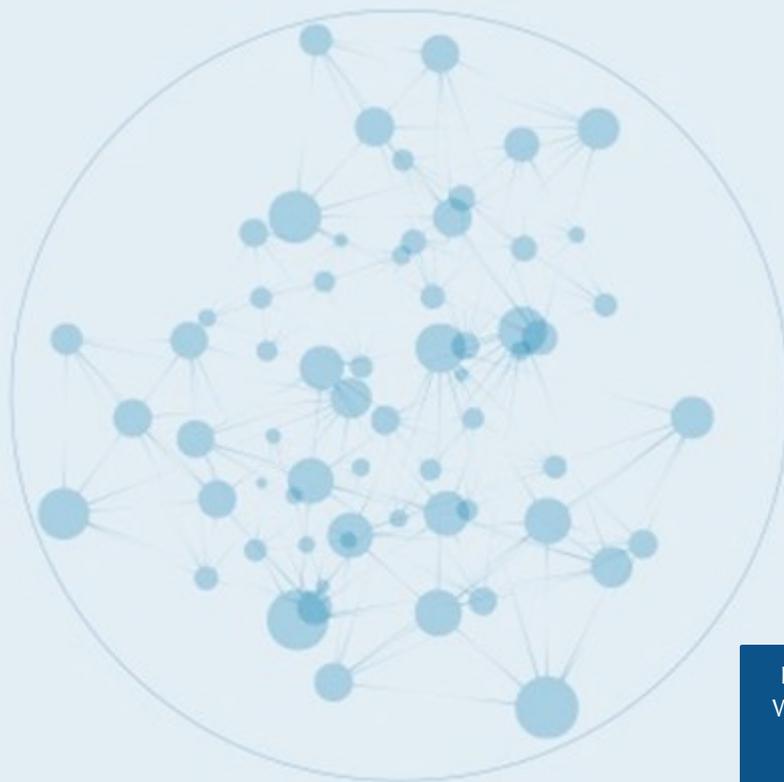




THE ROLE OF POLICY- DRIVEN INSTITUTIONS IN DEVELOPING NATIONAL FINANCIAL SYSTEMS FOR LONG-TERM GROWTH



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The UNEP Inquiry

The Inquiry into the Design of a Sustainable Financial System has been initiated by the United Nations Environment Programme to advance policy options to improve the financial system's effectiveness in mobilizing capital towards a green and inclusive economy—in other words, sustainable development. Established in January 2014, it will publish its final report in October 2015.

More information on the Inquiry is at: www.unep.org/inquiry or from: Ms. Mahenau Agha, Director of Outreach mahenau.gha@unep.org.

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About this report

This working paper results from a workshop the UNEP Inquiry and CIGI held on 2-3 December 2014 in Waterloo, Canada to discuss options for a sustainable global financial system. The workshop included participants from a range of academic and research institutions from the Waterloo region and abroad, including the University of Waterloo, the University of London, Harvard University, and the University of Gothenburg.

Comments are welcome and should be sent to simon.zadek@unep.org.

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Abstract

Access to affordable, long-term finance is a pre-condition for sustainable development. High financing costs in developing countries penalize green investment because of their higher upfront capital requirements. To facilitate access to long-term affordable finance for sustainable development, governments in developing countries are designing and implementing green industrial policies to de-risk clean technology investment by removing technology-specific investment barriers. Over the past ten years, the number of countries promoting renewable energy with direct policy support has nearly tripled, from 48 to over 140, and an ever-increasing number of developing and emerging countries are setting renewable energy targets and enacting support policies.

While establishing an adequate technology-specific policy environment is critical to mobilize private finance for sustainable development, the depth and diversity of national financial markets are also important determinants of the conditions under which private sector investment occurs. Developing countries tend to have weak financial systems, with local capital markets lacking long-term financial products in domestic currencies and under-developed financial intermediation, sometimes in combination with excess liquidity in the banking system. The degree to which countries are able to overcome these barriers and influence the allocation of lending to the private sector varies. Some countries have relied on directed credit to achieve public policy goals. Others are experimenting with regulatory or financial incentives. The past few years have also seen a growing interest in policy-driven institutions – such as national development banks (NDBs) and national green funds (NGFs) – to provide grants, credit-enhancement instruments or lend directly to project proponents in specific green sectors.

Billions of dollars are allocated by governments to support these interventions. Yet, there remains a gap in our understanding of their comparative effectiveness to deepen national financial systems. As part of ongoing efforts to bridge this gap, the paper discusses the role of NGFs in catalysing institutional innovations and facilitating access to long-term affordable finance for green, low carbon and climate resilient investment. It is divided into three sections. Section 1 lays out some of the challenges associated with raising private sector financing for sustainable development in developing countries. Section 2 reviews existing strategies to develop national financial systems. Section 3 adopts an ecosystem lens to assess the possible roles of NGFs in deepening national financial systems.

The paper concludes that there has been a disproportionate level of focus on the capacity of NGFs to manage international green and climate finance. While NGFs could play a supporting role in the design and implementation of NAMAs, their direct capitalization from international sources is likely to remain limited. The paper argues that the key added value of NGFs might lay in their capacity to foster institutional innovations and partner with other financial and regulatory institutions in such a way as to increase the diversity and depth of local financial markets and enhance the domestic supply of green finance.

1 Opportunities and challenges for financing sustainability

Sustainable development in developing countries involves the promotion of high levels of domestic savings and investment, as well as the efficient allocation of these funds to green, low carbon and climate resilient skills, technologies and infrastructure. This first section discusses some of the opportunities and challenges faced in meeting these objectives.

1.1 Investment Needs and Gaps

The transition to sustainable development will involve trillions of dollars of new investment annually, and the reallocation of many tens of trillions of dollars of existing assets that underpin today's unsustainable economy (UNEP, 2014a). For example, the World Economic Forum (2014) projects that by 2020, about US\$5.7 trillion will need to be invested annually in green infrastructure to build new transport, energy and buildings infrastructure which is cleaner and more resilient, much of which will be in today's developing world. This will involve shifting the world's annual US\$5 trillion in business-as-usual investments into green investments, as well as mobilizing an additional US\$700 billion annually in additional investment to ensure this shift actually happens.

It is critically important to distinguish additional investment from additional costs. In many sectors, investments required for a transformation of the global economic system are potentially profitable. Investment in energy and resource efficiency not only reduces resource consumption and pollution loads but also generates attractive returns on investment. McKinsey (2011) estimates that potential efficiency gains in the energy, water, waste and transport sectors could unlock annual savings to society of US\$2.9 trillion by 2030, at current market prices. Importantly, developing countries account for 70 to 85 per cent of resource productivity opportunities.

The existence of significant potential for sustainable development investments should make a compelling case for businesses, private investors and households to independently adopt green, low carbon and climate resilient technologies and practices. However, total investment in renewable power and fuels (excluding large hydro-electric projects) actually fell for the second year running in 2013 after years of rapid growth, reaching US\$214 billion worldwide, some 14% lower than in 2012 and 23% below the 2011 record. The decline reflected a sharp fall in solar system prices but also the effects of policy uncertainty in many countries.

Thus, there remains a significant gap between the global investment needs and current levels of investment. The investment gap is particularly critical in low income countries that account for an even more modest share of investment flows (US\$10-20 billion). While South Africa attracted US\$4.8 billion in large scale renewable energy investment, the rest of Africa accounted for less than 1% of total investment (UNEP, BNEF, 2014).

This regional unevenness substantially compounds the global energy transition challenge. Under the IEA baseline case forecast (2014), non-OECD markets are expected to account for around 70% of new renewable power generation from 2013-20. Renewables are projected to meet only 35% of fast-growing electricity needs through 2020, illustrating the still-significant role of fossil fuels and large upside for greater renewable growth (IEA, 2014).

1.2 Barriers to climate investments

Investment in seemingly profitable opportunities faces a range of informational, technical, institutional and financial barriers. The following is a non-exhaustive list of generic barriers to green, low carbon and climate-resilient investment clustered into five key categories:

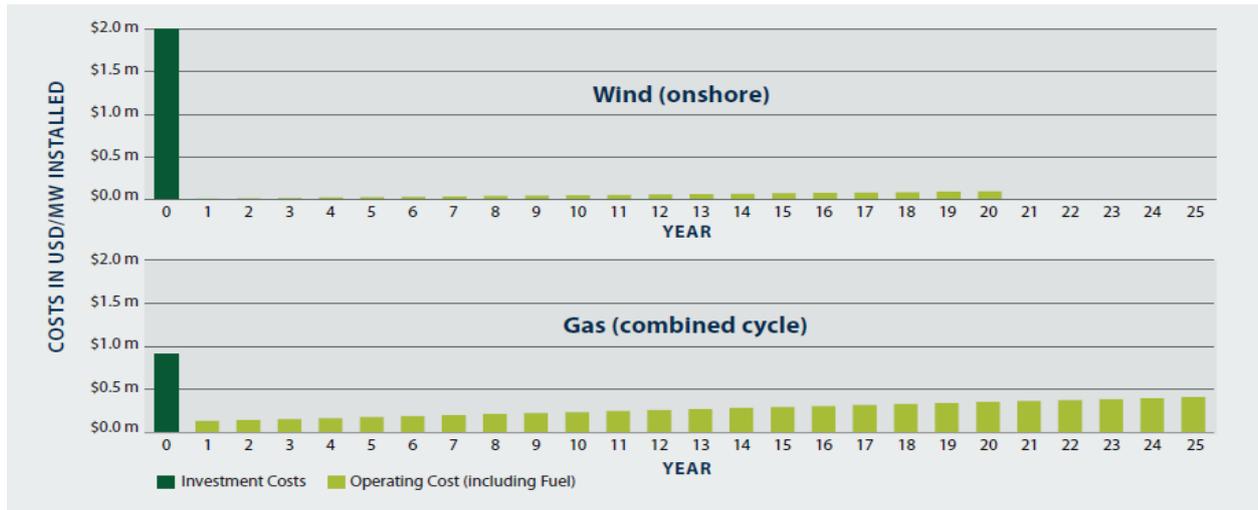
- *Information and awareness barriers:* the business community in developing countries has a limited awareness of the risks and opportunities associated with global environmental changes and the transition to green, low carbon and climate resilient development pathways. Even if a business is aware of climate risks, it is difficult to integrate scientific information on long-term climate change scenarios into site-specific short-term business plans (UNEP, 2011a).
- *Technical and capacity barriers:* technical skills to adopt and adapt green technologies and practices are in short supply and technical standards and quality assurance mechanisms are missing for new clean technologies.
- *Institutional and regulatory barriers:* lack of integration of climate and environment risks into legislation and codes (building codes, land zoning, safety codes, etc.), insufficient enforcement of existing regulations (environmental and social impact assessments, land tenure regimes, green procurement, etc.); complex, inconsistent or opaque licensing procedures for green investment leading to transaction delays and costs.
- *Market barriers:* green markets often suffer from uncertainty on market size, entrenched monopolies and policy barriers to new market entrants, difficulty to convert social benefits into private profits and mismatch between time horizons of costs and benefits.
- *Financial barriers:* Budgets are lacking to implement public policies and strategies and provide critical public services (rule of law, security, etc.); access to international capital markets is limited and local capital markets are under-developed to finance investment projects.

All these investment barriers translate into perceived higher risks and thus higher financing costs. Providers of financing require a higher return and will offer less attractive financing terms to compensate themselves for these higher risks. In practice this translates into higher interest rates (debt), required returns (equity), shorter loan tenors and a higher share of more costly equity in capital structures.

These high financing cost environments in developing countries particularly penalize clean investment when compared to conventional investment because of their respective cost profiles. Many green infrastructure and technologies typically have higher upfront capital requirements in exchange for lower operations and maintenance costs.

As an illustration, Figure 1 shows the different cost profiles of electricity generation from onshore wind energy and combined-cycle gas plants. Investment costs account for approximately 80% of the total lifetime technology costs for wind energy but only account for around 15% in the case of gas (Waissbein et al., 2013). Conversely, annual operating costs are relatively low for wind energy but predominate in the case of gas. Likewise, climate resilient roads will have higher construction costs than climate vulnerable roads but require less operation and maintenance work.

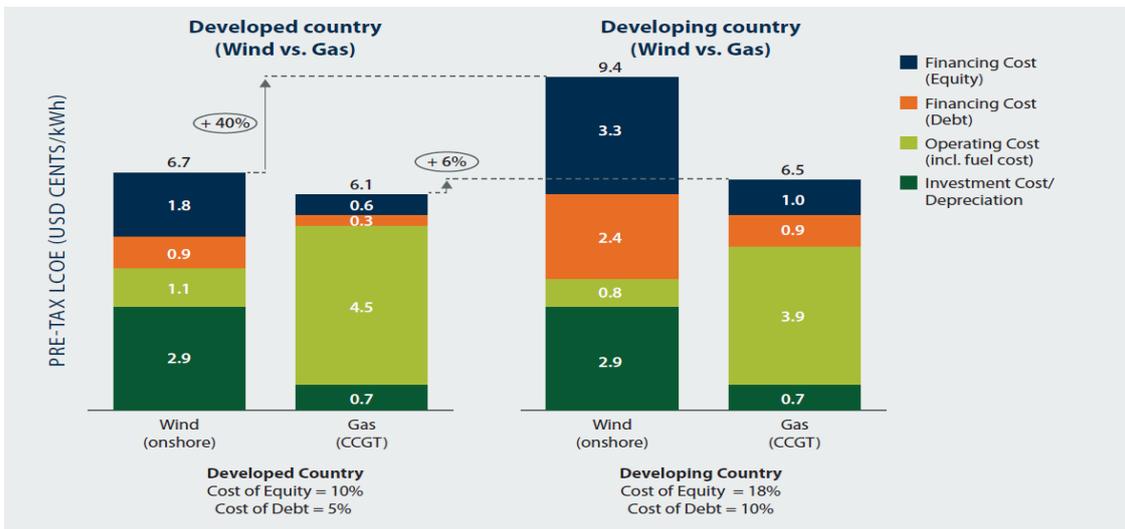
Figure 1: Capital Intensity of Clean Technologies



Source: Weissbein et al., 2013

High financing costs will dramatically impact the competitiveness of green, low carbon and climate resilient clean technologies and infrastructure. Figure 2 compares the levelized cost of electricity (LCOE) of onshore wind energy and combined-cycle gas in a developed and developing country. In a developed country benefiting from low financing costs, wind power can be almost cost-competitive with gas. In a developing country with higher financing costs, wind power generation cost becomes 40 percent more expensive than in a developed country. In contrast, gas only becomes 6 percent more expensive due to these higher financing costs. Thus, in a typical developing country, wind power is no longer competitive with gas, simply because of the impact of high financing costs.

Figure 2: The Impact of financing costs on wind and gas power generation costs



Source: Weissbein et al., 2013

This sensitivity of climate investments to financing costs is central to the challenge of reallocating private sector flows from business-as-usual to climate-friendly activities. If private finance for sustainable development is to be mobilized at the scale required to meet the world’s pressing environmental challenges in a timely manner, a key objective must be to provide access to large quantities of low-cost and long-term (with respect to loan tenors) financing.

In order to address this, governments seeking to facilitate access to long-term affordable finance for sustainable development are designing and implementing green industrial policies to de-risk clean technology investment. By removing technology-specific investment barriers, providers of debt and equity can offer lower financing costs and more attractive financing terms, reflecting the lower risks in the investment environment (Glemarec, 2011; Glemarec et al., 2013; Waissbein et al., 2013). Since 2004, the number of countries promoting renewable energy with direct policy support has nearly tripled, from 48 to over 140, and an ever-increasing number of developing and emerging countries are setting renewable energy targets and enacting support policies (REN21, 2014).

1.3 The importance of national financial systems for sustainable development

While establishing an adequate technology-specific policy environment is critical to the mobilization of green private finance, the depth and diversity of national financial markets are also important determinants of the conditions under which private sector investment occurs. Developing countries have been benefiting from the recent appetite of investors for higher yield bonds to increase their access to capital markets. Before 2006, only South Africa had issued a sovereign bond. In 2014, more than a dozen Sub-Saharan countries had done so. Sub-Saharan African countries have raised nearly US\$7 billion during the first three quarters of 2014. The proceeds from the bond sales are used to improve infrastructure, restructure debt and finance deficits (Dealogic, 2014). However, international markets can only be part of the solution. Because of past debt restructuring events, many developing countries are still unrated by the major credit ratings agencies. Only a handful of developing countries are rated BBB and above by S&P, which is considered as the lowest investment grade by market participants.

Furthermore, the bulk of climate investment comes from the private sector at the local level. 76% of all climate finance is spent by countries entirely within their own borders, reflecting a strong preference of investors for a familiar environment that they perceived as lower risk (CPI, 2013). The importance of local financial markets will keep growing as decentralized renewable energy and energy efficient investments scale up in the coming years. These investments will need to be supported by national financial systems and local currency products.

Financial markets in developing countries are usually immature. Numerous variables have been used to analyse the level of financial development of a country, including: the level of deposits in banks, bank concentration and the level of overall credit provided by the banking sector, in particular to private firms; the size of domestic stock and bond markets; and assets of non-bank institutions such as pension funds and life insurance companies. In most developing countries stock and bond markets are very thin and bank lending represents the largest source of financial intermediation (Freedman and Click, 2006). Furthermore, the banking sector tends to be highly concentrated; reducing the likelihood that more than one bank might be willing to lend to an investor. Table 1 compares key banking indicators across regions.

Table 1: Banking Indicators across Regions

	Credit to the private sector (% GDP)	Bank concentration (% of assets owned by three largest banks)	Deposit money bank assets (% of GDP)
Country average of developing and emerging economies by region			
Sub-Saharan Africa	20.9	81.2	23.3
Latin America and the Caribbean	46.0	66.8	50.6
Europe and Central Asia	45.1	64.6	40.0
East Asia and Pacific	57.3	64.4	53.6
South Asia	40.2	53.2	45.3
Middle East and North Africa	46.7	70.1	64.3
Country average by income group			
High-income	117.8	73.6	117.4
Upper middle-income	50.9	67.5	54.8
Lower middle-income	40.7	64.7	40.3
Low-income	18.8	79.5	21.2
World average	60.0	71.1	62.3

Source: Standley (2010) based on IMF and WB data.

Limited deposits are found often in combination with excess liquidity in the banking system. For instance, the assets of many commercial banks in the sub-Saharan region include non-remunerated liquid assets at levels that significantly exceed statutory requirements. Over the period 1990 and 2009, the ratio of liquid reserves to total assets for the median bank in sub-Saharan Africa (SSA) has varied between 11% and 19%. In comparison, over the same period, the liquid reserves to total assets ratio for the median bank in OECD has not exceeded 5% (Nana and Samson, 2014).

The issue of large bank reserves in developing countries is critical as it freezes funding that could be used to increase the supply of credit for a rapid transition to a green economy. Freedman and Click (2006) estimated that reducing involuntary excess liquidity could translate into billions of dollars in additional financing for infrastructure and private sector development. In a sample of 35 developing countries, they found that these additional resources totalled US\$531 billion.

However, it is difficult to identify a single cause behind the build-up of these large reserves. Institutional constraints such as lack of competition in the banking sector, asymmetric information, or an underdeveloped interbank market and market for government securities are also often cited as key explanatory factors (Saxegaard, 2006).

Limited opportunities for lending and the risk of borrower default might also make banks reluctant to lend to private businesses. Agénor, Aizenman and Hoffmaister (2004) highlight, in particular, the role of increased uncertainty or risk of default as a rationale for commercial banks' voluntary build-up of holdings of non-remunerated liquid assets during the East Asian crisis. Banks make lending decisions largely based on the value of assets pledged by a borrower rather than a borrower's expected revenues and cash flows. To hedge against the risk of borrower default, borrowers must often satisfy collateral requirements well in excess of 150% of the amount of the loan, effectively excluding most potential borrowers from debt financing and, in particular, excluding those desiring to start a new business (Freedman and Click, 2006).

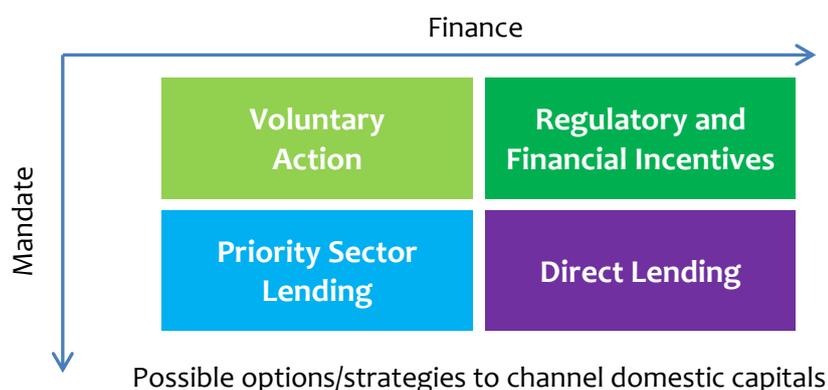
An alternative view underscores the importance of precautionary motives, which lead banks to keep liquid assets as a safeguard against unexpected withdrawals (Nana and Samson, 2014). Underdeveloped and unreliable payment systems in many developing countries are such that banks are likely to face frequent demand for cash withdrawals. Furthermore, the lack of deposit insurance in several countries poses a risk of bank runs. Finally, the fact that capital markets are less developed suggests that banks cannot accommodate liquidity shocks simply by raising new external finance on short notice. (Nana and Samson, 2014). Last and not least, political uncertainty in a number of fragile states may act as a deterrent to long-term investment and encourage high reserves as a buffer.

To unlock finance for long-term growth in developing countries, the public sector will need to adopt a two-pronged approach. It will need to establish an adequate policy environment to reduce technology-specific investment risks (Glemarec, 2011; Glemarec et al, 2013; Waissbein et al, 2013) as well as develop national financial systems. Given the urgency of a green economy transition, both approaches must be implemented in concert.

2 Developing National Financial Systems for Sustainable Development

A variety of interventions can be used to develop national financial systems and provide local access to affordable, long-term finance. To guide the discussion, this section clustered them into four key categories by type of actions: voluntary action; priority sector lending; regulatory or financial incentives as well as direct lending by policy-driven financial institutions.

Figure 3: Strategic approaches to expand supply of affordable, long-term finance



2.1 Voluntary Action

An increasing number of financial institutions in both OECD and developing countries recognize that climate change and ecosystem service degradation increase uncertainty and investment risks, while also producing new opportunities. This growing awareness of the finance community provides an opportunity for policy makers to engage financiers in the design and implementation of voluntary industry instruments that encourage greater lending to low carbon, climate resilient investments. The financial sector can foster action in several areas:

- Design innovative investment products (green bonds, weather indices, catastrophe bonds, etc.) that can mobilize affordable, long-term finance for green investments;
- Develop standards and tools (environmental indices, carbon trackers, etc.) that encourage investment in companies that make a positive contribution to green development;
- Adopt voluntary targets to reduce the carbon content of their portfolio;
- Grow their loan and investment portfolio to green sectors through voluntary industry compacts or individual commitments;
- Request information on carbon and environmental liabilities from prospective borrowers and disinvest from companies with high carbon and environmental risk exposure;
- Support regulatory policy and efforts to address climate change risks and unsustainable commodity supply chains;
- Help policy makers assess any knock-on effects that changes to financial regulations might have on low carbon transition investment and improve the overall policy design and environment; and
- Forge public-private partnership to finance and invest into renewable energy and energy efficiency opportunities in emerging markets.

The finance community has already taken on a number of far-reaching initiatives to change existing lending practices over the past decade. For instance, over 200 financial institutions have signed the UNEP FI Statement of Commitment on Sustainable Development. A number of investor coalitions have been created, including the Principles for Responsible Investment (PRI) Initiative in 2006. Today the PRI

initiative includes close to 1,200 members representing US\$34 trillion of assets under management. In addition to promoting the integration of Environmental and Social Safeguards (ESG) in the due diligence of their members, investor associations have also supported robust public action against climate change. As an illustration, the US-based Investor Network on Climate Risk actively supported pollution standards for power plants (UNEP, 2014).

Despite these significant steps, infrastructure still represents less than 1% of pension fund assets globally, with even lower allocations to low carbon infrastructure (World Bank, 2013). Similarly, only 7% of the global capital market was subject to ESG screening in 2009 (UNEP, 2011b). Incentives throughout the entire financing chain remain misaligned with long-term development goals. Notably, present compensation schemes enable bankers and fund managers to capture short-term upside gains without being penalized for long-term losses. As a result, the 2007/2008 financial collapse hardly affected banking bonuses. While these bonuses were justified before the crisis by the need to align manager incentives with those of the investors, they were defended after the crisis as a necessity to retain talent (Stiglitz, 2012). Whether policy dialogue and voluntary industry initiatives can affect lending practices remains an open question. In the absence of complementary regulatory measures, a concern is that the prevalent short-term investment horizon of the finance industry will limit the effectiveness of ESG standards in highlighting and mitigating long-term investment risks.

2.2 Priority Sector lending

Priority sector lending (also called directed lending) was employed virtually everywhere to promote development of selected industries and to alleviate financial constraints faced by domestic firms. Governments typically implement priority sector lending programs based on the concern that the financial sector might otherwise under-serve socially beneficial projects because of market failures, including underpriced risks, externalities, information asymmetries, or high transaction costs that the private sector is unwilling to bear. Stiglitz et al. (1993) state that in developing countries, banks without directed loans would “not allocate funds to those projects for which the social returns are the highest”.

Policy objectives that may motivate state-directed lending include financial inclusion to expand financing for sectors like SMEs or agriculture, which frequently have a share of credit that is lower than their share of output or to address concerns over income inequality or national security. For example, the unmet annual need for credit for SMEs is estimated to be between US\$2.1 trillion to US\$2.5 trillion in developing countries (Stein et al., 2010). Table 2 summarizes the most common forms and beneficiary sectors of priority sector lending in Asia.

Table 2: Most common forms and beneficiary sectors of priority sector lending in Asia.

Country	Preferential Lending	Priority Sectors
	Loan Quotas	
India	40%	Agriculture (18%), SMEs, export, microfinance
Indonesia	20%	SMEs
Philippines	8%	SMEs (6% small; 2% medium)
Thailand	20% of deposits	Agriculture (14%) and small-scale industries (6%)
	Interest Rate Cap	
Viet Nam	200 basis points above deposit ceiling	Agriculture, SMEs, export, technology
Malaysia	200 basis points above base lending rate	SMEs

Source: Creehan, 2014

However, an extensive body of literature argues that directed lending is a major cause of fiscal distress in developing countries despite some initial positive contribution to growth (World Bank, 1989, Kruk and Haiduk, 2013). Directed lending can place a heavy burden on budgetary resources. Governments do not simply command banks to lend money; they often have to compensate them in the form of direct refinancing, holding of government deposits in concerned banks and direct budgetary subsidies. In essence, governments are the true lenders in disguise, while commercial banks are used as mere intermediaries.

Priority sector lending can also affect banking system stability if recipient sectors suffer asset quality problems. Concerned about mounting asset quality issues in India's banking system, the Reserve Bank of India recently assessed the asset quality of each lending sector. For example, non-performing loan (NPL) figures in India from 2001 to 2013 demonstrate a consistently higher share of NPLs coming from priority sectors, including SMEs. Though SME loans comprised just 8.9% of total credit, they represented 15.1% of NPLs, 6.2 percentage points higher than expected if SME loans were of similar asset quality to overall lending (Creehan, 2014). Directed lending might also result in higher interest rates and/or lower supply of loans for non-priority sectors. Banks might hedge against these negative effects of direct lending on the quality of their assets by charging higher interest rates for non-favoured borrowers and by increasing excess liquidity.

Furthermore, directed lending partially deprives banks of their autonomy to make decisions over the provision of credit. Thus, it weakens the banks' intermediation role. A key function of financial intermediation is to allocate capital to higher yielding projects (Levine, 2005). By circumscribing the capacity of financial intermediaries to act as agents that close information gaps between savers and investors, directed lending can stifle the development of national financial systems and their contribution to economic growth (Kruk and Haiduk, 2013). Priority sector lending requirements may also discourage foreign banks from entering a market to the extent they must follow the same mandate.

Given these risks, some governments have drastically moved away from priority sector lending. In the East-Central European economies, including Poland, Hungary, and Slovakia, bank privatization to

foreigners was one of the tools used to break from past directed lending practices after a series of costly bank recapitalizations as a result of bad debts (Mihalyí, 2004).

Others are adjusting existing priority sector lending approaches to minimize economic distortions. For instance, India is contemplating a system of Priority Sector Lending Certificates (PSLCs) that would replace strict directed lending quotas. PSLCS would be a hybrid directed lending quotas/certificate trading system. Qualified lenders that would lend to priority sectors would earn a PSLC, and could then sell them to another banking institution seeking to fulfil a priority sector lending quota. Loans would remain on the books of the originating institution and banks seeking to meet their quotas via PSLCs would not assume any risk (Creehan, 2014). As seen with GHG emission trading systems, the administrative costs of establishing and operating PSLCs is likely to be high in under-developed financial systems.

As another alternative to strict quotas, one proposal has been for central banks to establish differentiated reserve ratios on loans for green investments. For example, the Central Bank of Lebanon has enabled commercial banks to use part of their mandatory reserves to make low cost, long-term loans to clean energy projects (UNEP, 2014b). The theoretical justification for this innovation is that commissioned clean energy projects are less risky than conventional fossil fuel projects as they are not exposed to fossil fuel price volatility. However, differentiated reserve ratios will be of limited impact in countries suffering from excess involuntary reserves.

2.3 Regulatory and Financial Incentives

Governments are also exploring regulatory and financial incentives to encourage the supply of loans for under-banked sectors.

A first option is to remove the generic institutional and legal barriers that deter the supply of credit to infrastructure and the private sector in developing countries. Barriers include poor contract enforcement and inadequate collateral laws that render it difficult for lenders to obtain recoveries from defaulters. In the absence of credible contract enforcement mechanisms, collateral assets are critical to access finance. According to Honohan and Beck (2007), the main reason why individuals are denied loans is insufficient collateral, which is the result of inadequate documentation for ownership claims. Strengthening judicial systems and the enforcement of regulations are also central to deepening national financial systems (Dahou et al, 2009). Although there is a strong consensus on the importance of removing structural lending barriers, it is recognized that it is a long-term project that involves deep rooted governance issues and extends far beyond the boundaries of finance.

A complementary regulatory avenue is to address misaligned incentives that encourage short-termism in the finance industry and penalize long-term green investment. A critical ingredient in regulation is how firms compensate risk takers. In the wake of the 2007/2008 financial collapse, a number of policy makers and academics have proposed modifying incentives for bankers and fund managers to reduce the boom-bust behaviour of financial markets and promote the adoption of long-term investment horizons. As discussed earlier, voluntary action is unlikely to resolve this issue. A regulatory solution would provide that any bonus would be accumulated in an escrow account. This could be cashed only after a period equivalent to an average full cycle of economic activity has taken place (Griffith-Jones et al, 2010). As considered by the European parliament, another solution would be to cap bonuses. A third would be to hold bankers and fund managers legally responsible for taking excessive risks in managing other people's

money. Money managers would be asked to exercise the highest degree of fiduciary responsibility in line with their published objectives and could face lawsuits for improper conduct (Griffith-Jones et al, 2010).

While regulations to address short-termism in the finance industry remain a work-in-progress, a number of countries have also taken steps to mandate environmental and social risk assessment as part of financial due diligence. This approach is particularly popular in developing countries. However, loan officers might find it difficult to conduct meaningful environmental assessments in the absence of appropriate environmental databases, tools and skills. In such a context, environmental and social impact assessments risk becoming a perfunctory requirement, inducing a false sense of security without tangible impact on lending practices. Stringent enforcement of mandatory environmental and social standards on the other hand is likely to discriminate against small financial institutions, critical to the stability and creativity of financial systems, as well as against lending to small and medium enterprises, which are already under-funded.

To supplement regulatory incentives, countries are relying on a variety of financial incentives, including loan guarantees, credit lines, subordinated financing, tax breaks, regulatory exemptions, and cash grants. Direct financial incentives can rapidly transfer risk or compensate for risks, and thereby bring about concrete investment in medium-risk environments. These first investments can establish a track record and guide further policy work to reduce investment risks.

However, each of these mechanisms has drawbacks. In the case of credit guarantees, moral hazard may lead to excessive lending and additional asset quality stress, while also undermining the effectiveness of interest rates in managing risk (Creehan, 2014). They can also place a heavy fiscal burden on government budgets. An analysis by Booz & Company shows that taxpayers and ratepayers provided subsidies worth US\$1.4 billion on a US\$1.6 billion solar project in California (New York Times, 12 November 2011). The package of government subsidies, which included loan guarantees, cash grants and higher electricity rates, largely eliminated the risk to the private investors and almost guaranteed them large profits for years to come. Similar concerns have been expressed vis-à-vis clean energy investment projects in developing countries. For example, the financial engineering of a large concentrated solar panel (CSP) project in Ouarzazate, Morocco, exposes rates of subsidization and risk transfer that, while being obviously attractive to private investors, place a heavy burden on the government's shoulders (Falconer and Frisari, 2012). Thus, financial incentives should be part of a broader de-risking strategy and be phased out as soon as possible (Glemarec et al., 2013; Waissbein et al., 2013).

2.4 Direct Lending

In the absence of sufficient private sector financing, many countries have used public funding through National Development Banks (NDBs) to support long-term investment. The theoretical justification for direct lending is that public and private financing sources are not always substitutable as they have different investment objectives. Private investment is driven by the profit motive and will under-invest in sectors where public benefits cannot be easily monetized and captured, such as social cohesion, ecosystem service management and adaption to climate change.

The history of NDBs goes back to the Industrial Revolution, first in France, then in Germany and Italy. They successfully managed to provide large amounts of financing to their growing industries. Today there are around 750 NDBs in the world with varying regional distribution, different characteristics and mixed forms of ownerships, private, public and mixed (DESA, 2005). For example, the German Development Bank, Kreditanstalt für Wiederaufbau (KfW), has a mixed federal and state ownership

structure. It is the second largest commercial bank in Germany and provides a variety of project financing, credit enhancement and cooperative banking services. KfW deals mainly with those business areas that are considered less profitable in the short-term, such as clean energy.

Today, NDBs in G20 countries have combined assets exceeding US\$3 trillion (DESA, 2013). However, NDBs worldwide are at diverse stages of ‘readiness’ to fully promote climate-related programs. Many still need to build capacity, and to acquire experience in the preparation, risk assessment, evaluation, and monitoring of climate projects. NDBs are created with public funds. They offer the advantage of allowing taxpayers to profit from the upside if their lending operations are profitable. However, they also expose tax-payers to the downside and can become a fiscal liability if loans are non-performing. Recent NDBs tend to be mostly second-tier banks due to the fact that they often poorly performed as first-tier banks, and appeared to be politicized in their decision-making. In 1993, a World Bank study reported that 39% of the development finance intermediaries were experiencing serious portfolio problems (DESA, 2005).

Most developing countries have also established national green funds, often to manage extra-budgetary resources (including earmarked environmental taxes, nature-for-debt swaps, international and national environmental grants, etc.). These funds mostly provide technical assistance and capital grant or manage revolving funds. More recently, NGFs have also been created to respond to the growing demand for direct/enhanced access to international climate finance. Notably, national climate funds are expected to channel finance from the Green Climate Fund and bilateral donors to developing countries to implement National Appropriate Mitigation Actions.

So far, emphasis for these most recent NGFs has been placed on transparency and financial management rather than financial innovation in order to respond to the standard requested by the use of international public finance. Their common objective is to progressively build national capacities in assuming four core functions: the collection, blending, coordination, and monitoring/verification/reporting of climate finance (Flynn, 2012). Recognizing the limitations of international public finance, some NGFs are also expected to raise complementary innovative sources of domestic climate finance and developing public-private-partnerships, such as the underwriting of green bonds and the capitalization of public private equity funds. This second role is particularly critical in contributing to the development and deepening of local capital markets.

While the short term and longer-term potential of NGFs to channel green finance and act as a change agent is well understood, capacity of countries “to blend domestic and international, public and private, and concessional loan and grant climate finance at the national level” remains, in practice, a challenge. The ease of setting up environmental funds has led to a proliferation of under-capitalized structures. A recent UNDP study of seven national climate funds in Asia and the Pacific (2012) reviewed the various objectives, sources of funding and governance architecture of seven funds, and highlighted the discrepancy between their objectives and actual means of implementation. Most funds remain under-capitalized, are facing institutional and human resource capacity constraints and issues of efficiency and cost-effectiveness. Environmental funds are typically small players in national environmental finance systems, which are typically marginal elements of public finance systems (Peszko, 2002). However, a few success stories such as the China CDM Fund or the Thailand Energy Efficiency Fund show that NGFs, if properly designed and managed, can be part of a process of developing efficient national financial systems (UNDP, 2012; Peszko, 2002).

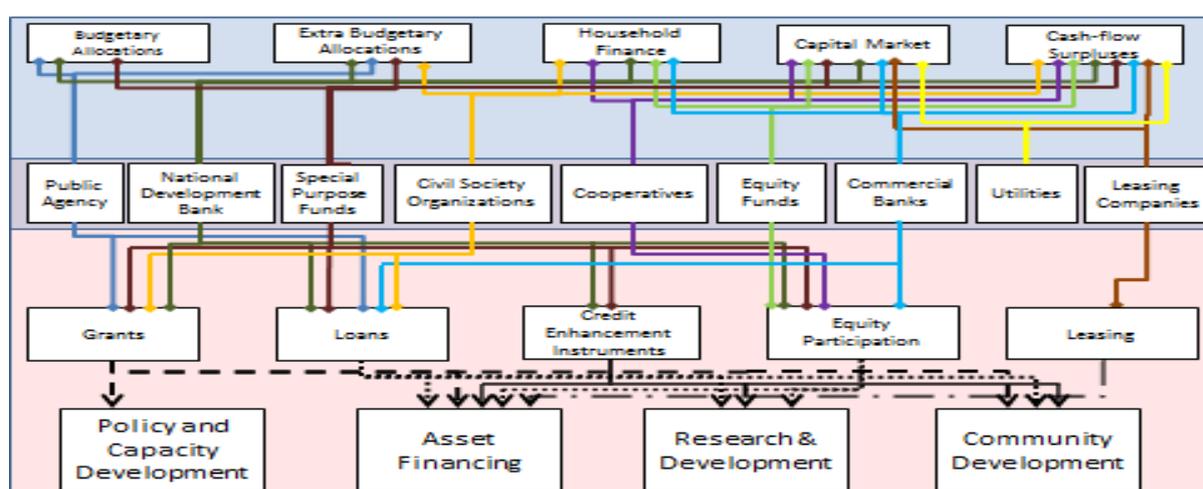
3 Roles of NGFs to Develop National Financial Systems

This third section discusses the potential roles of the new generation of NGFs in developing national financial systems, focusing on financing for green energy.

3.1 An ecosystem approach to national financial systems

Between the sources of investable capital (household and corporate savings, budgetary and extra-budgetary resources, capital markets) and those who need capital to develop green projects, there is a myriad of intermediary players. This includes those who have a fiduciary responsibility to invest financial assets (e.g. commercial banks, pension trustees, insurances) and those who actually invest assets (e.g. asset managers) for a fee. Alongside these three main groups, investment consultants, research analysts, brokerage firms, credit rating agencies and international and national regulators. The graphic below provides a simplified illustration of the various actors of a national financial system for green energy.

Figure 4: A schematic representation of national financial systems for green energy



These different financial market players do not operate in isolation. They are strongly interconnected and usually form part of an integrated financing supply chain. Banks issue sovereign bonds on behalf of governments and governments provide policy support and credit instruments to facilitate the issuance of these bonds, as required. The capacity of national financial systems to provide intermediation services between lenders-savers and borrowers-spenders and to convert short-term deposits into long-term loans will depend on the diversity of financial actors and the quality of their interconnections.

Financial markets can be analysed as distinctive ecosystems. The 2007-2008 financial crisis has inspired a lot of research to apply insights from biological ecosystem stability to assessments of the financial crisis. This novel approach acknowledges that regulations have tended to focus on the workings of individual institutions with little attention paid to how the financial system worked as a whole. This research has underlined the systemic risk posed by a small numbers of big banks and the key advantage of a greater diversity of smaller financial institutions in terms of stability and useful financial innovations (Viegas et al., 2013).

The same ecosystem approach can be applied to the diffusion of financial innovations. A product developed for a given financial ecosystem might not be automatically transposable to another financial ecosystem. It depends on the individual institutions that compose this ecosystem and their

interconnections. For this reason, business and financing models pioneered in OECD countries to promote the green economy are unlikely to be transferrable as such to developing countries. They are context-based and closely depend on their national policy and financial environment.

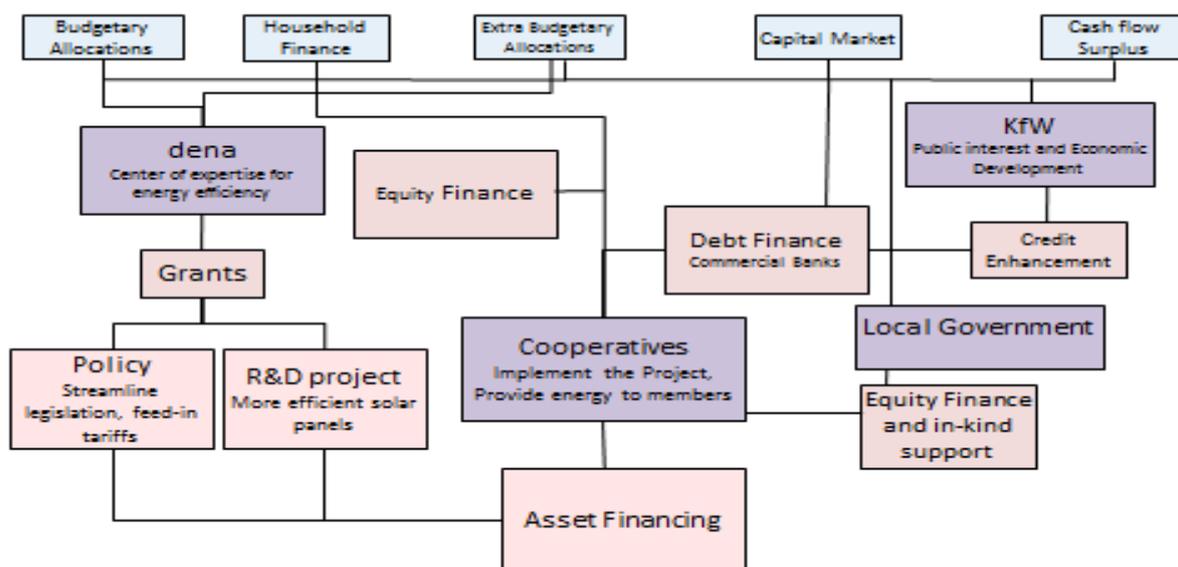
A comparative analysis of the experience from France and Germany shows how small differences in national financial ecosystems can have large consequences in terms of financing for clean energy deployment. France and Germany have similar financing sources, institutions, and instruments. Both countries are committed to a rapid energy transition and support decentralized solar energy. Still, in 2013, photovoltaics panels produced 6% of the country total electricity in Germany (Wirth, 2014), against only 1% in France (photovoltaic info). Furthermore, cooperatives in Germany produce the bulk of solar electricity while France still relies more on individuals (Poize and Rüdinger, 2014). Table 3 summarizes both similarities and differences between the two policy and financial ecosystems.

Table 3: German and French Enabling Environment for Decentralized Power Generation

	Similarities	Differences
Strategic and regulatory framework	Both have adopted national sustainable development plans through legislation & have regularly updated it (France: “National Sustainable Development Strategy”, Germany: “Perspectives for Germany – Our Strategy for Sustainable Development”)	1) The German Federal government has been simplifying regulatory requirements to involve citizens in the energy transition for almost 10 years (notably for cooperatives with a 2006 law). France is only starting the process. Due to France’s focus on consumer protection, the number of required permits/authorizations is large and time consuming to obtain. 2) Germany implementation arrangements for its energy strategy are more comprehensive, with clearer division of responsibilities among key institutions, and quantified goals & indicators.
Institutional Ecosystem	Both have national public agency (DENA for Germany, ADEME for France) and a development bank (KfW for Germany, CDC/Bpifrance for France) supporting Sustainable Development.	Greater decentralization in Germany: regions directly support renewable energy cooperatives and finance representation & lobbying in Berlin.
Financing	Both have strong national developments banks (KfW for Germany, CDC/Bpifrance for France).	KfW facilitates the provision of preferential loans to cooperatives; CDC or Bpifrance do not. In 2010, KfW concessional loans supported approximately 43% of all renewable investment, and 72% of all incremental energy efficiency investments. KfW’s main focus area is green transition while renewable energy is only one out of four targets for CDC.
Political Economy	Both countries recognize and value synergies between environment, innovation and employment.	In France, high trust in nuclear power with more people favourable than opposed to it and continued belief by key politicians that France cannot afford the energy transition. In Germany, opposite trend: population and politicians in favour of quick transition. Easier thus for Germans to accept (temporary) higher electricity prices or higher taxes on energy consumption.

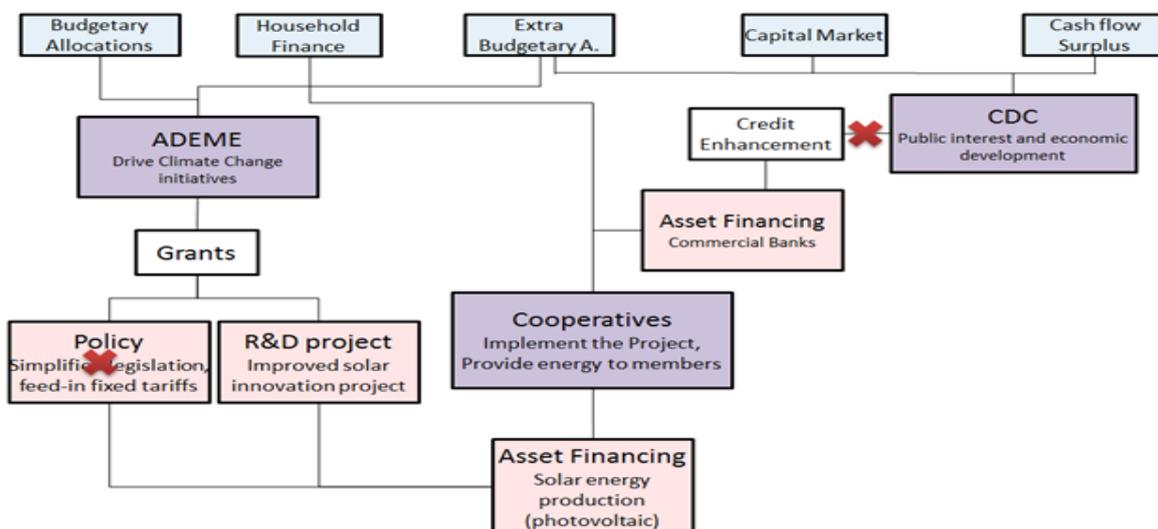
Figure 5 schematizes the financing ecosystems for decentralized energy in Germany. KfW, the national development bank, plays a linchpin role in financing the energy transition by providing preferential loans to cooperatives. In 2010, KfW concessional loans supported approximately 43% of all renewable investment, and 72% of all incremental energy efficiency investments. The 2006 German cooperative law has been designed to enable citizens to seize these financing opportunities and become active players of the energy transition.

Figure 5: Local solar energy system in Germany



As a whole, the French ecosystem is very close to the German financial ecosystem. Differences can be described in terms of a very small number of “missing links”. The French development bank, CDC, is less engaged than KfW in climate change and does not provide preferential loans to cooperatives. Furthermore, the French legislation for cooperatives is focused on financial risk management and can dampen citizens’ initiatives. These missing links are represented in Figure 6.

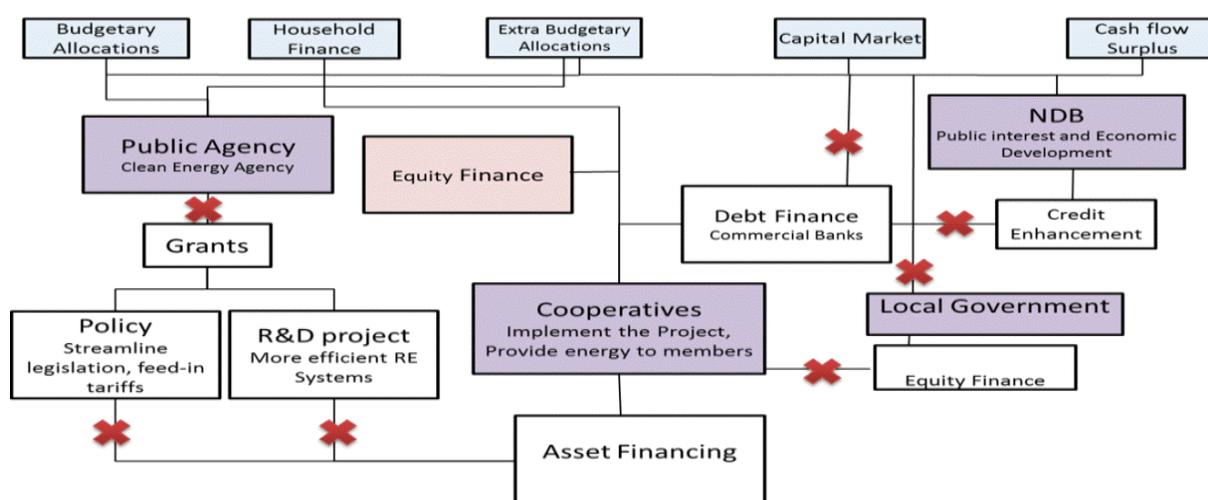
Figure 6: Missing links for local solar energy system in France



These missing links or “broken connections” are likely to be a significant factor in the reduced number of cooperatives projects and/or delayed implementation in France. However, these missing links have been identified and are being quickly addressed. The French government is designing a new energy law aimed at improving the regulatory side, by simplifying requirements both to launch a project and to find public financing or technical support. As part of the new energy transition law, one proposal is to enable local governments to participate in the financing of local projects and streamline the multiple authorizations required into one (Volodia Opritchnik, letter GES, September 2014).

In most developing countries, nascent financial markets will be characterized by a greater number of institutional and regulatory missing links. These links will be compounded by gaps in financial instruments and will prove more challenging to address. Figure 7 schematizes typical missing links for decentralized energy financing in developing countries.

Figure 7: Missing links for local solar energy system in developing countries

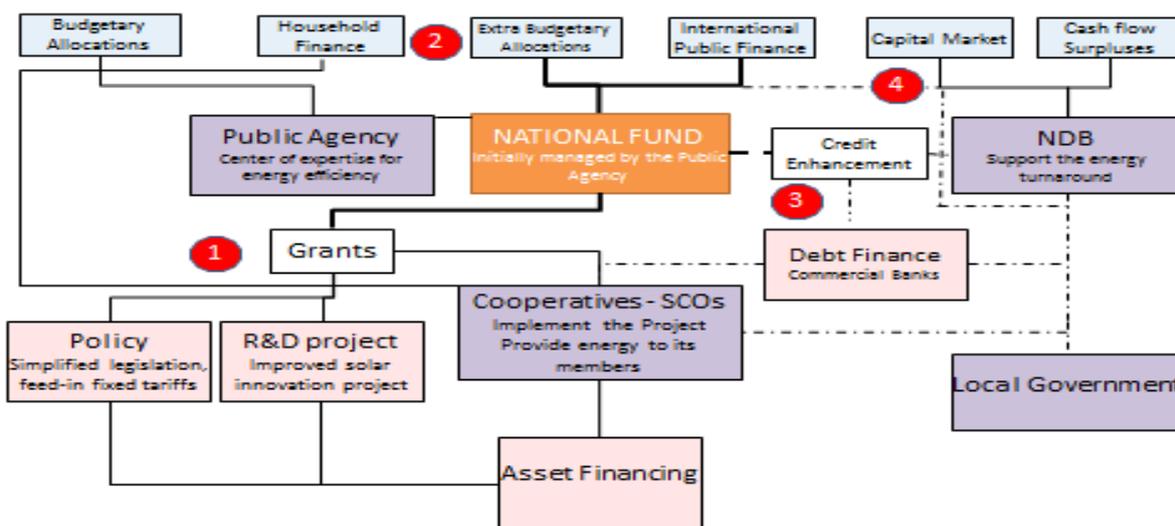


The existence of these “missing links” means that sector priority lending, policy dialogue and regulatory or financial incentives on their own are unlikely to develop local capital markets in an optimal manner. Institutional innovations are required to strengthen the entire supply chain for sustainable development finance.

3.2 A phased approach

Given their easiness to set up and their institutional flexibility, NGFs could play a key role in deepening the national financial infrastructure and accelerating the development of local capital markets by targeting “missing links” and fostering institutional innovations. Every domestic financial ecosystem is unique. So should be the objectives and evolutionary paths of NGFs. As an illustration, Figure 8 summarizes the potential roles of an NGF to deepen a national financial infrastructure for decentralized renewable energy.

Figure 8: Potential Roles of NGFs to Deepen Financial Infrastructure for Renewable Energy



An NGF could evolve through a series of phases to strengthen both demand and supply for sustainable development finance. In a first phase, the initial focus of an NGF could be to provide grants for policy and skills development in support of the establishment of a policy environment to de-risk technology-specific clean investment. This objective could be captured in a policy NAMA and funded by a mix of international climate finance (NGF, multi/bilateral funds, bilateral donors, etc.) and domestic budgetary resources.

The objective in the second phase would be able to raise innovative sources of finance as extra-budgetary resources. Innovative finance means different things to different people. The Innovative Finance Initiative (Dalberg, 2014) conducted a survey of 350 financing mechanisms that have been recognized as innovative financing. Table 4 clusters them into 14 different categories of instruments.

Table 4: Classification of innovative financing instruments

	What is innovative?			How does it support development?		
	New Product	New Market	New Participants	Mobilize Resources	Financial Intermediation	Deliver Resources
Securities and Derivatives						
Bonds and Notes			X	X	X	
Guarantees		X	X		X	
Loans	X			X		
Microfinance Investment Funds		X	X		X	
Other Investment Funds		X		X	X	
Other Derivative Products	X	X		X	X	
Results-based Financing						
Advanced market commitments	X	X			X	
Awards and Prizes	X				X	
Development Impact Bonds	X					X
Performance-based contracts			X			X
Debt-swaps and buy-downs	X			X		
Voluntary contributions						
Carbon Auctions (voluntary)	X	X	X	X		
Consumer Donations			X	X		
Compulsory charges						
Taxes	X			X		

Source: Dalberg (2014)

Although voluntary and compulsory contributions contribute to only 10% of the total innovative financing mechanisms, they can represent a substantial source of finance for sustainable development. Within the category of compulsory contributions, the largest single example is the “solidarity levy on airline tickets”, a small tax on airline tickets in certain countries that mobilizes private sector funds to support UNITAID. It has raised US\$1.9 billion, or 65% of UNITAID’s funds, since its inception in 2006.

Several of these instruments are tied to a percentage of companies’ incomes. In developing countries, levies on extractive industries could become a major source of finance for clean energy access and green development (Bazilian et al, 2013). While most corporations and citizens tend to resist additional taxes, experience shows a much greater willingness to pay for services that contribute to a positive business and/or physical environment. NGFs can provide a transparent and direct link between an innovative instrument and the associated societal benefits, enhancing the willingness of targeted voluntary or mandatory contributors to pay.

Designing and implementing innovative instruments can be complex, time consuming and fraught with political risks. Since innovation design is a costly trial and error process, an NGF can act as a dedicated public institution tasked with adapting existing innovative financing instruments to the unique requirements of the country.

A third phase could be to facilitate access to affordable, long-term financing by providing credit enhancement mechanisms (partial loan guarantees, subordinate loans, first-loss equity positions, etc.). The NGF could provide these services through partnerships with development and commercial banks. In this third phase, NGF is acting more as a catalyst than a fund management and mobilization instrument. Its core objective is to promote institutional and financial innovations. It analyses the national financial ecosystem and acts as an intermediary across existing institutions whenever necessary. It fulfils this task by partnering with existing institutions. A national fund will aim to build on existing institutions, creating the necessary connections to enable the financial ecosystem to grow, diversify and deepen up. The NGF would act as an independent financing body only when no existing institution is able to provide the required services.

The fourth phase would be to directly deepen local capital markets through facilitating the issuance of local currency-denominated bonds. Throughout history, governments have used bond markets to steer capital into new infrastructure, from sewers to railways to highways. Bonds are well suited to the capital intensity of climate investments. The global bond market, currently US\$83 trillion in size, can provide much of the capital needed but remains chronically underutilized in financing our low-carbon transition (Bank for International Settlements, 2012).

Developing capital markets to supplement the financial intermediation role of banks would further boost green economic development. Kick-starting any new bond market requires government support, typically in the form of initial liquidity and trading volume from government-backed bond issuance, or through other forms of credit support, until such times as the investors become familiar with the opportunities. The development a corporate green bonds market will need the same type of support. It will be particularly challenging in developing countries where it necessitates the simultaneous development of local-currency bond markets and green bond markets. NGFs present a potentially important vehicle for developing domestic local-currency bond markets and mobilize domestic savings to finance small-scale infrastructure investments in developing countries (Bond et al, 2012). NGFs could either support the development of a regulatory framework to facilitate the issuance of bonds, provide credit enhancement instruments or even issue them on behalf of central institutions and municipalities.

For example, the Bangladesh Municipal Development Fund (BMDF) provides financial and technical support to municipalities in order to increase their capacity to plan, finance, implement and operate infrastructure in a cost-effective and efficient manner. The BMDF is empowered to “arrange and receive loans, aid, grants and donations from any lawful source”. It was capitalized from two World Bank International Development Association (IDA) credits (2004 and 2010). The BMDF is trying to raise additional resources to expand its operations and support revenue-producing projects for climate-change mitigation and adaptation. With UNCDF assistance, it is currently exploring options to enhance its procedures for loan application and appraisal, and for project preparation and implementation to enable it to act as an intermediary for market financing (UNCDF, 2013).

Conclusion

The track record of NGFs is mixed. Past funds were often under-capitalized and poorly managed. This has raised doubt about the pertinence of creating ad-hoc financial institutions to achieve sustainable development objectives. However, there is a renewed interest in NGFs within the context of providing direct access to international public finance to address issues relating to climate change. The emphasis of international climate finance on robust fiduciary standards and the availability of international support for climate finance readiness might enable the new generation of NGFs to build on past experience and to play a supporting role in the design and implementation of NAMAs.

Notwithstanding the importance of this role, this paper argues that the key added value of NGFs could be in their capacity to foster institutional innovations. They are highly flexible mechanisms capable of acting as a complement to, or, building on the activities of, other national institutions to enhance the supply of green finance. NGFs can supplement and increase the efficiency of voluntary and regulatory action to deepen national financial systems and foster a rapid transition to a green economy in developing countries.

Mandates or financial incentives are inefficient when the main reasons for insufficient private sector financing are breaks in the green finance supply chains. A major role of NGFs could be to forge alliances across a variety of different regulatory and financial institutions at the national and local levels to develop long-term financing models adapted to the unique conditions of developing countries. NGFs could focus on connecting different actors to address existing breaks in the green finance supply chain, deepen financial intermediation, develop new investment products and unlock involuntary excess reserves.

Successful funds are likely to follow different evolutionary paths. Some funds might be terminated once their transformative mandate has been achieved while others might be integrated back into budget. Still more might evolve into permanent public investment funds or be transformed into national development banks or boutique commercial banks. The establishment of an NGF is an institutional investment and the benefits of such a fund will need to be weighed against the required capacity development costs at each phase.

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