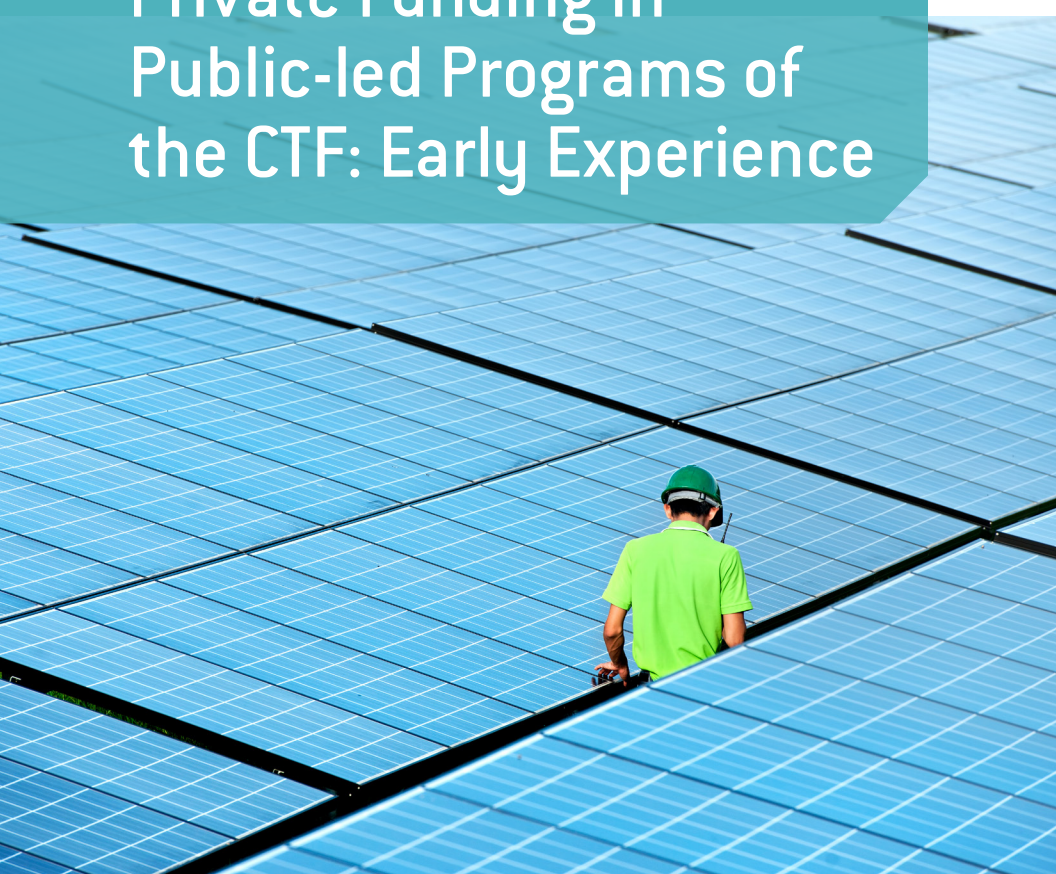




CIF LEARNING

Private Funding in Public-led Programs of the CIF: Early Experience



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Scaling up climate finance is a US\$100 billion per year challenge.

As global average temperatures reach record levels in 2012, the urgency to promote low-carbon investments in developing economies is clearer than ever. Capping the global average temperature increase at an acceptable level—ideally below 2°C—will require enormous clean energy investments with the greatest need in developing countries where the poor suffer the most from the impacts of climate change. Most of that financing—as much as 80%—must come from the private sector.

To jump-start climate-smart investments, the Clean Technology Fund (CTF), one of two Climate Investment Funds, was launched in 2008. The goal is to mobilize large-scale financing for new low-carbon technologies in developing economies. Today the CTF is delivering on that promise by providing blended finance, including concessional lending and grants, to developing countries through five multilateral development banks: the African Development Bank (AfDB), the Asian Development Bank (ADB), the European Bank for Reconstruction and Development (EBRD), the Inter-American Development Bank (IDB) and the World Bank Group (WBG).

Clean Technology Fund (CTF) US\$4.8 billion¹

Demonstrate, deploy, and transfer scaled-up low carbon technologies in renewable energy, energy efficiency, sustainable transport

- Pledges: US\$4.8 billion (based on the exchange rate as of August 2012)
- Endorsed investment plans: 16
- Projects: 103
- Expected to leverage: US\$34 billion (for Phase I countries, first 13 investment plans)

Chile, Columbia, Egypt, India, Indonesia, Kazakhstan, Mexico, Morocco, Nigeria, Philippines, South Africa, Thailand, Turkey, Ukraine, Vietnam, Middle East and North Africa Region (Algeria, Egypt, Jordan, Morocco, Tunisia)²

¹ As of August 2012

² Phase II countries Chile, India, and Nigeria received a first tranche of requested funding in August 2012, additional funding must be mobilized to fully realize these three plans.

Climate investment fund managers are also looking to attract other sources of finance to further scale-up the deployment of clean technologies.

The World Bank Group estimates that the incremental investment needed to reduce greenhouse gas (GHG) emission growth in developing countries is about US\$250 billion per year. Given the scale of the challenge, innovative approaches are needed. Fiscal constraints in developed countries and competing demands on developing country budgets mean that relying on domestic and international public budgetary funds alone will not be enough to generate the enormous investment financing needed for a “green economy,” which by any definition will need to be climate resilient. Thus, private sector engagement is crucial to secure the substantial amounts of finance required for both mitigation and adaptation actions. The needs, too large to be funded entirely from public budgets, must be baked into investment decisions across economies.

The business community has begun to invest in clean technologies despite a labyrinth of financing, regulatory and policy risks. And new tools such as the CTF are creating opportunities to use limited public funding to scale up private investment and expand investment opportunities in emerging markets.

Private sector investments under the CTF are financed in three main ways: (i) directly to private sector entities through the private sector arms of the MDBs; (ii) through public-private initiatives or partnerships (PPPs) in which the private sector provides a service and is paid (usually by a public agency) for the service; and (iii) through public investment programs that include components funded by private sector entities.

Private Sector Arms of the MDBS have been successful in using CIF resources to leverage private sector financing.

Within the CTF programs of the MDBs, the organizational locus for generating private sector funding for clean technology is usually the private sector arms, which have a long history of working closely with private investors and financiers in developing countries. These private sector-led programs and projects are meant to contribute to overall market transformation by using CIF funds to invest directly into private enterprises to break down barriers to investment, including risk (real or perceived) and cost barriers. As a result of the efforts of the private sector arms of the MDBs, CTF

projects are already registering early contributions to the global US\$100 billion target. Indeed, approximately one-third of CTF funds—US\$2.0 billion in total—committed to date have been for direct private sector projects and programs implemented through the private sector arms of the MDBs. The experience of the private sector MDB units in lending to private enterprises was previously documented in the November 2011 paper, *Climate Investment Funds: Lessons Learned from Private Sector Interventions through MDB Intermediaries*.³ That document was the first of two papers requested by the CTF Trust Fund Committee on lessons learned from private sector engagement in the CTF.⁴ It focused on interventions financed directly through the private sector arms of the MDBs, and demonstrated that for the sample of projects included (see chapter 2, page 10 of the above-mentioned paper) leverage ratio is 1 to 9, meaning that every dollar of CTF funding leverages US\$9 of MDB and private financing.

This paper examines the early experience of public sector-led CTF programs in engaging the private sector and mobilizing private funding.

³ CTF-SCF/TFC.7/Inf.4, October 24, 2011

⁴ The earlier paper noted that “engaging the private sector is a phrase often used with different meanings in the context of climate finance.” The paper suggested that any activity where the private sector (i) develops climate projects, (ii) provides capital to climate projects, or (iii) provides capital to climate funds can be considered “engaging the private sector.”

Private financing in public sector-led CTF programs shows early signs of promise.

For reporting purposes, CTF programs are classified as either “public” or “private sector” depending on which arm of the respective MDB the CTF funds are channeled. If a program is implemented by the private sector arm, such as the International Finance Corporation (IFC), it is classified as a “private sector” program. If it is implemented by the public sector arm, such as the International Bank for Reconstruction and Development (IBRD), then it is classified as a “public sector” program. Both the public and private sector CTF programs have been successful at leveraging financing from an array of funding sources, including from other development banks, international banks and aid agencies, national and municipal budgets in recipient countries and from private investors.

Between January 2009 and June 2012, US\$2.0 billion of CTF funding was allocated (committed) by the CTF Trust Fund Committee for 29 programs in 12 countries (see Box 1 for definition of program). Within this US\$2.0 billion of CTF funding, approximately US\$1.4 billion was allocated through the public sector arms of the MDBs and about US\$615 million through private sector MDB channels (Table 1).

This approval gives the green light for project sponsors to develop the project further and to line up co-financing. All of the discrete projects within the ten public sector programs listed in Table 1 with the preliminary green light have also reached the stage of approval by the respective MDB governing board.

As per Table 2, in the ten CTF public sector programs approved by both the CTF Trust Fund Committee and the MDB boards as of June 28, 2012, the approximately US\$1.4 billion in CTF funding has attracted about US\$12.4 billion of co-financing, including US\$4.9 billion of private sector finance. Thus, in this cohort of CTF funding, every dollar of funding brought in US\$9 of co-financing. Although the public sector CTF projects, managed by national and municipal governments or agencies, did not as a matter of priority set out to maximize private co-financing, private financing is present in 8

TABLE 1: CTF PROJECTS APPROVED BY THE TRUST FUND COMMITTEE (AS OF JUNE 28, 2012)⁶

	Country/ program	Project Title	MDB	Investment Type	TFC Approval	(expected) MDB Approval	CTF FUNDING (\$ M)
1	Colombia	Strategic Public Transportation Systems Program	IDB	Public	Aug-11	Sep-11	20.0
2	CSP-MENA	Morocco Ouarzazate CSP	IBRD	Public	Jun-11	Nov-11	97.0
3	CSP-MENA	Morocco Ouarzazate CSP	AfDB	Public	Jun-11	May-12	100.0
4	Egypt	Wind Power Development Project(Transmission)	IBRD	Public	May-10	Jun-10	150.0
5	Indonesia	Indonesia Geothermal Clean Energy Investment Project	IBRD	Public	Dec-10	Jul-11	125.0
6	Mexico	Urban Transport Transformation Project	IBRD	Public	Oct-09	Mar-10	200.0
7	Mexico	Efficient Lighting and Appliance Project	IBRD	Public	Sep-10	Nov-10	50.0
8	Mexico	Public Sector Renewable Energy	IDB	Public	Nov-11	Nov-11	70.6
9	Morocco	One Wind Energy Plan	AfDB	Public	Oct-11	Jun-12	125.0
10	South Africa	ESKOM Renewable Support Project-Wind	AfDB	Public	Nov-10	May-11	50.0
11	South Africa	ESKOM Renewable Support Project-CSP	AfDB	Public	Nov-10	Oct-11	50.0
12	South Africa	ESKOM Renewable Support Project-Wind	IBRD	Public	Nov-10	May-11	50.0
13	South Africa	ESKOM Renewable Support Project-CSP	IBRD	Public	Nov-10	Oct-11	200.0
14	Turkey	Private Sector RE and EE Project	IBRD	Public	Mar-09	May-09	100.0
		Sub-total					1,387.6
11	Kazakhstan	District Heating Modernization Framework	EBRD	Private	Jan-11	Mar-11	42.0
12	Kazakhstan	Renewable Energy I-Waste Management Framework	EBRD	Private	Jun-11	Dec-12	22.5
13	Kazakhstan	Renewable Energy II-Kazakh Railways Sustainable Energy Program	EBRD	Private	Oct-11	Dec-12	7.3
14	Mexico	Private Sector Wind Development(La Ventosa)	IFC	Private	May-09	Jan-10	15.6

15	Mexico	Renewable Energy Program	IDB	Private	Nov-09	Jun-10	53.4
16	Mexico	Energy Efficiency Program-Part 1	IDB	Private	May-11	Sep-12	24.4
17	Philippines	RE Accelerator Program	IFC	Private	Sep-10	Feb-12	20.0
18	Philippines	Sustainable Energy Finance Program	IFC	Private	Feb-11	Feb-13	10.0
19	South Africa	EE Program	AfDB	Private	Oct-10	Sep-12	7.5
20	South Africa	Sustainable Energy Acceleration Program	AfDB	Private	Oct-10	Mar-13	42.5
21	South Africa	Sustainable Energy Acceleration Program	IFC	Private	Oct-10	Oct-11	42.5
22	Thailand	EE Program	IFC	Private	Oct-10	Jun-11	7.5
23	Thailand	Renewable Energy Accelerator Program	IFC	Private	Jun-10	Jun-11	40.0
24	Thailand	Sustainable Energy Finance Program	IFC	Private	Oct-10	Jun-11	30.0
25	Thailand	Private Sector Renewable Energy program	ADB	Private	May-12	Jun-12	100.0
26	Turkey	Commercializing Sustainable Energy Finance Program	IFC	Private	Sep-09	Apr-10	21.7
27	Turkey	Turkish Private Sector Sustainable Energy Financing Facility	EBRD	Private	Jan-10	May-10	43.3
28	Turkey	Turkish Private Sector Sustainable Energy Financing Facility	EBRD	Private	Aug-10	Jul-11	6.8
29	Ukraine	Renewables Direct Lending Facility-Creating Markets for Renewable Power	EBRD	Private	Oct-10	Nov-10	27.6
28	Ukraine	Renewable Energy II - Novoazovsk Wind Project	EBRD	Private	Oct-11	Oct-12	20.7
29	Vietnam	Sustainable Energy Finance Program	IFC	Private	Sep-10	Oct-10	30.0
Sub-total							615.1
Grand-total							2,002.7

TABLE 2: PRIVATE CO-FINANCING IN CTF PUBLIC SECTOR PROGRAMS (US\$ MILLION)

CTF program	Country	Implementing Agency (MDB)	CTF	MDB loan to gov.	Gov. contribution	Other international institutions (including bilateral agencies)	Domestic public financial institutions	Private finance 11	International commercial bank (debt)	Total	% private (equity + debt)
Strategic Public Transportation Systems Program ¹	Colombia	IDB	20.0	300.0	203.0			148.1		671.1	22.1%
Wind Power Development Project ²	Egypt	IBRD	150.0	70.0	55.0	371.0		100.0	100.0	846.0	23.6%
Geothermal Clean Energy Investment Project ³	Indonesia	IBRD	125.0	175.0	275.0					575.0	
Urban Transport Transformation Project ⁴	Mexico	IBRD	200.0	150.0	1,093.0			732.0		2,175.0	33.7%
Efficient Lighting and Appliance Project ⁵	Mexico	IBRD	50.0	250.0	102.7	7.1	127.0	176.0		712.8	24.7%
Renewable Energy Program, Proposal III ⁶	Mexico	IDB	70	220.0			250.0	1,960.0		2,500.0	78.4%
Ouarzazate CSP (Regional—MENA) ⁷	Morocco	IBRD/AFDB	197.0	416.0	190.0	446.0		169.0		1,418.0	11.9%
ESKOM Renewables Support Project ⁸	South Africa	IBRD/AFDB	350.0	520.0	44.0	396.0				1,310.0	
Private Sector RE and EE Project ⁹	Turkey	IBRD	100.0	497.0			127.0	431		1,155.0	37.3%
One Wind Energy Plan ¹⁰	Morocco	AFDB	125.0	448.0	76.0	570.0		1,203.0		2,422.0	49.7%
Total			1,387.0	3,046.0	2,038.7	1,790.1	504.0	4,919.1		13,784.9	35.7%

Footnotes:

1. Government contribution includes both central (\$61 m) and municipal (\$142 m) financing.
2. Other international institutions are EIB, KfW, and PPIF. Private equity is Build-own-operate transfer contract. International commercial bank will finance \$100 million in loans.
3. Government is PT. Pertamina Geothermal Energy (PGE, a state-owned enterprise).
4. Government includes National Infrastructure Fund (FONADIN), states, and municipalities.
5. Total amount includes Guarantee Facility Component (GEF:\$5.0M, and Mexican government:\$30.0M). Other international institution is GEF. Domestic public financial institution is NAFIN which raises funds through private markets by issue bonds. Private equity represents private Mexican household contributions.
6. Domestic public financial institution is NAFIN which raises funds from private markets. Equity finance is \$750 m; debt finance is \$1210 m.
Source: IDB project manager and NAFIN staff estimates as of 8/31/2012
7. Other international institutions are AFD, KfW, EIB, and EC Neighborhood Investment Facility (NIF). Private finance includes both equity and debt. PPP includes Moroccan Agency for Solar Energy (MASEN)/GoM and competitively selected private companies.
8. Government contribution is Eskom Holdings (state-owned enterprise). Other international institutions are EIB, KfW and AFD.
9. Domestic public financial institution is TKB. Private finance includes sub-borrower equity contribution to TKB sub-loans (\$66 m) and loans from TSKB, a domestic private bank (\$365 m). TSKB is funded by international organizations including AFD, CIB, EIB and KfW.
10. Other international institutions are EIB, KfW, EU/NIF, Bank of Austria and IsDB.
11. Private finance includes investor equity, household equity and loans from domestic private banks. Private international loans in column K.

BOX 1. CAVEATS ON DATA

This paper examines the proposed financing plans of the public sector-led CTF projects that were approved by MDB boards by June 2012. Table 1 shows 14 public sector-led projects (for these purposes, a project is defined as being implemented by one MDB); in this paper we collapse these into ten programs, counting, for instance, the four Eskom renewable support projects in South Africa as one program. These 10 programs are shown in Table 2 and summarized in Annex 1. Before a project or program is submitted to the MDB governing board for approval it needs to prepare a detailed co-financing package. While the proposed funding package gives a good idea of the expected sources of funding for the project, most projects (both public and private) have not reached full financial closure, with signed contracts, by the time of board approval.⁵ Because the time taken to reach financial closure varies from project to project, for the purposes of this paper, we look at proposed financing plans w/o projection of financing plans than the investment plans approved by the Trust Fund Committee. However, actual financing will only be finalized when the project reaches full financial closure and is implemented, so these figures may change. (This is also true for private sector projects.)

A second caveat on data concerns the project boundaries. The definition of the project boundary is determined by the project manager and may not be consistent across projects. For instance, some projects include household equity as part of the project financial structure, others do not. The need for a consistent definition of project boundaries for the purposes of comparing financing plans is discussed in the recommendations section.

The concept of “leverage” in CIF programs has not been clearly defined, either for public sector-led or private sector projects. The term leverage is generally used to refer to co-financing in CIF projects and programs from private sector and other sources, such as international and domestic commercial banks and national and municipal governments. As with the boundary issue, there is a lack of consistency across CIF programs in the discussion of leverage. Any conclusions about the extent of leverage of private finance in public sector-led projects or comparisons of leverage between public-led and private-led CTF programs must keep this in mind.

⁵ The data on CTF projects/programs in this paper was collected through a series of interviews with the MDB staff managing the projects/programs, and is current as of June 2012. In some cases, the data differ from earlier estimates published in investment plans, project summaries and in aggregate tables on CIF funding as financing amounts have been refined.

out of 10 of the public projects (see column on private finance in Table 2) and private finance accounts for 36% of the total funding of these projects.

These public sector CTF projects draw in funding from a wide range of co-financiers: loans from bilateral agencies such as Agence Française de Développement (AFD), the Bank of Austria and KfW; international financial institutions, such as the Islamic Development Bank, European Investment Bank (EIB), EC Neighborhood Investment Facility (NIF) and Public-Private Investment Fund (PPIF); domestic development and investment banks, such as National Infrastructure Fund (FONADIN) and Development Bank (NAFIN) in Mexico and the Development Bank of Turkey (TKB) and a Turkish domestic private bank (TSKB); in addition to equity investments from households and private investors. It is noteworthy that in these examples, private investment originates from both domestic and international sources.

In the eight public sector programs with private financing, the share of private finance in the total ranges from 12% in the Morocco/MENA Regional CSP program to 78% in the Mexico Renewable Energy Program (refer to Annex 1 for more details). There is not a clear sectoral pattern; for example, both energy and transport programs attracted private funding. Private equity accounted for 37% in the Turkey Renewable Energy/Energy Efficiency Project, 50% in the Morocco One Wind Energy Plan, 25% in the Mexico Efficient Lighting and Appliance Project and 24% in the Egypt Wind Development Project.

Based on ten case studies from the current CTF portfolio, value added is coming in three broad areas that support learning and leveraging of financing, which in turn nurture economies of scale for investments in clean technologies.

ECONOMIES OF SCALE

Learning & leveraging

CTF investments: Setting the stage

By tailoring regulatory and policy environments	By investing in complementary infrastructure	By reducing risk and increasing “comfort” for private investors
Case Study 2: Egypt Wind Power Development	Case Study 2: Egypt Wind Power Development	Case Study 2: Egypt Wind Power Development
Case Study 3: Indonesia Geothermal Clean Energy Investment Project	Case Study 4: Mexico Urban Transport Transformation Project	Case Study 4: Mexico Urban Transport Transformation Project
Case Study 6: Mexico Public Sector Renewable Energy	Case Study 8: Morocco One Wind Energy Plan	Case Study 7: Morocco Ouarzazate Concentrated Solar Power
Case Study 7: Morocco Ouarzazate Concentrated Solar Power	Case Study 1: Colombia Strategic Public Transportation Systems	Case Study 5: Mexico Efficient Lighting and Appliances
Case Study 8: Morocco One Wind Energy Plan		Case Study 9: Republic of South Africa Eskom Renewables Support Project
Case Study 10: Turkey Private Sector Renewable Energy and Energy Efficiency Project		

By tailoring regulatory and policy environments. Based on the fairly small sample of the ten public sector CTF projects approved so far, three factors appear to play a role in stimulating private co-investment. We do not claim that the CTF directly or exclusively brought about policy and regulatory changes, but they seem to have been important factors in enabling private investment:

- i. Creation of a regulatory and policy environment to enable private investors to participate. For instance, in the case of renewable energy, a regulatory framework that allows private power producers to sell into the grid or directly to large industries has stimulated private investment in power production using renewable energy.
- ii. Other countries in the region developed the legal and policy framework and government support for joint public-private partnerships (PPPs) as part of the CTF project (Morocco, MENA-CSP program). Using CTF funds, temporary support has been provided in some cases to

offset price differences between renewable energy and fossil fuels to compensate for the higher cost of newer, riskier technologies, unrealized economies of scale or existing subsidies on fossil fuels.

- iii. Incentives include feed-in tariffs or other transitional price supports. In some cases, CTF funding supported technical assistance and policy reforms directly; in other cases, the CTF projects complemented an MDB development policy operation that financed broad sector-wide reforms.
 - Case Study 2: Egypt, *Wind Power Development Project* (IBRD): technical assistance to develop competitive tendering practices for identified wind power sites was provided with CTF funding. A new law (developed in tandem with CTF support) would also provide changes in land use policies and removal of customs duties on imported equipment
 - Case Study 3: Indonesia, *Geothermal Power Generation Development Project* (IBRD): will help to develop a simplified pricing and compensation policy, including provisions to mandate electricity off-take from geothermal generators, and build domestic capability to competitively tender new transactions. Initial investment by the public sector and regulatory and pricing reforms supported by the CTF project are intended to lay the groundwork to attract private partners in future.
 - Case Study 6: Mexico, *Mexico Public Sector Renewable Energy* (IDB): improvements in the regulatory environment allow for private projects as independent power producers, small producers and self-providers. IPPs and small producers can sell directly to the Federal Electric Company (CFE).
 - Case Study 7: Morocco, *Ouarzazate Concentrated Solar Power (CSP)* (AfDB and IBRD): the government's strategy to attract private investment includes establishing a supportive legal, regulatory and institutional framework. To encourage private sector participation (for this project as well as future ones), the government is gradually removing subsidies on fossil fuels to encourage energy efficiency among consumers and to create a level playing field for investors and providing transitional support measures until the cost of CSP is reduced and fossil fuel subsidies are fully removed.

- Case Study 8: Morocco, *One Wind Energy Plan* (AfDB): the government strengthened its legal and regulatory framework to create an enabling environment for private investment in renewable energy production. Under the new laws, electricity generated from renewable energy projects (concentrated solar) may be connected to the national grid; private renewable energy promoters may export electricity through the national transmission grid and private renewable energy promoters may construct dedicated high-voltage direct current transmission lines for export if the capacity of the national grid is limited.
- Case Study 10: Turkey, *Private Sector Renewable Energy and Energy Efficiency Project* (IBRD): benefited from the policy framework to allow private energy producers to provide electricity into the grid.

By investing in complementary infrastructure. A second important factor is public investment in complementary infrastructure, whether construction of roads and bus lanes for rapid transit projects or transmission lines and grid extensions to link renewable energy power producers to consumers. Providing complementary infrastructure can be the missing link to enable private investment. Public funding may also be needed to support early retirement or scrapping of older, higher-carbon infrastructure.

- Case Study 2: Egypt, *Wind Power Development Project* (IBRD): electricity transmission infrastructure allows private independent power producers to sell into the grid.
- Case Study 1: Colombia, *Strategic Public Transportation Systems* (IDB): central and municipal governments invest in optimization of bus operations and improvement of road infrastructure.
- Case Study 4: Mexico, *Urban Transport Transformation Project* (IBRD): public funding covers exclusive bus lanes, stations, transfer terminals and bus depots. Cities also pay private bus operators to scrap old, high polluting buses and to move to new routes.
- Case Study 8: Morocco, *One Wind Energy Plan* (AfDB): the public sector invests in transmission and distribution infrastructure as well as energy storage.

By reducing risk and increasing “comfort” for private investors. A third area CTF funding has supported is government action to reduce perceived and actual risks for private sector investments. To offset the higher risk of

investing in developing country and emerging market programs, governments have provided a number of incentives to reassure private investors.

- Case Study 2: Egypt, *Wind Power Development Project* (IBRD): a proposed law in Egypt would allow acceptance of foreign currency denominated power purchase agreements (to eliminate foreign exchange risk).
- Case Study 4: Mexico, *Urban Transport Transformation Project* (IBRD): the government created FONADIN, a public infrastructure fund, to promote private participation in financing infrastructure by channeling public investment to joint public-private projects. Blending CTF funds and private commercial bank loans reduces the cost of funds to compensate for perceived higher risk.
- Case Study 5: Mexico, *Efficient Lighting and Appliances Project* (IBRD): provides low-income households with low interest credits to replace old and inefficient appliances with energy-efficient appliances.
- Case Study 7: Morocco, *Ouarzazate CSP* (AfDB and IBRD): the financial support from IFIs is part of the strategy to reinforce the credibility of the public agency (MASEN) as an investment partner for private investors and to reassure private investors about Morocco's willingness and capability to continue to subsidize solar energy over the time period needed. The objective is to reduce the perception of risk and thus the equity rate of return required by private sponsors. The project also introduced the PPP instrument as a contractual mechanism that will provide an incentive for private participation.
- Case Study 9: South Africa, *Eskom Renewables Support Project* (AfDB and IBRD): deployment of renewable energy power through the CTF project would lead to establish cost and performance benchmarks that drive the private sector towards future investment in this industry.

CTF can overcome barriers to enabling private investment.

Multiple factors inhibit private investment in infrastructure in developing countries. Many of these are well known development challenges such as country risk, lack of domestic entrepreneurs, inefficient domestic banking services and under-developed capital markets. In addition, deployment

of clean technologies in developing countries has been limited because many new technologies are in the early innovation stage and have not yet achieved critical mass in terms of practical experience with implementation, and therefore costs do not benefit from economies of scale.

Even where technologies have been commercially proven in developed countries, they may not have been tested in developing countries due to (perceived) higher risks and thus higher rates of return demanded by investors; weak policy, regulatory and legal systems; lack of credit-worthy private counterparts and insufficient supporting infrastructure. In this context, public subsidies, such as those provided through the CTF, can be useful to accelerate investment, promote learning and scale economies, demonstrate success and progressively reduce costs to the point where commercialization and large-scale deployment of low-carbon technologies become attractive to more private investors.

The CTF experience provides valuable lessons for how public investment programs can help to overcome some of the barriers to private investment, leading to greater opportunities for private sector-led investments in future. In the public sector CTF projects that brought in the largest share of private finance, governments gave clear priority to attracting private investment and enacted regulatory and policy changes needed to support private investment.

But not all CTF investments attract private sector participation.

Within the sample of projects approved by June 2012, the two CTF projects that did not attract any private financing were the Indonesia Geothermal Clean Energy Investment Project and the South Africa Eskom Renewables Support Project. Today there are additional programs that did not receive private sector co-finance.

Indonesia Case: Developing greenfield geothermal projects poses unique risks associated with extracting the steam resources and is substantially higher cost than fossil fuel alternatives in Indonesia. Moreover, there has been scant private investment in the overall power sector in the country since the global financial crisis in 2008 and the size of the few private power projects is much smaller than the scale required to make geothermal energy projects economically viable at the national

level. However, the CTF project is expected to kick-start a scale-up in geothermal development at the national level, and increase the prospects for greater private participation in the future since the steam resources in these fields will be known with greater certainty and the experience base will have been substantially broadened.

South Africa Case: The CTF investment plan consists of the public sector Eskom Renewables Support Project, and two CTF projects for Energy Efficiency Program and Sustainable Energy Acceleration Program implemented through the private sector arms of AfDB and IFC. The latter two projects did mobilize considerable private financing. Although the Eskom project does not have any private investment, one of the goals of the program is to put in place the legal and regulatory frameworks that will allow for future private investment in wind power production.

Conclusion and Recommendations for Future Work

The success of CTF public sector projects in attracting private investment centers on ability to address enabling environments, complimentary infrastructure, and investor risk appetite.

This review of private funding in public sector-led CIF programs and the earlier review of private sector-led CIF programs provide some preliminary findings and point to recommendations for future work.

The CIF set out to leverage public funding with resources from other investors. In the case of CTF funding through the IFC and other private sector arms of MDBs, an explicit goal was to leverage CTF funding with private finance. While this was not the mandate of the public sector CTF programs, these also have brought in co-financing from private sources. For the small sample of programs that had reached the stage of MDB board approval at the time of writing, each US\$1 of CTF resources led to US\$3.6 of associated private finance.

The CTF provides suggestions for how public investment projects help to attract private investment for clean technologies by:

- ✓ **Tailoring regulatory and policy environments**
- ✓ **Investing in complementary infrastructure**
- ✓ **Reducing risk and increasing “comfort” for private Investors**

As the international community faces the challenge of mobilizing US\$100 billion annually in climate finance by 2020, the early experience of the CTF provides evidence that, as the Stern Review ⁷ noted, public investment programs with MDB financing can create financing packages in which total investment is a multiple of the initial public climate finance contribution.

⁷ HM Treasury, London (2006). *Stern Review on the Economics of Climate Change*.

The preliminary reviews of the private sector and public sector-led CIF programs point to the need for additional work to better understand the mechanisms by which scarce climate finance for developing countries can effectively leverage many times its value from other financing sources.

- **Definition of project boundaries.** The different CIF programs—the CTF, Forest Investment Program, Pilot Program for Climate Resilience, and Program for Scaling up Renewable Energy in Low Income Countries—include a range of project designs. To enable accurate comparison across programs, work is needed to outline clear, transparent definitions of project financing boundaries across technologies or sectors, and determine what should be included in the definition of the project or program. For instance, some projects include both power generation and transmission. Others only cover transmission. Is it appropriate to compare them when assessing leverage? Project scope and boundaries are currently determined by team leaders in consultation with country counterparts. It would be useful to have a commonly accepted set of principles for the delineation of project boundaries.
- **Definition of leverage.** The term “leverage” is used in CIF projects to refer to the ability of CIF funding to draw in funding from a range of other sources. However, without a clear consensus on the definition of leverage, including who can be considered to be leveraging whom and what methodologies are used to calculate, it is difficult to obtain an accurate understanding of the performance and potential of different CIF programs to leverage funding. The literature on climate finance proposes several approaches to defining leverage. It would be useful as a next step to undertake a process to reach consensus among CIF stakeholders on the definition that is relevant for the CIF and other climate finance programs.
- **Attribution of policy reforms.** Several CTF programs aspired to promote policy reforms intended to incentivize private investors to invest in clean technology. In some cases, desired policies were enacted successfully, in others they were not. It will be important during the course of project implementation to track the extent to which these policy goals were realized.
- **Use of financial intermediaries in public CTF projects.** Channeling CTF funds through financial intermediaries occurs in both private sector and public sector-led CTF programs. MDB private sector arms are concerned about possible market distortions from public sector

lending through financial intermediaries. A future study may want to examine the results and develop guidelines for public programs using financial intermediaries.

- **“Crowding Out” private investment.** MDB private sector arms are also concerned that public CTF investments may draw in funds from the private sector in a distortionary and discriminatory way that impedes further private investment. A future study may want to examine this issue as well.

As a next step to this analysis, the CIF Administrative Unit proposes to commission a knowledge product that (i) undertakes a process to generate consensus on an agreed definition of “leverage” in CIF programs; (ii) outlines guidance in defining program financial boundaries; and (iii) examines leverage across all CIF programs, based on the conclusions of (i) and (ii).

Annex: Summary of Private Sector Involvement in Public CTF Programs

Case Study 1:	Colombia Strategic Public Transportation Systems Program
Case Study 2:	Egypt Wind Power Development
Case Study 3:	Indonesia Geothermal Clean Energy Investment Project
Case Study 4:	Mexico Urban Transport Transformation Project
Case Study 5:	Mexico Efficient Lighting and Appliance Project
Case Study 6:	Mexico Public Sector Renewable Energy
Case Study 7:	Morocco Ouarzazate Concentrated Solar Power
Case Study 8:	Morocco One Wind Energy Plan
Case Study 9:	Republic of South Africa Eskom Renewables Support Project
Case Study 10:	Turkey Private Sector Renewable Energy and Energy Efficiency Project.

CASE STUDY 1: COLOMBIA STRATEGIC PUBLIC TRANSPORTATION SYSTEMS PROGRAM

This program scales up and builds on the successful Bogota TransMilenio system, expanding the corridor-based Bus Rapid Transit (BRT) system to a fully integrated and optimized urban transport system. The CTF program will extend this integrated approach to four medium-sized cities. The program seeks to retain and expand the relatively high share of public and non-motorized transport to compete with the rapidly growing motorization rate, especially motorcycles.

A combination of central and municipal government budgets, lending from the Inter-American Development Bank (IDB) and private equity contributed by private bus companies will reorganize urban transport, remove and replace old buses with new low-carbon vehicles, optimize and coordinate bus routes and operations and promote a shift from private cars to buses, bicycles and walking.

Government budgets (central and municipal) will finance investment in infrastructure such as improvements in the road network and bus lanes, construction of new transfer terminals, depots and bus stops and traffic control systems. Private equity investment covers fleet renewal, electric fee collection facilities and some terminals. Provision of bus services is through concessions to private bus operators. The program will provide essential

public funding to promote early retirement and scrapping of high GHG-emitting vehicles and the introduction of low-carbon bus technologies.

The total program cost is US\$671 million. Government budgetary funding is US\$203 million (30%). The IDB loan, with a central government guarantee, is US\$300 million. CTF concessional loan is US\$20 million (3% of the total). Private equity is US\$148 million, or 22% of the total program.

CASE STUDY 2: EGYPT WIND POWER DEVELOPMENT

The first IBRD project in Egypt's CTF Investment Plan will finance construction of efficient new transmission lines needed to transport renewable wind energy produced in the Gulf of Suez, the region with the best wind potential in Egypt, to the national grid. The program supports the Government of Egypt's goal to increase renewable energy to 20% of the total energy market by 2020. In addition to this ambitious target, a new electricity law was submitted to parliament and other measures to reduce the cost of wind power are underway. These include agreement that the government would cover the additional costs of renewable energy projects, finalization of the land use policy for wind power developers, elimination of customs duty on wind equipment and acceptance of foreign currency denominated power purchase agreements (to eliminate foreign exchange risk). However, as of June 2012 the law has not been approved and its future is uncertain given the current political situation.

Private investment in electricity generation under the framework of independent power producers led to the construction of three privately developed power plants between 2002-2003 but there have been no new private investments in power plants since then. Under the CTF-backed wind development program, the provision of electricity transmission infrastructure and technical assistance to support competitive tendering for identified wind power sites will enable construction of one of the largest private sector wind programs in the region and will provide a good foundation to scale up private investment in renewable wind energy in future. It will be the first large scale private sector competitively bid project in renewable energy in Egypt. The program will start with a 250 MW wind farm and is expected to be followed by additional 250 MW wind farms in subsequent years, reaching as much as 3,000 MW in wind power from the Gulf of Suez and Gabel El-zait and entailing almost US\$6 billion in private investment.

The total cost of the current wind power development program is US\$846 million. The CTF concessional loan is US\$150 million (18%). The IBRD loan is US\$70 million (8%) and other international lenders (KfW, EIB and PPIF) together provide US\$371 million (44%). Private investment of US\$100 million and a private commercial bank loan of US\$100 million (24% of the total) will finance construction of a 250 MW wind farm under a Build-Own-Operate (BOO) arrangement. Through competitive bidding, the BOO program targets to achieve competitive electricity tariffs through an international tender which is expected to stimulate private investment from international and local investors in Egypt's power sector. Eight to ten pre-qualified bidders will compete for the BOO contract. These include a mix of Egyptian and international companies. To estimate the potential for the site, the pre-qualified private bidders have teamed up to carry out wind measurement; as a group they have put up US\$1 million to finance wind measurement. Procurement for the project is expected to be entirely from private sources.

CASE STUDY 3: INDONESIA GEOTHERMAL CLEAN ENERGY INVESTMENT PROJECT

This is one of two public CTF projects that do not involve private investment in the first phase. The proposed project is intended to re-start investment in geothermal energy in Indonesia as part of Indonesia's 2010 *Geothermal Roadmap and Low Carbon Growth Strategy* following the hiatus provoked by the 1997 Asian financial crisis and uncertainty in the regulatory and incentive environment. Indonesia's geothermal potential is estimated at around 27,000 MW, roughly 40% of the world's geothermal resource. Despite this large potential, less than four percent of Indonesia's geothermal resources are currently developed to produce power.

Prior to the financial crisis, in 1991 the Government of Indonesia allocated development rights in 18 geothermal sites to public and private developers (2,652 MW and 1,848 MW, respectively). Private power producers installed and operate 857 MW of their 1,848 MW allocation and public state-owned enterprises developed and operate 332MW of their 2,652 MW allocation. Since the financial crisis Indonesia has found it difficult to mobilize financing even for conventional power generation such as coal.

In addition to the challenge of attracting investment, geothermal energy in Indonesia faces a number of regulatory and capacity barriers. The cost of geothermal electricity generation in Indonesia is competitive but is higher than fossil fuels, partly because Indonesia is richly endowed in coal resources. Geothermal energy also poses unique risks, including exploration risks for greenfield projects. Thus public funding has been needed to buy down the cost. The scale of investment needed for geothermal power plants is large (about US\$1 billion per year); in Indonesia private investment in energy is currently only about US\$300–400 million per year. This has impeded private investment in geothermal energy. On the policy side, an IBRD-financed Geothermal Power Generation Development Project will help to develop a simplified pricing and compensation policy, including provisions to mandate electricity off-take from geothermal generators, and build domestic capability to competitively tender new transactions. Initial investment by the public sector and regulatory and pricing reforms supported by the CTF program are intended to lay the groundwork to attract private partners in future.

All preparation support and feasibility studies, drilling and technical assistance will be / were to have been contracted to private companies and all construction of the publicly owned power plants would be done by private companies.

CASE STUDY 4: MEXICO URBAN TRANSPORT TRANSFORMATION PROJECT

The Mexico Urban Transport Transformation Project finances integrated mass transit corridors, mass transit systems such as bus rapid transit (BRT) and light rail transit (LRT), non-motorized transport, low-carbon buses, scrapping of old vehicles and institutional development to improve traffic management efficiency and encourage modal shifts away from private cars.

As part of its development strategy the Government of Mexico set up FONADIN, the national infrastructure fund, which is managed by BANOBRAS, a government-owned development bank. Within FONADIN the government established the Federal Mass Transit Support Program which offers grants and loan guarantees for urban transport projects. One of the goals of this window is to promote private participation in financing infrastructure by channeling public investment to joint public-private

projects. The Government of Mexico set up a framework for private sector investment through regulatory policies, support for competitive tenders for service provision and infrastructure concessions. The policy framework and government co-funding promote private investment in transport infrastructure (buses), maintenance and operations and mass transit corridors. Private financing is expected to lower the overall cost of public transport and to improve financial sustainability. Public funding covers exclusive bus lanes, stations, transfer terminals and bus depots. Cities also pay private bus operators to scrap old, high polluting buses and to move to less lucrative routes.

The total program cost is US\$2.1 billion. The government contribution (federal, municipal and city) is US\$1 billion. The IBRD loan is US\$150 million and the CTF concessional loan is US\$200 million. Through the National Infrastructure Fund (FONADIN), the government on-lends its own funds and IBRD/CTF funds to private operators at a subsidized rate to cover the higher cost of low carbon vehicle purchase (hybrid buses are assumed to cost 43% more than conventional buses), which is financed by private bus operators. The subsidy is achieved by blending low cost CTF funding with private bank loans taken by private operators. Private operators also benefit from the modal shift (from cars to new buses) and from reduced competition from scrapped buses. The total private equity investment is US\$732 million or 34% of the total project cost.

It is likely that all procurement of goods and large civil works contracts will be from private suppliers.

CASE STUDY 5: MEXICO EFFICIENT LIGHTING AND APPLIANCE PROJECT

As part of its Sustainable Energy National Program and in keeping with its Low-Carbon Development Strategy, Mexico has ambitious plans to reduce the growth of electricity consumption through energy efficiency measures in end-use sectors. Air conditioning, home appliances and electronics are expected to be the main growth areas of residential electricity demand in Mexico. Despite the fact that Mexico provides electricity subsidies (which the government has a plan of action to address) to residential consumers, the average residential tariff in Mexico is about the same as that in the US, Chile and Colombia and is considered high enough to induce energy

efficiency measures. Previous experience with residential energy efficiency programs in Mexico shows that price incentives are enough to make it attractive for households to replace inefficient lighting and appliances. However, the high up-front cost of appliances, and the relatively high cost of compact fluorescent bulbs for low-income consumers, and conservative lending practices by commercial banks lead to high transaction costs and interest rates that dampen the adoption of energy efficient technologies. To this end the Mexico Efficient Lighting and Appliances program provides financing to purchase and distribute compact fluorescent bulbs (CFLs) to low-income households and provides vouchers and low-interest credits to low- and medium-income households to replace old, inefficient appliances with energy-efficient appliances.

The IBRD loan, CTF concessional loan, government funding and loans from NAFIN will cover the cost of the vouchers and low-interest credits for appliance replacement. Consumers will finance about half the cost of the appliance replacements (US\$176 million out of US\$353 million) directly. Private financing for the appliance replacement component is 50%; consumers will also be responsible for repaying the loans and credits, so ultimately will cover 86% of the cost of the improved/new appliances. For the project as a whole (including institutional strengthening, technical assistance and the CFL replacements) direct private financing is 26% and private financing after loan repayment is 45%.

It is anticipated that procurement of the bulbs and appliances will be from private suppliers.

CASE STUDY 6: MEXICO PUBLIC SECTOR RENEWABLE ENERGY

The Public Sector Renewable Energy Program is the third component of a three-part public-private renewable energy program. CTF funding leverages IDB and IFC loans and guarantee support to financing through NAFIN, the domestic Mexican infrastructure bank, to investments in private wind and small hydro power plants. Under phases I and II, CTF funding blended with IFC and IDB funding to finance two large wind farms, Eurus and La Ventosa. Following the development of the first two projects with IDB funding, the third phase—Proposal III—is meant to accelerate and scale-up finance to a larger number of private projects by engaging NAFIN.

Recent improvements in the regulatory environment allow for private projects as independent power producers (IPPs, under a tender-based system), small producers and self-providers. IPPs and small producers sell directly to the Federal Electric Company (CFE). Under the self-provider arrangement, private power developers and energy-intensive manufacturing companies pool their capital resources to form a joint venture.

The US\$70 million CTF concessional loan leverages US\$250 million in NAFIN financing and an additional US\$220 million line of credit to NAFIN from a prior IDB loan for total CTF and MDB financing of US\$290 million. Proposal III also provides a US\$5 million grant from the GEF to promote the manufacture of wind turbines by private companies in Mexico. The CTF and MDB financing of US\$290 million will leverage US\$1960 million in private equity investment, for a total private share of 78% of the program.

CASE STUDY 7: MOROCCO OUARZAZATE CONCENTRATED SOLAR POWER

Concentrated solar power (CSP) is a new renewable energy technology that has not yet achieved economies of scale and associated cost reductions. The government of Morocco has ambitious plans to scale up renewable energy through CSP and it has an explicit goal of attracting private investment into CSP. The strategy to attract private investment includes establishing a supportive legal, regulatory and institutional framework. A law has been passed creating the Moroccan Agency for Solar Energy (MASEN) and an Energy Efficiency Agency. A new law allows MASEN, under certain conditions, to sell electricity to public and private operators in national and foreign markets in addition to selling to Morocco's electric utility, the *Office National de l'Electricité* (ONE). Agreements have been signed that set the conditions for connecting and operating solar power plants and selling the electricity into the grid. To encourage private sector participation in its ambitious renewable energy program the government is taking three important steps: (i) gradually removing subsidies on fossil fuels to encourage energy efficiency among consumers and to create a level playing field for investors; (ii) implementing demand-side management and energy efficiency measures to limit electricity demand growth and in particular peak demand, to avoid having to install high cost generation unit to cover demand that is the result of inefficient use; and (iii) providing transitional support measures until the cost of CSP is reduced and fossil fuel subsidies

are fully removed. Private partners in the public-private partnership are being selected through a competitive process after pre-qualification. The financial support from the international financial institutions (World Bank, AfDB, CTF and others) is part of the strategy to reinforce the credibility of the public agency (MASEN) as an investment partner for private investors and to reassure private investors about Morocco's willingness and capability to subsidize solar energy over the time period needed. The objective is to reduce the perception of risk and thus the equity rate of return required by private sponsors. The project is the most ambitious PPP in the region and, if successful, it will demonstrate the value of the PPP model for CSP plants that can be replicated. The PPP between MASEN and private developers will establish a contractual mechanism that will provide an incentive for private participation.

CASE STUDY 8: MOROCCO ONE WIND ENERGY PLAN

As part of the CTF program, Morocco strengthened its legal and regulatory framework to create an enabling environment for private investment in renewable energy production. Under the new laws, electricity generated from renewable energy projects may be connected to the national grid; private renewable energy promoters may export electricity through the national transmission grid and private renewable energy promoters may construct dedicated high-voltage direct current transmission lines for export if the capacity of the national grid is limited. The wind energy program is carried out as a public-private partnership. The public sector invests in transmission and distribution infrastructure as well as energy storage, in this case hydro-storage energy generating systems. When wind energy is being generated but not fully consumed the excess energy is used to pump water to the water heads of hydro-power stations. The hydro sites will supply baseload power, displacing the need for investment in gas turbines that usually accompany wind farms.

The private sector invests in the wind turbines as well as local manufacture of wind equipment. All the wind farms will be tendered as public-private partnerships or as independent power producers. The private-public partnership program scales up private investment in energy by investing public resources in transmission and distribution and allowing private power generators to supply energy into the grid. Private investment of US\$1,203 million accounts for 50% of the total program.

CASE STUDY 9: REPUBLIC OF SOUTH AFRICA ESKOM RENEWABLES SUPPORT PROJECT

This large program has three components: (i) South Africa Renewables Support Project, CIF financing US\$350 million, co-financing US\$960million; (ii) Sustainable Energy Acceleration, CIF financing US\$85 million; and (iii) South Africa Energy Efficiency Program, CIF financing: US\$15 million. The latter two components are implemented by the IFC and AfDB and so are not included in this analysis of public investment projects with private co-financing.

The South Africa Renewables Support Project comprises two components which will be implemented by Eskom, the public energy utility:

- a. Sere Wind Farm (100 MW). The Western Cape Province Wind Energy Facility has the technical potential to accommodate up to 200 MW of wind capacity. A priority activity for this subsector is development of Phase I of this wind site—the Sere Wind Power Project, consisting of a 100 MW wind farm comprising forty to fifty 1.5 to 3.0 MW wind turbines sized for moderate to low wind regime.
- b. Upington CSP (100 MW). CSP is the renewable energy source with the largest potential in South Africa. Grid-connected solar thermal power can provide large volumes of firm generation capacity, comparable to that provided by coal-fired power plants. However, in addition to being more costly, the initial CSP plants will have higher risk than a coal-fired power plant. The capital cost of the project is estimated at about US\$600 million, excluding contingencies. Given the uncertainties around the technology, and the need to incorporate the latest technological developments based on global experience in the plant design, contingent financing of about US\$150 million has been included in the financing plan.

Part of the Government's energy security strategy includes designing a legal and regulatory framework to attract private sector investment in generation, with a focus on renewable and low carbon activities. To stimulate private investment in renewable energy as part of the CTF program the Government plans immediate development of renewable energy power projects to demonstrate the viability of renewable technologies and to address the technological and institutional barriers to the development of wind and CSP projects.

The CTF co-financed CSP plant would be a flagship; it would establish cost and performance benchmarks for the broader deployment of CSP technology in the country and potentially in the sub-region. The replication potential is significant. However, currently CSP has a levelized cost of electricity two to three times that of supercritical coal-fired power plants and very limited operational experience at scale. The Eskom plant would help buy down costs and risks for subsequent IPPs, interested in entering the sector thanks to South Africa's attractive renewable energy feed-in tariffs, but constrained by uncertainties related to cost and risks. Similarly, the strong potential for scaling-up to utility-scale wind power faces major barriers such as high costs relative to coal-fired production, inability to provide baseload power due to output intermittency, and incremental transmission costs to connect isolated wind power sites to the grid. In the absence of the MDB and CTF support, the current economic crisis would have further delayed the implementation of the renewable energy projects. The program would help demonstrate the viability of large scale renewable generation, thus driving the renewable industry and the private sector towards future investment in renewable energy on the continent.

CASE STUDY 10: TURKEY PRIVATE SECTOR RENEWABLE ENERGY AND ENERGY EFFICIENCY PROJECT

In this innovative program, two of Turkey's development banks, one private and one public, mobilized funding from international institutions to lend to private borrowers to invest in renewable energy and energy efficiency. The program developed the policy framework to allow private energy producers to provide electricity into the grid.

The program comprises a concessional CTF loan of US\$100 million, a World Bank loan of US\$497 million and US\$313 million in loans from other international lenders (AFD, CIB, EIB and KfW). These loans leveraged private equity investment from project sponsors. The initial program quickly became a success, with substantial demand for additional private investment in renewable energy and energy efficiency.

All sub-borrowers are private. The private equity required of sub-borrowers is a minimum of 15% for renewable energy and 25% for energy efficiency. It's estimated that 100% of procurement is from domestic and international private suppliers.



Private Funding in Public-led Programs of the CTF: Early Experience
