1. Introduction

This memo is intended as a companion to a new Global Climate Network (GCN) report, *Investing in Clean Energy: How can developed countries best help developing countries finance climate-friendly energy investments?* Principally aimed at policymakers, financiers and experts, it includes detailed information on five financial instruments proposed by the GCN in our main report. Collectively, the instruments have the potential to leverage significant amounts of private sector capital for low-carbon and clean energy projects in developing countries.

As noted in the Copenhagen Accord, developed countries have jointly committed to mobilising US$100 billion each year from 2020 to support climate change adaptation and mitigation in developing countries. Although the Accord does not specify the relative contributions of public and private sources of finance to meeting this goal, it is clear that to be most effective, the goals of each source envisaged should be closely aligned. Furthermore, each type of funding should be used in a way that maximizes the overall resources available.

Using public funds as a means to unlock significant amounts of private capital for climate change mitigation will be critical to achieving and going beyond the US$100 billion yearly target. The GCN believes that governments should commit
a proportion of a future climate fund – as called for by the Copenhagen Accord (article 10) – to help remove the barriers to mobilising private capital for mitigation. This could include allocating funds to provide incentives or act as a guarantee for private investors, reducing real or perceived risk, both of which will be critical to reducing the costs of capital for clean energy technologies.

The financial tools discussed in this memo offer practical examples of how public funds could be used to leverage private investment in clean energy projects. It is the GCN’s firm view that governments should explore the use of this family of tools as part of an investment partnership with the private sector. In the description below, we assume that the different tools are being used as part of an international climate fund.

2. Description of financial leveraging tools

Each of the instruments proposed in this memo address barriers to private investment in climate change mitigation. They are perhaps less appropriate as a means of supporting most adaptation projects, however, which are likely to be financed through bilateral and multilateral agreements, traditional direct assistance funding and the UN Adaptation fund.

Taken together, the tools can be divided into two distinct categories. Loan guarantees, policy insurance, and foreign exchange liquidity facilities are designed to reduce the risk to lenders and are therefore most accurately termed debt-based mechanisms. In contrast, a pledge fund and low-carbon fund with subordinated equity can help increase equity investment; hence, they are deemed examples of equity-based mechanisms.

Some of these mechanisms will be more applicable to different types of investors, as well as different types of projects. For instance, while sovereign wealth funds are suited to participation in a pledge fund or a subordinated equity fund, debt-specific instruments, such as loan guarantees and foreign exchange liquidity facilities, are more applicable to banks.

The following table summarises the leveraging tools in question and provides brief information concerning the risks they address and their potential leverage ratio. Each of the instruments and how they operate in practice is then addressed in turn in the remainder of this section.
Loan guarantees

Certain projects involve various types and degrees of risk that cannot be reduced by conventional financial or policy tools. Examples include projects in countries with significant political turmoil, countries where contracts are not given high legal standing, or countries where energy markets are highly dysfunctional. For these types of risks, the best way to reduce the risk to private lenders is to issue a loan guarantee.

When government – or, in the case of this memo, an international fund backed by developed countries – issues a loan guarantee, it promises to pay back the loan if the borrower cannot make the payments. The risk is now on the guarantor as opposed to the lender. As a result, the lender is in a position to charge a much lower interest rate on the loan.
From the guarantor’s perspective, they have to keep enough money in an account to cover the cost of the loan guarantee. The cost to the guarantor is the present value of the expected payouts on the guarantee, inclusive of any recovery in liquidation (from selling the project’s assets). For an extremely risky project (with, for example, a 50 percent chance of default and the ability to only recover 50 percent of the costs of the project in liquidation), the cost of the guarantee could fall in the region of 10 percent to 15 percent of the total loan. This implies a leverage ratio of 6x to 10x.

Policy insurance

Some projects depend on one specific policy to be profitable. It can be assumed that private finance is available if the project is profitable, but not available if the project is unprofitable. An example is a renewable electricity generation project that is profitable with a feed-in tariff in place, but not profitable without the feed-in tariff. In this case, an international climate fund could buy an insurance policy against the feed-in tariff disappearing and give the policy to the project developer. Consequently, the fund has only spent the cost of the policy, but has enabled the financing of the entire project.

One way to think about the cost of the policy is to model the policy as a ‘put option.’ A simulation of this process is described in appendix 1, but the principle is that the feed-in tariff is treated as an asset that can be traded (just like a stock). The developer could buy a ‘put option’ (which gives them the right, but not the obligation, to sell the asset at a specific price at a point in the future) on the feed-in tariff asset. If the feed-in tariff were to disappear, they would exercise the ‘put option’ and accrue the same amount of money as originally specified.

Based on preliminary analysis of this ‘put option’ model, the insurance policy for a feed-in tariff could cost about 10 percent of the total feed-in tariff value. Calculating the exact leverage ratio is complicated, because it involves knowing the total value of the feed-in tariff over the lifetime of the insurance and the cost of the project. Nevertheless, the GCN estimates that the leverage ratio could be at least 10x.

Foreign exchange liquidity facility

If a clean energy project has revenues in a local currency, but has to repay a loan in foreign currency, the project is exposed to exchange rate risk. In some countries,
this risk is significant. While many currency-hedging methods exist today, a relatively simple one which an international climate fund could provide is a ‘foreign exchange liquidity facility.’

A foreign exchange liquidity facility is similar to a line of credit, in that it can be drawn on when the project needs money and then repaid when the project has more money than expected. The chart at right, taken from JR Sheppard and Company LLC (2004), illustrates how the tool works in practice. If and when the local currency is devalued below a certain point (line 2) and the developer cannot afford the debt payments, the developer can draw down the liquidity facility, and then repay the facility either when the exchange rate improves or the project is able to increase revenues through rate changes.

To date, this mechanism has been used very rarely and there is a notable absence of data estimating how much the mechanism would cost. We expect the cost would be much lower than either a loan guarantee or policy insurance, but any estimate of a leverage ratio would be extremely imprecise.

Pledge fund

Many relatively low-risk climate mitigation and clean energy projects in developing countries face two hurdles. First, project developers often do not have sufficient access to equity. Second, the projects tend to be too small for many equity investors to consider. To help overcome this challenge, an international climate fund could operate a type of equity capital fund known as a ‘pledge fund.’

In this model, equity investors (such as sovereign wealth funds, large private-equity firms, and pension funds) would ‘pledge’ to invest a certain amount of money in projects over the course of a set time period (for instance, one year). The fund would analyze numerous small projects and conduct the due diligence on projects on behalf of the equity investors. The investors could then decide where to invest on a project-by-project basis.
This serves two benefits to the investor. First, they now have access to smaller deals that would likely not have come to their attention otherwise. Second, the thorough analysis of each deal is being performed by the fund, so the investors’ resources involved in analysis are greatly reduced.

The pledge fund model will only apply to a limited number of projects. The fund would pay for all of the analysis/evaluation of projects, and the return would be the amount of equity that was raised for a project. The return-to-pay ratio is the leverage ratio. In many venture capital funds, the fund’s managers charge an annual management fee of 2 percent of the total fund size. If we assume that the pledge fund would be in effect for five years, that implies a management fee of 10 percent, or a leverage ratio of 10x.

Subordinated equity fund

Projects with a higher risk for equity investors may need a different model than the pledge fund. These projects could benefit from a low-carbon fund in which the international climate fund acts as a lead investor, but takes a subordinated equity stake.

In this model, the climate fund would evaluate projects and then decide to invest a specific amount of money in a project. Other equity investors would also invest, but their risk would be reduced because the climate fund would take a subordinated stake. That is, the other investors would get their money back first, then the Fund would get paid back, and finally private lenders would get paid back. Ideally, the Fund would make money on these investments, but these profits may come over a long time period, so the initial investment should be seen as an outlay that is only intended to leverage private investment.

The leverage ratio for the Fund’s subordinated equity stake is probably relatively low, but may work for bigger projects, so the actual dollar values may be large. An estimated leverage ratio of 2x could therefore be expected.

3. Summary of financial leveraging tools and conclusions

The table below summarizes the characteristics of each of these mechanisms which an international climate fund backed by developed country finance could provide. It is worth noting that no two mechanisms have the same characteristics, which suggests that each mechanism is appropriate for a different type of project.
A clear role for managers of a prospective international climate fund could therefore be to determine which mechanism is right for which project, with the ultimate goal of financing cost-effective projects for climate change mitigation and clean energy projects in developing countries worldwide.

The attraction of using developed country-backed guarantees and incentives for clean energy – either through an international climate fund or otherwise – is twofold. First, the involvement of developed country governments will reduce the cost of the capital and, consequently, second, more deployment of clean energy may be possible, which will lead to a greater degree of ‘learning by doing’ and hence further reduce technology costs.

<table>
<thead>
<tr>
<th>Mechanism</th>
<th>Leverages debt or equity?</th>
<th>Risk level</th>
<th>Mitigates many risks or few?</th>
<th>Leverage ratio (private to public)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loan guarantees</td>
<td>Debt</td>
<td>High</td>
<td>Many risks</td>
<td>6x-10x</td>
</tr>
<tr>
<td>Policy insurance</td>
<td>Debt</td>
<td>Medium</td>
<td>Adaptable to many, but ultimately just one</td>
<td>10x and above</td>
</tr>
<tr>
<td>Foreign exchange liquidity facility</td>
<td>Debt</td>
<td>Low</td>
<td>One</td>
<td>?</td>
</tr>
<tr>
<td>Pledge fund</td>
<td>Equity</td>
<td>Low</td>
<td>Many</td>
<td>10x</td>
</tr>
<tr>
<td>Subordinated Equity fund</td>
<td>Equity</td>
<td>High</td>
<td>Many</td>
<td>2x-5x</td>
</tr>
</tbody>
</table>
Appendix I: Insuring a feed-in tariff policy

This appendix offers a brief description of how ‘put options’ could be used to simulate insurance on a feed-in tariff as part of a policy insurance mechanism. This is not intended as a recommendation that this model actually be used, but rather is as an exercise to think about how this insurance might be priced.

1. Renewable energy developers would issue a certificate for each MwH of generation from their project. This certificate would be redeemable for cash from the government, making it functionally equivalent to a feed-in tariff, but also making it a tradeable asset, against which derivatives can be created.

2. The host country would institute a feed-in tariff, on either a MwH or KwH basis, although MwH makes for easier financial transactions (simply because it deals in bigger numbers).

3. The International Climate Fund would buy a put option on the feed-in tariff asset from a bank. This option gives the holder the right, but not the obligation, to sell an asset to the issuer for a specific price at some point in the future. (A European-style put option is preferable here, as they can only be exercised at a specific date.)

4. The International Climate Fund would buy put options for the amount of power they expect the project to generate. As the project generates power (and is awarded certificates), the fund issues a put option for every certificate to the developer.

5. The developer can now either redeem the certificate for the feed-in tariff or exercise the put option. The latter would occur if the feed-in tariff has disappeared or otherwise gone down in value.

6. The fund has to buy the put option, but this is much less expensive than being on the hook for the entire feed-in tariff. A put option for an asset with a US$20 current price, US$18 strike price, 50 percent volatility, 365 days to maturity, and 4 percent interest rate costs roughly $2, or 1/10th of the amount of the US$20 feed-in tariff.
References


Endnotes

1 The report is published separately and available for download from http://www.globalclimatenetwork.info.


3 Insurance mechanisms are seen by the insurance industry as being important in adaptation as most initiatives are aimed at bringing risk within certain boundaries. See, for instance: http://www.climatewise.org.uk/.

4 For further information on loan guarantees and how the US government is using this tool to support domestic nuclear power projects, see: Caperton, Richard W. 2010. “Protecting Taxpayers from Financial Meltdown.” Center for American Progress (http://www.americanprogress.org/issues/2010/03/nuclear_financing.html).


6 For more information on this point, see: Caperton (2010).

About the Global Climate Network

The Global Climate Network is a collaboration of independent, influential and progressive research and policy organisations in countries key to tackling climate change. Together, members of the Network are committed to addressing the constraints faced by sovereign governments in agreeing international action.

The Network aims to help governments clear a pathway towards an effective and fair international agreement for avoiding dangerous climate change by proposing bold low-carbon policies and using data and analysis to persuade policymakers that climate change mitigation is in their interest.

The Network is working to:

• Address the political (economic, social and cultural) constraints barring the way to action by bridging the divide between domestic and international policy.
• Promote equitable solutions that take into account the huge development, financial and energy challenges countries face.
• Champion ideas and innovations to help construct a new political narrative that links action on climate change with enhanced economic and social well-being.

Alone, each Network member has significant credibility and influence. By producing joint research, staging events together, and seeking to influence policy, the Global Climate Network can help bridge the dangerous divide that exists and is currently widening between international negotiations and national politics.

The Network’s members are:

• ippr, London, also acting as the secretariat for the Network: The UK’s leading progressive think tank with a strong track record on research and policy.

• Center for American Progress, USA: Founded by John Podesta, former Chief of Staff to President Clinton.

• Research Centre for Sustainable Development, China: An institute of the Chinese Academy of Social Sciences. Dr. Pan Jiahua, its director, is one of 12 members of the Chinese Experts Committee for Climate Change.
• **The Energy and Resources Institute**, India: The country’s leading climate and energy research institute whose director-general, Dr. Rajendra Pachauri, chairs the UN’s Intergovernmental Panel on Climate Change and is a close adviser to the Indian government.

• **Bellona Foundation**, Norway: Bellona is renowned internationally for its groundbreaking work on carbon capture and storage and other important low carbon technologies.


• **The Climate Institute**, Australia: Set up in 2005, the Institute is a leading voice in climate research and advocacy, pioneering clean technology and investment solutions with government and business.

• **IMBEWU Sustainability Legal Specialists**, South Africa: An influential Johannesburg based legal consultancy specialising in sustainability law with a strong climate change focus.

Dr. Rajendra Pachauri, John Podesta (see above) and Lord Chris Patten of Barnes, former European Commissioner for External Affairs, are the Network’s first patrons.