Clean Energy Investment

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Abbreviations

BIT	bilateral investment treaty
CTF	Clean Technology Fund
GHG	greenhouse gas
GW	gigawatt
IF	Integrated Framework for Trade-Related Technical Assistance to Least Developed Countries
IGO	intergovernmental organization
IIA	international investment agreement
IPCC	Intergovernmental Panel on Climate Change
IPO	initial public offering
LDC	least developed country
MDB	multilateral development bank
MW	megawatt
U.K.	United Kingdom
UNFCCC	United Nations Framework Convention on Climate Change
U.S.	United States
WTO	World Trade Organization

Summary of key issues, challenges

- If investment in energy infrastructure falls short of the monumental levels needed, we will be facing a crisis of development. If the investment materializes and is channeled into traditional modes, however, we will have a crisis of environment. The efforts needed diverge much further from the baseline case than we have yet succeeded in going.
- One of the ways to address this problem is to focus on fostering significant new flows of clean energy investment from the private sector. The public sector funds committed to date, and likely to materialize in future, are at least an order of magnitude too sparse.
- At the international level, international investment agreements may contain language that leaves government regulators exposed to binding compensable arbitration over climate change-related measures that impair investor profitability.
- At the domestic level, addressing policy and regulatory obstacles to clean energy investment may be one of the most important ways that governments, MDBs and donors can observe their various technology transfer obligations. Trade policy may have a role to play here, similar to the role it plays in the Integrated Framework collaboration that aims to help LDCs better exploit potential gains from trade liberalization.

Summary of concluding thoughts

- Arguably, technology transfer is an investment problem; not enough investment (both domestic and foreign) is flowing into dissemination of clean energy technologies. The key challenge is how to make such investment a more attractive proposition.
- Given the attention being paid to clean energy investment and technology transfer, and the financial resources being pledged, it is surprising that there has been so little focus on domestic and international barriers to investment. Ignoring these will ultimately frustrate efforts to bring about significant levels of technology transfer in many countries.

Clean energy investment as an environment and development challenge

Energy investment in developing countries is critically important to achieving development goals.

> "*Without access to modern energy services, the poor are deprived of opportunities for economic development and improved living standards. Modern energy services provide lighting, cooking, heating, refrigeration, transportation, motive power and electronic communications that are indispensable to increasing productivity, creating enterprises, employment and incomes, and accessing safe water and sanitation, as well as health and education.*" (World Bank, 2006:1)

A key aspect of the development challenge for the coming decades is the immense need for new energy supplies. For many in developing countries the issue is basic needs. 2.4 billion people still use traditional biomass for cooking and heating, and 1.6 million women and children die each year from exposure to the resulting indoor air pollution (*Ibid*). 1.6 billion people worldwide have no access to network electricity (mostly in Sub-Saharan Africa and South Asia), and 80 per cent of those are the rural poor of developing countries (IEA, 2006: 157).

Energy needed to feed rapid economic growth in urban centres is also significant. IEA (2007) cites a need for $22 trillion dollars in new energy investment between 2005 and 2030.[1] By 2030 the result would a 55 per cent increase in global primary energy use, with developing countries accounting for three quarters of that total (IEA, 2007). China alone in 2005 added more than 70 GW of new capacity to its grid—equivalent to adding two 650 MW generating stations per week or adding, over the year, the entirety of the U.K.'s installed generating capacity (Green, 2006).

In some sense, the IEA investment figures are better understood as warning than as a projection: if these torrential flows of new investment do not materialize—and there is no promise that they will—then we will have a crisis of development.

On the other hand, as the IEA also makes clear, if they materialize along the lines of business as usual then we will have a crisis of *environment*. Energy is a huge part of the climate change equation, accounting for some 80 per cent of global CO_2 emissions (IEA, 2007). IEA's reference case—the scenario that involves $22 trillion dollars of new investment—results in a 57 per cent increase in CO_2 emissions by 2030. Even the IEA's best-case scenario—the *Alternative Policy Scenario*—results in a 27 per cent increase between 2005 and 2030.

These figures stand in alarming contrast to the needs, as laid out by the IPCC's fourth assessment report and others (IPCC, 2007). The IPCC analysis, which is criticized by many as being too conservative[2]—estimates that to have even a 50 per cent chance of making a stabilization target of 2°C global temperature increase, global emissions will have to peak by 2015, and be reduced from year 2000 levels by 50–85 per cent by 2050.[3] In other words, even the IEA's most optimistic projections take us squarely in the wrong direction.

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1 This is the IEA Reference Case.

2 See, for example, Hansen (2007); Spratt and Sutton (2008).

3 IPCC (2007: table TS.2). The 50 per cent odds are implied by the fact that the figures in that table are based on "best estimate" of climate sensitivity of 3°C, meaning there is a roughly 50 per cent chance that it could be higher or lower than 3°C. Obviously the shape of the probability distribution is also important.

Missing the 2°C target is seen by many to be courting disaster that extends beyond the environmental, to significantly impact development goals as well. According to the UN Scientific Expert Group on Climate Change (2007:5):

> "*In our judgment and that of a growing number of other analysts and groups, ... increases beyond 2°C to 2.5°C above the 1750 level will entail sharply rising risks of crossing a climate "tipping point" that could lead to intolerable impacts on human well-being, in spite of all feasible attempts at adaptation*."

Meeting the challenge

Daunting though this context may be, it is nonetheless possible for energy to make a substantial contribution to sustainable development. There are four elements to a success scenario:

1. Massive new investments globally in clean energy[4], but most significantly in the developing countries that are the major source of growth in energy demand to 2030.

2. A transformation of existing energy supply infrastructure, primarily focused in developed countries where the majority of the world's stock is located.

3. A long-term collaborative effort by governments to foster revolutionary new clean energy technologies, and to help commercialize promising existing immature technologies, given the hurdles faced by private sector investors to doing so unassisted.

4. A focus on consumption, particularly but not exclusively in OECD countries. In part this can be achieved by a focus on end use energy efficiency and conservation measures. But absolute reductions in consumption will also be necessary, particularly in light of likelihood that successful conservation and efficiency efforts will simply allow for increased consumption (the so-called "rebound effect") (Polimeni *et al.*, 2008).

This paper focuses on the first of these four challenges (without prejudice to the importance of the other three). That is: how do we ensure that investment flows into new clean energy infrastructure in developing countries?

Public investment in clean energy has been on a steady increase. In February 2007, the finance Ministers of the U.S., U.K. and Japan proposed a $10 billion Clean Technology Fund to "help developing countries bridge the gap between dirty and clean technology" (Paulson, Darling and Nukaga, 2008). Part of Japan's Cool Earth Partnership, a fund worth $10 billion over five years, would go into the CTF, as would $2 billion from the U.S. and $1.5 billion from the U.K. over three years. Japan has also contributed to two funds in the Asian Development Bank that may have some impact in this area—the Investment Climate Facilitation Fund and the Asian Clean Energy Fund. As generous and necessary as such expenditures are, however, they are a drop in the bucket relative to the need. Even if 100 per cent of these funds were directed straight to clean energy investment in developing countries (in reality much less than that will be so directed), and was renewed annually until 2050 at those levels, it would amount to less than one per cent of developing country needs for such investment as projected by the IEA, even for its *reference* case.[5]

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4 For the purposes of this paper, clean energy technologies can be defined as those that emit substantially fewer GHGs than their conventional counterparts.

5 Even if we assumed the funding was mandated to cover only the incremental difference between clean and conventional energy infrastructure, rather than covering the total needed investment, we would come up an order of magnitude short.

Obviously the private sector is going to have to be the main driver for the needed levels of investment. Private sector clean energy investment has, in fact, been growing at a furious pace over the last few years. In 2004 it stood at $30 billion globally, and by 2007 this figure had almost quadrupled to $117 billion. (NEF, 2007) While this is an encouraging trend, the volumes do not yet stack up well against the needs. Of that $117 billion only $55 billion was actual asset financing (the remainder being *inter alia* investment in IPOs, venture capital and private equity). IEA's $22 trillion figure averages out to sixteen times this much annually.

This leaves us with the question: how can governments, MDBs and IGOs facilitate more of this kind of investment? With the limited funds available relative to the needs, it is inevitable that the best they can do is to act as facilitator and catalyst for larger flows of private sector resources. This paper will argue that there are several avenues that might be successfully pursued by governments to make such investments more attractive for private sector lenders and investors. It asks: what are the obstacles to clean energy investments, and what are the missing incentives? It finds these at both the domestic and international levels.

Obstacles and opportunities: The international level

The international regime for investment is in fact less like a regime than it is like a spaghetti bowl of separate agreements. There are a few obligations under the WTO's Agreement on Trade-Related Investment Measures, there are considerably stronger provisions contained in over 2,500 bilateral investment treaties, and there are about 30 investment chapters in bilateral and regional free trade agreements with commitments of a similar, often more ambitious, nature. The overall number of such international investment agreements (IIAs) is growing furiously.[6]

How does that body of law affect investment in clean energy? Its ostensible purpose is to protect investors, and thereby to increase flows of investment.[7] In the event that it did so—and the much-debated question of whether it does is beyond the scope of this paper—investment law might help foster clean energy investment, though it could conceivably also foster investment in traditional high-GHG emitting installations. As well, it might restrict policy flexibility to regulate in favour of clean energy. Or it might also be used to allow for proactive discrimination in favour of clean energy investment. These last two possibilities are briefly examined below.

Investment law varies from agreement to agreement, and the types of measures it applies to are specific to each case, but it is nonetheless possible to say in general terms how the "typical" investment law provisions might affect certain types of measures that favour clean energy investment.

Official promotion of clean as opposed to "dirty" energy investment would be unaffected under most IIAs, since in only a few agreements are there obligations that cover pre-establishment. That is, most investment law covers treatment of investors only *after* the investment has been made. For those few IIAs (albeit a growing number) that do cover pre-establishment investments, as long as government promotion of clean energy treats foreign and domestic investors alike, there should be no legal concerns.

6 For an overview of that growth, and the drivers that underlie it, see Cosbey *et al.* (2004).

7 It did just this in the case of *Nykomb vs. Republic of Latvia*, where the investor took Latvia to binding arbitration after it retroactively changed a regulation that had decreed a higher feed-in tariff for new energy supply.

A policy that created new limitations on GHG emissions from exiting installations, or which outright closed them or demanded significant retrofits from them, would face two types of restrictions, based on commitments in most IIAs related to expropriation, and to fair and equitable treatment. If the new policy had significant economic impacts (regardless of whether or not it had the same impacts on domestic facilities), the foreign investor might be able to argue that his or her investment was being indirectly expropriated, and claim damages. The case law on this is contradictory, some saying that a non-discriminatory measure of general application taken in the public interest cannot be expropriation, and others saying that any measure with strong enough economic impacts is expropriation, with damages due.[8] In the final event there is no *ex ante* certainty on this question.

The second type of obligation—fair and equitable treatment—is mostly about just and transparent process. But it has also come to mean, in some awards, no costly regulatory surprises. Most *bona fide* regulation, if undertaken transparently and fairly, would be safe from such challenge, unless there was a stabilization clause in place between the investor and the host government. Such agreements typically guarantee an investor unchanged regulatory treatment for a number of years, and if one exists when new regulations are brought in, it can be the basis for arbitration under the fair and equitable treatment obligations.

A useful role for trade policy in this area would be to clarify the definition of expropriation, though such an undertaking would be difficult because of the scattered nature of the "regime." There is, certainly, precedent on which drafters can draw in elaborating *new* agreements, including language from the 2004 US model BIT which cautions that "the fact that an action or series of actions by a Party has an adverse effect on the economic value of an investment, standing alone, does not establish that an indirect expropriation has occurred," and goes further to assert that "Except in rare circumstances, nondiscriminatory regulatory actions by a Party that are designed and applied to protect legitimate public welfare objectives, such as public health, safety, and the environment, do not constitute indirect expropriations."[9] It might also be useful for trade policy makers to consider the impacts of host country stabilization agreements on their climate-related obligations, there being a dearth of analytical work in this area.

Beyond the sorts of restrictions that IIAs might impose on domestic governments, it is useful to think about how such agreements might proactively foster clean vs. dirty investment. A survey of practice indicates that none of the current agreements do this, though the Energy Charter Treaty—a treaty explicitly aimed at fostering increased energy investment—does have some potentially useful environmental elements (Malik *et al.*, 2008).

Obstacles and opportunities: The domestic level

Investors, both foreign and domestic, consider a number of factors when making decisions on clean energy investment, a large number of which can be rolled together under the heading *domestic environment for investment*. In so doing, they assess how risky or difficult it will be to make an investment in a given country using a given technology, and add this to the expected costs. The sorts of barriers involved are varied. At the level of investment generally, investors look for such things as political and macroeconomic stability, educated workforce, adequate infrastructure (transportation, communications, energy), functioning bureaucracy, rule of law, strong finance sector, as well as ready markets for their products and services.

8 For an example of the former, see *Methanex vs. the United States of America*. For an example of the latter, see *Metalclad vs. the United States of Mexico*.

9 US Model BIT, Annex B.

There are a number of barriers that are specific to *clean energy* investment. These include a lack of clear guidance on future energy policy (lack of signals), monopoly structures for existing producers with lack of purchase agreements or feed-in tariffs for independent producers, lack of fiscal incentives for clean energy production, weak environmental regulation and enforcement, subsidies for conventional energy sources, a domestic financial sector that has little experience with new technologies, and so on.

These types of policy barriers will differ fundamentally from country to country, a function of the many factors that shape national energy policies, including history, politics, geography and chance. But the basic story remains the same: many countries, particularly the least developed among them, are not getting their full share of potential clean energy investment because their existing policies make them unattractive for any but the highest return projects. This basic finding is repeated in study after study. (Amin, 2000; Chandler and Gwin, 2008; Point Carbon, 2007: Dayo, 2008) That being the case, any focus on clean energy investment that does not address domestic barriers will be hamstrung from the outset.

What can be done to address this challenge, and is there a role for trade policy in the effort? The first need is for analytical national studies that highlight the obstacles to clean energy investment and the potential for profitable investment of this type. As noted above, the opportunities and obstacles will vary significantly from country to country, and diagnostic studies will help to identify the full range of potential actions that are needed to help make clean energy investment more attractive to both domestic and foreign investors. Trade policy makers have taken a lead role in similar efforts, notably the Integrated Framework for Trade-Related Technical Assistance to Least Developed Countries, which has a mandate to perform these types of diagnostic studies to identify obstacles to increased export trade. The Integrated Framework is a collaborative endeavour, involving the IMF, ITC, UNCTAD, UNDP, World Bank and WTO. The type of effort described here would obviously demand different partners, including the International Energy Agency, the World Bank (which has an active Energy Sector Management Assistance Program), perhaps the Energy Charter Treaty and others. But the WTO should arguably be at the table, given its mandates on investment and technology transfer, and its stated objective of sustainable development.

Following on from this type of diagnostic study there would need to be a concerted effort at implementation, in which trade policy makers arguably have less of a role to play than do those involved with official development assistance. This again would mirror the role the WTO has played in the IF exercise.

Action in this area would also be possible at levels below the multilateral. In both diagnosis and implementation there may be a role for the types of cooperative mechanisms that are normally established under modern bilateral and regional trade agreements; these agreements typically cover cooperation, technical assistance and capacity building on environment and development matters, among others (OECD, 2007).

Concluding thoughts

There is a flurry of activity, funding and political capital being directed at the challenge of clean energy technology, aimed at getting it into the hands of investors in developing countries as they make decisions that will have climate change impacts for generations to come. The World Bank has established its Clean Technology Fund, Japan has announced its Cool Earth Partnership, the U.K. and U.S. have followed suit with billions of dollars committed. Other multilateral development banks and individual donor countries are also active in supporting dissemination of technology to address climate change concerns.

The related theme of technology transfer is also attracting an increasing amount of attention. For the first time in UNFCCC negotiating history it is a key issue, having been incorporated in the Bali Action Plan commitments. Negotiators are searching (with varying degrees of success) for ways in which to give effect

to the technology transfer obligations to which they have subscribed under the UNFCCC, the Kyoto Protocol and the Bali Action Plan.

In the area of clean energy investment the two agendas come together. The problem of technology transfer is essentially an investment problem; not enough investment is taking place in transformative technologies that will both provide new sources of energy, and do so at a significantly lower cost to the environment. Successfully addressing the barriers to clean energy investment, making host countries more attractive for that investment, is essential for technology transfer. It is, in fact, arguably one of the most effective policy options that governments have available for fostering technology transfer. As noted above, governments cannot muster the scale of resources necessary to make them the primary drivers of technology transfer. Some argue further that they are ill-equipped because ownership of the requisite intellectual property rights vests with the private sector (a set of issues examined in greater depth in another of the background papers from this series on intellectual property rights and technology transfer). In any case, improving the domestic investment environment for clean energy technology is an entirely appropriate role for governments, MDBs and aid agencies in the pursuit of both development and environmental benefits. It is therefore surprising that in all the activity related to clean energy investment and technology transfer there has not been more attention paid to this challenge.

More attention also should be paid to the implications of international investment agreements for climate-related investment. The uncertainties of interpretation, particularly with respect to indirect expropriation, may in the final analysis chill new regulations designed to address climate change. And there may be potential for IIAs to take on an unprecedented proactive role in promoting clean investment, as opposed to any and all investment, but this possibility needs much more thoughtful analysis.

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