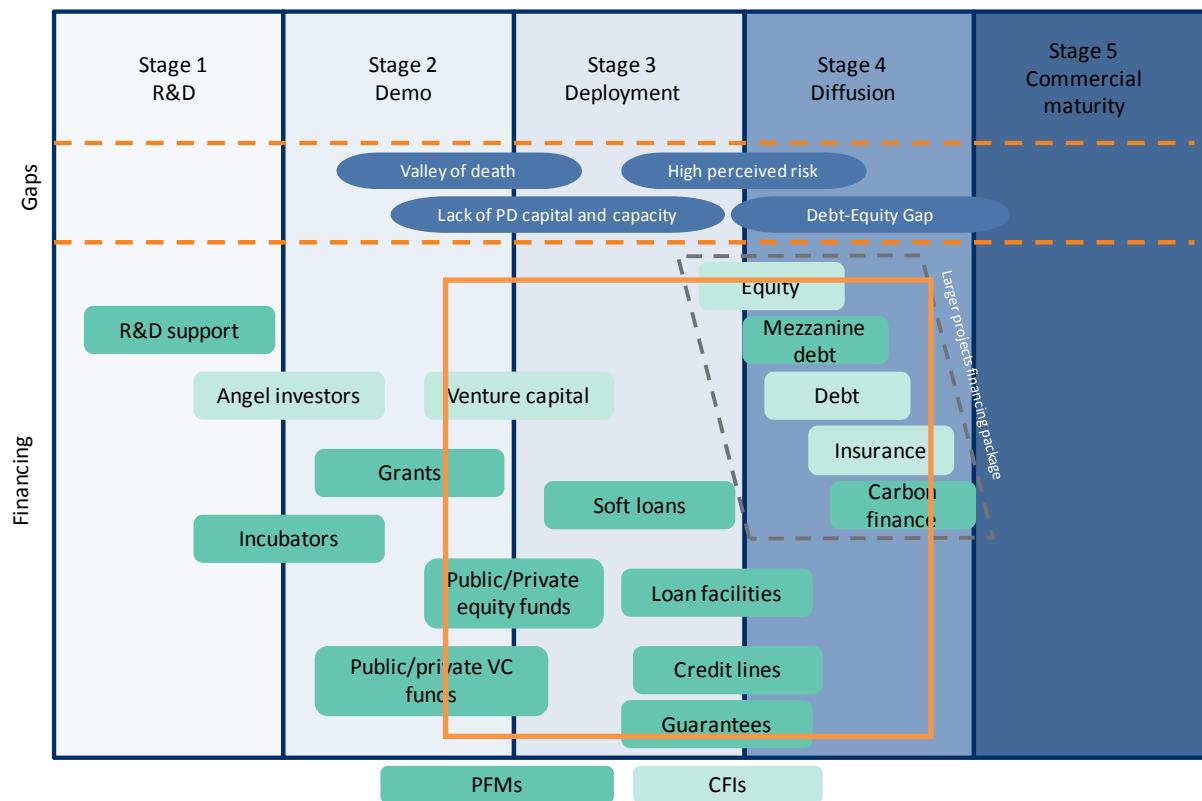
*“in less mature financial markets, including most developing countries, public funding mechanisms are absolutely necessary, **both** to make up for a lack of private capital providers and to compensate for imperfect and evolving policy environments. Private investors seeing the commitment of national governments or multilateral institutions will then often follow suit and join a project or nascent market, knowing that some of the early policy and commercial risks will be shared by other players. Once commercially proven, PFMs then shift from being technology focused to supporting projects or enterprises in deploying and diffusing low carbon technologies.”*

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<sup>4</sup> In the case of development assistance and cooperation (i.e. ODA), a third objective of increasing access to modern energy services among the poorest and neglected segments of society could also be added.

<sup>5</sup> See UNEP (2008:8) for an overview and description of these sources of finance.

Figure 4.1 Gaps and Financing options at different levels of technological maturity



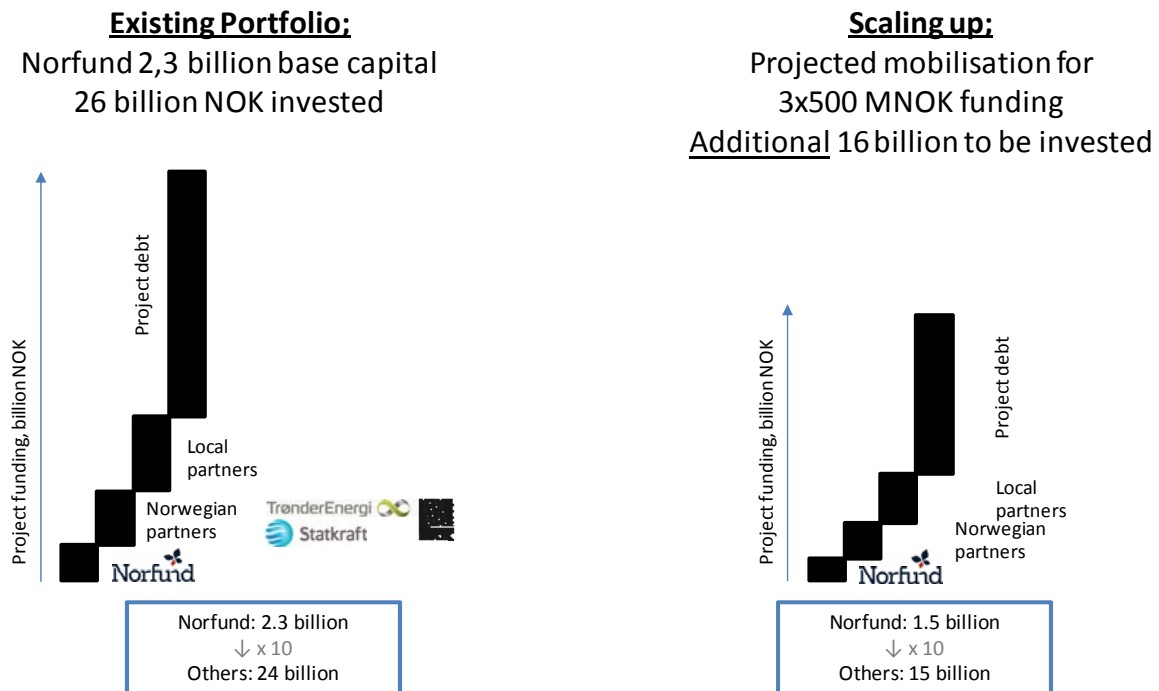
Source: UNEP, 2008

A final consideration to make in the selection of an appropriate PFM is the project type/market segment. UNEP (2008) divides relevant project into large scale grid-connected renewable energy and industrial energy efficiency projects, and medium, small and micro-scale RE and EE. Each of these project types will imply different types of interventions, if it is to target a high leverage effect.

### Leveraging Private Finance

The *Public Finance Mechanisms to Mobilise Investments in Climate Change Mitigation* (2008:6) report by UNEP claims that “an assessment of experience with a number of different models of PFMs shows a typical leverage ratios range from 3 to 15:1. Based on this assessment, it is estimated that if a concerted programme of PFMs were scaled up, USD10 billion in public monies could leverage USD 50-150 billion in total investment in the climate mitigation sectors.” The report refers to an IFC Partial Credit Guarantee for energy efficiency programs (Estimated leverage: 15:1 (UNEP 2008)). However, the provision of ODA will inevitably face trade-offs against other development objectives and commitments, such as those presented as guiding principles below. **Explicitly targeting either rural energy solutions or higher cost technologies, for example, will almost always mean a lower leverage effect of ODA.** In a UNDP (2010) document, examples of 1:1 for GEF Small Grants Program (community-level rural off-grid energy projects), and 1:9 for an improved cook-stove program in Nepal are mentioned.

Figure 4.2 An illustration of how Norfund measures and communicates its success in leveraging funds, including its ambitions in an eventual Norwegian Clean Energy Partnership



## 40 billion + NOK deployed, real money in real projects

Making these types of estimates, however is not a simple matter of arithmetic. In order to estimate the actual leverage effect, one must be able to estimate the amount of financing provided as a consequence of the PFM contribution. This necessarily implies a qualitative assessment of the decision making process for each of the providers of capital. In other words, it is nearly impossible to arrive at an accurate/undisputable leverage estimate. However, in determining the potential scale of the leverage effect, executing officers should consider both direct and indirect leverage effects of a proposed project;

**Direct Leveraging Effect.** Norfund is a PFM which claims to achieve an approximate 10:1 direct leverage effect, although some of this leveraged money can also be classified as public, yet commercial, capital. Public contributions can leverage private capital by means of a few channels:

1. **Scaling-up effect.** If a project is likely to go forward, a PFM contribution could be justified if it can further increase capital injection from other partners. As a general rule, the leverage effect will be higher for projects with higher debt:equity ratios.
2. **Risk mitigation.** If a PFM can be structured in a way which mitigates specific risks for developers, than either the contribution and/or liability (guarantee) can leverage (less expensive) private financing. However, while PFMs can utilize AAA credit ratings and/or a comparative advantage in bearing certain risks, the scale and duration of liabilities from guarantees should not be underestimated.
3. **Critical bottlenecks.** PFM's can offer an advantage as they can potentially be targeted/ utilized in ways that private funds cannot – in particular items that must be (e.g. by law) by public authorities. In some cases, a small PFM contribution can unlock the entire project financing package.

**In-direct Leveraging Effect.** The promoters of the World Bank Group's Climate Investment Funds call these effects as "Transformative Effects".

1. **Revolving funds.** A successful PFM fund dedicated to clean energy should be able to replicate any direct leveraging effects several times, albeit over a long time horizon.
2. **Demonstration.** Successful first-of-a-kind projects in a given country will in most cases make other projects possible and/or cheaper for the host country. In the case of power generation, a successful implementation will almost surely reduce the perceived risk substantially.
3. **Reform driver.** If stakeholders can utilize the momentum and incentives associated with specific projects to achieve and solidify sector reforms, well targeted PFM contributions can result in substantial leverage effect. One recommendation of this report is that ODA financed technical assistance should be more often targeted at specific projects as reform drivers.

*Box 4.1 Publicly Backed Guarantees (PBGs)*

The UNEP (2010) publication titled *Publicly Backed Guarantees as Policy Instruments to Promote Clean Energy* defines PBGs as a “contractual obligation by which a government (institution), against payment of a fee, assures compensating payment to a lender or an investor in case of default on an obligation that another party is committed to. The report notes that “PBGs are employed when elevated risk perceptions block the flow of finance to activities of high value to the economy and public sector risk sharing can lift investment to the levels desired by society.”

The World Bank Group offers a menu of guarantees which are (almost) always backed up by a sovereign guarantee and protect private debt against a government’s failure to meet specific obligations to a private or public project.<sup>6</sup> Giek also offers investment guarantees with similar terms as MIGA, but has a threshold regarding “Norwegian Content”.<sup>7</sup> Additionally, UNEP (2010; Section 7) lists a number of clean energy specific guarantee facilities/instruments currently be developed and implemented on a project/program basis in developing countries.

Both investors and policy-makers often refer to the attraction of PBGs in stimulating private investment. Indeed, when properly structured to align risks and incentives and sufficiently capitalized, guarantees can offer an attractive option for policy makers looking for an effective leverage ratio. However, as noted in UNEP (2010), “fees (paid for PBG coverage) seldom cover the full costs of PBG programs and it is their opacity which attracts politicians: they impose a contingent liability (since funds are required only when a guaranteed loan fails), which may lead to payment from the public budget first during somebody else’s term.” For donors, in particular, it must be understood that while guarantees have an important role to play, they will imply substantial long-term liabilities for donors and will likely not be particularly conducive with annual budget process. Further, given immediate needs, setting off significant resources for a guarantee instead of providing an up-front financing source must be carefully considered.

<sup>6</sup> For a concise overview of WBG guarantees see: [http://siteresources.worldbank.org/INTGUARANTEES/Resources/Overview\\_of\\_the\\_World\\_Bank\\_Guarantee\\_Program.pdf](http://siteresources.worldbank.org/INTGUARANTEES/Resources/Overview_of_the_World_Bank_Guarantee_Program.pdf)

<sup>7</sup> For overview of Gieks products, see: <http://www.giek.no/default.asp?menu=27&page=1&cells=0>

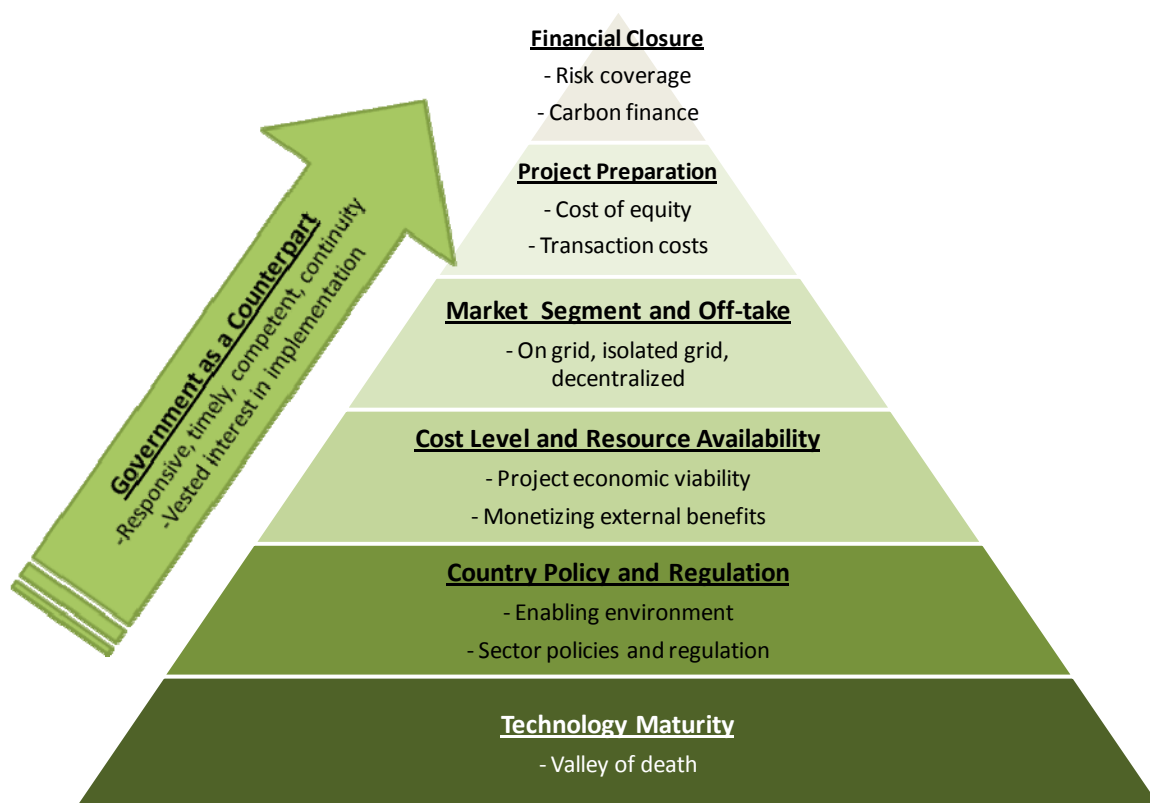
## 5 BARRIERS TO INVESTMENTS

If PFMs are to directly leverage significant amounts of private investment in renewable energy, it should be targeted at key barriers that are currently preventing the realization of projects in developing countries. Relevant barriers encompass technical and financial competence, local knowledge, lack of financial and risk instruments, etc. These barriers should then be considered in light of the comparative advantage of potentially externally financed PFMs.

Accordingly, Norad has reviewed relevant literature and interviewed investors (primarily Norwegian) active in this space. The pyramid of potential barriers depicted in Figure 5.1 illustrates how a viable project is built upon factors which are both internal and external to the project. Major obstacles at any stage on the way up the pyramid will likely put a stop to the project. The figure also attempts to illustrate the fact that in a PPP, the government will have a critical role in advancing the project up the pyramid in a timely and cost effective manner. Annex 5 provides a more comprehensive matrix of the bottlenecks and barriers.

The general principle for guiding public intervention should be to assist developing countries realize economic and social benefits from clean energy projects by enabling these benefits to be monetized in the form of upfront (private) financing. The challenge is that there are a number of barriers that prevent exactly this.

*Figure 5.1 Financial closure pyramid for clean energy projects – a tool for categorizing the potential project barriers and corresponding entry points for donors*



Source: Norad

### *Key Barriers to financial closure*

As a principle, the scope of this report is to focus on; i) potentially projects which look to employ well-tested and relatively low cost technology, and ii) support directed at specific projects, rather than policy and regulation reform. This implies that we start with consideration of the third step in the pyramid and up, as well as the arrow on the side.

## *A. Cost level and resource availability*

For a given project to be viable, it must be at or near a cost level which is competitive with fossil fuels, over its lifetime. Renewable energy projects are generally characterized by high up-front investment costs and low operating costs, relative to fossil fuel projects. Thus, the so-called levelized cost of a renewable energy project is primarily a function of the investment cost and resource availability; that is the utilization factor. Assuming that resource availability is good, a number of barriers can hinder countries from building a power sector on least-cost basis.

The team has concluded that relevant key barriers facing investors in this category include;

**A.1 Non-reflective fossil fuel prices.** A combination of subsidized fossil fuels and what is being increasingly viewed as under pricing of carbon puts renewable energy at a competitive disadvantage, distorting the market in favor of investments in fossil fuels based generation.

**A.2 High cost of capital.** Significant project risks imply high risk premiums and thus a high cost of capital. This situation implies a disproportionately negative effect on high upfront cost projects, such as renewable energy solutions.

**A.3 High operational cost trap.** Due to the complexities and risks of raising up-front financing, countries often install fossil fuel capacity which has a lower investment cost but higher levelized cost (per kWh).

**A.4 Economic viability does not ensure financial viability.** Often civil works, particularly around hydropower projects, have broad ranging social and economic benefits over a lifespan which is much longer than what can be converted into project financing (typically no more than 20 years). More generally, in nearly all cases, renewable energy installations will have a longer life-span and thus economic benefit than that which can be monetized in project finance, implying a mismatch between available upfront financing and total economic benefits.

**Relevance for PFMs:** Overall, this category of barriers is highly relevant for PFMs. Investors, particularly in hydropower, emphasized the dilemma of up to 100 years of economic benefits, but 10-20 year financing perspectives. They emphasized that this makes many renewable energy projects unnecessarily expensive and/or out of reach for most poor countries. However, international actors/donors can only improve the viability of clean energy projects through selective channels, with A.2 and A.4, in particular representing potential targets for PFMs. Even then, the required contributions can be quite high.

## *B. Market Segment and Off-take*

For a given project to be viable, it must address the permits, regulations, policies, infrastructure needs, etc related to the specific market segment it is targeting. In some countries, private investment will be both possible and viable on-grid but not off-grid. In other countries, the opposite may be true. Each market segment requires a unique set of competencies, agreements and financing structures.

The team has concluded that relevant key barriers facing investors in this category include;

**B.1 Credit-worthiness of PPA.** In order to be project financed, any large scale renewable energy project will have to obtain at a minimum a 10-20 year Power Purchase Agreement (PPA), as any bank will require this as security for its loan. However, in most poor countries, the primary off-taker (national utility) is characterized by limited financial self-sufficiency and is often subject to regulatory changes and political tides. As a result, the PPA will require a viable guarantee as a back-stop for the PPA. While various guarantee instruments have been often creatively applied to address this key barrier (IBRD, MIGA, even Giek), unless some sort of standard and well capitalized and long-term instrument is established, it is unlikely that large-scale renewable energy investments will be rolled out with any sort of haste, especially in Africa. As one could imagine, this barrier is even more acute in the case of off-grid projects.

**B.2 On-grid infrastructure needs.** In almost all cases, large on-grid projects require a significant investment in a new transmission line. However, in some cases, a private investor is not allowed to invest in and/or operate transmission lines. Additionally, while the transmission line is required to

realize a project, it is usually not economically defensible that the individual project bears the entire cost of the line, as it will likely come to benefit other projects, and maybe even the power system as a whole.

**B.3 Isolated grid business models.** Most renewable energy investors do not have the competence, financial appetite, presence or logistics for investing in or operating rural distribution networks. Thus, if renewable energy is to be deployed on a large scale, business model innovation will be needed whereby a single, preferably credit worthy, off-taker purchases the electricity. In most cases, public financing will likely still be needed.

**B.4 Information and Small-scale-financing for decentralized energy solutions.** A wide body of research has demonstrated the economic viability associated with up-front investments in improved household energy solutions that reduce energy expenditures and improve quality of service. Despite a theoretical payback of as low as a few months, penetration is very limited, with the lack of information, training and liquidity/savings of household often attributed as the primary barriers.

**Relevance for PFMs:** Overall, this category of barriers is also highly relevant for PFMs. Indeed if the combination of low ability to pay and high risk levels associated with off-take is to be addressed in the short-term, international PFMs will have to play an important role. However, improving this situation will require large financial commitments/liabilities that are likely beyond the scope of current ODA levels, and outside the mode of cooperation/delivery that bilateral donors are accustomed to.

### *C. Project Preparations*

The development of a project from an idea to a bankable set of documents and agreements requires the engagement of a highly risk-tolerant investor. Making a project 'bankable' requires a high degree of competence, with many years of experience, as meeting the demands of commercial and multilateral banks is highly resource intensive. As one investor noted "if we knew with relative certainty that the market was there, we would be willing to put in this upfront investment", but in most low income countries, a final financially viable sales agreement (PPA) is far from standard or certain.

**C.1 First-mover cost.** Once the documentation and agreements are brought to a certain level, it becomes much easier to involve other investors. This implies that the essential role played by project developers is primarily dependent on the cost-reward of bringing the project through the first milestones, and any increase in this cost will represent a significant reduction in their returns. This is why in screening countries to target in investment strategies, a key criteria is almost always the existence of precedent projects. Accordingly, developing first-of-a-kind projects or agreements will represent high transaction costs and likely delays which will deter most serious developers. Further, given that much of this cost fixed, irrespective of project size, it will disfavor small and rural markets.

**C.2 Networking gap.** Despite improvements due to improved means of communication, there remain significant challenges in matching local knowledge with technical expertise with financial resources. In international conferences, it can be witnessed that project developers and financiers speak different languages and are clearly frustrated with the approach of the other.

**C.3 Ensuring long-term sustainability.** To ensure long-term sustainability an investor would have to comply with a number of environmental regulations, ensure that the project contributes to social development in the areas (through Social Corporate Responsibility (CSR) activities), and transfer capacity to operate and maintain the project to local staff and partners (HSE). There are increasing expectations for international investors, in particular, increasing both the costs and risks and thereby also the cost of electricity for those projects that are implemented. Clearly, this challenge will be even more prevalent in the lowest income markets.

**Relevance for PFMs:** Overall, this category of barriers is relevant for PFMs, and indeed most donors and other public institutions offer this type of support. In general, it is a relatively straightforward and attractive to provide this type of support. It can be argued that if one can make significant and meaningful contributions to A & B above, professional investors are capable and willing to invest in project preparation.

#### *D. Financial Closure*

Finally, given that the above ‘fundamental’ or ‘economic’ factors are in place, then financial closure will require a certain degree of financial engineering, whereby the primary aim is to assign all relevant risks in an efficient manner.

The team has concluded that relevant key barriers facing investors in this category include;

**D.1 Complex project finance structures.** Even small projects require a plethora of agreements (according to Trønder Energi, the 13MW Bugoye HPP required some 140 agreements). This both limits the number of potential financial actors and leads to an increase in project costs.

**D.2 Complex PPP structures.** Public and private actors often have very different modes of operation, communication, planning horizons, etc., and finding common ground whereby the two partners take on mutually complimentary roles is often cumbersome, time consuming and frustrating. When agreement is struck, however, a highly effective distribution of responsibility and risks is the often the result. Nonetheless, it will almost always be the case that both parts will view the other with a certain degree of skepticism and this will surely plague the cooperation.

**D.3 Lack of standardization.** While there is increasing interest in investing in renewable energy projects, there remain significant gaps in the types and capitalization of financial products. Innovative solutions have been developed on a case-by-case basis. However, a significant scaling up will require a certain level of standardization, which will likely include significant risks and/or financial liabilities being carried by public entities, local or foreign (donors).

**D.4 Limited carbon finance.** In its current form, the carbon markets offer little to no relief to renewable energy projects, particularly in Africa. The carbon price is too low and the associated risks are too high, so that the impact of carbon revenues on investment models is negligible. It is striking that as of today, it is not possible to raise debt of any kind with future CER sales as collateral. Until the fundamentals of the carbon market are sorted out, it is the team’s conclusion that financial engineering will do little to raise carbon finance for clean energy projects.

**Relevance for PFMs:** While donors may view this barrier as tempting area to intervene, so as to have a broad impact on clean energy project development on a global scale, humility is likely required. It is unlikely that assisting and/or providing financial instruments for enabling financial closure is the comparative advantage of donors. In fact, investors may view such a role with skepticism and thus be counterproductive. Donors should instead focus on more upstream economic/financial viability barriers and leave the financial structuring to professional investors.

#### *E. Government as a Counter Part*

The Project Pyramid above makes an important distinction between the role of the government in ensuring an enabling environment as a policy maker and ensuring progress for the project as a partner in the PPP. Clearly, one of the primary attractions of including the public sector as a partner is its ability to make both marginal and significant improvements to the enabling environment during the course of project preparation. Nonetheless, the team found it useful to separate these two roles in the pyramid and analysis.

**E.1 Competence and Resources.** In addition to all of the elements of the pyramid, public actors must, as a partner in a PPP, manage more general overall economic and policy issues. Thus, bringing a project of reasonable size from idea to financial closure will often require even greater sophistication, skill sets, dedication, and professionalism than that which is required of the private investor. It is rarely the case that investors in low income countries meet these qualities when approaching authorities with investment proposals.

**E.2 Public incentives.** Ideally, both private and public partners will have an incentive for timely and cost effective implementation based on predictable decision making processes. However, public actors must take a wide range of considerations seriously in their investment decision, including social and economic development, and equity and environmental concerns. Additionally, it is no secret that



bureaucrats and politicians can (over)react to highly unpredictable political whims. In the worst case political maneuvering and/or corruption can stop a project at any stage on the pyramid.

**Relevance for PFMs:** Overall, this category of barriers is highly relevant for PFMs. It is critical that this type of support not be confused with more traditional policy and capacity building support. It is meant to align interests and incentives, while focusing the efforts of all involved on a common goal – the implementation of clean energy PPPs. This type of support requires patients, donors willing to take risks and what will inevitably appear to be significant contributions with a high degree of uncertainty as to the final outcome. In addition to PPP implementation, it is inevitable that a successful program, in the case of large PPPs, will focus efforts and align incentives that should act as a catalyst for reforms.

### *Key Investor Perspectives*

Investor perspectives have been perhaps the most important source in determining both the critical barriers and the corresponding conclusions as presented in the “Relevance for PFMs” sections. While, a complete analysis of the responses and discussions is not particularly useful the team wishes to document a limited set of not so-obvious observations by investors that provided the team with particularly useful insight;

1. While there is focus on the need for investment, the problem is not the availability of investment or interest by investors.
2. Perhaps the most frustrating aspect of project development in developing countries is the lack of a competent, dedicated and predictable public counterpart.
3. New renewable energy is expensive in poor countries. Although investors often argue for higher tariffs, they do recognize that the barriers described above do in fact mean that poor countries pay “too high” a price for their projects.
4. Nuanced view on public involvement. While investors see a number of benefits from involving the public sector in projects (including alignment of incentives and risk mitigation), the wrong type of involvement can be a show stopper. The specific concern about host country participation on the board/management was raised. Donors must take this concern seriously and find acceptable compromises.
5. Failure of CDM to generate up-front financing for renewable energy projects, particularly in Africa. While CDM has likely increased interest from equity investors and even provided the potential upside to allow for investment, it is striking that no financial institution is yet willing to provide a loan against future CER sales. Indeed, the low price and high level of risk combined with high capex level inherent in renewable energy means that the impact of CER revenues on the overall economics of typical projects is very marginal.
6. Multilateral PFMs do not have to be inaccessible to Norwegian investors. On the one side, a number of Norwegian investors have established working relationships with multilateral institutions and accessed their funds. Indeed, it is often the case that by partnering with these institutions, investors can benefit much more than what is possible by means of bilateral contributions. On the other side, Multilaterals are increasingly opening up for strategic/flexible partnerships with bilateral donors that could also improve accessibility (see Proposal on IFC Mezzanine Finance).
7. Finally, it was argued by one investor that bilateral and multilateral donors are contributing to a system which simply makes it much easier for governments and developers to implement fossil fuel projects. Specific reference was made to plethora of permits, rights and negotiations, as well as the environmental and social standards placed on the development of clean energy projects.

## 6 GUIDING PRINCIPLES FOR SUPPORT TO PPPS

Providing public funding in favor of privately owned and promoted projects introduces a range of issues and complexities that donors are not accustomed to nor have the proper internal procedures and routines to ensure that support is provided in an effective yet responsible manner. Fortunately, Norway is not alone in developing guidelines regarding the selection of projects and/or delivery mechanisms with which to provide support. Norad is aware of operational guidelines being developed by the World Bank in supporting the private sector through its **Climate Technology Fund (CTF)**. Among others, the guidelines puts emphasis on “achieving transformational outcomes in a sector, sub-sector, country, sub-sector, country, sub-national region, sub-region, or region while demonstrating that these outcomes would not be possible without support from the CTF.” Projects are then to be measured against a range of criteria related to both public objectives and financial viability;

- **Public objective** criteria include; a) potential GHG Emissions Savings, b) Cost-Effectiveness, c) Demonstration Potential at Scale, d) development Impact, e) Implementation potential, f) additional costs and risk premium
- **Financial viability** criteria include; a) financial sustainability, b) effective utilization of concessional finance, c) mitigation of market distortions, and d) risks.

Norad thus builds on these criteria, relying UNEPs analyses, literature review, interviews with investors and embassies and Norad’s own experience. Importantly an attempt has been made to both make the criteria specifically relevant to bilateral Norwegian assistance and develop the criteria to a more specific/operational level.

1. **Donor support to PPPs should be motivated by the potential for helping the partner country realize *economic and/or social net benefits*.** In many cases, a project would introduce wide ranging and long-term economic benefits for the country and its citizens, but country conditions and/or financial markets may make it impossible to monetize these benefits and thereby generating sufficient upfront financing. Given the particular aim of mobilizing private investment, donor contributions should target projects with this characteristic.
2. **Donor support to PPPs should be provided in a manner which targets, and thereby alleviates, a *critical barrier to the realization of a specific project*.** Put another way, a relevant mechanism should i) have an effective delivery/administrative set-up, ii) allow for mitigation and/or an effective redistribution of risks, and iii) provide sufficient funding to alleviate the relevant barrier. It would be expected that if (i)-(iii) are accounted for, a sufficient pipeline of projects will present itself.
3. **Donor support to PPPs should result in *economic/financial benefits for the country, not the developer or project owner*.** This requires careful consideration of the planned ownership structure, the PPA negotiations, timing of the support, the delivery mechanism, the general rules of disbursement, and the relationships and communication with both public and private actors. Despite all of these considerations, in most cases it should be possible to structure the support to fulfil (3) as well as the other guiding principles.
4. **Donor support should target those investments that are near commercial viability and thus can achieve a *high public-private investment ratio*.** Have demonstrated, or hold promise for (confirmed by experts and private sector), ability to leverage a significant amount of private investment. According to UNEP, an assessment of experience with a number of different models of PFMs shows that typical leverage ratios range from 1:3 to 1:15, but also noting the additional potential for ‘revolving funds’ which involve reinvestment of the same funds in consecutive projects. The mechanism’s leverage ratio will be indicated with ‘high’ or ‘low’.
5. **Donor PFMs should reflect the particular nature of donor contributions and thereby harness the *comparative advantage that this implies*.** That is donors should look to utilize the relatively high credit rating, predictability and financial backing that private investors often site as reasons for not investing. At the same time, donors must recognize their own limitations,

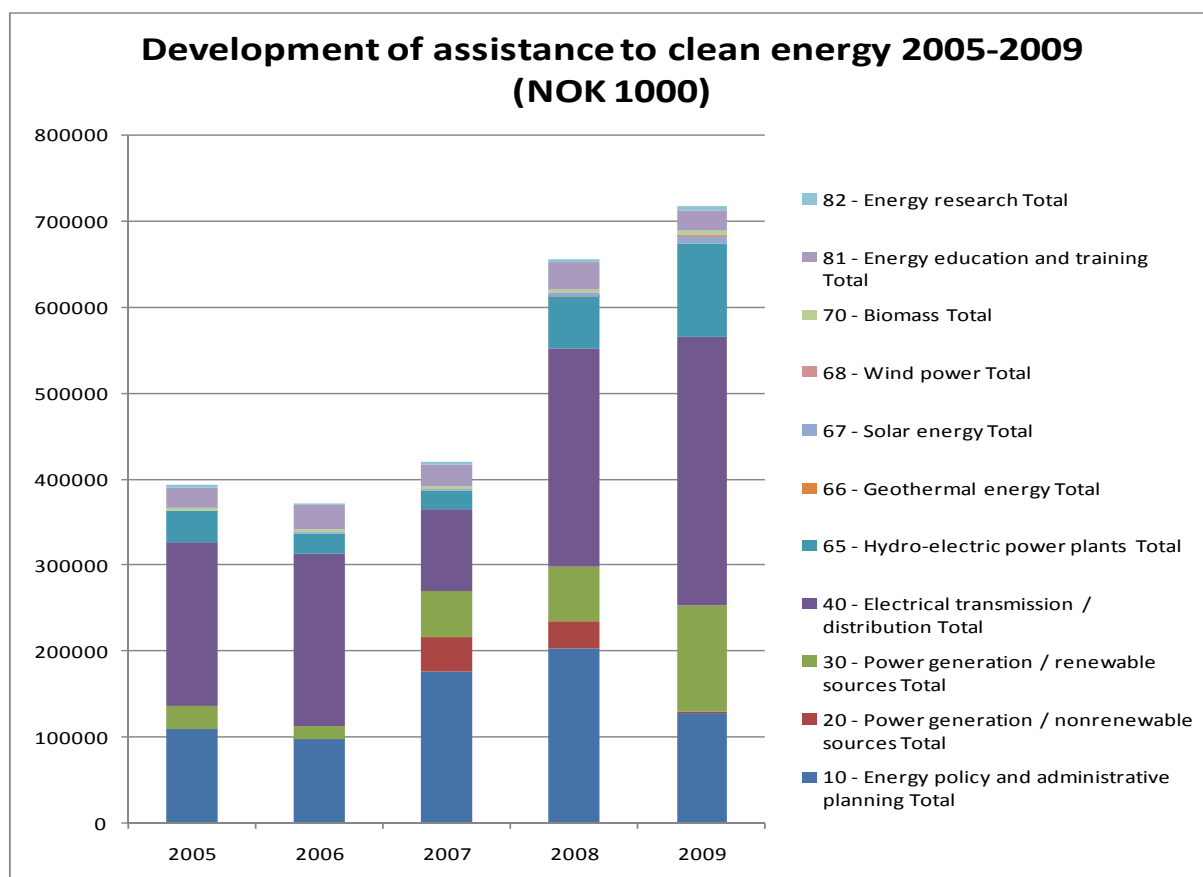
particularly regarding challenges in long-term budgeting/commitments. Additionally, donors must be aware that it is desirable for public and private entities to bear some/certain risks, and should thus be very conscious about taking on or alleviating key risk components. Finally, choice of geographic and technology focus should build on the prior focus, competence comparative advantage of Norwegian ODA, with particular consideration to the often cited view of Norwegian assistance as presenting a flexible, demand driven source of support, as opposed to many bilateral and multilateral institutions.

6. **Targeting the (rural) poor is ideal, but targeting general economic growth and adhering to partner country priorities is also legitimate.** In general, donor support should look to intervene in a manner which ensures benefits reach the general public and specifically the poor. Indeed, Norwegian support has primarily been targeted at stimulating economic growth and thereby relying on “a rising tide lifts all boats”. While this approach is still legitimate and relevant, a number of evaluations have questioned the poverty focus of Norwegian power sector support. Thus, as a guiding principle, it is argued here that rural clean energy projects should be prioritized. Indeed specific recommendations are provided later in the report to this end. Additionally, political guidance is already in place regarding a geographic focus on LDCs.
7. **Donors must be willing to commit the resources and time required to see their support through.** As already noted, supporting PPPs through to implementation will be demanding and risky also for donors in all aspects. Thus, while *individual donor officials* should be encouraged to take on this risk and commitment, *donor organizations* must then back them up with an institutional accountability to the project. This will require careful and critical selection of the target projects characteristics, including technology, size, stakeholders, etc. Particularly important and obvious is the likely need for large commitments in the face of an uncertain process.
8. **All else equal, in considering new PFMs, an existing organizational set up which allows for effective delivery is preferable.** That is, having an already existing enabling political and organizational set-up and implementation support in Norway and/or internationally will improve the likelihood of success. Ideally, the preferred PFM(s) will have a champion which has already built momentum and internal support for implementation. Whether the mechanism has or has not an existing organization for implementation of programs will be indicated with ‘yes’ or ‘no’.

## 7 REVIEW OF NORWAY'S CLEAN ENERGY PFM TOOLBOX

Public Norwegian funding finds its way to international clean energy projects through many channels. Of specific relevance for Norad is Norwegian ODA directed at clean energy, which grew significantly from just over NOK 400m in 2007 to over NOK 700m in 2009. While Figure 7.1 does not depict a long track record of growth in ODA towards this purpose, it does indicate the start of potential trend which is supported by Norad's observation of increased interest in clean energy projects, particularly among embassies.

Figure 7.1 *Development of Assistance to Clean Energy excl. Statkraft and SN Power Invest*

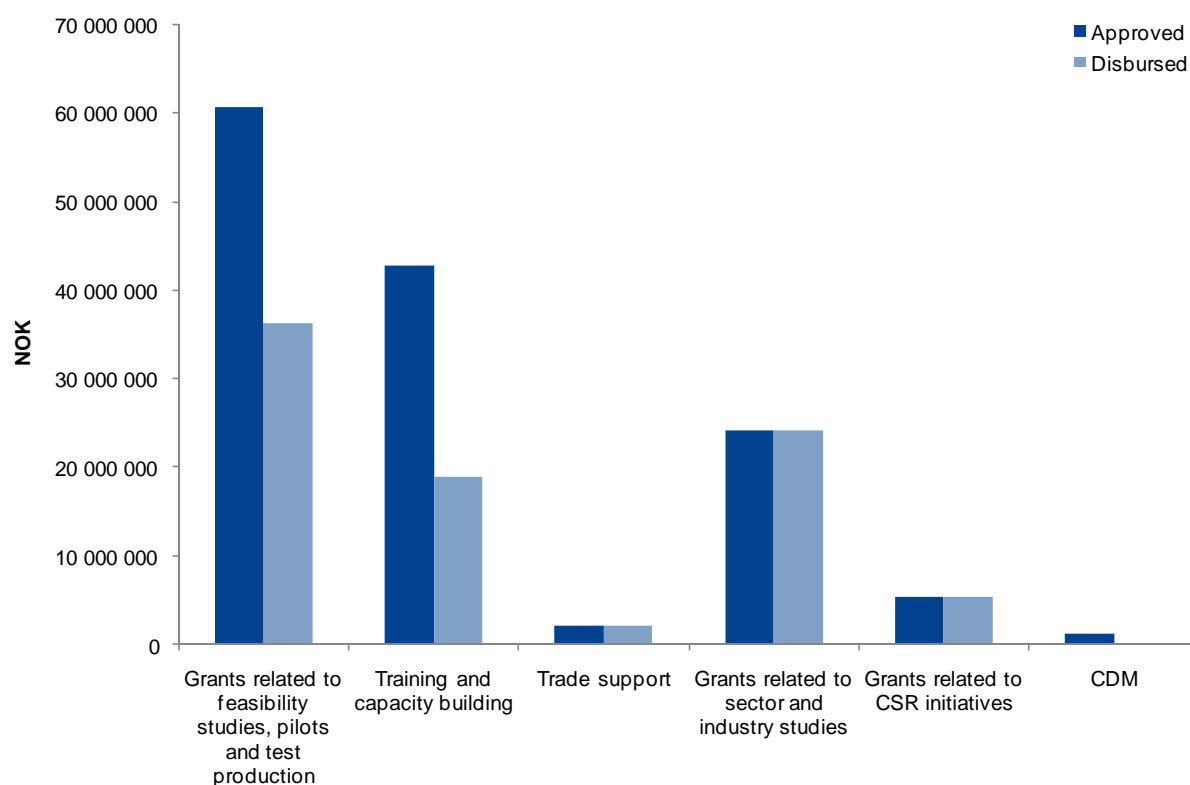


Speaking about the Norwegian 'clean energy PFM tool box' more generally, one can point to a number of sources of publicly allocated funding.

- **Embassy support based on bilateral agreements.** Embassies are the primary focal/delivery point of Norwegian development assistance, including in clean energy. The embassies enter into program agreements with Government counterparts in partner countries, based on the explicit request/prioritization of the Government of the given project.
- **Norad's Department for Private Sector Development and Environment (NUMI).** Today, NUMI has a range of support schemes to facilitate private sector development by means of financing and guidance provided primarily to Norwegian investors and businesses, including (see Annex I) for more details): feasibility studies (FS), training and capacity building (T&CB), trade support (TS), sector and industry studies (SIS), corporate social responsibilities initiatives (CSR), and CDM development (CDM). In total, NUMI channel approximately 80-90 millions NOK a

year through the PSD scheme. Figure 7.2 below illustrates the disbursements in relation to approved support for each of the windows.

Figure 7.2 The relation between approved and disbursed funds in 2009 (NOK)



- **Norfund.** Norfund's investments in clean energy are usually done through SN Power where Norfund holds 40 percent of the shares (the other owners are Statkraft and private investors). In addition, Norfund has invested in the 13MW Bugoye HPP in Uganda together with TrønderEnergi (See Box 7.1). It is worth noting that in the case of SN Power, the company tends to own about 50 percent of individual projects, with a 40 percent equity share. Thus, when Norfund invests in clean energy projects they tend to have a leverage factor of about 1:10 on their investments, in addition to any reinvested earnings Norfund's equity totalled NOK 5.3 billion as of December 31 2008.
- **Veiledningskontoret for næringsutvikling i utviklingsland.** This service was established through collaboration between Norad and Norfund as a one-stop-shop for companies aiming at investing in developing countries. The support available includes information about current bilateral and multilateral support mechanisms and how they can be combined as well as general reviews of projects, including advice on how to develop and tune products and applications, location and sustainability. Furthermore, Veiledningskontoret for næringsutvikling i utviklingsland assists with application support and organizes and/or participates in initial project meetings with relevant stakeholders. It also facilitates possibilities for companies to meet other actors with experience relevant to their current projects and ideas. The office does not have the possibility to give directly monetary support through grants or loans. It was set up as an entry point for inexperienced business developers into the array of bilateral and multilateral support mechanisms.
- **Innovation Norway.** Innovation Norway was established in 2004 as a state-owned company with the mandate to promote nationwide industrial development beneficial for Norway's, as well as individual business', economy. Innovation Norway offers loans, grants and guarantees to both individuals and to businesses. In general, one of the main purposes of Innovation Norway is to mitigate the risks of project developers and increase the likelihood of success nationally or

internationally. One key area is Energy and Environment, where Innovation Norway assists small and medium-sized businesses working with innovative energy and environmental technologies to grow internationally. This mainly comprises providers of services and expertise related to new technology and providers of new technology, either delivery system or individual components. Innovation Norway offers support in network building, marketing and profiling, financing, and market analyses. Targeted areas include energy systems and energy efficiency, climate friendly energy and transport, clean water and clean air, and capture and storage of CO<sub>2</sub>. With a yearly budget of 3.3 billion NOK Innovation Norway is a sizeable actor. But as a bilateral mechanism in this context, Innovation Norway's mandate is to support Norwegian businesses' activities in Norway or abroad, and it does not have a specific focus on development cooperation.

- **Garanti-instituttet for eksportkreditt (GIEK).** GIEK is the central governmental agency responsible for providing insurance and guarantees of export credits. The main goal is to promote Norwegian investment abroad as well as export of Norwegian goods by mitigating the risks involved. GIEK assists small as well as large companies and covers both commercial and political risks in about 150 countries. Its main products include buyer credits, supplier credits, pre-shipment guarantees, bond guarantees, investment guarantees, letters of credit guarantees, and whole turn-over schemes. The guarantees are issued on behalf of the Norwegian Government and can be used as a security to facilitate funding
- **EksportFinans.** Eksportfinans was established 1962 and is owned by the Norwegian Government together with a consortium of banks operating in Norway. The aim is to deliver competitive, long-term financing in order to make projects succeed within the export sector, with emerging market loans provided only when GIEK provides a guarantee. Foreign buyers of Norwegian capital goods and services are offered export financing in order to facilitate the purchasing. Norwegian buyers with international business activity are also provided with financing. Eksportfinans issues bonds in several currencies globally. One percent of the financing targets energy projects. For such projects, Eksportfinans offers loans on Commercial Interest Reference Rate (CIRR) with a fixed interest rate and a re-payment period of between two and 15 years. Alternatively, loans can be given on commercial terms with fixed or floating interest rate and a re-payment period of up to 20 years. Eksportfinans can also act as guarantor for up to 85 percent of the contract amount, on commercial terms.
- **Ministry of Finance – CDM credit purchases.** The Storting has authorized the Ministry of Finance to purchase emission credits (Certified Emission Reductions (CER) and Emission Reduction Units (ERU)) from Joint Implementation (JI) and Clean Development Mechanism (CDM) projects. The Ministry's plan is to buy 27m tons for delivery between 2008 and 2012. For 2010, the combined appropriation and authorization is 4.9 billion Norwegian kroner, approximately 600 million euro. The Ministry prioritises contracts in countries where few projects are currently registered and considers offers from all stages of the investment process. Contracts are continuously negotiated and the Ministry may also enter into contracts on deliveries after 2012. The minimum contract size is 50,000 tonnes of CO<sub>2</sub> equivalents combined for the period 2008-2012.
- **International Center for Hydropower (ICH).** ICH has the vision of "being the preferred supplier of good hydropower competence for a better and cleaner world", by applying the following approaches; develop and carry out capacity building activities in clean energy, with particular focus on hydropower; cooperate with other central Norwegian actors to contribute to the Clean Energy for Development Initiative; networking; contribute to institutional building and improved management by means of increased understanding of hydropower; and offer services to Norwegian and international actors.

*Box 7.1                      The Example of Bugoye – a model for the future? (Source: Econ Pöyry)*

On 7 October 2009, the Bugoye Hydropower station in Uganda was opened by the President of Uganda. The run-of-river hydropower station has a capacity of 13MW, corresponding to seven percent of Uganda's total capacity. The station is the first completed hydropower facility in Uganda that has been commercially financed.

The project was originally initiated by SN Power, but after an unexpected retreat, the rights to the project were overtaken by TrønderEnergi together with Norfund<sup>8</sup> through Tronder Power Ltd., a special purpose project vehicle formed for the Bugoye Hydropower project. SN Power had a turnkey contract under which the suppliers charged a risk premium for the supply. TrønderEnergi instead took a larger part of the risk themselves, and could thereby lower the construction costs. The Government of Norway supported the project by allocating ODA grant to the project company. Instead of allowing the grant to finance specific parts of the project, e.g. the transmission or local development, the grant was given as a lump sum, financing a share of the total investment. This gave Tronder Power Ltd. the possibility to access control over all parts of the project and to decide where the grant should best be used. The final structure was decided as follows:

Financing		USD million
Equity	TrønderEnergi 68%, Norfund 32%	19.7
Grant from Government of Norway*		8.9
Debt from the Emerging Africa Infrastructure Fund		32.0
<b>TOTAL</b>		<b>60.6</b>

\* Structured as zero interest loan to be transferred to equity in the hands of Government of Uganda in 2034.

The initial plan was to have the ODA grant channelled through the Ugandan Ministry of Energy to the project company. The Ugandan Ministry of Finance did however not allow the money to pass through the state budget. According to Norfund, the reason might be that such a procedure would have required a public procurement process. Instead, the Ugandan state preferred to let it be a “Norwegian” project, possibly also not to risk having to defend why the Bugoye project was chosen for support from the state budget, when several other potential projects needed support as well. Consequently, the Ugandan state did not contribute financially to the project. The grant was therefore disbursed from the Norwegian Ministry of Foreign Affairs through Norfund directly into the project as a technical assistance facility. This process was however time-consuming, and the Government of Norway did not submit any written commitment regarding the financial contribution. TrønderEnergi and Norfund therefore had to cover the grant with a guarantee until the money was disbursed.

#### *Experiences from Norad*

The Norwegian state contributed USD 8.9 million to the project, which resulted in a 13 MW hydropower plant. This yields a cost per kW of USD 685<sup>9</sup>, for the grant only. According to Norad’s apprehension, this was a lot of money invested for a low output of the project, and it is hence considered as an expensive project. The model of disbursement also induced a kittle terrain where fundamental considerations concerning tied aid were brought to the fore. The project was developed in a grey zone concerning the issue of using public funds for supporting a private project. It became evident that Norad was lacking policies to handle these issues. It was also not entirely clear when public procurement needed to be applied, or how Norad should handle purchasing processes in this project, where ODA grant made it partly public. In addition, the Ugandan Ministry of Finance could not guarantee that all applicable rules had been followed when Tronder Power Ltd. overtook the project from SN Power, or if public procurements had followed Ugandan rules. Hence, even if the outcome of the project is considered very successful, the above mentioned aspects need further attention and consideration before entering into a similar project with ODA money in the future according to Norad.

#### *Experiences from the Royal Norwegian Embassy in Kampala, Uganda*

The Royal Norwegian Embassy in Kampala believes that the Bugoye Hydropower project has been very successful; although some minor problems connected to the fact that the project is rather newly established are currently being taken care of. The Embassy recognises that the process concerning disbursements of funds did follow standard procedures (having the funds disbursed through the Ugandan Ministry of Finance), but does not know where the problem occurred. Despite this, cooperation with both Norwegian and Ugandan parts has however worked excellent, according to the Embassy. The main sapience from the project, according to the Embassy, is to be for the Norwegian authorities to follow their own rules, which they are imposing on the developing countries in which they work. As a donor, Norway has the possibility to influence rules and procedures for development cooperation, but must also act as a role model when it comes to fulfilment.

<sup>8</sup> Normally, Norfund invest in hydropower through SN Power. However, if SN Power is not interested in the project, Norfund can invest together with other partners.

<sup>9</sup> Approximately 560 EUR/kW when considering the grant. Looking at the whole investment of 60.6 million USD, the price per kW is 4,662 USD or 3,785 EUR. Exchange rate from 22 June 2010 (www.xe.com).

### *Experiences from Norfund*

The main experience of the Bugoye project, from Norfund's point of view, is that the ODA delivery mechanism did not work out very well. Since Norway does not have an appropriate mechanism of direct support to the private sector after the mixed credits were phased out, the process became complicated and time-wasting. Referring to the fact that the Government of Norway did not issue any written agreements until the money was finally disbursed to Norfund, the process is also believed to be fairly unsecure.

Furthermore, Norfund's experiences comprise the fact that access to land, tax issues and import duties were imposing barriers to the project. These are generally hard issues for a small project to manage, and this was further reinforced by the fact that Bugoye Hydropower project was among the first projects of its kind in Uganda; even the Ugandan law had to be rewritten to cover all issues included. Different messages came from different authorities in Uganda, which made the process expensive and time-burdensome. These are examples of the fact that external effects in society might affect the possibility to carry out this kind of projects successfully.

Norfund further believes that one key problem is that governments in developing countries do not have a good understanding of what is required to make a project bankable, or how to manage transactions of this nature. This results in long processes and several misunderstandings. A suggestion from Norfund is therefore to establish a Transaction Advisor to be a middleman between the public and the private sector. This could act as grease in the wheel, assisting with issues and procedures of administration, legal matters and transactions. The Advisor could be an investment bank or a similar actor, and should be financed by the developed countries. To give the Ugandan Investment Centre more power, like its Tanzanian counterpart, would probably also be a good idea. Today, the advices from the Ugandan Investment Centre are not very valuable, which imposes further risks to the project.

### *Experiences from TrønderEnergi*

TrønderEnergi considers that the cooperation with Norwegian authorities, and in particular the Royal Norwegian Embassy in Uganda which has been the main contact point, has worked in an excellent way. One challenge was the final canalisation of the ODA grants, and the fact that it resulted in a third owner – the Ugandan state. This disrupted the picture a bit, but since this does not take effect within proximate time, TrønderEnergi does not consider it a problem. TrønderEnergi's main recommendation to actors in similar projects is therefore to compile guidelines together with the local Ministry of Finance well in advance on how to solve the financing issue.

One important component for TrønderEnergi was the guarantee issued by the Garanti-Instituttet for Eksportkreditt (GIEK), covering the political risk of the equity share. The high risk of investing in Uganda could otherwise have prevented TrønderEnergi from investing in the project.

The Ugandan authorities assisted with administrative processes, permissions, and practical help to get the local communities to give their support to the project. Despite this well-functioning cooperation, TrønderEnergi experienced problems of very slow processes and corruption connected to land acquisition. In addition, theft occurred at the construction site. TrønderEnergi however decided to solve this by supplementing the guards, instead of accepting military protection from the government since this was believed to put the good relation with the local communities at a risk.

Sources: Geir Hermansen, Norad  
Nils Dårflot, Royal Norwegian Embassy in Kampala  
Jon Einar Værnes, TrønderEnergi  
Mark Davis, Norfund

***Disclaimer: This high-level assessment has been carried out by Econ Pöyry. The assessment is meant to represent the opinions and perceptions of those interviewed, rather those of the team.***

### *High-level assessment of the Norwegian toolbox*

In order to identify potential strengths and/or weaknesses in Norwegian clean energy PFM toolbox, Norad has carried out a high-level assessment of each of the available instruments. First, each of the instruments are grouped within the type of bottleneck (ref pyramid framework) it addresses. Then the group of instruments targeted at these bottlenecks are scored in terms of their appropriateness and



completeness against guiding principles presented above. The results of this high-level assessment is summarized in

Table 7.1 below and key messages are then summarized.

Table 7.1

A stop-light (green-red) assessment of appropriateness and completeness of the Norwegian tool-box in addressing the various barriers and guiding principles for support

		Guiding Principles							
		Norwegian Support Mech	Economic & social benefits	Able to target critical barrier	Benefits to country not investor	Leverage ratio (direct & indirect)	ODA/ Norwegian comparative advantage	Targets the poor	Size - frame match
Relevant Bottlenecks	<b>Government as Counterpart</b>	Embassies Norad TC ICH		Flexible Embassies		Highly variable	Targeted at hydro management	Trickle down	Variable – requires commitment
	<b>Financial Closure</b>	Norfund Giek ExpFin FinDep	Does not alleviate econ-fin mismatch	N/A	Norfund requires return Giek too rigid	SNPower – excellent direct – but now crowding out?	“Norwegian Hydropower AS”	Returns will limit e.g. rural investments	Potential for very large investments
	<b>Project Preparation</b>	Embassies Norad FSP Norad PDD VeilKont		Flexible		Variable	N/A	Easy to make decision	Good understanding/ respect for cost
	<b>Market Segment and Off-take</b>	Embassies Norad TC Giek	Efforts and contributions marginal and too adhoc compared with scale of challenge.						
	<b>Cost Level and Resource Availability</b>	Embassies Norad FSP			Potential there but very complex	Both direct and indirect	Societal benefits of hydropower		Limited budget and risk aversion
	<b>Country Policy and Regulation</b>		Not Considered						
	<b>Technological Maturity</b>		Not Relevant						

Some of the key messages to draw from this table are;

- While Norway is a small international donor, it is highly visible and present in the energy sector.
- In general, relative to other donors, Norwegian support (both from Embassies and Norad), is viewed as highly flexible and responsive to country needs and priorities. It is also generally viewed as less rigid and bureaucratic than other donors, as well as willing to enter more risky countries and projects.
- Norway views itself as an energy nation. When it comes to clean energy specifically, Norway already takes a leading international role in promoting and supporting hydropower. It has leading international competence, particularly related to engineering, regulation and power system design. For a number of very convincing reasons, the further development of hydropower will be central to extending access to modern energy while achieving a sustainable energy development path in poorer countries.
- Assisting partner countries in bringing promising projects up the pyramid to financial closure is resource intensive, it requires significant staying-power (up to 5 years) and requires highly specialized and experienced (often international) specialists. This will particularly be the case when dealing with medium to large scale hydropower projects with multipurpose characteristics and public-private partnerships. Further, the path to financial closure can be rather uncharted for many countries and most embassies will be ill-equipped on foreseeing and planning for that path, let alone taking a project along it.
- Finally, the challenge of over-coming the barriers associated with a low off-take price and a non-credit-worthy off-taker is rather endemic throughout the developing world, whether it is on-grid or off. Making a significant contribution to reducing this risk will require, at the least, a dedicated analytical and trial-and-error approach, or, in the best case, a sustained multilateral effort.

# 8 OPTIONS FOR LEVERAGING PRIVATE INVESTMENT IN CLEAN ENERGY

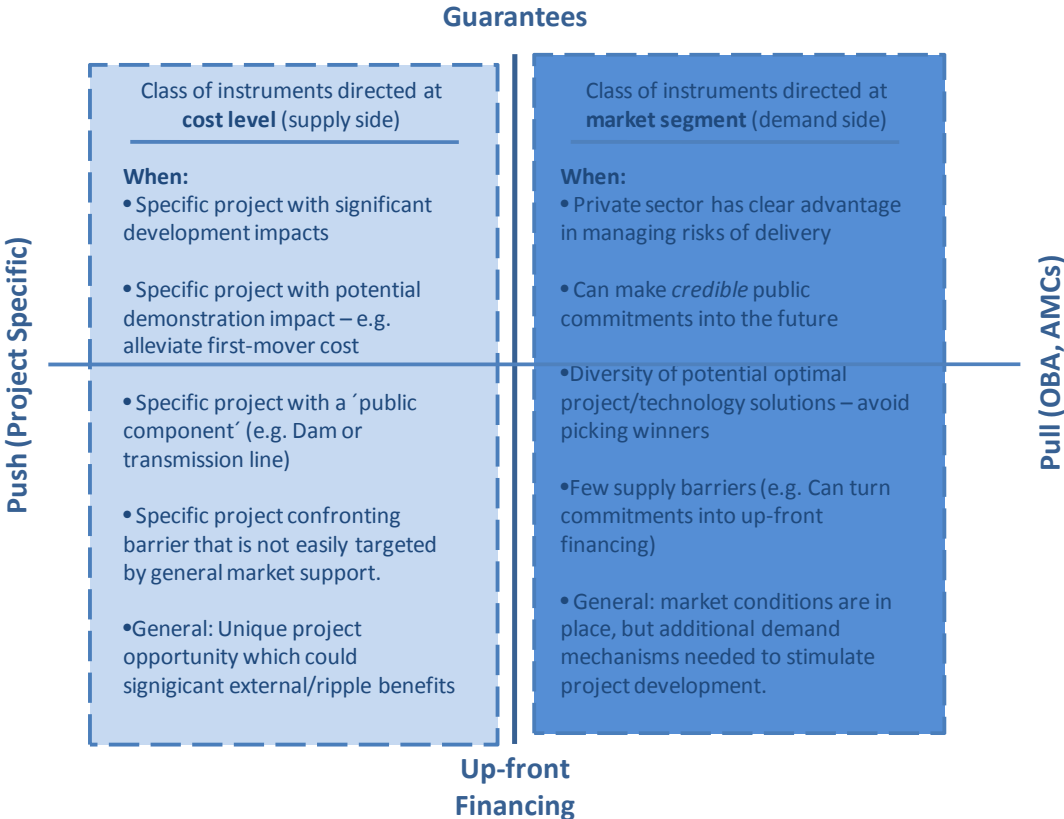
The objective of the executing officer should be to *maximize the total leverage effect of the PFM contribution by contributing to turning expected economic, social and environmental net benefits to the country into up-front financing, while adhering to the guiding principles in Section 6.* In structuring these contributions, one should target the ‘cost level’ and ‘market segment’ portions of the project pyramid presented above.

When selecting the most appropriate means of supporting the development of clean energy projects in a given country, one must take two categorical decisions regarding the delivery of the support;

- i. Is the contribution to be targeted at a specific and critical barrier preventing the realization of a given project, or is it to provide market incentives for the development of clean energy projects in general? (i.e. push v. pull mechanisms)?**
- ii. In what form is the contribution delivered/financed – up-front capital subsidy, a guarantee, or payment upon delivery?**

The wide range of PFMs for clean energy are largely defined by where they are placed with respect to (i) and (ii) above, as illustrated by Figure 8.1. Where exactly on this continuum authorities will find the most appropriate instrument will depend on (i)-(ii) above, as well as the specific circumstances in the country, as summarized in Table 8.1.

Figure 8.1 Visualizing the various PFM delivery mechanisms



Source: Norad

Table 8.1

Determining the most appropriate PFM

What is the target of the support?						
Specific Project			General Market Development			
Guarantee	Up-front Financing	Subsidy upon delivery of service	Guarantees	Subsidy upon delivery of capacity	Subsidy upon delivery of service	Hybrid: FIT and guarantee
<p><u>Examples:</u> MIGA, PRGs, GIEK, Mixed Credits</p> <p><u>When:</u> Project is econ/fin viable but considerable risk on IRR of project</p>	<p><u>Examples:</u> Capital cost buy-down, public equity contribution, public financing of transmission line</p> <p><u>When:</u> Significant economic (external) benefits that cannot be monetized into up-front financing</p>	<p><u>Examples:</u> Subsidized capacity payment of a project</p> <p><u>When:</u> Risk that actual delivery of service will be delayed or abandoned</p>	<p><u>Examples:</u> Off-take guarantee</p> <p><u>When:</u> Off-taker not credit worthy &amp; potential moral hazard (incentives for avoiding default) can be managed</p>	<p><u>Examples:</u> Auction for \$/KW installed, tax benefits (US)</p> <p><u>When:</u> Long-term financing expensive or unavailable and limited risk that service delivery will not be delivered</p>	<p><u>Examples:</u> Feed-in-tariff (FIT)</p> <p><u>When:</u> Risk that project will be abandoned, quality of service will be poor or public assets will be managed sub-optimally over time</p>	<p><u>Examples:</u> Power purchaser with both credit worthiness and subsidized price</p> <p><u>When:</u> Ultimate solution for utilities with low credit worthiness and ability to pay. Donors able to assume large long-term liabilities</p>
<p><b>Operational recommendations:</b></p> <ul style="list-style-type: none"> <li>Interact with investors, and listen to their signals regarding either government or donor backed project ideas and concepts. A lack of investor interest raises red flags both about the quality of the specific project and the likelihood that ODA contribution will result in leveraging investment.</li> <li>Utilize momentum and existing financial commitments that arise from projects being developed by private investors and identify contributions which could improve the economic result for the partner country.</li> <li>Look to utilize a growing diversity of PPP structures, which allows public/ODA contributions to be made responsibly and to the benefit of the country.</li> <li>Target infrastructure and/or civil works which naturally belong in the public domain and/or imply particularly high risks for private investors.</li> <li>As a general rule, projects that have obvious economic benefits (e.g. significant reduction in diesel consumption, or export of power to high price market) but are difficult to get financed are generally well suited for leveraging finance by means of ODA contributions. However, grants should encourage, rather than prevent, economic benefits being internalized in the up-front financing and tariff levels. Only once this has been done, should donors provide up-front grants. In other words grants should be targeted at leveraging finance, not allowing policy makers to avoid realistic reforms.</li> </ul>			<p><b>Operational recommendations:</b></p> <ul style="list-style-type: none"> <li>Interact with investors from an early stage, as if the barrier addressed and/or general structure of the support mechanism is not amenable/attractive to investors, significant transaction costs are likely to be used with limited effect.</li> <li>Developed countries have used market development mechanisms in clean energy for many years and any country program should be informed by these experiences.</li> <li>These mechanisms are rather untested in developing countries and they would imply a fundamental change in the way donors do business. This is primarily because they will imply substantial long-term commitments, which would mark a shift away from current 'light handed' approach of donors. It will also imply an operational dependency on donor/external finance for a number of years.</li> <li>Given the above, donors will likely want to; i) define programs on an auction or first-come-first-serve basis, with fixed budgets, ii) target small-scale projects, and/or iii) team up with other donors/multilaterals.</li> <li>It is not clear, particularly for on-grid renewable energy projects, that OBA for kWh delivered (FIT) is superior to OBA for KW installed. First, payment based on KW installed (on time and on budget) helps alleviate financial constraints faced by many countries. Second, given a very small operational cost, it is unlikely that the project will be abandoned or operated sub-optimally as long as some financial incentives remain.</li> <li>These mechanisms are likely particularly well suited for small-scale rural energy solutions, as; i) the financial commitments can be limited, ii) it is highly unlikely that authorities will be successful in picking the best technology and business model solution(s) over time, iii) this type of support will drive business model innovation, and iv) one can avoid significant transaction costs relative to the small investments of individual projects.</li> </ul>			

## **9                    CONSIDERATION OF NEW PFMs**

Thus far, the report has presented a bottom-up approach to identifying the most critical means by which PFMs, particularly, ODA can have a real positive impact in leveraging PPPs in clean energy. Additionally, Norad has taken into consideration a number of potential concrete ideas/proposals that have originated in various forum, including; Norad, Embassies, Clean Energy Working Group, IFC and interviewees.

*Table 9.1 Possible new PFMs to consider*

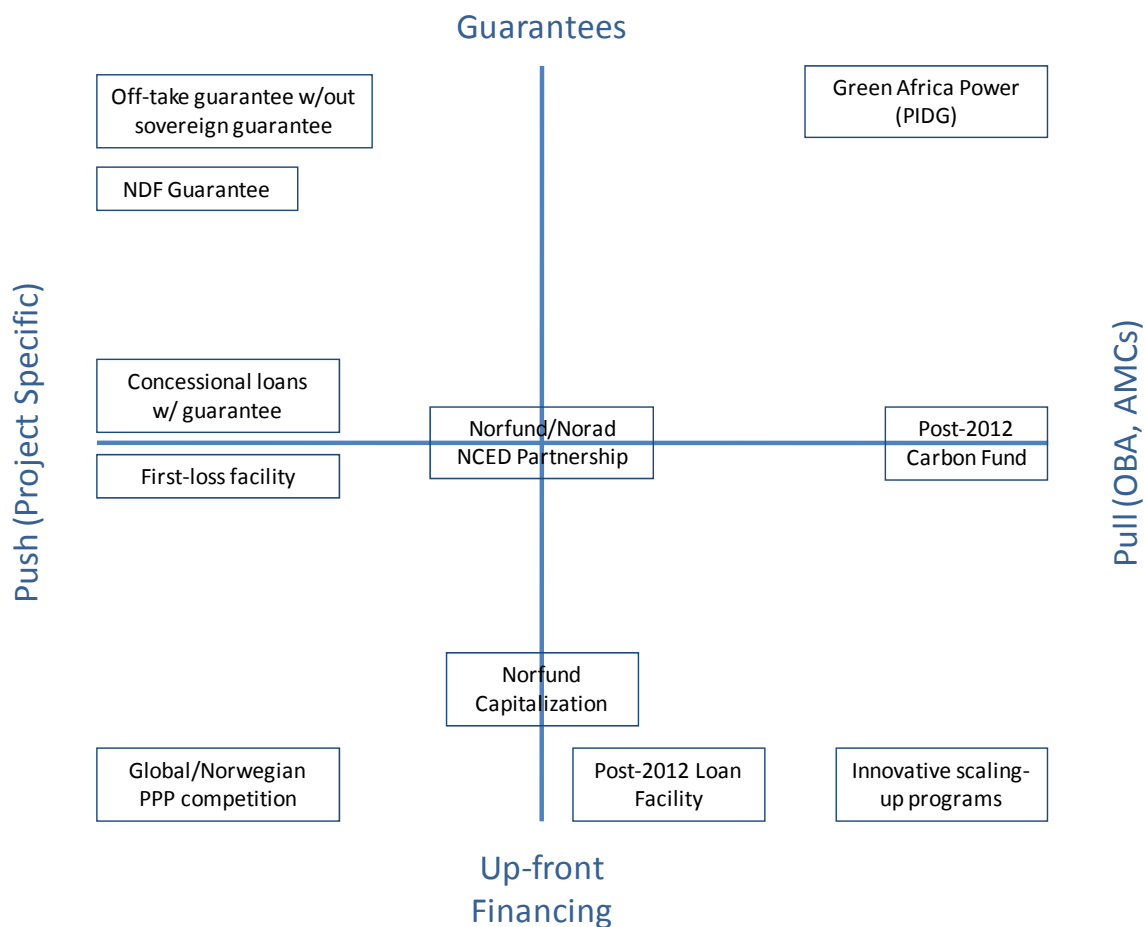
PFM Type	Specific Mechanism	Brief Description	Consideration
Concessional lending	Untied concessional lending and guarantee facility	With the mobilization of private investment as a key objective, concessional lending is a natural instrument to consider. The candidate PFM would learn from difficulties in the previous mixed credit program and probably be similar to the untied instrument now being implemented by SIDA. See Annex II for more on SIDA’s scheme	The potential leverage effect is large – both direct and indirect. This instrument would however either require a significant administrative and personnel change at Norad or a strategic cooperation with Norfund. The team has not been convinced that there is a particular role for a Norwegian lending facility that would justify this change. Seen from a leverage point of view, a contribution to a multilateral institution would likely prove equally/more effective.
	Green Africa Power (PIDG - AMC)	An internationally capitalized fund to purchase new renewable energy at a premium price and sold on to utility, at a loss in the near term. Fund would retain ownership of CERs. Contact person: Andrew Reicher, PIDG Or Ryan Anderson, Norad	Addresses two main critical barriers – the ability to pay and credit worthiness of the off-taker. Could represent one of few mechanisms designed for significant delivery of mitigation finance, while also contributing to increased access. Implies increased financial stake of developed countries in functioning of carbon market. However, PFM would represent substantial contributions and liabilities over a long period, as well as a change in the nature of the relationship between donor and recipient, with donors playing an important role in recipient country power sector.
Innovative off-take guarantees	PPA Off-take guarantee without explicit sovereign guarantee Off-grid programs	Enter into dialogue with MIGA, IFC, GIEK and 1-2 partner countries regarding the potential for partially donor financed/backed PPA guarantees that don’t require sovereign guarantees. Partner with other donors and the World Bank to explore solutions to the off-take risk that in most cases represents a show-stopper risk for rural electrification. The overall aim would be to establish some type of guarantee that is backed by a national umbrella organization or government entity that could be applied at the village level and rolled out.	While implementation of such a mechanism is likely some time off, as well as difficult for a donor to implement, large-scale rolling out of grid-connected renewable energy will likely require innovative international partnerships to overcome the credit risks of projects. As noted below, Norway should consider focused 1-3 country rural energy programs. This proposal could be a part of such a program. The proposal is hereby presented by Norad as potential alleviation of a critical bottleneck, which has the potential for replication if successful.
Targeted Equity Grant Contributions	PPP Competition IFC Mezanine First Loss	Follow the German model and introduce an annual competition for PPP grants. Possibly consider including both Norfund and IFC projects in the competition. NUMI and ENA are discussing piloting the idea within renewable energy. Contact Person: Mari Sofie Furum or Ryan Anderson, Norad IFC has proposed a Norwegian contribution to their renewable energy facility whereby Norway provides ‘first-loss’ capital for relevant projects. This will act as a type of guarantee, particularly for equity providers, against certain risks – including commercial	This mechanism has been tentatively proposed by consultants that have been hired by NUMI to consider a new structure for their so-called OPS grant scheme. The proposal, at this stage, is simply to look more closely at the German experience. ENA (Norad) views this as potentially a step in the right direction, with the biggest concern being the demand for the grants, and thus eventual quality of projects to be supported. This is why ENA has recommended considering strategic partnerships – e.g. the proposed IFC Mezanine scheme. Appears to be a highly effective manner for delivering grants to projects in a manner which both will leverage private investment both directly and indirectly, introducing an element of guarantees which is often cited by investors as a desirable role by donors. Initial grants could be awarded on a

PFM Type	Specific Mechanism	Brief Description	Consideration
		risks. Contact Person: Wi Jen Leow, IFC	project basis, but allow reuse of these funds at IFC upon repayment by project. Norad's PPP mechanism could be used to select projects. The mechanism is unique in that it combines up-front financing with risk mitigation for investors and represents a mechanism for delivering a type of guarantee in manner and size that is manageable for a bilateral donor.
	Output Based Aid (OBA) & Advanced Market Commitments (AMCs)	This type of support implies a transition from project-specific support to sector-wide market development. These mechanisms make available financial rewards as a result of realized outputs – e.g. MWh delivered, MW installed, or business model innovation. These mechanisms require significant up-front transaction costs but is meant to establish clear rules and procedures to make the support available to private investors, so as to allow up-front financing. Norad views these support mechanisms as the likely approach to improving the ability/willingness of donors and multilaterals to work with the private sector.	As donors look to both; provide sector-wide support, rather than project-specific, and; make donor support more accessible to private investors (especially for small-scale projects) these type of "pull" approaches will likely have to become more prevalent. AMCs are being actively considered and tested by DFID. Norway will also have to consider this class of mechanisms in light of its on-going consideration of Energy+. This type of support is being considered in India, in cooperation with DFID. It has been discussed that Norway could consider a follow-up conference to the DFID conference in January, 2009. Finally, Norad has encouraged MFA to encourage SREP to incorporate these types of mechanisms in their Financing Modalities.
	Norfund Capital Increase/NCEP	See section below on the Norfund-Norad proposed Norwegian Clean Energy Partnership.	Norad views this partnership as the best candidate mechanism for significantly and rapidly scaling up clean energy support and maximizing the leverage effect of this support. It also offers an opportunity for a genuine PPP, including an opportunity for an innovative role for ODA/Norad by means of the proposed first-loss mechanism.
	Norfund Post-2012 loan facility	Norfund targets small scale, preferably Programmatic CDM projects to provide loans based on future CER generation. Would be among first of a kind. Contact Person: Mark Davis, Norfund	Norad has concluded that the fundamentals of the carbon market do not make it attractive for interventions targeted at mobilizing private investment. However, at some point, this type of loan facility must be demonstrated, if CDM is indeed to generate significant upfront financing to renewable energy projects. Further, the fact that it targets small-scale projects means that the poor will likely be beneficiaries.
Carbon Finance	NDF – Nordic Climate Guarantee Facility	Named a Climate Guarantee, but appears more as a standard equity guarantee facilitated earmarked for clean energy projects. However, it can explicitly guarantee against future CER revenues. Contact Person: Helge Semb, NDF	This facility is arguably better positioned to offer Nordic investors in clean energy a fully untied guarantee than export agencies. In the face of Norwegian investors with increasing sophistication and international components, this could offer greater flexibility. However, it is not clear that NDF has the competence or structure to scale this facility up. More specifically, it is likely not the case that an NDF facility would have a larger leverage effect of a similar facility managed by IFC.
	IFC Post 2012 Carbon Fund	Partner with IFC to purchase post-2012 CERS. IFC contributes with risk sharing products and/or financing, as well as capacity building to local partner banks. Contact Person: Wi Jen Leow, IFC	Appears to be a useful, complimentary approach to packaging CER purchases with up-front financing. Leverage effect of CER purchases is not obvious however. Nonetheless, this could be a mode for purchasing CERS which entails a much higher development impact than bilateral purchases by the Finance Department. To that end, a relationship between FD and IFC could be facilitated.



PFM Type	Specific Mechanism	Brief Description	Consideration
Multilateral Initiatives	See Annex IV		
Rural Energy	Country Scaling-up Programs	Selection of 1-3 countries in which to focus Norwegian efforts on maximizing grant money and pursuing a large scale rural-electrication program with partner countries. Should maintain focus on consistent progress towards commercial viability by means of business model (not technology) innovation.	This proposal is hereby presented by Norad to fill the gap of what is widely seen as a lack of poverty focus in Norwegian power sector assistance. It is meant to present a structured and focused proposal to approaching this issue and avoiding ad-hoc projects in partner countries. If Norway is to get serious about rural energy access, it should aim to contribute to the global progress in the field and not just focus on access in a given project. Rural energy service is a broad category (e.g. solar lanterns v. full electrification), and Norway should focus on certain business models and not expect to tackle all types.
	Telecom based scaling-up	<p>Could be seen as a specific proposal for the above. Involves using the enormous growth of telecom base stations so as to provide favorable economics and sustainability to rural electrification in relevant communities.</p> <p>For more info on this concept and the potential, see: <a href="http://www.gsmworld.com/our-work/mobile_planet/green_power_for_mobile/4599.htm">http://www.gsmworld.com/our-work/mobile_planet/green_power_for_mobile/4599.htm</a>.</p>	Norad views this proposal as highly interesting and goes a long way in addressing many of the barriers to rolling out rural electrification. In addition, the proposal aligns the interests of the telecom operator with that of the communities. The mere fact that thousands of stations based on diesel generation are being constructed every month indicates the potential for rolling out. Norad is familiar with a number of companies exploring this concept and would propose entering into a strategic dialogue regarding a partnership.
Public Counterparts	Scaling up and professionalization of ICH	<p>Demonstrate Norway's commitment as a global leader in promoting hydropower in Africa by significantly scaling up and broadening the scope of ICH. Norad and ICH enter into strategic partnership and use it as a flagship to export BOTH top Norwegian and International competence and encourage cooperation among African countries. Should include the establishment of at least one African training center, with meaningful and resourceful partnership with an African partner/s. Must include expanding scope of work to include among others project financing, project planning, PPP structures, project structuring and tendering, and negotiations.</p> <p>Contact Persons: Ryan Anderson, Norad and Tore S. Jørgensen, ICH</p>	This proposal is made by Norad as a means of professionalizing Norway's general capacity building within hydropower. Additionally, and perhaps more importantly, it is meant to provide the basis for the technical and commercial competence to carry out a regional program to assist regional governments in becoming a competent counterpart in PPPs. Further, ICH would also be a basis for a proposed intensified Norwegian effort to promote hydropower through Multilateral Institutions. Finally, ICH should make strategic partnerships with other similar international initiatives so as to be at the forefront of pursuing innovative PPPs in hydropower in cooperation with partner countries.

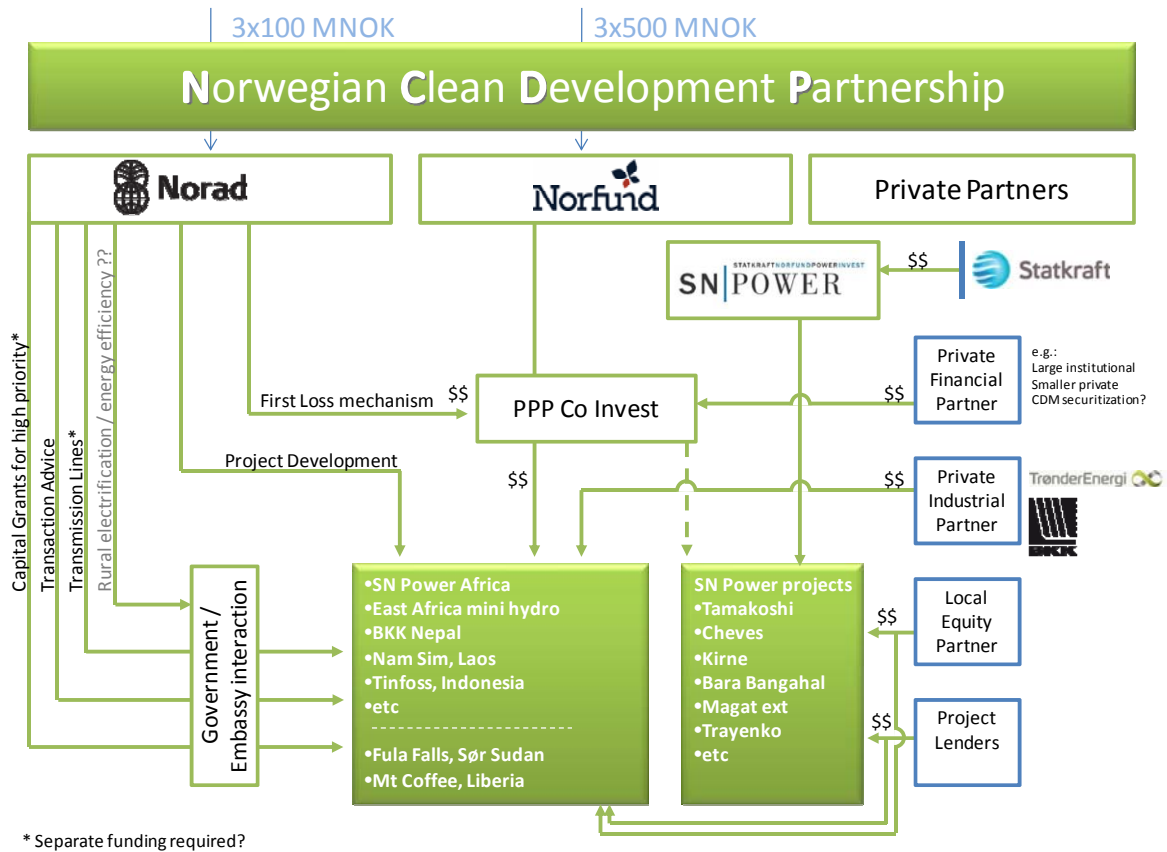
Figure 9.1 Visualizing how the individual PFMs considered above fit into the overall framework



### A Norwegian Clean Energy Partnership

Based on discussions regarding Norwegian development policy/priorities, the development of this report and an attractive project pipeline at Norfund, Norfund and Norad have worked out a proposed Norwegian Clean Energy Partnership (NCEP), as illustrated in Figure 9.2. The three main components of this partnership include; i) a co-investment vehicle which facilitates investment by industrial and financial investors in specific projects, ii) a first-loss facility managed by Norad meant to mitigate risk to equity holders and thereby make specific projects more attractive for investors, and; iii) the possibility for coordination between project developments and Norwegian technical and financial support primarily through Embassies. Norad views this as a pragmatic solution that utilizes Norfund’s project pipeline and international experience to mobilize private investors, while allowing for a value-added partnership between Norfund, Norad and Embassies.

Figure 9.2 The Norwegian Clean Development Partnership



## 9 Recommendations for targeted PFMs

9. **Clean Energy for Development Initiative (CEI) – towards a more coordinated and results-based initiative.** In the absence of a *global* clean energy program in the Norwegian development portfolio, the CEI should become more focused on pursuing and coordinating actual results in Embassies’ clean energy programs. That is, CEI should establish specific measurable goals for all additional funds earmarked for clean energy. These should be simple in terms of measuring and communicating – e.g. i) new MW installed (also due to leveraging), ii) new MWh produced, iii) HHs provided with modern energy services, and iv) reduction in GHG emissions. By explicitly targeting these outcomes, the CEI will; be more focused and clear regarding the target outcomes; have increased incentive in sharing and applying good practices across embassies and; gain increased influence with respect to Embassies in targeting outcomes. Finally, this will allow for a structure/organization of new funds which is largely consistent with immediate (reporting) challenges concerning climate finance delivery. A results-based CEI and associated governance structure (including some decision-making/prioritization powers) should be launched in 2011 and be the focus of the CEI Annual Report 2011.

10. **Renewable Energy Financing Group (REF) at Norad.** Norad hereby launches a Group meant to provide targeted assistance to embassies in contributing to the realization of priority clean energy projects that have a public-private partnership (PPP) profile. The group will have the target objective of; “in partnership with public and private stakeholders, achieve financial closure for 1-3 medium-to-large scale hydropower projects in LDC(s) within 18 months and thereby leverage significant additional funding to clean energy projects”. REF will remain focused on 3-4 projects at any given time and will evaluate priority/candidate projects at the various embassies on a continuous basis. Full embassy support for REF’s involvement will be a pre-requisite and REF will maintain a limited budget for project-targeted consultancy at its disposal.

11. **Norwegian Clean Energy Partnership.** The CEI and Norfund hereby propose the establishment of the Norwegian Clean Energy Partnership between Norfund-Norad-Embassies. Norad views this as the best candidate mechanism for significantly and rapidly scaling up bilateral clean energy support and maximizing the leverage effect of this support. It also offers an opportunity for a genuine PPP, including an opportunity for an innovative role for ODA/Norad by means of the proposed first-loss mechanism. A potential strategic/scaled-up partnership between ICH and Norad should also be considered under this umbrella partnership.
12. **Supporting Government as a counterpart.** In relevant countries, technical assistance and institutional cooperation programs should be structured around the overall goal of *realizing* hydropower projects. Assistance should be provided/timed so as to address critical barriers and thereby help move projects up the financing pyramid. Broadly speaking, this involves providing international expertise and capacity building to help realize the project(s) as well as maximize the benefits to the country. According to investors and Norad's own experience, this is a particularly relevant bottleneck on large projects. CEI should be provided some NOK30-50m per year and a mandate to target specific project opportunities (PPPs) in partner countries with scaled up and targeted assistance tied to the implementation of large-scale projects, including cross-border power export projects. This should be a Norad facility, in cooperation with International Center for Hydropower, specific multilateral initiatives including PPIAF and ESMAP, and leading international expertise, by means of a framework agreement.
13. **Financial contributions to large scale (hydro) projects.** Embassies should diligently carry out an 'investment barriers analysis', in consultation with the private investor, and ask critical questions which cover each of the elements presented in the pyramid framework introduced in this report. Ensure that contributions are aimed at realizing economic benefits for the country into up-front financing – typically in the form of civil works. Alleviating up-front capital costs and providing enabling risk coverage will likely continue to be more relevant than OBA-type contributions for these types of projects.
14. **From (pre-) feasibility studies to PPP programs.** Embassies must take a commercial perspective when offering support to feasibility studies, river master plans, etc. Likewise, Norad should be critical and demand that i) Embassies or implementing partners demonstrate/document that the given project is among the most attractive sites/rivers for investors, and ii) the study is the natural next step in a defined program to bring the project forward towards financial closure. In many cases, if these elements are not present, support is better directed to either multilateral activities (e.g. CTF) or other donor supported projects.
15. **Rural energy.** Carry out support activities only in the frame of country-wide rural energy programs, either in the form of support to a 'franchise program' (e.g. telecom proposal) or OBA support mechanisms. Discourage ad-hoc, opportunistic support to rural electrification projects. More generally, the embassies and Norad must collaborate to ensure that consecutive projects share lessons learned and Norwegian support should maintain an unwavering focus on *business model* innovation in rural energy solutions and progressing towards commercial viability – i.e. leveraging more and more private investment.
16. **First-loss financing.** Norad views the proposed first-loss facility concept as particularly interesting in terms of leveraging finance and innovation, as it allows for both risk mitigation while also providing up-front financing (instead of loss-reserves for a guarantee). This facility can be employed in a strategic partnership with **IFC** and/or **Norfund**, and should be channelled through Norad on a project-by-project basis. Additionally, it could be included as a component of a PPP competition hosted by a NUMI/ENA (Norad) cooperation.
17. **Multilateral.** It is noted that the CTF administrators claim a public:private investment ratio of about 1:3 – this should thus be the benchmark for bilateral initiatives. Based on the analysis in this report and a review of potential multilateral channels, increased contributions to **SREP** should be considered. SREP targets many of the most critical barriers discussed in

this report and explicitly targets leveraging of private investment. Norad is positive to the approach of SREP to focus on a few countries, which also implies a direct link between additional funding and additional countries. SREP has a clear potential to absorb significant additional capitalization and a substantial (additional) contribution could award Norway significant weight in the determination of priorities and modalities of the program. Providing first-loss capital to **IFCs Renewable Energy Mezzanine Finance facility** is also a highly attractive program in terms of leveraging private investment to rather advanced project concepts/proposals.

18. **Energy+.** A real partnership which involves a significant, rapid and coordinated scaling up of public contributions to clean energy will almost surely require a shift from project-by-project support (push mechanisms) to market development mechanisms (pull mechanisms – OBA). This will likely require that donors and multilaterals concede control on which projects/developers receive the support, but is likely the only way of overcoming the institutional/fundamental challenges that plague cooperation between donors and private investors. As long as increasing energy access is a major goal of Energy+, both higher costs of renewable energy and off-take risks will likely have to be addressed. A potential starting point for Energy+ may be to identify the (many) barriers which are not easily addressed by ODA, rather than seeing Energy+ in light of the existing/traditional governing structures of ODA. Any global mechanism that is successful in making a significant contribution to scaling up access to modern and clean energy will be simple, predictable and easily accessible to private investors.

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