PART 4

Ensuring integrity and transparency in climate change mitigation

4.0

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Transparency International

Reducing global greenhouse gas (GHG) emissions will require a transformative shift in energy policy, technological innovation, resource management and consumption habits. Around the world, solutions are being introduced, including developing policies for energy efficiency, implementing market-based mechanisms, such as emissions trading or carbon taxes, and rolling out low-carbon technologies.

Despite the urgent need to reduce global levels of GHG emissions, in 2010 the International Energy Agency (IEA) noted that 'the world has continued to move – and even at an accelerated pace – in the wrong direction'.[1] Reversing this trajectory is possible, but, with little room for error, mitigation solutions must be designed, implemented and managed with the transparency and oversight necessary to guarantee their effectiveness. The authors in this part outline much of the progress that has already been made in reducing opportunities for corruption and improving the accountability of mitigation actions, and identify areas that still have to be addressed.

The rigorous measuring, reporting and verification of emissions are crucial for finding appropriate abatement solutions and measuring progress. Taryn Fransen's opening contribution emphasizes how accounting systems for GHG emissions inform mitigation strategies and determine the effectiveness of emissions reduction efforts. She notes that, although robust systems of GHG accounting have been developed, opportunities for manipulation and gaps in reporting requirements continue to exist.

These concerns take on greater importance as the number of countries measuring, reporting and verifying emissions grows. While developed countries are historically

responsible for climate change and must meet binding commitments to reduce emissions, many developing (non-Annex I) countries are also now crafting their own mitigation strategies. Although many of these plans are to be supported by developed countries, trust remains weak. A contribution from Juan Pablo Osornio, Ingmar Schumacher and Krina Despota considers the capacity, commitment and corruption challenges that will need to be addressed for developed and developing countries to collaborate on mitigation strategies. These considerations will become increasingly important in the years ahead, as developing countries now rank among the top global emitters.

While by no means the only path to widespread emissions reductions, a number of contributions in this part consider carbon markets because of their prominence in the debate on mitigation strategies. The introduction under the Kyoto Protocol of market-based mechanisms presents opportunities for the cost-effective reduction of GHG emissions, but also significant risks. Lambert Schneider suggests in his analysis that the European Union's Emissions Trading System (EU ETS), the Clean Development Mechanism (CDM) set up under the Kyoto Protocol, and other carbon markets, while a potentially powerful tool to mitigate climate change and incentivize technological innovation, can be susceptible to conflicts of interest and regulatory weaknesses. Supporting case studies on the government allocation and sale of emissions allowances from Emília Sičáková-Beblavá and Gabriel Šípoš of TI Slovakia and Gábor Baranyai for TI Hungary, respectively, illustrate how failure to transparently manage carbon credits undermines public trust. These are followed by an examination from TI Sri Lanka of shortcomings in the implementation of environmental impact assessments (EIAs), which could carry implications for the environmental sustainability of CDM projects or adaptation activities in that country.

Thomas Marcello traces the recent history of the voluntary carbon markets and, although he notes an increasing trend towards quality on the part of carbon credits, he also identifies opportunities for improving the environmental and social integrity of offset projects. Gernot Wagner, Nathaniel O. Keohane and Annie Petsonk then look towards the future of carbon markets, suggesting that sectoral crediting – in which entire industrial sectors in developing economies meet an emissions cap and sell credits derived from this reduction – will be successful only if the system is designed with integrity from the outset.

Shifting away from markets, this part then focuses on the private sector. The business community holds considerable sway over whether efforts to stop climate change are successful. A transformative shift towards low-carbon infrastructure and technologies threatens the interests of many dominant market players, however,

most notably the fossil fuel industry. If these companies cannot identify opportunities for profit in this new context, the risk grows that they will unduly exert their influence to slow mitigation progress. David Levy considers how innovative business models, collaboration between private sector actors and predictable policy signals at local, nation and international levels can keep industry positively engaged in a transition to a low-carbon future.

Ultimately, business responsibility towards climate change solutions must improve. While reducing emissions remains the most crucial mitigation activity that businesses can undertake, it is important to recognize that mitigation outcomes are increasingly shaped by corporate involvement in public climate change policy. Ryan Schuchard and Laura Ediger argue that corporate disclosure that includes the robust reporting of engagement with public climate change policy has a direct impact on the scope and effectiveness of GHG reduction strategies, and is thus a central component of business best practice in the climate change arena.

That message resonates with the anti-corruption community, which has for years worked closely with companies to improve corporate reporting. Transparencia por Colombia provides one example of these efforts, with a summary of a pilot study aimed at improving standards of transparency in corporate governance in private and publicly owned utility companies – an exercise that can contribute to broader expectations for reporting on climate-relevant information, such as energy efficiency.

The extent to which companies represent their actions and products honestly also relates directly to the purchasing choices of consumers – choices that, in turn, have an impact on global emissions. Fred Pearce tracks the ongoing tendency of some companies to mislead consumers about the climate-friendly credentials of products and services, and considers how governments and consumers can step up their efforts to hold companies to account.

As companies make adjustments to mitigate climate change, so too must governments. The move towards a low-carbon future will be marked by the widespread roll-out of renewable energy sources and shifting resource demands. How prepared countries are to manage the governance challenges associated with this transformation will have direct consequences for the public's trust in such initiatives, the interest of the private sector in financing low-carbon projects and, ultimately, the success of a transition to a green economy. Nadejda Komendantova and Anthony Patt present evidence that perceptions of corruption in bureaucratic processes in North Africa could significantly increase the costs of developing renewable energy projects. A case study from TI Spain flips the equation, describing how financial incentives for renewable resources in the form of feed-in tariffs created incentives for fraud in the absence of robust oversight mechanisms.

The development of a green economy will also place intensified demand on natural resources, such as those used in solar installations or hybrid vehicles, among other things. Stefan Bringezu and Raimund Bleischwitz map many of these natural resources against areas of weak governance and consider whether sizeable monetary transfers could trigger a new, green 'resource curse'. Transparencia Bolivia takes a closer look at how one country has so far balanced the development of its lithium reserves with public participation and information-sharing.

Finally, while every effort must continue to be made to reduce global GHG emissions, some scientists are now beginning to consider the possibility of intentional manipulation of the Earth's atmosphere. This continues to be a controversial and an undesirable means of reducing global temperatures, with unpredictable consequences, but one which may nevertheless move ahead. Graeme Wood explores the current lack of accountability surrounding research and governance in connection with geoengineering.

Notes

1. International Energy Agency, *Energy Technology Perspectives 2010: Scenarios and Strategies 2050* (Paris: IEA, 2010), p. 5.

4.1

Greenhouse gas accounting

A foundation for sound climate governance

Taryn Fransen[1]

Formulating, implementing and enforcing policies intended to reduce greenhouse gas (GHG) emissions[2] requires credible and reliable information that shows where emissions come from and who is responsible for them. Just as they are essential for the integrity of the global financial system, standardized accounting frameworks, transparent reporting mechanisms and robust verification systems are vital for effective climate governance.

The consequences – to the environment, communities and markets – of inadvertently inaccurate or intentionally misleading GHG information are significant. The expansion of carbon markets and offset trading has added even more layers of complexity and vulnerability to the integrity of GHG accounting.

Because GHG accounting has many objectives, various accounting approaches have been developed (see box 4.1). For example, the Kyoto Protocol relies on national GHG inventories to determine whether participants meet their agreed-upon emissions limits. Likewise, carbon markets depend on standardized methodologies to ensure that credits translate accurately into tonnes of emissions reduced. Corporate executives and investors rely on corporate GHG inventories to assess the financial or reputational risks associated with emissions. Finally, consumers increasingly have the option to choose among competing products based on their carbon footprint.

Although great strides have been made over the last decade towards standardizing GHG accounting and promoting emissions disclosure, information is still sparse or unreliable for some critical emissions sources. Moreover, the absence of robust rules

for some types of GHG accounting leaves certain accounting and reporting systems vulnerable to manipulation.

Because emissions are the result of decisions by a decentralized and diverse set of actors in virtually every sector of the global economy, developing comprehensive GHG information will require time, financial investment and capacity-building.

Box 4.1 Major types of GHG accounting frameworks

National

National GHG inventories, required for parties to the United Nations Framework Convention on Climate Change (UNFCCC), are intended to document all human-caused emissions and removals within a country. Inventory reporting requirements are decided by the Conference of the Parties (COP) to the UNFCCC, and methodologies are developed by the Intergovernmental Panel on Climate Change (IPCC).[3] The Kyoto Protocol has additional accounting rules that determine which sources and sinks[4] count towards a country's assigned amount of permitted emissions. Increasingly, subnational jurisdictions, such as states, provinces and cities, also conduct GHG inventories based on a similar approach.

Corporate

Corporate GHG inventories include a company's direct emissions (from sources owned or controlled by the reporting company) as well as indirect emissions from purchased electricity and other sources not owned or controlled by the reporting company. Companies use inventories to assess risks, identify opportunities to reduce emissions and publicly report emissions information. Standards include the GHG Protocol Corporate Standard and ISO 14064-1 of the International Organization for Standardization (ISO).

Facility

Facility-level accounting includes emissions from a specific industrial installation; facility-level data collection is either a component of corporate GHG inventories or is undertaken to comply with mandatory reporting requirements.

Project

Project-level accounting, which quantifies the impact of GHG mitigation projects, is used to assign credits for offset projects in compliance-driven carbon markets, such as the Clean Development Mechanism (CDM), and in voluntary markets. Rules include the GHG Protocol for Project Accounting, ISO 14064-2 and the Voluntary Carbon Standard, as well as methodologies used in specific markets, most prominently the CDM.

Product

This emerging practice tracks emissions associated with a specific good or service throughout its life cycle – be it a clothes dryer, a loaf of bread or mail delivery. The GHG Protocol and ISO are both developing international standards. The Carbon Trust has developed a standard (PAS-2050) for product life cycle accounting in the UK.

Strengths and weaknesses of the GHG accounting infrastructure

During the last decade five accounting elements have emerged that facilitate a 'true and fair'[5] description of GHG emissions or reductions. They are:

- accounting principles;
- accounting frameworks;
- quantification methods;
- reporting systems; and
- quality assurance and verification.

Each element plays a unique role in ensuring robust and transparent GHG information, but each also has shortcomings or vulnerabilities.

Accounting principles

The principles of accuracy, comparability, completeness, consistency and transparency, used initially by the UNFCCC to guide the development of national GHG inventories, have been modified for other types of GHG accounting, such as at the corporate or project level (see table 4.1).

GHG accounting principles provide guidance to practitioners by applying standards and requirements to specific situations. In some cases, fundamental trade-offs exist between principles. For example, completeness suggests that even small, highly uncertain sources should be included in an inventory, although this could compromise accuracy. Applying GHG accounting principles is therefore more of an art than a science, and more developed accounting frameworks and quantification methods mean that practitioners will need to rely less on subjective interpretation of the principles.

Principle | Definition	National	Corporate	Project
Accuracy | Ensure that GHG emissions are neither systematically over- nor under-quantified; reduce uncertainties as far as practicable.	✓	✓	✓
Comparability | Estimates are comparable between different reporting parties, based on agreed methodologies and formats.	✓		
Completeness | Account for all sources, sinks and gases within inventory boundary; consider all relevant information.	✓	✓	✓
Conservativeness | Use conservative assumptions, values and procedures when uncertainty is high; do not overestimate GHG reductions.			✓
Consistency | Allow meaningful comparisons of emissions estimates over time.	✓	✓	✓
Relevance | Use data, methods, criteria and assumptions that are relevant to the intended use of the information and serve the decision-making needs of users, including external stakeholders.		✓	✓
Transparency | Disclose and explain assumptions and methodologies clearly; disclose and justify any exclusions.	✓	✓	✓

Sources: WRI and World Business Council for Sustainable Development (WBCSD), *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (rev. edn.) (Washington, DC: WRI/WBCSD, 2004); WRI and WBCSD, *The Greenhouse Gas Protocol: The GHG Protocol for Project Accounting* (Washington, DC: WRI/WBCSD, 2005); UNFCCC, 'Updated UNFCCC Reporting Guidelines on Annual Inventories following Incorporation of the Provisions of Decision 14/CP.11', Document FCCC/SBSTA/2006/9 (New York: UNFCCC, 2006).

Table 4.1 GHG accounting principles

Accounting frameworks

Accounting frameworks create common expectations regarding the construction of GHG accounts and make it easier to identify potential bias. They delineate which sources should be included in the accounts, determine which entities should account for which emission sources or reductions, and promote the comparability of GHG information between entities and over time.

Certain elements play a fundamental role in limiting opportunities to manipulate GHG accounts, including the following:

- The *inventory boundary*, which establishes all GHG sources that have to be accounted for and limits the possibility of skewing results by arbitrarily including or excluding certain sources from consideration. The comparability of accounts depends critically

on standardized rules for determining who accounts for which emissions (for example, the joint ownership of a single facility), and how far up or down the value chain company or project owners should go to account for their effects on emissions.

- The ability to *track emissions over time* consistently from a given base year. A robust accounting framework will not allow a company or country to claim 'reductions' simply by applying a different methodology to the base year compared to the reporting year, or by including sources in the base year that are excluded from the reporting year.
- Emissions reduction projects are compared against a baseline scenario that estimates what an emissions level would be without mitigation efforts. Identifying the baseline scenario involves consideration of hypothetical, counterfactual situations in order to determine whether reductions occurring under the project are 'additional' to those that would have happened anyway. As section 4.3, following, indicates, establishing consistent and objective approaches for this has proved to be difficult.

Despite the safeguards provided by accounting frameworks, two major gaps remain. First, they simply have not been developed or standardized for some situations. For example, no standardized approach yet exists for financial institutions and governments to estimate likely GHG impacts from policies and investments, though some banks and jurisdictions are exploring this.[6] Nor is there yet a commonly accepted framework that balances a company's GHG assets (offsets or other reduction instruments) and liabilities (emissions). Therefore, a company can reduce emissions from a source, sell credits from the resulting reductions and still count these same reductions towards meeting its own voluntary reduction goal, effectively double-counting the reduction. This issue primarily affects corporate accounts under voluntary programmes, and new guidelines are being developed to address it.[7] A similar problem may arise in national GHG accounts, as developing countries that are eligible to host CDM projects are also taking on voluntary reduction targets. No rules prevent CDM or Reducing Emissions from Deforestation and Forest Degradation (REDD) projects from counting against the targets of both buyer and seller countries simultaneously. Moreover, because seller (developing) countries' targets are voluntary in the international context, it is unclear how this might be resolved.

The second shortcoming relates to accounting standards that are insufficiently robust to prevent manipulation. For example, in order to evaluate compliance with national emissions targets, the Kyoto Protocol considers the effects of afforestation, deforestation and reforestation. Because deforestation is narrowly defined, however, emissions from some types of land conversion are not counted against a country's allowed emissions. So, if a forest area is cleared but is not intended for another land use, this does not count as deforestation, and therefore a country's emissions are not

debited against the assigned amount – even if the deforested area does not get replanted or regain its original forest cover and carbon storage level.[8]

Quantification methods

Although it is sometimes possible to measure GHG emissions directly from the flue, it is far more common and cost-effective to calculate emissions by multiplying a unit of a commonly tracked activity, such as fuel consumption, by a factor of GHG emissions in terms of that unit, known as an emission factor. The adequacy of this approach depends on the availability of complete and accurate activity data and of appropriate emission factors, which are more widely available for some source types than for others. Carbon dioxide emissions from fossil fuel combustion, for example, can be estimated to a fairly high level of certainty. On the other hand, estimates of nitrous oxide from agricultural soils and transport, methane from landfills, and perfluorocarbons (PFCs), hydrofluorocarbons (HFCs) and sulphur hexafluoride (SF6) are subject to far greater uncertainty,[9] due to technology, local climate or other considerations.

While these factors can compromise the quality of GHG information, robust accounting standards and methodologies limit the potential for exploiting the inherent uncertainty in order to manipulate information. For example, quantification methodologies for offset projects typically require a procedure for calculating emission factors and to estimate reductions conservatively.

Reporting systems

Reporting systems collect GHG information and make it accessible to a range of stakeholders, including regulatory agencies, GHG reporting programmes or the general public. Reporting can be mandatory or voluntary and, although a great deal of reported information is publicly available, it is not comprehensive.

At the national level, UNFCCC parties are required to report their emissions to the secretariat either annually (Annex I countries) or every few years as determined by the COP (non-Annex I countries). While most non-Annex I countries follow IPCC inventory guidelines, they are not required to do so, making reports variable in quality.[10] Under the 2010 Cancún Agreements, however, non-Annex I countries would submit biennial update reports that contain national GHG inventories as well as information on mitigation actions, needs and support received.[11] This revision would greatly enhance the time series of data available, though it is not clear whether it would improve inventory quality.

Capacity is a significant obstacle to comprehensive reporting. Historically, most non-Annex I counties have treated GHG inventories as one-off projects rather than ongoing programmes. This is consistent with the funding mechanism provided through the Global Environmental Facility, which was designed to support individual national communications rather than the establishment of ongoing inventory programmes.[12] Consequently, money has been used to contract experts to prepare single reports rather than invested in establishing permanent data collection processes and programmes.[13] Until funding and technical capacity is scaled up to enable non-Annex I countries to submit regular and comprehensive data, it will be impossible to understand national and regional emissions trends fully.

Subnationally, facility-level reporting is generally required in countries where GHG emissions are or may soon be regulated – namely Australia, Canada, the EU, Japan and, as of 2010, the US. Reporting laws do not cover all sources; regulators typically require reports from sources that produce a significant share of total emissions. Developing countries generally do not require facility-level reporting, although this may change as more countries contemplate new national emissions limitations. Facility-level information can be made public, although some programmes exempt companies if disclosure would compromise confidential business information.

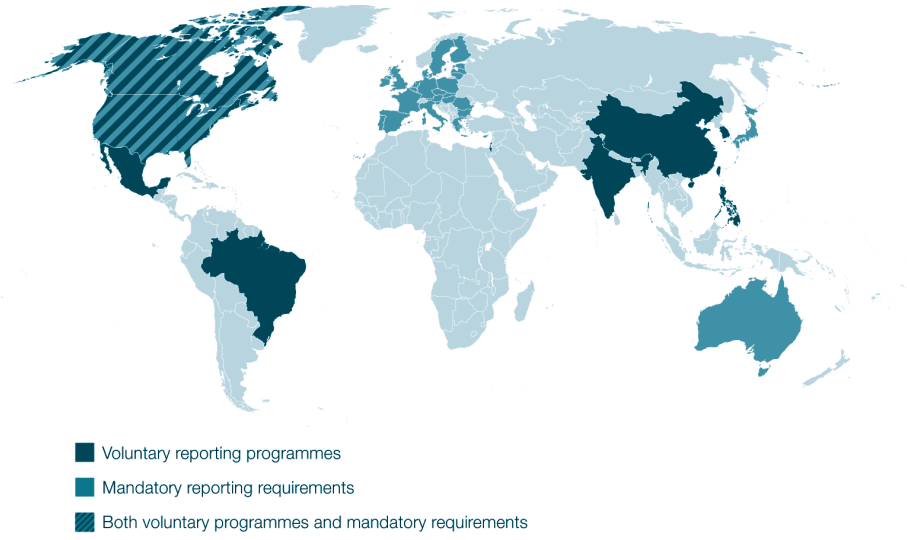
A growing number of companies disclose their emissions voluntarily, a trend driven by stakeholder and investor demands, baseline establishment and protection,[14] and participation in voluntary programmes (see figure 4.1).[15] Voluntary GHG registries include the Climate Registry (North America), Brazil's GHG Protocol Program and similar programmes developed to build capacity, engage the private sector on climate issues and create the political will for mitigation. Some industry associations also run programmes for their members. The quality of information varies by programme; some are more prescriptive than others in terms of adherence to internationally accepted accounting standards and quantification methodologies. Since their focus tends to be on building capacity and engagement in GHG issues, most do not require verification.

Ideally, GHG reporting systems would not only promote comprehensive data collection, but also present it in a manner convenient for a range of audiences to use and interpret. This requires that data be easily accessible – in a public, online database, for instance – and presented in a transparent format that can be aggregated and disaggregated. It also requires thoughtful communication based on a commonly understood terminology. In 2009, for example, the UK Statistics Authority suggested that a report by the Department of Energy and Climate Change fell short of codes of practice for suggesting that emissions had dropped 12.8 per cent without clarifying

that almost a third of this represented carbon credit purchases. While the data were correct, the authority pointed out that non-expert readers might misinterpret them.[16]

Overall, the trend is clearly towards increased GHG reporting, both mandatory and voluntary. By the beginning of 2009 only eight non-Annex I countries had submitted national inventories for 2000 data; by mid-2010 25 had done so. Australia and the US have begun requiring facility-level reporting, and Canada has ratcheted down the emission threshold at which reporting becomes mandatory.

At the corporate level, the Carbon Disclosure Project, which acts on behalf of 475 institutional investors to solicit GHG information from companies, found that 83 per cent of its Global 500 respondents reported GHG emissions.[17] Intensifying these efforts requires not just the financial and technical expertise to produce comprehensive and robust reports but also the public pressure to ensure that reporting is a priority.



This map does not include global voluntary programmes such as the Carbon Disclosure Project or WWF Climate Savers.

Source: Adapted from Taryn Fransen et al., *Measuring to Manage: A Guide to Designing GHG Accounting and Reporting Programs* (Washington, DC: WRI, 2007).

Figure 4.1 Jurisdictions with voluntary, corporate-level GHG accounting programmes

Quality assurance and verification

Quality assurance and verification are essential for ensuring the integrity of GHG reports. A variety of approaches have been piloted and adopted for national inventories, facility-level reporting and crediting mechanisms. Nonetheless, oversight capacity and technical knowledge need to be significantly enhanced to ensure the reliability of GHG information.

At the national level, GHG inventories of Annex I countries are assessed by international experts, who have to pass a qualifying examination. The review process is generally considered adequate, although reviewer capacity is an ongoing challenge.[18] While the UNFCCC has made significant investments in building this capacity, the number of available experts is insufficient to meet review needs, creating a struggle to ensure the integrity of inventories.

Non-Annex I inventories have not historically been subject to technical review, but the Copenhagen Accord and the subsequent Cancún Agreements provide for a process of 'international consultations and analysis' of the biennial update reports.[19] This process, the subject of a highly contentious international debate, aims to enhance transparency of mitigation actions and their effects while avoiding infringements on national sovereignty or taking a view on the appropriateness of domestic policies and measures. While it is not yet clear what form this process will take, some form of technical review would greatly help to enhance transparency and trust in the reported data. It would also provide a channel for feedback to non-Annex I technical experts on how to improve their inventories. Should non-Annex I inventories become subject to an Annex I type of review process, however, the shortage of qualified reviewers will become even more acute.

Similar capacity challenges for verifying mitigation projects include a paucity of technically qualified experts and possible conflicts of interest between offset project developers and those who assess the emissions reductions of those projects (see Lambert Schneider, section 4.3).[20] In response to shortcomings in the third-party verification process, the CDM Executive Board has increased its oversight, scaling up its staff fivefold over the last five years.[21]

Programmes mandating facility-level reporting may also require reporting by accredited third parties or allow spot auditing when non-compliance is suspected. At the national, project or facility level – for programme managers and regulators alike – devising verification and quality assurance requirements is a matter of balancing risk with cost. Comprehensive verification can be resource-intensive, requiring extensive time investment by technical experts. Some steps can be taken to overcome

this hurdle: Japan, for example, is developing an electronic data system to faciliate data collection at the corporate and national levels.[22]

For voluntary corporate inventories, some programmes and companies have indicated that the value they receive from verification does not justify the cost. Although most programmes typically do not require third-party verification, some, such as the Climate Registry, the Brazil GHG Protocol Program and the Mexico GHG Program, offer differentiated recognition to companies that report verified information. Other voluntary programmes emphasize technical assistance, capacity-building and inventory management planning – focusing on facilitating rather than verifying information accuracy. Honest misreporting can still happen. In 2009 an energy company familiar with GHG reporting systems nevertheless misclassified 70 million tonnes of carbon.[23] Verification can therefore provide an extra layer of protection from reputational risk.

Certainly, steps are being taken across various GHG accounting initiatives to improve quality assurance. Accreditation schemes now certify competent verifiers, and the ISO has developed standards for verifying GHG and accrediting verifiers.[24] While these relatively new efforts provide valuable guidance on identifying competent verifiers, broader reforms may be needed to protect against conflicts of interest.

Moving forward

Driven by the emphasis on 'measurable, reportable and verifiable' mitigation actions in the international policy framework, and by private sector interest in managing GHG-related risks all along supply chains, there is tremendous momentum towards more comprehensive and robust GHG information. As reporting becomes more widely mandated and encouraged, capacity has begun to replace political will as the prominent constraint. Technical and financial support, new accounting frameworks, enhanced data collection and user-friendly quantification tools will contribute to building the necessary capacity.

Countries and companies that are major sources of emissions require technical support to develop data sets and adopt methodologies to prepare reliable inventories. The technical knowledge of reviewers and verifiers must be enhanced, and the number of experts filling these roles considerably expanded, in order to meet the needs of both private sector accounting initiatives and national GHG inventories. For the national inventories of developing countries, assistance in building technical capacity should be matched by financial support from the international community so as to develop more frequent and robust inventories.

Increasing stakeholder access to GHG information will be enhanced by identifying and prioritizing gaps in accounting frameworks and implementing multi-stakeholder processes to fill these gaps. Candidates include 'balance sheet' frameworks and new approaches for governments and international financial institutions, including multilateral development banks, to account for the GHG impact of their policies and investments.

Enhanced data collection is also needed. By building on existing non-GHG data collection systems, it should be possible to ensure consistency while promoting synergies and saving resources. For example, China collects energy data to support its Top 1000 Energy-Consuming Enterprises programme. GHG data could be collected simultaneously through relatively simple amendments.[25]

Developing a comprehensive and user-friendly database of emission factors and GHG quantification methodologies for inventory developers would facilitate data quantification. Such a resource could build on the current IPCC emission factor database, but its mandate should be broader than national inventories in order to include corporate, facility and life cycle accounting, and it should contain user-friendly guidance on selecting appropriate emission factors for various sources and applications.

While building capacity, policy-makers and civil society must remain vigilant to ensure that the emerging policy architecture builds on existing systems so as to address GHG accounting, reporting and verification needs adequately. This is especially important given the uncertain future of the Kyoto Protocol and its associated emissions-tracking infrastructure.

The global community needs to work towards improved practices in reporting emissions and removals from land-use change. Common standards are also necessary for national registries to track inventories, reduction units and associated transactions. The role of civil society organizations in demanding access to GHG information and deploying it to call attention to best and worst practices is also critical; these organizations should seek opportunities to enhance their technical capacity.

Taken together, these steps would greatly enhance the availability and utility of GHG information for decision-making and accountability purposes.

Notes

1. Taryn Fransen is a senior associate with the Climate and Energy Program at the World Resources Institute (WRI).
2. Throughout this contribution, the term 'emissions' refers both to emissions of GHGs to the atmosphere and to the removal of carbon from the atmosphere through carbon sequestration; 'emissions reductions' refers to increases in emissions removals.

3. IPCC Task Force on National Greenhouse Gas Inventories: see www.ipcc-nggip.iges.or.jp.
4. According to the Fourth Assessment Report of the IPCC, a source is any process, activity or mechanism that releases a GHG, an aerosol or a precursor of a GHG or aerosol into the atmosphere, and a sink is any process, activity or mechanism that removes a GHG, an aerosol or a precursor of a GHG or aerosol from the atmosphere. See www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-annexes.pdf.
5. The term 'true and fair' is a financial accounting convention to signify that accounting reports represent correct and complete information about a business's financial situation.
6. See, for example, go.worldbank.org/SCH4V8MXE0.
7. For more information on the forthcoming guidelines, see www.ghgprotocol.org/performance-tracking-guidelines.
8. Florence Daviet, *Forests in the Balance Sheet: Lessons from Developed Country Land Use Change and Forestry Greenhouse Gas Accounting and Reporting*, working paper (Washington, DC: WRI, 2009).
9. Kristin Rypdal and Wilfried Winiwarter, 'Uncertainties in Greenhouse Gas Emission Inventories: Evaluation, Comparability and Implications', *Environmental Science and Policy*, vol. 4 (2001), pp. 107–116.
10. Taryn Fransen, *Enhancing Today's MRV Framework to Meet Tomorrow's Needs: The Role of National Communications and Inventories*, working paper (Washington, DC: WRI, 2009).
11. UNFCCC, 'Draft Decision -/CP.16: Outcome of the work of the Ad Hoc Working Group on long-term Cooperative Action under the Convention.'
12. Clare Breidenich and Daniel Bodansky, *Measurement, Reporting and Verification in a Post-2012 Climate Agreement* (Arlington, VA: Pew Center on Global Climate Change, 2009), pp. 13–14.
13. Ibid.
14. Companies operating in countries where emissions are not yet regulated sometimes anticipate that regulators will eventually allocate emissions allowances based on historical emissions levels. This possibility can create a perverse incentive that discourages companies from taking early, voluntary action to improve efficiency. Some companies view the establishment of GHG inventories as a means to document their baseline emissions and avoid being penalized with lower permit allocations under eventual regulation.
15. See Samantha Putt del Pino et al., *Sharpening the Cutting Edge: Corporate Action for a Strong, Low-Carbon Economy* (Washington, DC, WRI, 2009).
16. Correspondence from Sir Michael Scholar, UK Statistics Authority, to Tim Yeo, MP, 'Reporting of UK emissions under the EU trading scheme', 19 October 2009.
17. PricewaterhouseCoopers (PwC), *Carbon Disclosure Project 2009: Global 500 Report* (London: PwC, 2009).
18. See Fransen (2009), pp. 3-5.
19. UNFCCC, 'Draft Decision -/CP.15: Copenhagen Accord', 18 December 2009; UNFCCC, 'Draft Decision -/CP.16: Outcome of the work of the Ad Hoc Working Group on long-term Cooperative Action under the Convention.'
20. Mark Schapiro, 'Conning the Climate: Inside the Carbon-Trading Shell Game', *Harper's Magazine*, February 2010, pp. 31–39; Emma Lund, 'Dysfunctional Delegation: Why the Design of the CDM's Supervisory System Is Fundamentally Flawed', *Climate Policy*, vol. 10 (2010), pp. 277–288.
21. Schapiro (2010).

22. International Carbon Action Partnership (ICAP), *Summary Report on the First Global Carbon Market Forum on Monitoring, Reporting, Verification, Compliance and Enforcement: 'Backbone of a Robust Carbon Market'* (Berlin: ICAP, 2008).
23. *Recharge* (Norway), 'Carbon hole the size of Denmark', 11 December 2009.
24. ISO 14064-3 ('Specification with guidance for the validation and verification of greenhouse gas assertions'); 14065 ('Requirements for greenhouse gas validation and verification bodies for use in accreditation or other forms of recognition'); 14066 ('Competence requirements for conducting greenhouse gas validation and verification engagements with guidance for evaluation').
25. Michelle Zhao, 'On common ground: a CO_2 calculation tool based on China's *Energy Utilization Status Report*', unpublished paper prepared for the WRI, 2009.

4.2

Measuring, reporting and verification of NAMAs and their support

Considering capacity, corruption and commitments

Juan Pablo Osornio, Ingmar Schumacher and Krina Despota[1]

Although industrialized nations are widely agreed to be historically responsible for climate change, it has become increasingly evident that mitigation efforts by these countries alone will be insufficient to ensure that greenhouse gases (GHGs) do not cause a global temperature rise of more than 2°C above pre-industrial levels. GHG emissions from developing and emerging economies (non-Annex I countries) are growing rapidly. In absolute quantities, China is now the world's largest emitter,[2] and projections suggest that, by 2025, emissions from developing countries including Brazil, China, India and Mexico could outpace those of developed countries.[3]

While the principle of 'common but differentiated responsibilities' has been interpreted to mean that developed countries should take the lead on emissions reductions, international negotiations have in recent years recognized that developing countries[4] also need to work towards reducing emissions and developing their infrastructure along a low-carbon pathway. The 2007 Bali Action Plan called for developing countries to consider undertaking measurable, reportable and verifiable (MRV) 'nationally appropriate mitigation actions' (NAMAs).[5] The agreements reached at COP 16 in Cancún in 2010, called the Cancún Agreements, reconfirm that commitment by clearly stating that developing countries will introduce NAMAs to achieve a deviation in emissions relative to business-as-usual emissions in 2020. Unlike the somewhat ambiguous acceptance of the Copenhagen Accord, the Cancún

Agreements' broad support boosts emerging countries' incentives to design and implement mitigation actions.

The Cancún Agreements also provide the tools needed for NAMAs to be accomplished. They call for a registry to match finance, technology and capacity-building support from developed countries, with NAMAs from developing countries – also to be listed in the registry – that require the international support. The Cancún Agreements further agreed that NAMAs receiving international support would be subject to domestic and international MRV following guidelines still to be developed, while NAMAs that required no international support would be subject to domestic MRV also following as yet undetermined guidelines.

How these terms – NAMA and MRV – are developed in practice continues to be discussed in the international arena, just as they are being operationalized in many national and local contexts. Broadly speaking, NAMAs can be any range of activities by a developing country to reduce GHG emissions, from cap-and-trade programmes or carbon taxes to technology deployment programmes or sustainable development initiatives. Although more precise categories continue to be negotiated, three general types might be envisaged: unilateral NAMAs, requiring no international funding; supported NAMAs, using international financing, capacity-building or technology support from developed countries; and credited NAMAs, earning credits from the international carbon market.[6]

Box 4.2 Major sources of public financing for developing-country mitigation

Public support for mitigation financing currently comes through a variety of channels. Bilateral support from developed countries (Annex II)[7] under the United Nations Framework Convention on Climate Change is reported through national communications,[8] or via the Global Environment Facility (GEF). Between 2003 and 2006 the GEF's annual funding to climate change projects was about US$163 million, and between 2003 and 2007 OECD Development Assistance Committee members contributed an annual average of US$3.5 billion specifically for climate change mitigation.[9] Multilateral development banks (MDBs) also fund climate change mitigation in various ways: average annual commitments to clean energy and energy efficiency in developing countries totalled some US$4 billion annually in 2006 and 2007,[10] and the World Bank also purchases GHG emissions reductions credits derived from mitigation projects based in developing countries.

The MDBs, via the World Bank, also contribute to the Climate Investment Funds (CIFs) – financing instruments aimed at driving low-carbon and climate-resilient development. By July 2010 the Clean Technology Fund (CTF), one programme under the CIF umbrella, had allocated over US$4 billion to investment projects related to 13 investment plans in countries that are ODA-eligible.[11] Plans include the development of wind power (Egypt), concentrated solar power

(Middle East and North Africa), energy-efficient transport (Mexico) and geothermal energy (Indonesia).[12] Non-governmental organizations (NGOs) have noted a lack of transparency in the process used to select country investment plans, and have called for greater involvement from civil society in the development of investment plans.[13] The newer Scaling-up Renewable Energy Programme in Low-income Countries, established at the Copenhagen conference in December 2009, had received almost US$300 million in pledges by mid-2010.[14] Discussion regarding the governance and transparency of bilateral funding and the CIFs – which also include funds for adaptation – are discussed more broadly in part 5 (see Rebecca Dobson, section 5.1.1).

Towards greater trust and cooperation

Though progress was made in Cancún, international negotiations over MRV systems have been particularly contentious. Although, historically, reporting has been a common feature in multilateral environmental agreements, the verification of such data has not.[15] Implementing MRV systems could be seen to be leading developing countries towards the eventual introduction of binding emissions reductions targets,[16] or placing undue hardship on developing countries.[17] Acknowledging these potential problems, the Cancún Agreements explicitly decided that content and frequency of national communications from non-Annex I parties would 'not be more onerous than for [Annex I States]'. To achieve this, as has been the case with national communications, developed countries will provide financial support for developing countries' reporting. One would view this as the first and basic step that ensures trust-building and signals commitment towards cooperation.

Robust implementation of MRV systems should be welcomed as a tool for enhancing trust between both Annex I and non-Annex I countries and between citizens and their governments. It is also important to acknowledge that a number of countries that are likely to rely on external support for mitigation activities are also those for which perceptions of corruption are high.[18] For developed countries, therefore, a robust MRV system may provide assurances that resources for mitigation actions will be managed responsibly, even in countries or regions sometimes perceived as demonstrating lower levels of government accountability. Further, within countries that will receive international support for NAMAs, MRV may provide citizens with an added layer of accountability to ensure that their governments are implementing effective mitigation strategies and programmes.

Developing countries also stand to benefit from an MRV system that keeps closer tabs on support from developed countries. Experience from development aid demonstrates that support often has been delivered against timescales ill-suited to

their intended projects and that allocation may be managed by multilateral organizations that inadequately represent the interests of developing countries.[19] Tracking commitments in the context of climate change can be particularly difficult. One study examining pledges for mitigation and adaptation made by the European Union in 2001 found that it was impossible to say with any certainty whether commitments had been met by 2009.[20] A strong MRV system that links mitigation actions to specific funding commitments will help alleviate much of the financing uncertainty faced by developing countries. For both parties, rigorous measuring, reporting and verifying of NAMAs and of their support should help develop trust and facilitate cooperation. Creating such a system presents some challenges, however.

Overcoming challenges in measuring, reporting and verifying NAMAs and their support

Developing capacity

Among the biggest challenges for implementing MRV systems for NAMAs will be obtaining sufficient financing and technological support to ensure reliability and accuracy and to enable the development of in-country expertise. At the national level, the experience of self-reporting in other governance regimes suggests that developing in-country expertise in monitoring and reporting can fall short even after decades. For example, 20 years after the World Trade Organization's (WTO's) Trade Policy Review Mechanism was introduced, only one-fifth of 70 developing countries had independent agencies to undertake policy reviews.[21]

Within the climate regime, developing and developed countries alike have struggled with accuracy in their national communications, and long delays between submissions have not been uncommon.[22] Funding and support for developing countries' national communications have been sporadic, making it difficult to develop ongoing systems for monitoring and reporting on emissions.[23] With regards to reporting frequency, the Cancún Agreements state that non-Annex I parties will submit national communications and inventories every four years, along with biennial update reports on GHGs (least developed countries and small island developing States will have greater flexibility in meeting these timelines). While the Agreements state that this should be done according to capacity, enhanced reporting can be expected to place strain on a country's financial and technical resources. In mid-2010, the expert group[24] that provides technical support for the development of national communications noted a lack of technical support for non-Annex I countries undertaking their third national communications.[25] Thus, as guidelines for domestic and international MRV are developed, a simultaneous challenge will be to ensure

that national institutions tasked with measuring, reporting and verifying mitigation actions in developing countries are given the support they need – both from developed countries and civil society – to build domestic-capacity.

For supported NAMAs, international MRV systems could include in-country visits by expert reviewers, allowing for more accurate verification of emissions and policy actions, though this would require significant resources.[26] Centralized reviews, which the UNFCCC currently coordinates for Annex I countries, will need further resources for reliably gauging mitigation policies in developed and developing countries. Insufficient capacity to support international or domestic MRV systems will result in lower accuracy in tracking the progress of mitigation efforts.

Designing adaptable MRV models

A second challenge for the years ahead will be to develop MRV guidelines that accurately capture diverse mitigation efforts and low-carbon development strategies. Some mitigation actions will not lend themselves to measurement against emissions targets – a plan to implement broad multi-sector energy efficiency policies, for instance. Ensuring that these efforts are nevertheless subject to measurement and review that allows comparison between countries, while allowing for differences in national contexts, will be crucial to ensuring that MRV systems are both relevant and fair.[27] Efficient and complete reporting will play a critical role in this aspect.

NAMAs that allow the measurement of emissions impacts may also stretch the boundaries of the current structures in place for accounting and verifying emissions. Credited NAMAs, for example, would present a threat of double-counting if a mitigation project was counted both as a reduction in a developing country's emissions while simultaneously creating emissions reductions credits used by an Annex I nation to count against its own emissions. Proposals to avoid this outcome include 'walling off' the emissions reductions from pre-existing Clean Development Mechanism (CDM) projects so that they cannot count against the emissions reductions goals of supported NAMAs.[28]

If proposals for the crediting of NAMAs move forward (see Wagner, Keohane and Petsonk, section 4.3.5 in this volume), entire industrial sectors in developing countries will be expected to reduce emissions collectively. This approach could present a number of challenges for MRV systems. In China, for instance, an estimated 1200 companies make up the iron and steel sector, the largest of which provided only 6 per cent of domestic crude steel production in 2007.[29] Relying on so many small producers to provide the data necessary to determine emissions reductions could present significant accuracy and resource challenges for MRV. Rules for the

measurement and reporting of a broad menu of mitigation actions must be agile enough to accurately address such nuances.

Addressing external and internal corruption

As NAMAs become operational, internal and external corruption and accountability risks are likely to present themselves. The establishment of CDM projects throughout the developing world has already highlighted examples of independent verification companies undertaking lax or inaccurate assessments of mitigation projects (see section 4.3 in this volume). There are also concerns that criteria determined by the host countries to assess the sustainable development benefits of CDM projects are vague, that the approval process is vulnerable to corruption and that, in some cases, conflicts of interest are a risk if the authorities entrusted to review CDM projects can also advise on project proposals.[30]

NAMAs that have no direct emission reduction target should nevertheless have quantifiable milestones for project implementation. MRV of these projects could thus create a more structured system of oversight that increases project accountability. Failure to design measurements that are objective and demonstrable could increase the incentives for those engaged in the project to siphon off funding for personal gain at the cost of project effectiveness. Large-scale mitigation projects involving significant financial flows may also prove susceptible to corruption throughout the project cycle if domestic verifiers have an incentive to create favourable reports. A truly independent system with public oversight will need to be implemented to ensure that MRV systems do not become the final stage of complicity in a corrupt process.

As the form of mitigation actions expands in developing countries, corruption risks may also multiply. Sectoral crediting that commits entire sectors of industry to an emissions cap could, in a worst-case scenario, lead to collusion among businesses in establishing an inflated emissions baseline or manipulating emissions measurements and reports. Such activities would not be unique to developing countries; in 1998 the US Environmental Protection Agency (EPA) agreed a settlement with companies in the diesel engine industry for over US$1 billion for selling engines equipped with software that disabled the engine's emissions control system during highway driving.[31] Especially in countries where technical expertise is lacking to monitor and measure mitigation technologies adequately, such risks may be expected to increase.

Confronting these risks in order to ensure a reliable reflection of emissions will require a similar arsenal of tools to those used by anti-corruption practitioners. The implementation and enforcement of the United Nations Convention against Corruption (UNCAC) and regional anti-corruption conventions can contribute to

the penalization of corruption while sending a clear message of zero tolerance with regard to corruption to private sector actors. Integrity pacts, in which both government departments and bidding parties for a public sector contract agree not to accept or offer bribes or engage in collusion, have been used successfully in Asia, Latin America and Europe to discourage corruption in public procurement. Such tools could be modified to stimulate a culture of trust and transparency in developing and implementing NAMAs, or to ensure that any verifying agencies that are established adhere to high standards of integrity. Although citizen oversight may prove difficult in an area as technically complex as GHG emissions, citizen monitoring may help ensure that international funding for NAMAs is appropriately accounted for at national and local levels or that milestones for project completion are met. In this regard the registry established by the Cancún Agreements could provide a basis for comparing project milestones and costs and thereby help in identifying potential sources of corruption.

Creating transparency and predictability in financing

In the climate change arena, resources provided by developed countries to developing countries have proved to be difficult to track. UNFCCC guidelines for reporting climate financing have not been updated in over a decade, parties use various budget and accounting methods and they may have an unclear assessment of their climate financing if it is provided through multiple government agencies.[32] Other channels for reporting climate funding, such as the OECD's Development Assistance Committee (DAC) Creditor Reporting System (CRS), are unable to capture a full picture of financing: aid is recorded on the basis of intent rather than project implementation; multilateral organizations do not always report to the OECD; and financing passing through multilateral organizations often separates donors from specified projects or aid objectives.[33]

A number of suggestions have been made for improving reporting guidelines. These include incorporating the OECD's Rio Markers – designed to help identify official development assistance targeted for climate change mitigation[34] – for use in national communications from developed countries, thus allowing cross-checking with the OECD's CRS;[35] development of an alternative marker system for classifying funds; and introduction of a standardized format for non-Annex I countries to report on assistance needs and sources in national communications.[36] Relating to the importance of capacity-building outlined above, it has also been noted that improving capacity must extend to the development of enhanced financial reporting structures in both developed and developing countries to enable cross-checking of financial commitments.[37] Most urgently, perhaps, pledges from donor countries should be

specific and time-bound, offering greater certainty and accountability to developing countries relying on such funding.

Encouragingly, the Cancún Agreements reflect some of these suggestions and concerns, calling for enhanced reporting on financial, technological and capacity-building support to developing countries, which would include reporting under a common framework. Civil society and academic groups can also play a key role in developing tools that keep track of whether developed countries are meeting their support commitments. Initiatives that create oversight in the public sphere can provide added accountability. Websites that enable visitors to search levels of aid assistance by donor countries or by specific sectors or project type provide a strong model that could be tailored directly to developed country support of NAMAs.

Prepared for change?

Although the Cancún Agreements lay the foundations for an enhanced reporting system for NAMAs and their support, the question for the years ahead is whether rigorous MRV systems can be introduced and implemented in a way that is sufficiently fair, transparent and flexible to be meaningful for a wide range of needs and projects. By anticipating some of the challenges today, relating to capacity, corruption and commitments, MRV systems can be designed to be robust. The challenges are significant – but so are the rewards: an effective MRV system can increase trust between industrialized and developing nations and between developing nations and their citizens. That trust ultimately fuels enhanced mitigation ambitions and enables long-term planning for mitigation strategies.

Notes

1. At the time of writing Juan Pablo Osornio was manager of sectoral projects for Mexico at the Center for Clean Air Policy. Ingmar Schumacher is currently an economist at the Banque centrale du Luxembourg. The authors have written this article in their personal capacity and the opinions expressed are not necessarily shared by CCAP or the Banque centrale du Luxembourg. Krina Despota is a contributing editor to the *Global Corruption Report*.
2. It merits mention that Chinese per capita emissions remain below those of developed countries, and it is also worth noting that almost a quarter of China's emissions were produced in the manufacture of goods that are ultimately exported. See National Public Radio (US), 'For developing nations, exports boost CO_2 emissions', 8 March 2010.
3. Kevin Baumert et al., 'Navigating the Numbers: Greenhouse Gas Data and International Climate Policy' (Washington, DC: WRI, 2005), p. 18.
4. These are referred to in the UN Framework Convention on Climate Change (UNFCCC) as non-Annex I parties.

5. While the scope of this paper is limited to MRV in the context of NAMAs and their support, it is important to note that the Bali Action Plan also called for the MRV of mitigation commitments or actions from developed country parties.
6. See, for example, Center for Clean Air Policy (CCAP), *Nationally Appropriate Mitigation Actions by Developing Countries: Architecture and Key Issues* (Washington, DC: CCAP, 2009), pp. 7–10.
7. Annex II parties consist of the Organisation for Economic Co-operation and Development (OECD) members of Annex I, except those countries with economies in transition.
8. National communications include information on emissions and removals of GHGs, as well as information on what steps the party has taken to implement the convention. National communications might include, *inter alia*, information on national circumstances, vulnerability assessments, financial resources, and public education and awareness.
9. Jan Corfee-Morlot, Bruno Guay and Kate M. Larsen, *Financing Climate Change Mitigation: Towards a Framework for Measurement, Reporting and Verification* (Paris: OECD/ International Energy Agency, 2009, pp. 17-18).
10. Ibid., p. 23.
11. Bretton Woods Project, 'Update on the climate investment funds' (London: Bretton Woods Project, July 2010), p. 4.
12. See www.climateinvestmentfunds.org.
13. CCAP (2009); Smita Nakhooda, *The Clean Technology Fund: Insights for Development and Climate Finance*, working paper (Washington, DC: WRI, 2010), p. 8.
14. Bretton Woods Project (July 2010), p. 1.
15. Clare Breidenich and Daniel Bodansky, *Measurement, Reporting and Verification in a Post-2012 Climate Agreement* (Arlington, VA: Pew Center on Global Climate Change, 2009), p. 7.
16. See Arunabha Ghosh and Ngaire Woods, *Governing Climate Change: Lessons from Other Governance Regimes*, working paper 2009/51, Global Economic Governance Programme, Oxford University. A final version of the article is included in Dieter Helm and Cameron Hepburn (eds), *The Economics and Politics of Climate Change* (Oxford: Oxford University Press, 2009), pp. 454–477.
17. Third World Network (TWN), 'Developing Countries Mitigation and MRV – Call for Balance in Negotiations', TWN Bonn News Update no. 10 (Penang, Malaysia: TWN, 5 June 2010).
18. David Frame and Cameron Hepburn, 'An Issue of Trust: State Corruption, Responsibility and Greenhouse Gas Emissions', *Environmental Research Letters*, vol. 5 (2010).
19. Ngaire Woods, 'Making Climate Financing Work: What Might Climate Change Experts Learn from the Experience of Development Assistance?', in Richard Stewart et al. (eds), *Climate Finance: Regulatory and Funding Strategies for Climate Change and Global Development* (New York: New York University Press, 2009), pp. 206–210.
20. Marc Pallemaerts and Jonathan Armstrong, *Financial Support to Developing Countries for Climate Change Mitigation and Adaptation: Is the European Union Meeting Its Earlier Commitments?* (London: Institute for European Environmental Policy, 2009), p. 16.
21. Arunabha Ghosh and Ngaire Woods (2009), p. 16; for more, see Arunabha Ghosh, 'Developing Countries in the WTO Trade Policy Review Mechanism', *World Trade Review*, vol. 9 (2010), pp. 419–455.
22. Ghosh and Woods (2009), p. 15.
23. Breidenich and Bodansky (2009), pp 13–14.
24. Under the UNFCCC, the Consultative Group of Experts on National Communications from Parties not included in Annex I was established to improve the process of national communication development by non-Annex I parties.

25. UNFCCC, 'Progress Report on the Work of the Consultative Group of Experts on National Communications from Parties Not Included in Annex I to the Convention', Document FCCC/SBI/2010/INF.2, 10 May 2010.
26. Breidenich and Bodansky (2009), p. 23.
27. Ibid., pp. 21–22.
28. See Ellina Levina and Ned Helme, *Nationally Appropriate Mitigation Actions by Developing Countries: Architecture and Key Issues* (Washington, DC: CCAP, 2009), p. 4.
29. Ned Helme et al., *Global Sectoral Study: Final Report* (Washington, DC: CCAP, 2010), p. 30.
30. Aaron Cosbey et al., *Realizing the Development Dividend: Making the CDM Work for Developing Countries: Phase 1 Report* (Winnipeg: International Institute for Sustainable Development, 2005), pp. 43–44; Jørund Buen and Axel Michaelowa, 'View from the Inside – Markets for Carbon Credits to Fight Climate Change: Addressing Corruption Risks Proactively', in TI (ed.), *Global Corruption Report 2009* (Cambridge: Cambridge University Press, 2009), pp. 41–45; *Financial Times* (UK), 'Beijing races to profit from fledgling trade', 2 December 2009. The last article cites the example of an individual who serves on the expert group approving CDM proposals in China while simultaneously acting as a consultant for CDM projects in the country. It is worth noting that this article only highlights the conflict of interest risk associated with serving these dual purposes simultaneously, making no suggestion that the individual has acted inappropriately in either capacity.
31. EPA, 'DOJ, EPA announce one billion dollar settlement with diesel engine industry for clean air violations', press release, 22 October 1998.
32. Dennis Tirpak, *Guidelines for Reporting Information on Climate Finance*, working paper (Washington, DC: WRI, 2010), pp. 4, 6; Breidenich and Bodansky (2009), p. 16.
33. Dennis Tirpak (2010), p. 9.
34. See, for example, OECD, 'Measuring Aid Targeting the Objective of the United Nations Framework Convention on Climate Change' (Paris: OECD, 2009), at: www.oecd.org/dac/stats/rioconventions.
35. Breidenich and Bodansky (2009), p. 26.
36. Tirpak (2010), p. 9.
37. See Remi Moncel et al., 'Counting the Cash: Elements of a Framework for the Measurement, Reporting and Verification of Climate Finance' working paper (Washington, DC: WRI, 2009), pp. 13–14.

4.3

The trade-offs of trade

Realities and risks of carbon markets

Lambert Schneider[1]

Over the past decade, carbon markets have become an important instrument to reduce global greenhouse gas (GHG) emissions. The main advantage of market instruments is that they can help achieve emissions reductions in a cost-effective manner. The carbon market provides regulated entities – regions, countries, companies – with flexibility as to where and how they reduce emissions: an entity with the opportunity to reduce emissions at low costs can implement more GHG abatement measures and sell its excess allowances to an entity that faces higher costs, thereby reducing the overall costs to achieve an emissions reduction target. Effective and robust carbon markets will, over time, see the price of carbon increase, creating incentives to reduce emissions, and signalling to investors and industry the necessity for long-term investment in low-carbon technologies.

Carbon markets were introduced under the Kyoto Protocol and have emerged in various regions. They have been used most prominently by the European Union (EU) and emerging economies, but markets were also established in the northeastern states of the US and in New Zealand. Carbon markets have significantly changed emissions trends in some sectors and contributed to the unlocking of new mitigation potentials. They also helped create awareness on climate change, in particular in developing countries. Despite these successes, they have also been criticized for various reasons, including that their oversight is problematic, that they have not resulted in the emissions reductions envisaged by proponents and that they have not helped developing countries sufficiently in achieving sustainable development.

Varieties of carbon markets

In 1997 the Kyoto Protocol introduced three market mechanisms: emissions trading, the Clean Development Mechanism (CDM) and Joint Implementation (JI). Broadly speaking, carbon markets take two forms: cap-and-trade and offsetting. Under cap-and-trade or emissions trading systems, governments or intergovernmental bodies determine a cap on the total amount of GHGs that can be emitted by participating regions, countries or companies and then auction or freely distribute allowances to participants. The entities must surrender an allowance for each tonne of GHG they emit. Participants that reduce their emissions beyond the allowances they hold may sell their unused allowances to companies or countries that need additional allowances to cover their emissions.

The 40 developed countries that agreed under the Kyoto Protocol to place a cap on their national GHG emissions were issued assigned amount units (AAUs), corresponding to their emissions reductions targets, which they may trade among themselves. In addition to this international trading scheme under the Kyoto Protocol, several countries and regions have introduced trading schemes under which emissions are capped at an installation or company level.

By far the largest such scheme is the EU's Emissions Trading Scheme (EU ETS), which began in 2005 and covers nearly a half of European CO_2 emissions. In 2009 the total value of EU ETS trading rose to nearly US$119 billion, making it the largest carbon market currently in operation.[2] The EU ETS includes major emitting sources in the 27 EU member states and Norway, such as energy providers, refineries and cement, iron and steel plants. Other cap-and-trade markets exist in New Zealand and in northeastern states in the US. Additional regional, national or city-based schemes are under development or discussion in Australia, Japan, South Korea, Switzerland and the US.

Cap-and-trade systems can be amended by offsetting mechanisms: the entities regulated by an emissions cap can then offset their emissions by purchasing credits generated by emissions reductions from uncapped sources, such as projects to reduce emissions in the developing world.

The CDM is the most prominent offsetting mechanism. Under this system, projects that reduce emissions in developing countries can earn certified emission reductions (CERs). These can be purchased by industrialized countries in order to meet emissions reduction targets set under the Kyoto Protocol. In addition, schemes such as the EU ETS allow participants to use CERs in order to partially fulfil their emissions reduction commitments. By August 2010 the CDM had registered over 2300 projects, and was expected to deliver about 1 billion credits up to 2012. In

2008 direct investment in CDM projects was worth US$6.5 billion, although this fell to US$2.7 billion in 2009 with the advent of the financial crisis and the lack of an international agreement on a post-2012 climate regime.[3] Similar to the CDM but smaller in scope, JI enables an industrialized country (or a private entity within that country) committed to an emissions cap to finance a GHG reduction project in another country that also has an emissions cap.

Governing carbon markets with transparency

Carbon markets are unique in a few crucial ways. First, the commodity that is traded – GHG emissions allowances – exists only on account of a political regulation, with the initial distribution of the commodity being politically defined. Furthermore, as a new market, regulatory oversight mechanisms have to be built from scratch. These factors can create opportunities for vested interests to influence the design of the markets and regulatory institutions.

Unlike other markets, neither buyer nor seller has an inherent interest in the quality of the commodity. While buyers face reputational risks, they do not face compliance risks if they purchase allowances with a low quality: the allowances entitle the buyer to emit a certain amount of greenhouse gas (CO_2 or CO_2 equivalents) whether or not these allowances represent actual emissions reductions that have occurred elsewhere.

These unique circumstances make it especially important that, in both the design and operation of carbon markets, the highest standards of oversight, transparency and effective enforcement are in place to ensure that the market works in a stable and predictable manner and fulfils its objective of providing real emissions reductions. The early lessons from carbon markets already in operation offer insights into how carbon markets will need to be improved and developed in the future to achieve real emissions reductions and instil public trust.

Setting an ambitious cap

Setting an ambitious – low – emissions cap is a prerequisite for achieving real emissions reductions. An emissions cap set too high creates an abundance of permits and does not provide incentives for investments in low-carbon technologies. For some regulated industries, though, conforming to an emissions cap may be unwelcome. The regulated entities have incentives to lobby for a generous cap and influence the design of the scheme. At its extreme, an overly generous cap can lead to no emission reductions at all and a collapse in the price for allowances, and thus the carbon market itself.

Two years after the introduction of the EU ETS, in 2007, the price for allowances fell close to zero. The collapse was precipitated by the release of emissions data from regulated companies, which demonstrated that market regulators had over-allocated permits, inadvertently driving down the price of carbon and lowering the incentives for business to take steps to reduce emissions. Some observers believe it is plausible that regulated businesses would have tried to influence the ministries allocating allowances by emphasizing the competitive disadvantage the cap-and-trade scheme imposed – activities that potentially led to an inflated cap.[4]

Implementing a sufficiently ambitious and long-term cap is imperative to ensure the stability of the market. The early collection of data on the actual GHG emissions of regulated entities helps establish realistic caps, but these data also need to be accurate and verifiable. The unintended over-allocation of allowances could be avoided by introducing a minimum price for auctioning emissions allowances, as proposed by the UK and US.[5]

Issuing allowances: auctioning versus free distribution

Once an emissions cap has been set, industries regulated by a cap-and-trade system either receive emissions allowances via auction or for free, or through some combination of the two. One of the advantages of auctioning allowances is that it ensures that the polluter pays for the carbon it emits. It avoids establishing rules for the free allocation of emissions allowances, which are often controversial and difficult to establish in a fair and non-discriminatory manner. The auctioning of emissions allowances can also generate considerable revenues, which can be used for different purposes, including for mitigation and adaptation activities.

The auctioning of emissions allowances can also face risks, however. When carbon markets have limited coverage, the additional costs for auctioning emissions allowances can potentially result in 'carbon leakage' – that is, the shift of production from installations covered under emissions trading to installations outside emissions trading schemes. Moreover, the auctioning process needs to be designed carefully in order to avoid actors in the market colluding to lower the price on allowances by coordinating bidding. More frequent auctions would limit the impact of any single auction on market prices, reducing the opportunities for manipulation while creating a more stable carbon price.

When distributing emission allowances for free, two main approaches have been followed so far: grandfathering, the allocation of emissions allowances according to an entities' historical emissions; and benchmarking, the allocation of emissions allowances on the basis of an emission performance benchmark, usually expressed as

tonnes of GHG per production. Grandfathering is problematic, because it undermines the 'polluter pays' principle.

Besides ignoring a moral argument that the industries should pay to emit greenhouse gases, free distribution is problematic because allowances represent a considerable asset that can yield windfall profits for regulated industries. In the ETS's first phase, free distribution and over-allocation resulted in profits of €6–8 billion for the EU's four largest power producers, which attributed a monetary value to the allowances they received for free but then passed them on as a cost to consumers.[6]

Benchmarking – distributing allowances on the basis of the performance of the most efficient installations in a given sector – does not violate the 'polluter pays' principle and provides a fairer means of allocating allowances. Entities that have implemented GHG abatement measures in the past are not punished but benefit, and entities that pollute more must purchase additional allowances. Beginning in 2013, EU ETS will distribute about one-half of allowances via benchmarking and the other half by auction.

Clearly, the regulated industries have incentives to lobby for the free allocation of emission allowances. For example, in 2009, before proposed cap-and-trade legislation failed in Australia, the Australian Conservation Foundation asked the Competition and Consumer Commission to investigate whether six companies engaged in 'misleading or deceptive conduct', alleging they exaggerated the damaging consequences of climate change legislation in order to gain free emissions permits.[7]

Offsets: demonstrating additionality

A key requirement for offsets is that the emissions reductions they generate must be 'additional', meaning that projects to reduce emissions must be proved not to have been implemented without the revenues earned from selling offset allowances. Offset allowances that violate this principle actually increase total carbon emissions, since they entitle the entity that purchases the allowance to increase emissions, while the emissions reduction from the offset project would have taken place regardless.

Under the CDM, the world's largest offsetting scheme, the current approach to demonstrate additionality mostly requires project participants to demonstrate under which conditions they would be able to proceed with the project activity. Proving additionality largely becomes a question of demonstrating the intention of the project developer in taking investment decisions. The rationale as to why projects rely on funding for offset allowances may be quite vaguely argued, however. Practical experience suggests that the current approach fails to identify the additionality of projects reliably, with several analyses suggesting that a significant number of registered projects are probably not additional.[8] The fact that, by October 2008,

76 per cent of all projects registered under the CDM had been completely constructed prior to being approved for credits calls further into question whether offset projects really relied on CDM-related financing.[9] In an effort to make the demonstration of additionality less subjective and more transparent, over the last two years the CDM Executive Board has adopted guidance that aims to assess in a more objective manner whether projects can be economically viable without revenues from offset credits, if the project is impeded by too many barriers without the CDM or if the CDM was seriously considered in the decision to proceed with a project.[10]

All the same, rules could be improved or replaced. For example, emissions benchmarks can be used to measure the performance of a specific type of CDM project: the average emissions rate of top-performing plants for a given project type could be used as a benchmark, and only projects that have a better performance than the benchmark would be eligible for credits.[11] For benchmarks to be effective, however, they must be updated regularly to reflect improvements in industry standards over time. Establishing benchmarks can be challenging, since industry performance data may be unavailable or confidential and because some sectors produce various products, necessitating multiple benchmarks. Market penetration rates, which can be used to judge the extent to which a technology is used within a sector, may also be used to determine whether or not projects are likely to be additional. While both are improvements over more subjective claims of additionality, however, neither can fully avoid the 'free-riding' of projects that would have been implemented regardless of the CDM.

Another proposed method to improve the environmental integrity of offset credits is to move beyond an offsetting mechanism by crediting only part of the emissions reductions. For example, for 2 tonnes of emissions reductions only one offset credit may be issued.[12] This option was proposed recently by the European Commission and in draft legislation for an emissions trading scheme in the US.

Box 4.3 HFC-23: a case of perverse incentives under the CDM

Hydrofluorocarbon-23 (HFC-23) is a powerful GHG generated as a by-product of manufacturing hydrochlorofluorocarbon-22 (HCFC-22). In developing countries HFC-23 is usually vented into the atmosphere, which has led to the capture and elimination of this chemical becoming the largest project type under the CDM. Nineteen registered HFC-23 projects are expected to deliver 476 million CERs by 2012, comprising about a half of the emissions reductions expected from the more than 2300 other CDM projects. With the abatement cost for eliminating HFC-23 less than US$1 per tonne of emitted CO_2 equivalent, revenues from CDM projects can easily exceed the revenue from HCFC-22 sales.[13]

Recent analysis of these plants indicates that such large revenues created perverse incentives for plant operators to produce more HCFC-22 and HFC-23 than they would have without the CDM.[14] Although the methodology for determining credits includes safeguards to prevent this, these were found to be ineffective, and CDM HCFC-22 plants were intentionally operated to maximize offset credits. Two plants reduced HFC-23 generation while they were ineligible for credits and increased it once they could again claim credits. One plant stopped HCFC-22 production when it was not allowed to claim further offset credits and resumed operation when it again became eligible. Moreover, several plants were found to be producing exactly the amount of HCFC-22 and HFC-23 for which they were allowed to claim credits, whereas production was lower or varied year to year before offset credits were rewarded.

In mid-2010 the non-governmental organization CDM Watch submitted a formal request to the CDM Executive Board to revise the crediting methodology. The proposed revision would introduce an ambitious emission benchmark and cut the credits claimed for eliminating HFC-23 by more than 90 per cent, reducing the incentive to increase HCFC-22 production or HFC-23 generation.

The chair of the CDM's Methodologies Panel recommended putting the methodology on hold, and CDM Watch noted that CDM Executive Board members who were reluctant to review the methodology often came from countries that had a direct stake in HFC-23 projects, such as Japan, where the government is associated with eight such projects, China, which hosts 11 of the registered projects and charges a 65 per cent levy on all HFC-23 credits, and India, which hosts seven projects.[15] While the methodology was not put on hold, the executive board decided to start an investigation into the issue and put the issuance of credits on hold. The World Bank, which contracted CERs from HFC-23 projects worth about US$1 billion, claimed that there was not sufficient evidence to support the allegations.[16]

Offsets: demonstrating sustainability

Under the CDM, as well as for voluntary standards that approve carbon credits for sale outside the compliance market, another requirement is that offset projects should contribute to sustainable development. A CDM project requires the host-country government to confirm that the project assists in achieving sustainable development goals, but leaves determination for what constitutes sustainable development to the discretion of that government. National authorities have little incentive to reject projects that have no or only a few sustainable development benefits, however, as this results in lost revenue for their country. Indeed, studies examining the sustainable development benefits of CDM projects suggest that the contribution of the CDM to sustainable development is low.[17] Sweeping reforms could call for an internationally agreed methodological standard for the assessment of the sustainable development benefit of offset projects.[18] Alternatively, a positive or negative list of project types could be agreed on the basis of commonly expected

sustainable development benefits. Several experts have also proposed the discounting of CERs – issuing fewer credits than correspond directly to the tonnes of carbon released – from projects with less sustainable development benefit, thereby giving sustainable development benefits a monetary value.[19]

Third-party verification: building capacity and strengthening independence

Under all carbon market mechanisms, private accredited companies or individuals are responsible for ensuring the quality of the commodity by validating projects and verifying that emissions or emissions reductions correspond to the claims of the involved entities. These entities must make sure that all the requirements set out by the authorities governing the carbon market mechanism are met. Ensuring the quality of third-party verification is central to any carbon market, and the quality of the validation and verification under the CDM and JI may have consequences for non-compliance markets (see Thomas Marcello, section 4.3.4 in this volume). Despite this role being crucially important for the integrity of the carbon market, the track record of verification agencies is varied.

Verifiers of CDM projects – designated operational entities (DOEs) – are accredited by the CDM Executive Board. DOEs are paid directly by project developers. This may undermine their independence in conducting their verification functions. In the past two years the CDM Executive Board has temporarily suspended the accreditation of four DOEs,[20] including the three largest market players. The board found either that DOE personnel lacked competence, that DOEs did not appear to have undertaken independent technical reviews or that the verifying companies did not follow internal review or audit procedures adequately to ensure project quality.[21] This suggests that there are deep-rooted problems in the validation and verification process. Moreover, fewer than half the DOE-validated projects pass the board without any corrections.[22] In an independent rating of DOEs on an A to F scale ('A' indicating a very strong performance, 'F' representing a very poor performance), the top-scoring DOE received a 'D', with all others scoring below this.[23] Other assessments suggest that 'DOEs are willing to rubberstamp project documents containing unverifiable and highly dubious claims',[24] and that in some cases documents presented to DOEs have been falsified, and verifying document authenticity is difficult.[25]

The capacity of personnel has been cited as a significant problem, with some verifying agencies reporting difficulties in hiring and retaining qualified staff. In some cases, staff members of verifiers who had acquired a basic level of expertise

moved on to become project developers, creating a potential for conflicts of interest.[26] Another problem is that the guidance by the CDM Executive Board is in some cases not fully clear, leading to differences of interpretation between the board and DOEs. Moreover, the accreditation process has relied strongly on formal requirements and is not very transparent, given that relevant documentation, such as assessments of DOEs by the CDM Executive Board, is not made publicly available. Increased transparency would serve as a learning tool for verifiers, and the public scrutiny could provide added incentives for verifying companies to improve their internal operations.

In recent years the CDM Executive Board has initiated different actions to improve the validation and verification process. A Validation and Verification Manual (VVM) was adopted by the CDM Executive Board in November 2008, followed by an accreditation standard. The UNFCCC Secretariat is starting to conduct trainings for DOEs. Furthermore, the board has decided to implement a policy framework to oversee DOEs systematically, which includes monitoring of their performance and which may trigger spot checks at the DOEs. As part of this new system, performance indicators have been calculated and made available to the CDM Executive Board – though not yet to the public. The board is also considering how DOEs can be made liable in case of over-issuance of CERs.

In addition to these efforts to address the shortcomings in the current validation and verification process, a broader set of penalties could also be implemented to address non-compliance on the part of verifiers, including financial sanctions and compulsory training and exams for the personnel of DOEs.

In the case of the CDM and for other offset programmes, a more fundamental reform could be that verifiers are paid out of a common fund to which project developers contribute, rather than being commissioned and paid directly by the project developers. This would diminish the opportunities for conflicts of interest.

Reporting emissions and tracking allowances: avoiding double-counting and ensuring transparency

Carbon markets require proper bookkeeping of the issuing and trading of emissions allowances in order to avoid any double-counting of emissions (when the same allowances are used by various entities to meet their emissions reduction targets). In the spring of 2010 the Hungarian government sold CERs that had been surrendered by companies participating in the EU ETS to an intermediary company.[27] Despite claims that the CERs would be kept out of EU carbon exchanges, the 'recycled' credits were soon traded on the EU market without buyers realizing that they could

not be used for compliance within the EU ETS. This led to the suspension of CER trade in European exchanges and a change in the European registry regulation to close this loophole.

In addition to avoiding such double-counting, it is key for the integrity of the market that regulated entities in emissions trading schemes report their GHG emissions in an accurate, conservative and transparent manner in order to assess compliance (see Taryn Fransen, section 4.1 in this volume). In the EU ETS, GHG emission data are reported according to well-established protocols, which usually have a low potential for gaming and require verification by third parties that may be held liable in cases of fraud. Generally, the introduction of trading schemes can significantly enhance the transparency of GHG emissions. Frequent reporting on GHG emissions, as well as on offsets and allowances, will enable the public to track the GHG emissions and compliance efforts of companies.

Implementing accountable and effective market oversight

Institutions responsible for overseeing carbon markets must be independent and accountable, and possess the technical knowledge necessary to make informed and reliable decisions.

Avoiding conflicts of interest and ensuring accountability

Within the oversight structures for carbon markets, conflicts of interest are a particularly salient concern. The CDM and Joint Implementation (JI) are overseen by the CDM Executive Board and the JI Supervisory Committee (JISC), respectively, each of which consists of 10 members elected by the parties to the UNFCCC and the Kyoto Protocol. Although members are instructed to act in their personal capacity, many hold multiple roles, such as serving as climate change negotiators for their country, representing their country's national authority (which gives national permission for CDM projects) or managing large government CDM purchasing programmes.[28] While the CDM Executive Board requires members to declare conflicts of interest,[29] members 'exercise personal discretion in deciding whether s/he has a real or perceived conflict'. Some members make formal statements regarding conflicts of interests, but others do not.[30]

A newspaper report suggests that, in closed-door meetings, board members have in some instances aggressively promoted projects that benefit their home countries or companies from their countries.[31] A statistical evaluation of all decisions by the CDM Executive Board suggests that, after quality criteria, political/economic variables also drive decisions. For instance, a project has a better chance of being

approved if the host country is also represented by a board member. Similarly, the involvement of powerful players such as the World Bank improves the probability of success.[32] While such examples may be the exception rather than the rule, the lack of defined conflict of interest guidelines leaves board members vulnerable to perceptions of conflict of interest. To address the problem more radically, it has been considered that staff for such positions should be full-time salaried professionals, rather than appointees.[33]

In the case of offsetting mechanisms such as the CDM and JI, many stakeholders, including project developers, have called for board meetings to be open, requested clarity on how decisions are made, and called for better substantiation of decisions and more direct communication with board members.[34] Ensuring sufficient accountability in carbon market governance requires proper consultation and communication with stakeholders before and after decisions are taken. A significant criticism of the CDM process was the lack of an appeals process for board decisions, which the Executive Board is working on.

Ensuring compliance, protecting against fraud

Central to any market are enforcement mechanisms that make sure that regulations are followed and that market integrity is safeguarded. In the EU ETS, a fine of €100 per allowance must be paid if an entity does not surrender the necessary amount of allowances.[35] This fine has, so far, successfully ensured broad compliance on the part of the regulated entities. Regulators also have to pay attention in order to prevent market manipulation and fraud, however, by ensuring sufficiently rigorous oversight, adopting penalties for offenders and providing regular in-depth information on the market. Strong oversight may be particularly important in the early stages of market development. In 2009 European regulators struggled to control VAT fraud, in which people opened trading accounts in a national carbon registry, purchased allowances VAT-free, sold the allowances on with VAT and then absconded prior to paying VAT to the tax authority. Such issues are not unique to the carbon markets, but will have to be regulated against vigilantly so as to bolster public trust in existing and emerging markets.

Managing public assets and revenues from the carbon market

Depending on how assets generated by carbon markets are distributed at the outset of the market, some or all of them might initially be held in public coffers. These assets can provide a significant source of revenue for governments and must be managed with the accountability expected of any public resource. This did not

happen in 2009, when a Slovakian environment minister was forced to resign after selling a portion of that country's AAUs at below-market prices and withholding details of the sale (see the Slovakia case study which follows this section).

The use of funds generated from sales of allowances also matters. Allowance auctions for the third phase of the EU ETS will generate significant revenue, 50 per cent of which is earmarked for climate programmes such as renewable energy and energy efficiency, reducing deforestation and funding adaptation to climate change. The Regional Greenhouse Gas Initiative in the eastern US also auctions allowances and uses revenues to boost investment for energy efficiency and renewable sources of power. In addition, 2 per cent of offset credits from the CDM are directed towards the UNFCCC's Adaptation Fund, and revenues derived from the sale of assigned amount units may also be invested in environmentally oriented projects – so-called Green Investment Schemes (GISs). This last practice could be quite important in the case of eastern European countries, which under the Kyoto Protocol were allocated emissions targets exceeding their actual emissions. The resulting surplus AAUs, referred to as 'hot air', can be sold on to other countries or carried over to subsequent commitment periods, considerably undermining the overall efforts to reduce GHG emissions if the allowances are used. A contentious debate has arisen as to how the carry-over of surplus AAUs can be prevented in a post-2012 climate regime.

In all cases, governments are entrusted with both an environmental and a financial asset, and have to manage these proceeds responsibly, transparently and accountably.

Robust carbon markets: a collective responsibility

As a leading tool for mitigating climate change, carbon markets must be designed carefully, and they require strong, transparent and accountable oversight. The lessons from existing carbon markets suggest that several loopholes were created in establishing new policy instruments, which stifled the potential of carbon markets to mitigate global GHG emissions. It is imperative that these lessons be considered in establishing new markets, and used to improve and reform the existing mechanisms.

Notes

1. Lambert Schneider worked previously for the Öko-Institut in Germany and as an independent researcher. In October 2010 he joined the UNFCCC Secretariat. This article was written before that appointment.
2. Alexandre Kossoy and Philippe Ambrosi, *State and Trends of the Carbon Market 2010* (Washington, DC: World Bank, 2010), p. 1.
3. Ibid., pp. 1–2.

4. Tamra Gilbertson and Oscar Reyes, *Carbon Trading: How It Works and Why It Fails*, Critical Currents Occasional Paper no. 7 (Uppsala: Dag Hammarskjöld Foundation, 2009), p. 35.
5. In the US, a price ceiling was proposed in the Waxman–Markey bill and the Kerry–Boxer bill; PointCarbon.com, 'UK govt calls for carbon floor price', 12 May 2010.
6. Richard Baldwin, *Regulation Lite: The Rise of Emissions Trading*, Law, Society and Economy Working Paper no. 3/2008 (London: London School of Economics, 2008), p. 10.
7. RechargeNews.com, 'Six Australian companies accused of carbon fraud', 15 June 2009; see also Australian Conservation Foundation, 'Complaint to the Australian Competition and Consumer Commission', 11 June 2009.
8. See Lambert Schneider, 'Assessing the Additionality of CDM Projects: Practical Experiences and Lessons Learned', *Climate Policy*, vol. 9 (2009), pp. 242–254; Martin Cames et al., *Long-Term Prospects of CDM and JI*, Climate Change Research Report no. 12–07 (Dessau: Federal Environmental Agency of Germany, 2007); Axel Michaelowa and Pallav Purohit, *Additionality Determination of Indian CDM projects. Can Indian CDM Project Developers Outwit the CDM Executive Board?* (Zurich: University of Zurich, 2007); David Victor and Michael Wara, *A Realistic Policy on International Carbon Offsets*, working paper no. 74 (Stanford, CA: Stanford Universty, 2008).
9. International Rivers, 'Rip-Offsets: The Failure of the Kyoto Protocol's Clean Development Mechanism' (Berkeley, CA: International Rivers, 2008).
10. Meeting report of the 39th meeting of the CDM Executive Board, annex 35; meeting report of the 41st meeting of the CDM Executive Board, annex 46; meeting report of the 50th meeting of the CDM Executive Board, annex 13.
11. Lambert Schneider, *Is the CDM Fulfilling Its Environmental and Sustainable Development Objectives? An Evaluation of the CDM and Options for Improvement* (Berlin: Öko-Institut, 2007), p. 58.
12. See Stefan Bakker et al., 'Differentiation in the CDM: Options and Impacts' (Bilthoven: Netherlands Environmental Assessment Agency, 2009); Sonja Butzengeiger-Geyer et al., 'Options for Utilizing the CDM for Global Emission Reductions', final report to the German Federal Environment Agency (Zurich and Berlin: University of Zurich, Perspectives GmbH, Öko-Institut and Point Carbon, 2010); Paula Castro and Axel Michaelowa, 'The Impact of CER Discounting on the Competitiveness of Different CDM Host Countries', *Ecological Economics*, vol. 70 (2009), pp. 34–42; Rae Kwon Chung, 'A CER Discounting Scheme Could Save Climate Change Regime after 2012', *Climate Policy*, vol. 7 (2007), pp. 171–176; and Lambert Schneider, 'A Clean Development Mechanism with Global Atmospheric Benefits for a Post-2012 Climate Regime', *International Environmental Agreements*, vol. 9 (2009), pp. 95–111.
13. UNFCCC, 'Issues arising from the implementation of potential project activities under the clean development mechanism: the case of incineration of HFC-23 waste streams from HCFC-22 production', FCCC/TP/2005/1; Lambert Schneider et al. 'Implications of the Clean Development Mechanism under the Kyoto Protocol on other Conventions. The Case of HFC-23 Destruction' *Environmental Law Network International Review* (2005); Technology and Economic Assessment Panel (TEAP)/IPCC, *Safeguarding the Ozone Layer and the Global Climate System: Issues Related to Hydrofluorocarbons and Perfluorocarbons* (Cambridge: Cambridge University Press, 2005), p. 427; TEAP, *Report of the Task Force on HCFC Issues (With Particular Focus on the Impact of the Clean Development Mechanism) and Emissions Reduction Benefits Arising from Earlier HCFC Phase-Out and Other Practical Measures – Response to Decision XVIII/12*, 2007, p. 57.

14. See request for revision REV0186, submitted by CDM Watch to the CDM Executive Board, available at http://cdm.unfccc.int, and Lambert Schneider, 'Perverse Incentives under the Clean Development Mechanism (CDM): An Evaluation of HFC-23 Destruction Projects', accepted by *Climate Policy* (forthcoming).
15. Environmental Investigation Agency (EIA), 'UN delays action on carbon market scandal', press release, 30 July 2010.
16. World Bank, 'Q&A for CDM HFC-23 incineration projects', 5 August 2010.
17. See Karen H. Olsen, 'The Clean Development Mechanism's Contribution to Sustainable Development: A Review of the Literature', *Climatic Change*, vol. 84 (2007), pp. 59–73.
18. See, for example, Karen H. Olsen and Jørgen Fenhann, 'Sustainable Development Benefits of Clean Development Mechanism Projects. A New Methodology for Sustainability Assessment Based on Text Analysis of the Project Design Documents Submitted for Validation', *Energy Policy*, vol. 36 (2008), pp. 2773–2784; Cristoph Sutter, *Sustainability Check-up for CDM Projects: How to Assess the Sustainability of International Projects under the Kyoto Protocol* (Berlin: Wissenschaftlicher Verlag, 2003); and SouthSouthNorth, *SouthSouthNorth CDM Toolkit* (Cape Town: SouthSouthNorth, 2004).
19. Bakker et al. (2009); PointCarbon.com (2010); Castro and Michaelowa (2009); Chung (2007); Schneider (2009: 'A Clean Development Mechanism').
20. These were DNV (Det Norske Veritas), KEMCO, SGS and TÜV-SÜD. At present there are over 30 DOEs.
21. Meeting report of the 44th meeting of the CDM Executive Board, annex 2, and meeting report of the 49th meeting of the CDM Executive Board, annex 2. The CDM Executive Board implemented a systematic monitoring of the performance of DOEs; the results of this performance assessment have not yet been made publicly available, however.
22. Lambert Schneider and Lennart Mohr, *2010 Rating of Designated Operational Entities (DOEs) Accredited under the Clean Development Mechanism (CDM)* (Berlin: Öko-Institut, 2010).
23. Ibid.
24. Lori Pottinger, *Bad Deal for the Planet: Why Carbon Offsets Aren't Working... and How to Create a Fair Global Climate Accord* (Berkeley, CA: International Rivers, 2008).
25. Jørund Buen and Axel Michaelowa, 'View from the Inside – Markets for Carbon Credits to Fight Climate Change: Addressing Corruption Risks Proactively', in TI (ed.), *Global Corruption Report 2009: Corruption and the Private Sector* (Cambridge: Cambridge University Press, 2009), pp. 41–45.
26. Mark Schapiro, 'Conning the Climate: Inside the Carbon-Trading Shell Game', *Harper's Magazine*, February 2010, pp. 31–39.
27. BusinessGreen.com, 'Carbon traders voice fears over recycled carbon credits', 17 March 2010.
28. Charlotte Streck and Jolene Lin, 'Making Markets Work: A Review of CDM Performance and the Need for Reform', *European Journal of International Law*, vol. 19 (2008), pp. 409–442.
29. Report of the 47th meeting of the CDM Executive Board, annex 62.
30. The meeting reports of the CDM Executive Board contain conflict of interest statements for some but not all members.
31. *New York Times* (US), 'Secret UN Board Awards Lucrative Credits with Few Rules Barring Conflicts', 7 April 2009.
32. Florens Flues et al., *UN Approval of Greenhouse Gas Emission Reduction Projects in Developing Countries: The Political Economy of the CDM Executive Board*, working paper no. 35 (Zurich: Center for Comparative and International Studies, 2008).

33. Streck and Lin (2008).
34. Ibid.; International Emissions Trading Association (IETA), 'The Joint Implementation Mechanism Post-2012', position paper (Geneva: IETA, 2009).
35. Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC.

4.3.1

Slovak public see no credit in government's carbon trading

Emília Sičáková-Beblavá and Gabriel Šípoš[1]

Under article 17 of the Kyoto Protocol, most industrialized countries and some economies in transition are permitted to sell 'unused' emission permits (assigned amount units: AAUs) to countries that exceed their agreed-upon emissions targets (see Lambert Schneider, section 4.3 above).[2] Slovakia, with average emissions for 2003–2007 that were 32 per cent lower than its 1990 Kyoto target, held a considerable amount of saleable emissions quotas by 2008.[3] In November of that year the Slovak government sold 15 million tonnes of its AAUs to Interblue Group, a US-based company headquartered in Washington state.[4] As a public resource, many would argue that these permits should have been sold transparently and at a fair market price. The Ministry of Environment, as the ministry responsible for allocating permits, chose not to organize any public tender or auction, however, and instead directly allocated the contract to Interblue.[5] When the media started questioning the transaction, in December 2008, it became clear that neither the contract nor the sale price was publicly available.[6]

Calls from the media and members of the opposition parties to make the contract public were refused by the then environment minister, Jan Chrbet, who argued that Interblue considered the information to be a trade secret.[7] By May 2009 journalists had discovered from secondary sources that Slovakia may well have sold its quotas at half the market price, representing an estimated €75 million in lost revenue.[8]

Further investigations found that Interblue had been formed only shortly before the transaction took place.[9] Later it was discovered that an individual

involved in the sale had other relationships with the ministry of the environment: an Interblue project manager had worked as an adviser for the ministry under both Chrbet and his predecessor.[10]

The prime minister rejected accusations made in the press that the government had sold the permits below the market price, but forced Chrbet to resign in May 2009 on the grounds that he had demonstrated a lack of political responsibility in failing to defend the contract.[11] The new environment minister, Viliam Turský, published the contract, but the sale price, volume of emissions and the name of Interblue's representative were omitted. Turský claimed that, 'based on the Act on Freedom of Information and the Act on Protection of Personal Data, we had the right to whiten it out', emphasizing that the buyer would have to agree to publish the full contract.[12] The act states, however, that if public resources are at stake such information is to be made available, and court precedent would seem to support this.[13]

Facing continued pressure from the media and non-governmental organizations, the ministry published the contract's full text in June 2009, revealing a sale price of €5.05 per tonne.[14] Analysts found that, at around the same time as the Slovak sale to Interblue, countries including Ukraine, the Czech Republic and Latvia had sold AAUs at approximately €10 per tonne.[15] Journalists further discovered that the Japanese government had been close to buying Slovakia's AAUs at a price twice that paid by Interblue.[16]

Interblue subsequently sold the AAUs at a minimum of €8 per tonne, earning at least €45 million.[17] The Interblue contract also gave the company the right of first refusal for a further 35 million tonnes of Slovakia's AAUs at the same price of €5.05.[18]

Elements of the media and others called on the government to cancel the contract and, if possible, reverse the sale of the first batch of permits.[19] In July 2009 Turský began to reconsider the agreement.[20] In the months that followed, negotiations were complicated by the fact that Interblue had ceased to exist, reportedly succeeded by Interblue Group Europe. This company has publicly offered to cancel the deal, yet the ministry of the environment did not recognize it to be a legal successor to Interblue and therefore expressed unwillingness to negotiate.[21]

Although the prosecutor general has initiated an investigation into the case on the grounds of misuse of power by public officials, no one had been charged as of mid-2010.[22] Media and civil society scrutiny might have brought the case to the forefront of public attention, but the authorities have made no formal, long-term changes to their practices for AAU sales. The opposition victory in the 12 June 2010 general election and the installation of a new government

brought promises to cancel the contract that had given Interblue the right to acquire additional AAUs; as of mid-August 2010, however, no progress had been announced.

In a market characterized by opacity, with little information publicly available about the pricing or structures of AAU transactions, the risk persists that citizens could lose out because of innocent – or deliberate – mismanagement.

Notes

1. Emília Sičáková-Beblavá is programme director at TI Slovakia and Gabriel Šípoš is director of the organization.
2. Kyoto Protocol to the United Nations Framework Convention on Climate Change, 1997.
3. European Environment Agency (EEA), 'GHG Trends and Projections in the Slovak Republic', in EEA, *Greenhouse Gas Emission Trends and Projections in Europe 2008: Tracking Progress towards Kyoto Targets* (Copenhagen: EEA, 2008), pp. 164–165.
4. ETrend.sk (Slovakia), 'Slovenské pozadie veľkého kšeftu', 22 April 2009; ETrend.sk (Slovakia), 'Ďalší kšeft SNS: Horúci vzduch', 3 December 2008. While early media reports suggested that 10 million tonnes of AAUs had been sold, the actual figure was 15 million tonnes of AAUs.
5. Etrend.sk (3 December 2008).
6. Ibid.
7. Ekonomika.sme.sk (Slovakia), 'Chrbet kryje Interblue Group', 24 April 2009.
8. ETrend.sk (Slovakia), 'Emisie: obludný škandál', 26 May 2009.
9. ETrend.sk (3 December 2008).
10. *Slovenská Tlačová Agentúra* (English-language) (Slovakia), 'HZDS alleges organized group stands behind AAU emissions sale', 26 March 2010; Ekonomika.sme.sk (Slovakia), 'Vláda predala emisie poradcovi', 25 March 2010.
11. DNES.sk (Slovakia), 'Fico: strašiakov vo vláde nepotrebujem. Chrbet končí', 5 May 2009.
12. *Slovak Spectator*, 'Slovak environment minister releases no additional info on Interblue Group', 3 June 2009.
13. *SME* (Slovakia), 'Chrbet zverejní zmluvu', 30 April 2009. The article states, that in the past, the courts have ruled that documents of public concern, unless explicitly closed by law, should be made available by public authorities upon request.
14. Ekonomika.sme.sk (Slovakia), 'Štát ustúpil a zverejnil celú emisnú zmluvu', 15 June 2009.
15. Ekonomika.sme.sk (Slovakia), 'Emisný škandál zaujal aj Švajčiarov', 21 November 2009.
16. Hnonline.sk (Slovakia), 'Japonci chceli emisie. Dali by dvakrát viac', 13 August 2009.
17. *Slovak Spectator*, 'New revelations blow lid on Interblue puzzle', 29 March 2010.
18. *Tlačová Agentúra Slovenskej Republiky* (Slovakia), 'Interblue Group Europe has new person in charge', 29 March 2010; *Slovak Spectator* (29 March 2010).
19. Spravy.pravda.sk (Slovakia), 'Dzurinda žiada zrušiť zmluvu s Interblue Group o predaji emisií', 16 June 2009; Ekonomika.sme.sk (Slovakia), 'Premiér kľučkuje pred emisiami (16 naj Ficových výrokov k téme)', 10 November 2009.
20. Hnonline.sk, 'Turský pre HN: S Interblue budeme určite rokovať, 8 July 2009.
21. Spravy.pravda.sk (Slovakia), 'Medveď: Interblue Group Europe nie je pre ministerstvo partner', 7 April 2010.
22. Hnonline.sk (Slovakia), 'Emisie. V hre je "práčka"', 7 June 2010.

4.3.2

Permit politics

Hungary's CO_2 allowances

Gábor Baranyai[1]

As the largest cap-and-trade market in the world, the European Union's (EU's) carbon emission trading system (ETS)[2] has received both praise and criticism. One early concern related to the allocation of emissions allowances. If allocated to regulated industries in excess of actual emissions, these permits can constitute hidden state aid; and, when distributed in a non-transparent manner, allowances can be a powerful tool to disburse unjustified subsidies, potentially becoming a hotbed for political favouritism.

Under the first two phases of the EU ETS (2005–2007 and 2008–2012), the allocation of permits was managed by each EU member state. National allocation plans (NAPs), which outline the number of allowances given to each regulated facility, were submitted by member state governments and approved by the European Commission. The relative discretion of member states to determine allocation methodology, the potential uncertainty of emissions data and lobbying pressures[3] in many countries resulted in the adoption of excessively generous allocation plans.

Hungary's misallocation of allowances

The preparation of Hungary's NAP for 2008–2012 was susceptible to industry lobbying. Political instability further complicated matters, with the position of environment minister – who oversees emissions allocations – reappointed three times within three years. Each subsequent minister was approached with new requests and proposals for more allowances for certain sectors and companies. Once the drafts had left the ministries involved, additional interests appeared at the Cabinet level, making oversight of the process increasingly difficult.[4]

In April 2007 the European Commission identified faults with the first 2008–2012 NAP submitted by Hungary,[5] including the over-allocation of emissions allowances. The Commission cut Hungary's emission ceiling for regulated facilities by 12 per cent, stating that methodological information used to determine allowance allocation was insufficiently substantiated and that Hungary had not demonstrated that information provided by regulated companies had been 'systematically verified by independent experts'.[6]

The Commission also found a system of built-in benefits for existing CO_2-emitting facilities. Under the NAP, these facilities would have been guaranteed access to extra allowances even in cases of production fluctuations, amounting to an ex-post adjustment of the emissions cap.[7] Therefore, these companies would have benefited financially from reduced emissions by selling allowances on the market, while essentially transferring the costs of increased production and higher emissions to the government by obtaining free allowances upon demand.

The 12 per cent cut in overall emissions, as ordered by the Commission, meant that Hungary's entire allocation had to be recalculated, undoing previous political and industry agreements and creating new incentives for lobbying.

The justification for subsequent reallocation was not always clear. Journalists reported in 2009 that the state-owned Vértes power plant was to receive an additional 400,000 allowances over what had originally been allocated, at an estimated market price of €6 million. Media sources suggested the plant was given the additional allowances under favourable conditions not justified by the emissions data.[8]

Flaws in the reallocation process were exacerbated by weak application of measures intended to enhance transparency. During the preparation of the amended NAP the government reduced the consultation timeframes from 15–30 days to 5–10 days.[9] This rendered the consultation process largely ineffective, depriving companies and the public of the chance to review and comment on the final allocation figures.

An EU-wide issue

Many of the problems that arose in Hungary were manifest throughout the EU. One researcher found that short timeframes in phase I (2005–2007) and complex allocation rules meant that 'most member state regulators had little time in which to process and verify large volumes of representations and pleadings from industry'.[10] Because these problems remained unresolved for phase 2 of the ETS (2008–2012), and on account of the global industrial downturn, 70 per

cent of ETS participants received unneeded emissions allocations in 2009.[11] The same year Hungary had a surplus of allowances for more than 1 million tonnes of carbon emissions.[12]

The fundamental challenges were recognized by the Commission, leading to an early and radical amendment of the allocation model: starting in 2013, the emissions cap will be determined at the EU level.[13] While national governments will have much less direct influence on allocation decisions, the future distribution of allowances may nevertheless be subject to lobbying at the Commission level.

The emissions allocation experience of Hungary and other EU countries will be instructive for establishing and reforming existing and future emissions trading schemes. Curbing undue influence will require mechanisms that enable transparency, such as publishing clear criteria for allocation, adequate timeframes for implementation, and the introduction of robust and mandatory lobbying registries to tie corporate interests more closely to policy interactions.

Notes

1. Gábor Baranyai is former head of department, Ombudsman for Future Generations, Hungary. He has written this article in his personal capacity, on behalf of TI Hungary.
2. See Lambert Schneider (section 4.3 of this volume) for a more detailed description of emissions trading schemes.
3. Markus Wråke, *Emissions Trading: the Ugly Duckling in European Climate Policy?*, Report no. B1856 (Stockholm: Swedish Environmental Research Institute, 2009).
4. Personal observation of the author.
5. Commission of the European Communities, 'Commission decision concerning the national allocation plan for the allocation of greenhouse gas emission allowances notified by Hungary in accordance with Directive 2003/87/EC of the European Parliament and of the Council', Commission Decision of 16 April 2007, Brussels, Recitals (17)–(28).
6. Ibid.
7. Ibid.
8. *Index* (Hungary), 'Szén-dioxiddal is kistafírozták Kapolyit', 14 January 2009.
9. By government decrees: 14/2008. (I. 30.) Korm. rendelet az üvegházhatású gázok kibocsátási egységeinek kereskedelméről szóló 2005. évi XV. törvény végrehajtásának egyes szabályairól szóló 213/2006. (X. 27.) Korm. rendelet módosításáról, section 3. Effective as of 30 January 2008.
10. Robert Baldwin, *Regulation Lite: The Rise of Emissions Trading*, Law, Society and Economy Working Paper no. 3/2008 (London: London School of Economics and Political Science, 2008).
11. Sandbag, *Rescuing the EU ETS from Redundancy* (London: Sandbag, April 2010).
12. Sandbag, 'Emissions map', at www.sandbag.org.uk/etsmap.
13. Directive 2009/29/EC of the European Parliament and of the Council amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community, *Official Journal of the European Union,* L 140, 5 June 2009.

4.3.3

Shortcomings and short cuts

Sri Lanka's environmental impact assessments

Transparency International Sri Lanka

Environmental impact assessments (EIAs) can be expected to have growing relevance for climate change mitigation and adaptation activities in a number of countries. EIAs are considered to be useful tools to strengthen provisions for adaptation measures such as climate-proofing in development projects,[1] and, under the rules of the Clean Development Mechanism (CDM), host countries can require project developers to produce an EIA if they believe a mitigation project could have significant environmental impacts.[2] To date, Sri Lanka has registered seven CDM projects – a low number compared to other Asian countries but higher than many participating countries outside the region. If mitigation and adaptation projects are scaled up in Sri Lanka, considerable efforts – by citizens, non-governmental organizations (NGOs) and the government – will be needed to ensure that the criteria used to assess the environmental integrity of these projects is robust and open to public oversight.

In Sri Lanka, though, EIAs may be a weak indicator of environmental sustainability. EIAs have been required for years in order to obtain development approval for ventures that could present adverse impacts on the environment, such as airports, industrial facilities, power stations or hotels.[3] The documented shortcomings are numerous, however: conflicts of interest, a lack of clear guidelines, challenges to public oversight and a failure to monitor impacts have all been attributed to the EIA process. These issues are worth examining, since they may reflect some

of the challenges the government will have to overcome in order to assess adequately the environmental ramifications of large-scale mitigation projects or adaptation activities.

A litany of challenges

Twenty-two government institutions are designated as approval agencies for EIA applications, with the Sri Lankan Central Environmental Authority (CEA) overseeing the process.[4] These agencies are responsible for determining the potential environmental impacts of proposed projects, soliciting participation from affected parties and deciding whether an EIA or a less comprehensive evaluation is required.

Ambiguity regarding the application of environmental assessments was illustrated in 2004, when the Environmental Foundation Ltd (EFL), a leading environmental NGO in Sri Lanka, brought a case against the CEA, challenging the validity of its approval of a mini-hydropower plant.[5] The EFL objected that approval had been granted on the basis of an initial environmental examination (IEE) report rather than an EIA report. IEEs are comparatively short and simple studies; unlike EIAs, they require neither public notification of project requests nor a public comment period. The case revealed that the project was ultimately approved on the basis of the proponent's answers to an 'environmental questionnaire' and a letter from the Department of Forest Conservation, rather than on an IEE or EIA. Among a number of errors the presiding justices found to have been made by the CEA was its reasoning that an environmental questionnaire could be equated with an IEE or an EIA.[6]

In Sri Lanka, the development of EIAs as well as their evaluation may also be susceptible to conflicts of interest.[7] Project developers employ consultancy firms of their own choosing to conduct the EIA,[8] potentially undermining the capacity for these firms to formulate unbiased assessments. State agencies financing projects may also propose that their parent ministry review the EIA, potentially adversely impacting objectivity.[9]

Public review, a crucial element of the EIA process, has mixed success. All EIAs are announced in national papers, and the public may make observations or submit queries over 30 days. If proposals prove controversial, the approving agency and the CEA hold public hearings. In the best cases, public oversight has led to the protection of lands inappropriately slated for development; in 2007 a massive public campaign led the CEA to reject an EIA that proposed an 800-hectare site of farmland and marshland be acquired for the construction of a new airport.[10]

Despite oversight provisions, however, the ability of the public to access and interpret EIAs can be compromised. In Sri Lanka, there is no provision to determine whether the proponent has justifiably responded to the concerns raised by the public.[11] The content of EIAs may also vary considerably, creating challenges for the public and reviewing committees alike: data may be scant, inconclusive or improperly analysed; alternative sites may be inadequately considered; and facts may deliberately be slanted towards a favourable outcome.[12] Overly detailed description of unwanted or irrelevant data on impacts[13] can force the public and evaluation committees to sift through mountains of data in search of relevant information.

The variable quality of EIAs can have direct impacts on the country's biodiversity and ecosystems. One study of 130 EIAs and IEEs completed in Sri Lanka found that almost one-fifth made no mention of ecological impacts, while over 40 per cent discussed impacts in only a few sentences.[14] The study further found that environmental assessments concentrated only on the direct ecological impacts of projects and not on indirect or secondary impacts. This could relate to the researchers' further finding – that, while the professional credentials of ecological consultants are often adequate, time and resources may be limited, making inputs on ecological impacts to EIAs and IEEs little more than tokenistic.[15] Follow-up monitoring also appears to be weak. In the above study, less than a third of environmental assessments included plans for monitoring the ecological impacts of the proposed development, but none made commitments to monitoring.[16]

Towards a reliable, robust process

If left unaddressed, these and other issues associated with the EIA process will have corrosive effects on both the natural environment and public trust. In too many instances, the media in Sri Lanka are not free to report independently, and public apathy means that citizen oversight can be insufficient. Despite these obstacles, steps must be taken to improve the EIA process. For both CDM projects, and the incorporation of climate resilience into new infrastructure development, these issues must be tackled. Although on paper EIA procedures are strong, their implementation can be improved. Taking the initiative to do so would be the first step the government could take to ensure that rigorous environmental safeguards underpin the development of all projects in Sri Lanka, climate-change-related or not.

Notes

1. Peter King, *Mainstreaming Climate Change into National Development Planning: A Training Manual* (Apia, Samoa: Secretariat of the Pacific Regional Environment Programme, 2010); Asian Development Bank (ADB), *Climate Proofing: A Risk-Based Approach to Adaptation* (Manila: ADB, 2005).
2. UNFCCC, 3CMP.1, paragraph 37(c); see FCCC/KP/CMP/2005/8/Add.1. Under the 2001 Marrakesh Accords, it is the responsibility of the host country to define the criteria for sustainability and determine whether proposed CDM projects meet these requirements. It is worth noting that there is currently no legislation in Sri Lanka that stipulates that all CDM projects must be accompanied by an EIA.
3. National Environmental (Procedure for approval of projects) Regulation no. 1 of 1993, Gazette Notification Number 772/22, dated 24 June 1993.
4. Specifying the State Agencies which are PAAs (EIA), Gazette Notification Number 859/14, dated 23 February 1995.
5. Environmental Foundation Ltd v. Central Environmental Authority and others; Application no. 1556/2004 in the Court of Appeal.
6. EFL v CEA and others, 1556/2004, Court of Appeal.
7. Lareef Zubair, 'Challenges for Environmental Impact Assessment in Sri Lanka', *Environmental Impact Assessment Review*, vol. 21 (2001), pp. 469–478.
8. Jagath Gunawardena, senior environmental lawyer, interview with author, 22 August 2009.
9. Zubair (2001).
10. *The Nation* (Sri Lanka), 'Weerawila airport too far out', 27 January 2008.
11. Gunawardena interview, 22 August 2009.
12. Dekshika Kodituwakku, 'The Environmental Impact Assessment Process in Sri Lanka', *SARID Journal of South Asian Affairs*, vol. 1 (2004).
13. Deputy Director General of CEA, Ramani Ellepola, at www.penta-eu.net/docs/Ramani_Ellepola.ppt.
14. The study's sample was taken from the 463 environmental assessments completed between 1981 and 2005. Two-thirds of these were IEEs and one-third EIAs. Miriya Samarakoon and John Rowan, 'A Critical Review of Environmental Impact Statements in Sri Lanka with Particular Reference to Ecological Impact Assessment', *Environmental Management*, vol. 41 (2008), pp. 441–460.
15. Ibid., pp. 455-456.
16. Ibid., p. 456.

4.3.4
Voluntary carbon markets
Successes and shortfalls

Thomas Marcello[1]

A maturing market landscape

Unlike in government-mandated cap-and-trade systems, participants in voluntary carbon markets are not driven by mandatory emissions reduction schemes. Actors include businesses that anticipate having to reduce emissions under an eventual compliance system; companies that wish to offset their current emissions as part of larger corporate responsibility efforts; governments seeking to institute net-zero emissions initiatives; and individuals hoping to offset their carbon footprint.

Trading takes place through over-the-counter (OTC) trading or exchanges. The OTC market comprises deals between buyers and sellers for credits generated from emissions reduction projects, known as offsets, and purchased voluntarily. The exchange market is dominated by the US-based Chicago Climate Exchange (CCX), the world's only voluntary cap-and-trade system. It offers a voluntary but legally binding cap-and-trade system in which members agree to reduce emissions against a baseline that can be met with both offsets and allowances.

Conservation-oriented non-profit organizations dominated the voluntary market throughout the 1990s, typically using carbon finance to fund forestry-related projects. As media attention, public awareness and corporate interest in climate change increased, however, private enterprise supplanted philanthropy as the underlying market driver. The private sector's share of the voluntary OTC market has risen significantly since 2002, standing at 91 per cent as of 2009 (see figure 4.2).[2] The overall market value increased sevenfold from 2006 to 2008 before falling by nearly 50 per cent to US$387 in 2009, on account of the economic recession (see figure 4.3).[3]

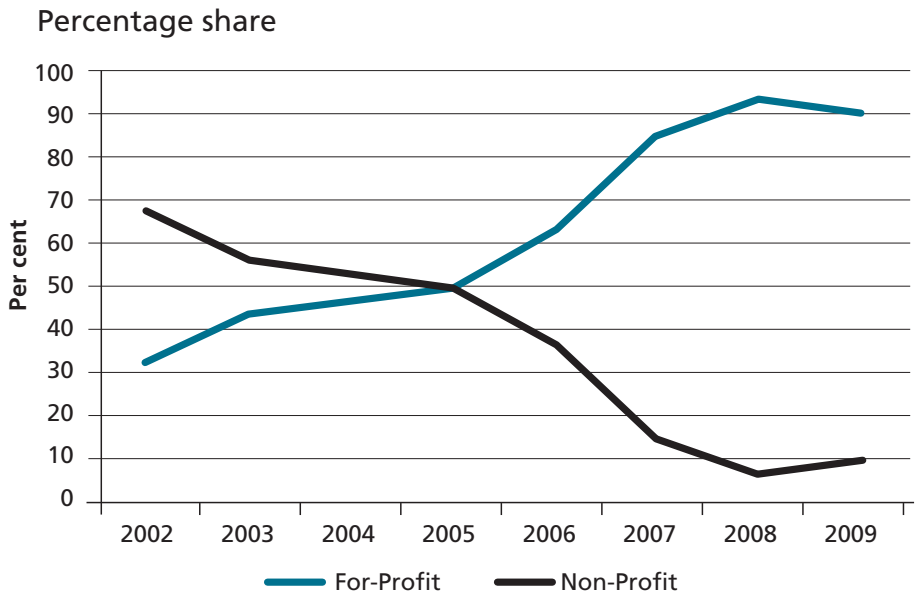


Figure 4.2 Non-profit versus private sector share of voluntary OTC market, 2002–2009

Source: Ecosystem Marketplace, Bloomberg New Energy Finance.

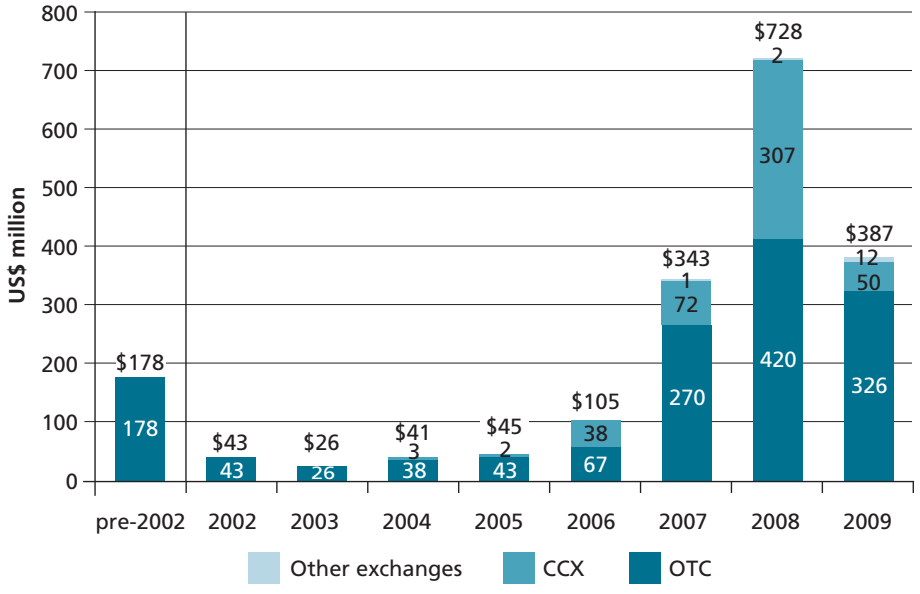


Figure 4.3 Historical annual value of the voluntary carbon markets

Although the voluntary carbon market is unregulated, it has progressively adopted best practices, standards, third-party verification and registries since 2006, coinciding with increasing private sector participation and extraordinary market growth. Despite this laudable progress, the voluntary market still has to address some transparency and accountability challenges in order to help ensure effective and credible operation.

Encouragingly, despite recent market contraction, the development of oversight and regulatory mechanisms to ensure offset quality has continued. In 2006 and 2007 myriad standards emerged to provide credibility to offsets sold on the voluntary market; by 2009 more than 90 per cent of offset credits met third-party standards.

Today, though the trend is towards consolidation of standards, with three third-party standards dominating the market,[4] more than 15 standards exist that focus on how carbon credits should be developed. Among other things, these standards might outline methodologies for making sure that projects provide net emissions reduction benefits, quantify emissions reductions from certain types of emissions reduction projects and define verification criteria.[5] This move towards the standardization of best practices for offset project developers was a necessary first step to ensure that market participants adhere to core principles, including the following:

- *Additionality*, which requires overall emissions reductions generated by offset projects to go beyond 'business-as-usual', addressing the question 'Would the offset project have been developed without the promise of financial benefits accrued from selling offset credits?'
- *Measurement*, which calls for the accurate and complete measurement of emissions reductions in order to award offset credits to projects, and ensure quality.
- *Prevention of leakage*, which addresses the risk that offset projects cause increased emissions elsewhere. For example, deforestation projects that are avoided may simply encourage deforestation in other areas. Offset projects, therefore, should not trigger leakage.
- *Permanence*, which refers to carbon benefits accrued that are irreversible. A forest offset project, for example, would be impermanent if it lacked an insurance mechanism to replace any carbon lost due to forest fire.

While adherence to these principles led to improvements in offset quality, without a central database of offset projects there were no mechanisms to prevent offset suppliers from selling the same emissions reduction to multiple buyers. Therefore, in 2008 standards organizations – the Climate Action Reserve, the Gold Standard (GS) and the Voluntary Carbon Standard (VCS) – created partnerships with third-party registry platform providers, which assign a unique serial number to each

third-party-verified offset to allow market participants to track offset ownership throughout the project life cycle. Registry providers also check other offset registries to guard against a project being listed in more than one registry. Starting in 2009, major registry infrastructure providers APX and Markit adopted the Society for Worldwide Interbank Financial Telecommunication (SWIFT) messaging system to track offset transfers across multiple registries.[6]

Pre-registered CDM projects: a credibility threat?

Even with quality criteria and market infrastructure in place, threats to the voluntary market's credibility remain. Criticism of the Clean Development Mechanism (CDM) accounts for some of this scepticism, as two of the most popular voluntary market standards, the VCS and GS, are based on the CDM methodologies.

Some research has led to scrutiny of the CDM. For example, by one estimate, additionality was 'unlikely or questionable' for 40 per cent of CDM projects registered by mid-July 2007,[7] though the figure could be even higher.[8] Verifiers and validators for non-CDM offset credits are often the same private sector companies accredited by the CDM, raising concerns that conflicts of interest and a lack of technical competence associated with CDM offsets could spill into the voluntary market.[9]

Pre-registered CDM projects – projects that have been submitted for review by the CDM Executive Board and may have already begun generating emissions reductions – can apply to the VCS and GS offset programmes in order to monetize emissions reductions while awaiting CDM approval. As of April 2009, of the 19.2 million tonnes of issued voluntary offset credits sourced from CDM-eligible nations, 53 per cent originated from pre-registered CDM projects.[10]

Although pre-registered CDM projects that are accepted by voluntary programmes might damage public perception of voluntary markets, the impact is mitigated by an increasingly knowledgeable customer base. The widespread use of offset registries increases transparency and enables buyers to determine offset quality and set bids accordingly.

Integrity shortfalls

For private sector buyers, both corporate social responsibility and public relations are typically identified as primary motivations for purchasing voluntary offset credits. The risk, however, is that companies that seek projects with

'storytelling appeal'[11] may overlook their commitments to due diligence. While the social and environmental quality of offset projects is increasingly important, project integrity varies. The Chicago Climate Exchange has come under scrutiny for selling offsets with allegedly questionable integrity; the exchange was criticized for offering to pay US landowners for offset projects, such as no-tillage farming, even though the projects had already occurred.[12]

Perhaps most often when project integrity falls short, it is due to conflict over land between offset developers and local residents. Even where no laws are broken, developing offset projects may violate the 'do no harm' principles of many of the standards established for the voluntary carbon market. Examples of problematic situations include the following:

- For a number of years, controversy surrounded a tree-planting project financed by Netherlands-based FACE (Forests Absorbing Carbon-dioxide Emissions),[13] which took place in an area at the centre of a violent dispute between people who had been evicted from land designated as a national park, and park rangers from the Ugandan Wildlife Authority. Although the offset project could not be held to be directly responsible for the conflict, one researcher argued that 'funding generated by the project likely provided additional incentives and justifications to administer evictions and violently patrol the area'.[14] FACE stated that it would stop planting trees in the area until the issue was resolved.[15] That the project was certified by the Forest Stewardship Council (FSC) may suggest the need for an added layer of oversight.
- In 2010 a wind energy developer was accused of damaging the livelihoods of native populations in India after it cut down some 12,000 trees and clashed with locals in connection with taking over farmland in order to construct windmills. The conflict ended with police tear-gassing and arresting the protesting farmers, who later expressed increasing hardship associated with the loss of land.[16]

Social and environmental risks are more pronounced in the forest sector because many projects require large tracts of land in developing nations, where land rights may not be clearly defined and where many indigenous populations may not have the means to challenge projects they oppose (see section 6.2 of this volume).

Wrongdoing in the voluntary market can also take the form of direct corruption, for example by the sale of credits for carbon emissions reductions that have not taken place and will never take place.[17] Although registries can prevent such fraud, counterfeiting carbon does occur. In one case, Hungarian company KlimaFa presented carbon credits to the Vatican, promising to plant trees and make the Vatican the world's first-carbon-neutral territory. The company offered offsets for sale but according to news sources never actually planted any trees.[18]

Market infrastructure alone will not surmount the challenges faced by the voluntary carbon market. Media exposure of poor offset practices is bad publicity for suppliers and buyers alike. Individuals who are inclined to offset emissions associated with frequent travel or other lifestyle choices will probably avoid purchasing offsets if they believe they are a marketing ploy backed by minimal environmental benefit. A desire to adhere to strong corporate responsibility practices may also have motivated some offset buyers, such as Nike, to forsake credits in favour of less controversial methods for minimizing their carbon footprint, such as reducing corporate travel and increasing energy efficiency.[19] For other private sector buyers, reputational risk creates an incentive to become knowledgeable about the marketplace and ask questions about the source of offsets.

Since its inception, the voluntary market has made tremendous strides towards improving the quality and reliability of carbon offsets, but much work remains to be done. Knowledgeable buyers, media oversight and enhanced market governance can continue to expose and reject shoddy or unjust offset projects. It is in the long-term interest of offset project developers and carbon credit suppliers to develop, demonstrate and demand integrity in the voluntary carbon market.

Notes

1. Thomas Marcello is a senior carbon analyst with Bloomberg New Energy Finance.
2. Kate Hamilton et al., *Building Bridges: State of the Voluntary Carbon Markets 2010* (New York and Washington, DC: Ecosystem Marketplace and Bloomberg New Energy Finance, 2010), pp. 27–28.
3. Ibid., p. 20.
4. The Voluntary Carbon Standard (VCS), the Climate Action Reserve and the CCX, which together hold 78 per cent of the market.
5. Hamilton et al. (2010), pp. 57–68.
6. Although SWIFT does not hold accounts, clear or settle transactions, its ability to transmit secure financial messaging among financial institutions worldwide is sufficient to track offset ownership considering they are intangible goods.
7. Lambert Schneider, *Is the CDM Fulfilling its Environmental and Sustainable Development Objectives? An Evaluation of the CDM and Options for Improvement*, report prepared for WWF (Berlin: Öko Institut, 2007), p. 44.
8. Madhusree Mukerjee, 'Is a Popular Carbon-Offset Method Just a Lot of Hot Air?', *Scientific American*, June 2009.
9. See also Hamilton et al. (2010), p. 57.
10. Bloomberg New Energy Finance, 'Will the supply glut of voluntary credits drive down carbon prices?', April 2009.
11. Hamilton et al. (2010), pp. 58, 96.
12. ClimateWire (US), 'Sale of Chicago Climate Exchange to ICE reinforces weak carbon market', 3 May 2010.

13. See *Inter-Press Service (Italy),* 'Uganda: Mount Elgon eviction has reduced us to beggars', 13 November 2009; ActionAid*, '*Benet under massive eviction from their homeland' (London: ActionAid, 2008*),* at www.actionaid.org/kenya/index.aspx?PageID=2661.
14. Melissa Checker, 'Double Jeopardy: Carbon Offsets and Human Rights Abuses', *Synthesis/ Regeneration*, no. 51 (2010).
15. Stephan Faris, 'The Other Side of Carbon Trading', *Fortune Magazine*, 29 August 2007, at http://money.cnn.com/2007/08/27/news/international/uganda_carbon_trading.fortune.
16. *Christian Science Monitor* (US), 'Carbon offsets: Green project offends Indian farmers who lose land to windmills', 20 April 2010.
17. This does not refer to forward sales of offsets that schedule for future generation.
18. *Christian Science Monitor* (US), 'Carbon offsets: How a Vatican forest failed to reduce global warming', 20 April 2010.
19. GreenBiz.com (US), 'Nike shrinks GHG footprint to 2007 levels and dumps carbon offsets', 22 January 2010.

4.3.5

Sectoral crediting

Getting governance right from the beginning

Gernot Wagner, Nathaniel O. Keohane and Annie Petsonk[1]

Several pathways lead into a low-carbon, high-efficiency future. Many go through something commonly called 'sectoral crediting', by which developing economies would both adopt emission reduction goals for entire economic sectors and allow reductions to be sold, via permits, into industrialized countries' compliance carbon markets. These twin elements of sectoral crediting contrast with project-by-project crediting, as is currently seen under the Clean Development Mechanism (CDM), and sector-level emission standards not linked to any market mechanism.

Properly designed and operated, sectoral crediting could unleash substantial investment in efficient emissions reductions across entire sectors. A quick look at the numbers makes the appeal of and need for sectoral crediting clear. The world now emits roughly 45,000 million CO_2-equivalent tonnes of greenhouse gases annually.[2] In order to avoid the most dangerous consequences of climate change, that number needs to decrease swiftly, and by at least one-half to two-thirds by mid-century.[3] Neither the market-based project-by-project approach of the CDM nor sectoral non-market standards on their own are likely to achieve this goal.

According to the World Bank's State and Trends of the Carbon Market 2010 report, the CDM accounted for 200 million tonnes of reductions below business-as-usual (BaU) levels in 2009, down from 400 the previous year.[4] Total CDM reductions are estimated to reach 1 billion tonnes by 2012 – far short of the amount needed.[5] Moreover, the benefits of these reductions are offset by their transfer to cover industrialized nations' emissions increases, and even if one project in any given sector in a

particular country reduces emissions, that gain could be offset by increases elsewhere in the same sector or elsewhere in the economy.

Mandated sectoral standards can be useful, but they have clear limits. Emissions reductions occur only up to the standard and often no further. Most importantly, standards usually take the form of limiting rates of emissions, or prescribing specific technologies. Rates may go down, but total emissions can still go up as output increases. Without a market component, there is little incentive for investors to seek reductions in total emissions.

Market-based sectoral crediting is gaining ground in some policy circles because it has the potential to move beyond the confines and risks of the CDM and standards, catalysing a faster, more effective transition to clean development. The Chinese steel sector provides an instructive example. McKinsey & Company estimates that by 2030 its emissions reduction potential could be as much as 350 million tonnes below BaU projections.[6] If other industrial sectors, such as chemicals and cement, are also included, the numbers quickly rise above 1 billion tonnes for China alone – equal to all CDM reductions by 2012.

Introducing some portion of these reductions as credits in carbon markets presents not just enormous opportunities but also some serious risks. With entire sectors capped, the consequences of unreliable or manipulated emissions reports, tainted verification processes, poor crediting methodology, or inadequate domestic legal and regulatory systems more broadly, grow exponentially. These risks make it crucial to get governance right in at least four areas.

First and foremost is the environmental integrity of the system. CDM projects that fail to reduce emissions exacerbate climate change. Non-performing sectoral crediting could have the same effect on a much larger scale. Credible measurement and reporting and conflict-of-interest-free, independent verification and enforcement are crucial for environmental integrity and a robust carbon market. Although industries may raise concerns about disclosing commercially sensitive information, experience in industrialized and emerging economies shows that emissions data – including greenhouse gas (GHG) emissions – can be disclosed in ways that promote transparency and protect trade secrets.[7]

Second are risks associated with the CDM model of issuing credits for reductions below BaU. If sectoral approaches are premised on this model, they will not lead us toward sufficient global emissions reductions to avert dangerous climate change. At a minimum, industrialized countries have to adopt more stringent targets to absorb the growing number of credits. Discounting should also be introduced, by which a certain portion of sectoral

credits would be automatically retired from the market, guaranteeing a net reduction of emissions credits, rather than 'emissions shifting', thus ensuring environmental benefits. Moreover, BaU is a projection and, thus, inherently unverifiable. Awarding credits for reductions below BaU creates incentives to inflate BaU projections – maximizing crediting at the expense of the environment. This is especially true for fast-growing sectors and countries, whose emissions will increase rapidly with large uncertainties around BaU projections. Consequently, the governance of sectoral crediting must shift away from BaU, to a fundamentally different model: the negotiation of sector-wide, country-specific baselines, based on historical emissions data and always keeping the environmental implications in mind, with credits awarded for reductions below those baselines. Lastly, there is a clear need for countries to develop the capacity to ensure accuracy in measuring, reporting and verifying the absolute tonnes of their emissions reductions.

Risks are also associated with crediting reductions in 'intensity' rather than in absolute emissions. Crediting intensity reductions – i.e. emissions per unit of economic output or per unit of energy output – risks minting 'credits' that are actually emissions increases if intensity declines occur amid high growth in output and energy use. Reducing total emissions is what matters to the atmosphere. Sectoral credits ought to be made, measured and reported in absolute tonnes of reductions from an absolute baseline. Absolute measurements are also useful in highly heterogeneous sectors, in which firms use a host of different technologies to produce similar products.

Finally, risks come with carbon markets themselves. Any market requires proper infrastructure, regulatory guidance and oversight. Especially in their early stages, markets can experience volatility and the occasional start-up woes. We learnt important structural lessons from the European Union's Emissions Trading Scheme (EU ETS).[8] In April 2006 EU ETS prices dropped by a half within five days as the first official figures were published, revealing that overall emissions were lower than had previously been assumed, and that credits had therefore been over-allocated. In April 2010 the EU published official data for 2009, showing that emissions had fallen by over 10 per cent. The market hardly budged. Prices already reflected expectations of lower emissions, based partly on the economic crisis and partly on the effectiveness of the ETS. The lesson: timely data, a liquid market, policy certainty and the ability to save reductions over time – the 'banking' of credits – also matter.

Proper market governance is similarly crucial. In both industrialized and developing countries, transparent and accountable agencies must be responsible

for maintaining mutually recognizable registries to track transactions and fund flows. Firms that monitor emissions and calculate baselines should be prohibited from marketing credits to avoid conflicts of interest. Such structural transparency offers important co-benefits – public participation in policy processes and better institutions for development – that reinforce the durability of the reductions achieved and the sustainability of the market itself.

Private investors may face additional risks under sectoral approaches compared to CDM. The role for policy here is not to eliminate risk, but to create the appropriate incentives to ensure that private capital and insurance markets can manage and mitigate it.

Sectoral crediting is not a goal in itself. The goal is to enable a rapid transition to enforceable, absolute emissions limits for all major emitting sectors, powered by a broad carbon market made up of global or linked national or regional emissions trading systems.

The first sectoral credit has yet to be issued. That allows us to get governance right and keep the goal in sight from the beginning. It is a tall yet not insurmountable order, and a step we ought to take to ensure that, if sectoral crediting moves ahead, a system is created that ultimately stabilizes the climate and helps transform the over US$5,000 billion-a-year fossil-fuel-based energy sector into a cleaner, greener future.[9]

Notes

1. The authors are, respectively, an economist, the chief economist, and an international counsel at Environmental Defense Fund.
2. See the World Resource Institute's (WRI's) Climate Analysis Indicators Tool (CAIT) database, cait.wri.org, for the most comprehensive emissions data.
3. Environmental Defense Fund (EDF), *Turn toward Climate Safety* (New York: EDF, 2009).
4. Alexandre Kossoy and Philippe Ambrosi, *State and Trends of the Carbon Market 2010* (Washington, DC: World Bank, 2010).
5. EDF analysis of UNEP Risø's CDM pipeline spreadsheet, at http://cdmpipeline.org/publications/CDMPipeline.xlsx; Kossoy and Ambrosi, 2010.
6. McKinsey & Company, *China's Green Revolution*: *Prioritizing Technologies to Achieve Energy and Environmental Stability* (New York: McKinsey & Company, 2009), p. 91, exhibit 37.
7. See, for example, US Environmental Protection Agency 40 Code of Federal Regulations (CFR) part 2, 'Proposed Confidentiality Determinations for Data Required Under the Mandatory Greenhouse Gas Reporting Rule and Proposed Amendment to Special Rules Governing Certain Information Obtained Under the Clean Air Act; Proposed Rule' (28 June 2010); Mexican Environmental Agency, *Informe Nacional de Emisiones y Transferencias de Contaminantes*, at http://app1.semarnat.gob.mx/retc/index.html.
8. For the most comprehensive review of EU ETS to date, see Denny Ellerman et al., *Pricing Carbon: The European Union Emissions Trading Scheme* (Cambridge: Cambridge University Press, 2010).
9. Fred Krupp and Miriam Horn, *Earth: The Sequel* (New York: W. W. Norton, 2008), p. 12.

4.4

Climate change, corporate change

Shifting business models towards the climate agenda

David L. Levy[1]

A global transition to a low-carbon economy requires the large scale mobilization of financial, technological and organizational resources, many of which are concentrated in the hands of large multinational corporations. Of the US$500 billion in annual global investment needed over the coming decades to keep warming within a 2°C limit, more than 80 per cent will have to come from private sources.[2] Climate change presents a profound strategic challenge to business, however. Measures to control the emissions of greenhouse gases (GHGs) most directly threaten sectors that produce and depend on fossil fuels, such as oil, power and transportation. Managers in energy-intensive industries, including cement, chemicals, paper and metals, have also been concerned – understandably – with the regulatory risk of higher costs for fuels and lower demand for energy-intensive products.

During the 1990s energy-intensive sectors responded aggressively to the prospect of mandatory GHG limits, and their influence on policy, especially in the US, constituted a virtual veto on regulation. In the last decade, government incentives, competitive pressures and non-governmental organization (NGO) campaigns have led many firms, in varying degrees, to craft business models that exploit potential market opportunities in low-carbon products and services. This shift in corporate political and market strategy has created a virtuous cycle, in which strengthened business coalitions have grown supportive of more stringent climate policy and widened the political space for action. This cycle is fragile, however, and, without

opportunities to transform climate risks into business opportunities, it is possible that undue corporate influence could again hinder mitigation efforts.

The momentum of this corporate conversion is already in danger of stalling. Climate change creates considerable competitive risk, as changes in prices, technologies and demand patterns disrupt traditional business models. Investing in new technologies can be a treacherous business. Automobile manufacturers, for example, find that they are dependent on existing infrastructure, creating barriers for electric vehicles, which require a network of charging stations. Multiple clean energy technologies are in competition, such as solar thermal versus photovoltaics, and 'thin film' versus 'crystalline silicon' solar cells, making it hard to pick winners.

Moreover, companies successful in one area of business cannot easily transition to new products and markets. Corporate managers know that the key lesson of business strategy is to stick to your 'core competences'. Exxon lost money when it tried to diversify in the 1970s energy crisis,[3] and now understands that its expertise lies in geology, hydrocarbon chemistry, extraction and distribution. Rather than embrace radical change, it has enhanced its capacity in related low-carbon technologies. In 2009 Exxon announced a US$600 million algae biofuels project with a biotech company, and a US$41 billion acquisition of a major player in the shale gas sector.[4] These investments represent a better strategic fit than solar or wind, though they entail cross-industry partnerships to acquire external capabilities.

Similarly, oil and gas companies have befriended the coal industry as proponents of carbon capture and sequestration (CCS) technology,[5] as the expertise to extract fluid fuels is closely related to that required to re-inject CO_2 underground. Although many of these emerging technologies will have to be proved to be environmentally safe and financially feasible, the model for cross-industry collaboration is strong, allowing companies to share risks, gain capabilities and shoulder the fixed costs of research and development.

Climate change presents a host of strategic uncertainties regarding the unfolding science, regulation, technological developments and competitor reactions. Thus, when British oil company BP committed itself to investing in solar and wind energy in 2000, it was competing in the same global oil market as Exxon, but perceived the risks very differently. BP plotted a strategy for a world in which mandatory emission controls appeared inevitable, carbon would carry a price tag, and consumers would demand low-emission products. A decade later, though, with growing regulatory uncertainty and its solar business far from profitable, BP has pulled back from its renewable energy investments, instead increasing its investments in Canadian oil sands.[6]

National and regional authorities have a vital role to play by implementing policies that provide incentives for positive corporate action. Bolstered by tax policies in Denmark and Israel, the company Better Place is developing a national replaceable battery infrastructure for pure electric vehicles that allows consumers to pay according to driving distance.[7] The Vélib bike rental system in Paris and the US-based Zipcar car rental firm similarly engage business and government in partnerships that transform markets and overcome systemic obstacles in infrastructure, scale and incentives.[8]

These initiatives move towards a service- rather than product-based business model. Moreover, they trigger competitive dynamics with far-reaching effects. Better Place has signed a deal with Renault–Nissan to supply the electric cars, and other car companies, fearful of falling behind, are accelerating their own plans for plug-in hybrids and pure electric vehicles.

Major companies in the US power sector have adopted a more proactive position on climate change in recent years. Duke Energy, Exelon and PG&E have joined initiatives led by the US Climate Action Partnership and the Pew Center on Global Climate Change that aim at emissions reductions by deploying renewables, boosting generation efficiency and implementing demand-side management policies.[9] These companies might anticipate a future national cap-and-trade regime and carbon price, but they face more immediate and local pressures, notably escalating renewable or alternative energy portfolio standards in more than 30 US states.[10]

US states are also attempting to restructure power markets to provide incentives for energy efficiency. Most frequently, this takes the form of small 'benefit charges' being added to bills, which are used to subsidize consumer efficiency upgrades.[11] Several states are also examining California's experience with rate decoupling, which rewards utilities with higher power prices for implementing energy efficiency and demand-side management measures.[12]

The lesson for public policy here is the importance of structuring incentives and managing expectations to shape business models and channel corporate resources in a positive rather than counterproductive way. In the face of global policy uncertainty, a key task is to maintain momentum by creating a predictable business and regulatory environment.

Business realizes the dangers of the proliferation of multiple regulations, standards and carbon trading schemes, and large firms are joining groups that press for clear, predictable and coherent climate policy. In 2007 more than 60 of the world's largest companies, including BP, Siemens, GE and Unilever, launched Combat Climate Change (3C), with the goal of developing 'a worldwide policy framework to replace the Kyoto Protocol from 2013 and onwards'. In December 2009, as the negotiations

mired in Copenhagen, Lars Josefsson, CEO of Swedish power company Vattenfall and chairman of 3C, warned that large-scale business investment was contingent on a binding international treaty and coordinated national initiatives.[13] In the absence of an international treaty, the onus falls on the private sector, along with local and national governments, to seek novel business models that stimulate the transition to a low-carbon future.

Notes

1. David L. Levy is chair of the Department of Management and Marketing at the University of Massachusetts, Boston, and director of its Center for Sustainable Enterprise and Regional Competitiveness.
2. International Energy Agency (IEA), *World Energy Outlook 2009: Executive Summary* (Paris: IEA, 2009), p. 14.
3. *Wall Street Journal* (US) 'Exxon chief makes a cold calculation on global warming', 15 June 2005.
4. MarketWatch.com, 'Exxon Mobil lays $600 million on the line for algae fuels', 14 July 2009; CNNMoney.com, 'Exxon to buy XTO in $41 billion deal', 14 December 2009.
5. See, for example, www.globalccsinstitute.com.
6. BusinessGreen.com (UK), 'BP shrugs off anti-tar sands shareholder resolution', 16 April 2010.
7. See Betterplace.com.
8. NPR.org (US), 'Paris' popular bike program may inspire others', 15 September, 2009; Government-fleet.com (US), 'City of Baltimore launches car sharing program', 1 July 2010.
9. See www.us-cap.org/about-us/about-our-members and www.pewclimate.org/business/belc/members.
10. Pew Center on Global Climate Change, *Climate Change 101: State Action* (Arlington, VA: Pew Center on Global Climate Change, 2009).
11. Ibid.
12. See Pew Center on Global Climate Change, 'Decoupling in detail', at www.pewclimate.org/what_s_being_done/in_the_states/decoupling_detail.
13. *Financial Times* (UK), 'Business coalition calls for firm CO_2 treaty', 23 November 2009.

4.5

Policy engagement

A missing link in corporate climate reporting

Ryan Schuchard and Laura Ediger[1]

Over the last decade many businesses have begun to measure, reduce and disclose greenhouse gas (GHG) emissions. By 2009 over 80 per cent of the world's largest 500 companies were reporting their GHG emissions to the Carbon Disclosure Project (CDP).[2] Efforts to report emissions continue to spread rapidly around the world, particularly in Brazil, Russia, India and China.[3] Today, however, corporate best practice is moving beyond merely tracking and reporting GHG emissions, to addressing publicly the risks and opportunities presented by climate change.[4]

As business has become more responsive to climate change, corporate involvement in climate policy has also skyrocketed: in the US the number of interests lobbying on climate change grew 400 per cent between 2003 and 2008 and estimated lobbying expenditures topped US$90 million annually in 2008.[5] For business, policy engagement presents an opportunity to shape the rules, incentives and institutions that define the overall operating context for companies. The promotion by business of systemic changes in climate-related public policy can help business move in a coordinated manner and on a large scale towards low-carbon investments.

As corporate involvement with climate change policy grows, however, so too must the scope of corporate reporting so as to enable stakeholders to understand the potential impacts of these activities. Comprehensive reporting on climate policy engagement must not only incorporate disclosure on political financing, but outline the process of identifying activities for engagement, demonstrate how corporate decisions about policy direction are taken and highlight areas for improvement. Such disclosure enhances accountability, creates a starting point for dialogue, and arms stakeholders with the tools necessary to distinguish public relations exercises from long-term, positive climate engagement.

The business case for involvement in climate policy

For many companies, involvement in climate change policy is seen as a critical investment. The absence of predictable and effective public policy can create bottlenecks in efforts to scale up investments in renewables and energy efficiency initiatives. For example, Google's programmes to help consumers save electricity may be reliant on US legislation that would attach a price to carbon and trigger interest in low-carbon technologies.[6]

Current uncertainty over the shape of future climate policy provides further motivation for companies to seek involvement on policy matters. Companies such as Ford and Hong-Kong-based power company CLP are calling on governments to provide the regulatory certainty they need to make multi-decade investments. Timberland CEO Jeff Swartz has argued, 'I just want to know what the facts are, and I'll get around to innovating in order to make a profit against them.'[7]

Corporate engagement in public policy: consequences for mitigation

Corporate engagement in climate policy can have direct consequences on whether – and how – national lawmakers and the international community find effective techniques for mitigating climate change. Business participation can add valuable technical expertise and generate significant investment capital for new initiatives. When corporate interests fail to align with mitigation goals, however, involvement may dampen or halt legislative attempts towards emissions reductions or low-carbon development.

In early 2010, for example, the powerful US Chamber of Commerce petitioned the US Environmental Protection Agency (EPA) over its finding that GHGs endanger public health.[8] 'Astroturf' organizations – supposed grassroots groups actually formed and funded by business – can also muddy the policy debate. In 2009 Greenpeace USA accused a major trade association for oil and natural gas companies of planning 'Energy Citizen' rallies to discourage support for a federal climate change bill.[9] In Europe intense lobbying from select sectors was believed by some observers to have diluted the EU climate policy targets.[10] Some Australian industries were similarly blamed for trying to weaken that country's attempts at a comprehensive emissions reduction plan (see also contributions 2.2.1 and 2.2.2, in this volume).[11]

Business interests do not always run contrary to the public good, however. Business involvement in initiatives such as Combat Climate Change, Caring for Climate and the Copenhagen Communiqué support calls for climate policy that puts the world on a path for climate stabilization. By early 2010 over 1000 global companies comprising some US$11 trillion in market capitalization and 20 million employees were calling

on policy-makers to enact climate legislation,[12] along with over 5000 US-based companies.[13] Encouragingly, reporting on climate policy engagement also seems to be on the rise. A BSR assessment of 150 global industry leaders shows that the vast majority of them are voluntarily reporting on some level of climate policy engagement.[14]

Reporting responsibly and comprehensively on public policy engagement

Environmental groups, consumers and investors are increasingly adding policy engagement to issues that companies are already reporting on, such as corporate emissions and mitigation strategies. At present, however, there is no widely accepted set of indicators for corporate reporting on climate engagement,[15] making it difficult for companies to decide what information to disclose or to compare their reporting practices with peers. It can also be difficult to describe the tangible influence a company has had on a policy process. Communication may occur primarily through informal discussions or indirectly through public statements, making cause and effect unclear.[16]

Nevertheless, there is an opportunity to establish more common definitions and norms around climate policy engagement that would lead to more meaningful discussions, better disclosure to stakeholders and greater incentives for companies to advance systemic climate solutions. Efforts are under way, but they are isolated. The Carbon Disclosure Project investor coalition and the Climate Counts consumer scorecard have both started to include policy engagement as a criterion in their company rankings. Until standards are established, businesses can take the lead in disclosing their engagement with climate change policy by meeting the following stakeholder expectations:

- *Building conceptual and technological links.* These demonstrate the impacts businesses have on climate change through their influence on public policies. In a similar way that British Telecommunications (BT) and Autodesk report emissions in terms of atmospheric share,[17] companies can list what governments they seek to influence, what commitments they seek of them and what this portfolio represents in terms of potential outcomes. They can reference the Climate Interactive C-ROADS platform, which shows the reduction potential of different regimes and the effects that their different commitments are likely to have.
- *Disclosing corporate processes*. The aim here is more comprehensive reporting regarding company activities and their underlying rationale, such as company strategy and, more generally, aspects of governance.[18] Companies can do several things to promote this kind of transparency. They can describe the decision-making process and roles for climate policy efforts, including the teams involved, and how the CEO and the board interact. They can show how the company undergoes decision-making

around issues related to climate change policy engagement – including how the company identifies issues, conducts reviews and pursues dialogue with stakeholders. Finally, they can show evidence that goals and commitments with core business strategy and actions are mutually reinforcing and, at the very least, not in conflict.

- *Creating benchmarks for performance on activities related to climate policy*. Disclosing financial and in-kind support to political parties and politicians, and listing membership in trade groups, are only the first steps in outlining engagement with climate policy. Other efforts, such as funding scientific research on climate change or releasing position statements, should also be included in reporting. The information on involvement in shaping climate policy should be publicly accessible and easily understandable, creating a benchmark against which to assess the impact of corporate efforts on policy outcomes.[19]
- *Engaging the board of directors on policy involvement*. Making boards the decision-takers on climate policy has been positively linked to both high-quality disclosure on climate policy and greater engagement with policy-makers.[20] Commitment at the highest levels not only leads to enhanced reporting but embeds these values throughout an organization, increasing the likelihood that the company's strategy on climate change is far-reaching.
- *Aligning policy efforts internally and externally with company strategy*. A corporation's public stance on climate change should cohere with the private actions it takes to shape policy through 'lobbying, whether as an individual company or as part of a group'.[21] Ensuring a consistent message among all business communications on climate policy and integrating this message into sustainability, marketing and government affairs teams makes it more likely that corporate messaging reflects a real commitment to mitigation strategies.
- *Providing evidence of improvement with each initiative*. Reporting instances of lessons learnt from climate policy engagement – in particular, challenges overcome – makes future engagement more effective.[22] Reporting may also highlight discrepancies between organizational and departmental positions.
- *Seeking independent verification to confirm reporting results*. External confirmation of reporting content can build credibility and bolster consumer and investor confidence in corporate reporting on policy engagement.

Taking the above as a minimum standard for policy engagement on climate change provides stakeholders with a clearer picture of the nature of business engagement in climate change policy and its consequences. Although commitment to combating climate change has grown in the last decade, there is still a long way to go. Comprehensive and comprehensible public disclosure of whom companies engage with in this global discussion, what outcomes they seek to influence and how they make and carry out those decisions is a crucial element in ensuring that corporate engagement carries real, positive and transparent consequences for mitigating climate change through public policy.

Notes

1. Ryan Schuchard is manager of research and innovation and Laura Ediger is environmental manager at BSR.
2. Carbon Disclosure Project, *Carbon Disclosure Project 2009: Global 500 Report* (London: Carbon Disclosure Project, 2009), p. 8.
3. Ibid.
4. Samantha Putt del Pino et al., *Sharpening the Cutting Edge: Corporate Action for a Strong, Low-Carbon Economy* (Washington, DC: World Resources Institute [WRI], 2009).
5. Marianne Lavelle, 'The climate lobby's nonstop growth', Center for Public Integrity (US), 19 May 2009, at www.publicintegrity.org/investigations/climate_change/articles/entry/1376; Marianne Lavelle, 'The climate change lobby explosion', Center for Public Integrity (US), 24 February 2009, at www.publicintegrity.org/investigations/climate_change/articles/entry/1171.
6. *Guardian* (UK), 'Google climate change chief wants price on carbon', 16 April 2010.
7. Politico.com (US), 'Big business pushes for climate action', 5 October 2009, at www.politico.com/news/stories/1009/27896.html.
8. *New York Times* (US), 'US Chamber petitions EPA to reconsider greenhouse gas endangerment finding', 16 March 2010.
9. BusinessGreen.com (UK), 'Greenpeace uncovers "astroturf" campaign to challenge US climate bill', 17 August 2009, at www.businessgreen.com/business-green/news/2247933/greenpeace-uncovers-astroturf.
10. Pew Environment Group, 'The European Union Climate Package' (Arlington, VA: Pew Environment Group), at www.pewglobalwarming.org/ourwork/international/bonn/EUClimatePackage.pdf.
11. Marian Wilkinson et al., '"Brown down" in Australia: Business interests thwart carbon controls on the hottest, driest continent', Center for Public Integrity (US), 6 November 2009, at www.publicintegrity.org/investigations/global_climate_change_lobby/articles/entry/1799.
12. WWF, *Business – The Real Deal* (Washington, DC: WWF, 2009), at http://assets.panda.org/downloads/action_bybusiness_onclimate_paper_corrected.pdf.
13. See www.americanbusinessesforcleanenergy.org/member/listing.
14. Ryan Schuchard, *Communicating on Climate Policy Engagement: A Guide to Sustainability Reporting* (San Francisco: BSR, 2010).
15. Ibid.
16. AccountAbility, *Towards Responsible Lobbying: Leadership and Public Policy* (London: AccountAbility, 2005).
17. For BT, see www.cdproject.net/CDPResults/65_329_219_CDP-The-Carbon-Chasm-Final.pdf; for Autodesk, see http://usa.autodesk.com/adsk/servlet/pc/item?siteID=123112&id=14981941.
18. In a 2010 report, BSR outlines nine elements that should especially be considered in the context of climate change. See Schuchard (2010).
19. Ibid.
20. Carbon Disclosure Project (2009).
21. Simon McRae, *Hidden Voices: The CBI, Corporate Lobbying and Sustainability* (London: Friends of the Earth, 2005); quoted in Schuchard (2010).
22. Schuchard (2010).

4.5.1
Colombia

Measuring transparency policies and mechanisms in public utilities

Alma Rocío Balcázar, Martha Elena Badel and Lorena Roa Barrera[1]

Reforms in the early 1990s opened Colombia's utility sector to private sector participation, creating what is today a blend of private and public management of utilities and presenting new challenges for oversight and accountability.

The management of and demand on public utilities can significantly influence levels of greenhouse gas (GHG) emissions. As large emitters, utilities also possess some of the greatest opportunities to reduce emissions. Energy efficiency in particular currently presents the largest and most cost-effective solution for reducing emissions,[2] a fact recognized in Colombia, which has received endorsement by the Clean Technology Fund for an investment plan proposing abatement measures in energy efficiency.[3]

With the potential to have significant impact on Colombia's carbon footprint, it is essential that utility managers undertake strategies to identify, assess and reduce environmental risks and GHG emissions, while ensuring that consumers understand both pricing structures and opportunities for energy efficiency.

Utilities in Colombia – particularly energy, water and sewage, waste collection and gas – are also beginning to apply for and obtain emissions reduction credits under the Clean Development Mechanism[4] (CDM) (see figure 4.4). The need for accountability and environmental integrity in implementing CDM projects makes a culture of corporate transparency all the more important.

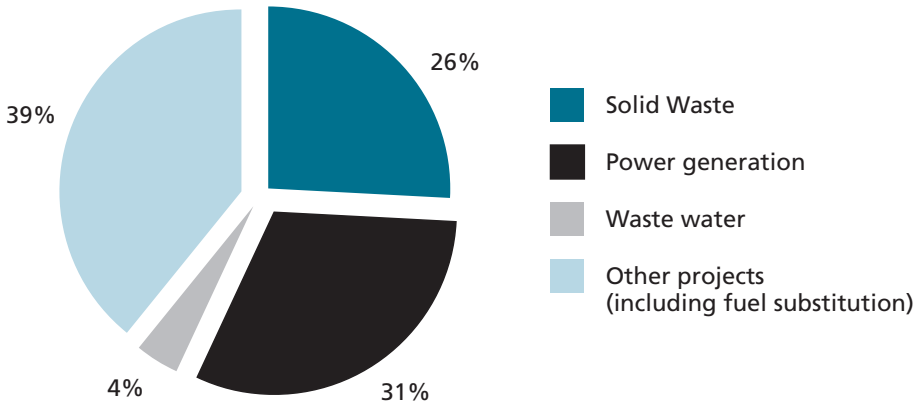


Figure 4.4 Public services in the Colombian CDM portfolio

Source: Adapted from the Colombian Ministry of Environment, Housing and Territorial Development, 2007.

Despite the importance of transparency in the management and provision of basic public services, Colombian utilities demonstrate significant shortcomings, including asymmetries in information that prevent stakeholders from learning how companies manage and deliver public services, and an absence of strong corporate governance practices.[5]

A pilot evaluation

To address some of these issues, Transparencia por Colombia launched a pilot evaluation in 2008, in which 10 public and privately managed utility providers participated.[6] This initiative, the first in the country, assesses the policies and mechanisms used by utility companies in order to support transparency, and seeks to forge an alliance with leading businesses to encourage other utility companies to emulate best practice.[7] Four factors of corporate transparency were measured: disclosure, dialogue, clear rules and voluntary controls (see table 4.2).

Although the model offers only limited insights as to how corporate transparency might influence GHG levels, the study nevertheless establishes a set of baseline expectations for accountability. If the evaluation leads to greater dialogue and information sharing between citizens and utilities, the impacts on consumer choices and long-term business strategy could have positive and direct consequences for emissions reductions.

Factors for transparency	Indicators	What is assessed
Voluntary controls	Additional or self-imposed controls	Assessment mechanisms, procedures, plans and methods adopted voluntarily by the company. Analysis of audit reports, risk management and other voluntary mechanisms.
Clear rules	Corporate ethics	Principles and ethical values are documented within the company, and there is a process for the communication of, and training in, these principles and values. Suppliers and contractors are aligned with the values.
	Corporate governance	Formalization of sound practices of corporate governance and the existence of basic information on concrete policy and measurement on issues including shareholder participation, functions of board of directors, dissemination of financial and non-financial information to stakeholders and periodic evaluation of governance practices.
Dialogue	Customer service systems	Efficacy of response systems and other mechanisms that ensure inclusion and equality meet needs and expectations.
Disclosure	Information to partners, shareholders and investors Information to customers Information to suppliers Information to society	Meets at least minimum standards for information provision and delivers significant information to stakeholders concerning items including corporate risks, profitability, social and environmental sustainability, and information on products and services.

Table 4.2 Colombian utility companies: Factors for corporate transparency, indicators and what is assessed by the pilot study

A mixed record on environmental responsibility

An average overall score of 57 out of 100 suggests a need for utility companies to take additional steps to enhance transparency. Broadly, these include communicating effectively with a diverse group of stakeholders; enhancing the use of information technologies for this purpose; establishing clear policies regarding the dissemination of management activities; and increasing

citizen engagement in and oversight of utility services. While utility companies showed greater responsibility regarding environmental impacts and policies than for other issues, the results remain mixed.

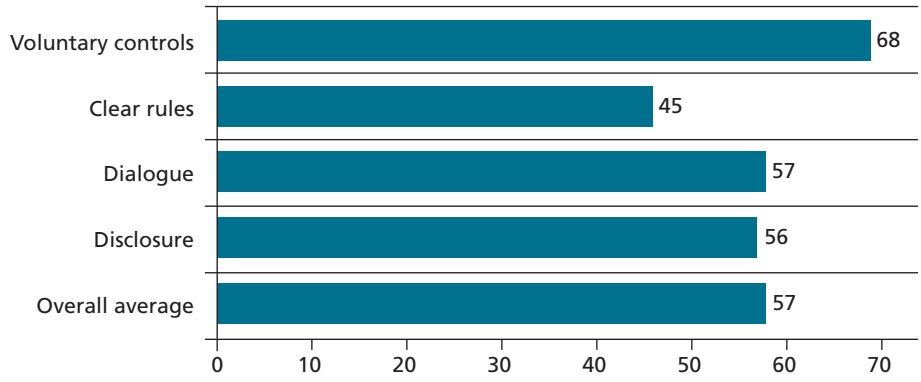


Figure 4.5 Pilot study of Colombian utility company transparency: consolidated results

The evaluation of disclosure revealed some encouraging results. Companies prepared and released reports for stakeholders that discussed environmental management and plans to mitigate their negative impacts on the environment. Many utilities were also found to have posted information on their websites to help consumers use their utilities more efficiently.

What was discouraging, however, was a lack of clarity in pricing and the failure of some companies to help customers understand contracts and invoicing. Consumers therefore face more difficulty in understanding and making decisions about their consumption patterns – a problem that could contribute to energy inefficiency and increased emissions.

The findings on voluntary controls pointed to a lack of corporate promotion of citizen oversight. While companies do make efforts to cultivate dialogue with stakeholders, citizens have access to few effective channels for direct engagement with companies or to solicit information from government oversight bodies.[8] One implication of this is that without access to such information, citizens are limited in their ability to work with utility companies and the government in order to assess companies' impact on Colombia's emissions levels, or collaborate on GHG emissions reduction initiatives.

Setting a standard in utility transparency

Initiatives such as this by Transparencia por Colombia, which has welcomed 13 new utility sector participants for future iterations of the evaluation, have a valuable role to play in encouraging transparency and good governance in utility management and reinforcing minimum standards of disclosure and dialogue.

Inevitably, such an evaluation cannot directly identify how transparency in utility companies affects GHG emissions. Nevertheless, questions of consumer awareness, citizen engagement, and information sharing and collaboration on the long-term strategy of public utilities hold direct relevance for planning emissions reductions. If, over time, the Transparencia por Colombia model and similar initiatives successfully foster widespread standards of transparency and accountability throughout the utility sector, then the ability of citizens to obtain information and engage with business could become not just best practice but common practice. For those who hope to foster dialogue between the public and utilities on climate strategy and energy efficiency, this development would be welcome.

Notes

1. Alma Rocío Balcázar is private sector director, Martha Elena Badel is private sector consultant and Lorena Roa Barrera is private sector professional at Transparencia por Colombia.
2. World Bank, *World Development Report 2010: Development and Climate Change* (Washington, DC: World Bank, 2010), p. 190.
3. In addition to energy efficiency, the plan focuses on abatement in urban transport. See Climate Investment Funds, *Clean Technology Fund Investment Plan for Colombia* (Washington, DC: World Bank, 2010).
4. For up-to-date figures on CDM projects in Colombia, see www.minambiente.gov.co.
5. Departamento Nacional de Planeación, *Prácticas de gobierno corporativo en empresas de servicios públicos domiciliarios: Lineamientos de política*, CONPES Document no. 3384 (Bogotá: Departamento Nacional de Planeación, 2005).
6. These were: Promigas, Telefónica Telecom, ISAGEN, Empresa de Energía de Bogotá, Aguas de Manizales, Empresas Públicas de Medellín, Electrificadora del Caribe and the companies of Grupo Sala: Aseo Emas Pasto, Emas Manizales and Aguas de la Sabana.
7. For the evaluation's complete methodology and results, see Transparencia por Colombia, *Políticas y mecanismos de transparencia en empresas de servicios públicos: Resultados del primer ejercicio de evaluación* (Bogotá: Transparencia por Colombia, 2009).
8. Transparencia por Colombia, 2009.

4.6

Enabling green choices

Ensuring consumers receive accurate, actionable information on the climate impacts of their consumption choices

Fred Pearce[1]

Defining 'greenwash'

A French nuclear power plant trumpets its green credentials by celebrating the award of a certificate for, among other things, using recycled toilet paper at its reactor.[2] A fast-growing airport in Scotland boasts of soaking up carbon dioxide by funding children to plant some trees – never mind the small matter of thousands more planes taking off each year.[3] Private jet companies advertise themselves as carbon-neutral.[4]

There is no agreed definition of 'greenwashing'; but it involves an effort to use publicity to encourage consumers of a product or service to believe that it is more environmentally benign than it really is, or to use the claimed benefits of one 'green' product to improve the reputation of an entire company or industry. Several governments and trade bodies have established guidelines for how to make proper, verifiable environmental claims. Here 'greenwashing' has generally been taken to indicate cases in which companies have hidden environmental impacts by deviating from such guidelines.[5]

Consumers should perhaps be flattered. Many corporations now understand that their customers expect them to have good environmental credentials. Green sells.[6] Such cases also show the potential for abuse of that expectation, however. As suppliers of products and services of every kind, from power to pensions, and cars to copying paper, splatter their advertising and public relations with bogus, misleading and frivolous claims, they threaten to undermine public faith in any kind of

environmental progress. Worse still, perhaps, successful greenwashing lets companies off the hook from taking their share of responsibility in confronting a global issue such as climate change. Transparency in terms of green claims, including through independent verification of these claims, is therefore essential to preventing greenwash.

Preventing greenwashing: no easy task

Some governments have tried to impose strict rules on environmental claims. Germany's competition law covers environmental claims in advertising, regulating when phrases such as 'environmentally friendly' can be used. Many have been reluctant to crack down, however. In the US, the Federal Trade Commission (FTC) has guidelines for environmental marketing, but successive administrations have not prioritized acting on them.[7]

In early 2010 the UK government's Department for Environment, Food and Rural Affairs (DEFRA) published guidelines for corporations that want to make credible environmental claims.[8] They boiled down to ensuring that claims were 'clear, accurate, relevant and verifiable'. Ministers refused to adopt a policing role, however, and rejected a proposal that had been made by parliamentarians on the House of Commons Environmental Audit Committee a year beforehand asking ministers to 'intervene directly to remove those [claims] found to be inaccurate or misleading'.[9]

Instead, governments prefer to rely on the growing promotional importance of eco-labelling schemes sponsored by non-governmental organizations (NGOs) and industry, such as those run by the Forest Stewardship Council and Rainforest Alliance to recognize forest-friendly products, and sometimes self-policing from the advertising industry itself.[10] The evidence, however, is that, while the former is growing in popularity, the latter is not working. The UK Advertising Standards Authority (ASA), an industry body, says that, despite a series of tough rulings, it has received a rising tide of public complaints about green claims in advertisements.[11]

The ASA says obviously bogus claims may be diminishing but more subtle propaganda is on the rise. Numerous products make unspecific claims about being 'green', 'eco', 'environmentally friendly', 'sustainable' or even 'carbon-neutral' without any attempt to define what they mean by such terms. Moreover, there is a growing use of images designed to seduce us into imagining that companies and products are green.

The ASA has recently rapped the knuckles of Renault, banning its advertisement of the Twingo – a car with above-average emissions for its size – as an 'eco-car',

pictured with leaves blowing out of its tailpipe.[12] It followed up by chastising the Anglo-Dutch oil giant Shell for showing flowers growing out of its refinery chimneys.[13]

The indications are that green image-making is becoming more subtle but more pervasive. Some common tricks are emerging. For example, big companies often green their corporate image by heavily marketing a handful of products with above-average environmental credentials, as if they represented the full range.

Oil companies such as BP and Shell now routinely spend millions of euros a year filling newspapers, billboard hoardings, websites and TV slots with promotion of their investment in renewable energy, when this makes typically around 5 per cent of their budgets.[14] Shell, for instance, has spent millions showing pretty images of a butterfly net catching CO_2 and a pocket calculator with a button marked 'less CO_2' – at a time when it has been cutting its investment in renewables and when its outgoing chief executive warned of wind, solar and hydrogen power: 'I don't expect them to grow much at Shell from here.'[15]

The Danish power company Dong trades on its green image at home, where it is a major supplier of wind energy, while building coal-fired power stations abroad – in Scotland, for instance.[16] Likewise, German energy giant RWE presents itself as green through its use of wind and water power, even though renewable sources make up only 2.4 per cent of the power generation of what is Europe's largest CO_2 emitter.[17]

A related strategy is to highlight the company's environmental research and development. German car manufacturer Audi promotes its greenness with descriptions of a 'fantasy car' that, it admits, may never be built, while the CO_2 emissions from its real fleet are still way off EU targets.[18]

Such strategies are most common from industries with bad environmental images, such as energy companies, airlines, oil giants, car manufacturers and some major retail chains. Top UK retailer Tesco, for example, claimed in 2009 to be 'setting an example' in tackling climate change, during a year in which it admitted to increasing its CO_2 emissions by almost half a million tonnes. Its argument was that its 'floor space' was increasing more rapidly than its emissions. Furthermore, 'setting an example' went only so far. Like other UK retailers, Tesco refuses to put doors on its store refrigerators, even though this could reduce their energy use by up to 10 per cent, according to one industry source.[19]

Airlines are feeling the heat over their high and fast-growing emissions. Sir Richard Branson's Virgin Atlantic has responded with high-profile investment in trials with biofuel. This cannot disguise the fact that its fleet emissions have been rising rapidly, however – and are higher than those of most African countries.[20]

Spurious statistics are legion in green promotion. European budget airline Easyjet claims prominently on its website that a typical journey on its planes has a smaller carbon footprint than the same journey by a hybrid car – a calculation that is sustainable only on the assumption that the car's passenger seats are empty, while the aircraft's passenger seats are full.[21] Similarly, Lamborghini announced a 35 per cent cut in future CO_2 emissions for one of its vehicles, glossing over the fact that the improvement will still leave it bottom of its class.[22]

A common greenwashing trick is for companies to associate themselves with 'green causes'. During 2009, in the run-up to the Copenhagen Climate Conference, Shell invested widely in funding and promoting special newspaper and magazine supplements on climate change issues.[23] Meanwhile, the French energy company EDF launched an annual 'Green Britain Day', advertised with a green Union Jack. It encouraged its customers to cut their carbon emissions, but made no parallel promises of its own.[24]

Greenwash can hoodwink governments as well as consumers, by encouraging them to make the wrong policy decisions in the belief that they are being 'green'. Arguably, one example is the widespread rebranding of the coal-mining and coal-burning industries with the notion of 'clean coal'. The idea is that, one day, carbon emissions will be tapped before they go up the chimney – a technology known as carbon capture and storage. Planned new coal-fired power stations are routinely advertised as being 'carbon-capture-ready'. This means little, though, since the plants are likely to be nearing the end of their lives before the technology actually becomes available.[25]

Some products may be environmentally benign enough in themselves, but come with huge energy and carbon footprints by the time we consume them. An example is bottled water. It is no more and no less 'green' than tap water at the time the bottle is filled. Trucking those bottles across countries – and often across international borders – gives them a much larger carbon footprint than water delivered by pipeline, however.

Looking for solutions: strengthening standards and empowering consumers

One way out of this quagmire, besides policing the claims themselves, is to circumvent them with agreed standards and to require manufacturers to advertise what standards their products meet. Cars in the European Union (EU) have to undergo a standard test to show their emissions, measured in grams per kilometre, and to include the results in their advertising. This at least allows purchasers to assess the advertising

claims against reality.[26] The EU also operates agreed energy efficiency labelling standards for white goods such as refrigerators, for example. Even in this respect, though, industry lobbying has sometimes devalued their transparency. The EU energy label now runs not from G to A, but on to A++, so a product that is graded A – apparently the highest category – turns out to be far from the best.[27]

Moreover, many products have no such standards. The EU has extended its range by introducing its own eco-label, a flower logo, for products that meet its standards of sustainability. More than 3000 products currently carry the flower logo. In Germany some 10,000 products carry the Blue Angel logo.

Even here things can go wrong, however. Two brands of widely sold copying paper, Golden Plus and Lucky Boss, carry the logo across the EU, vouching that the paper comes from sustainable sources. An investigation by an NGO, Forest and European Union Resources Network, in 2010 revealed, however, that significant amounts of the pulp from which the paper was made came, in part at least, from the clear-felling of virgin rainforest in the Indonesian island of Sumatra.[28]

More than showing that not all products carrying the logo live up to their claims, the investigation revealed a web of secrecy behind the EU's verification of claims, meaning, the investigators concluded, that the public could not find out in any detail why some products succeeded while others failed. Transparency is essential for public confidence on the process, and a re-evaluation of the assessments that candidates for the highly prized logo have to undergo is currently taking place.

The EnergyStar programme, run by the US government, aims to assist consumers in making environmentally and cost-friendly choices by awarding the EnergyStar label to energy-efficient products. A good programme in principle, vigilance in implementation appears to be lacking. In 2009 and 2010 the US Government Accountability Office (GAO) submitted products under the guise of fictitious companies and found that the programme was 'vulnerable to fraud and abuse', since many of the GAO's applications for EnergyStar approval were accepted without question, including a proposal for a gas-powered alarm clock.[29]

Until government standards are strengthened, it seems that public exposure remains the best defence against greenwashing, including the important role of the consumer in providing a check against the practice. There are initiatives, by civil society, consumers and, in some cases, the private sector, that work to spot and publicize greenwash. The Greenwashing Index, for example, is operated jointly by a US university and a social marketing agency, and encourages visitors to submit and rate examples of greenwash.[30] Other individual initiatives have also increased the reputational risk of greenwashing; by one estimate, the number of blogs discussing greenwash multiplied by 550 between 2005 and 2008.[31]

There is, of course, a downside to public exposure. Some companies say they now fear making claims about improving the environmental impact of their products in case it prompts critics to charge them with being less than perfect. Businesses should weigh this concern against the cost of doing nothing at all, though; a majority of surveyed consumers in the US and the UK now want companies to provide information on how their products are impacting on climate change, and two-thirds say that business must take global warming more seriously.[32] Consumers can continue to put pressure on businesses to communicate their efforts to become climate-friendly in ways that are honest, measurable and independently verified.

If companies fail to meet these expectations, a rising tide of misleading and frivolous environmental claims will breed confusion and mistrust, and eventually undermine public confidence in efforts to provide green products at all; and, if that happens, the main incentive for companies to clean up their act will be gone.

Notes

1. Fred Pearce is currently environmental consultant to *New Scientist*, an author of several books, including *Confessions of an Eco-Sinner*, and a regular contributor to UK newspapers, including the *Guardian*.
2. See vorort.bund.net/suedlicher-oberrhein/greenwash-kriegspropaganda.html.
3. *Guardian* (UK), 'Edinburgh airport's tree project is trampled by its carbon elephants', 1 April 2010; news.bbc.co.uk/1/hi/scotland/edinburgh_and_east/8585611.stm.
4. *Guardian* (UK), 'Green private jets? Don't make me laugh', 29 October 2009.
5. Typical types of greenwash include: hidden trade-offs, in which one 'green' attribute is highlighted to cover up a bigger environmental problem; unsupported claims that cannot be checked; vague claims, such as 'environmentally friendly' or 'eco'; irrelevant claims, such as 'CFC-free', when no products contain the compound; and misleading images.
6. OgilvyEarth, *From Greenwash to Great. A Practical Guide to Great Green Marketing (without the Greenwash)* (New York: OgilvyEarth, 2010), at http://assets.ogilvy.com/truffles_email/ogilvyearth/Greenwash_Digital.pdf.
7. FTC, *Guides for the Use of Environmental Marketing Claims* (Washington, DC: FTC, 1992), at www.ftc.gov/bcp/grnrule/guides980427.htm; *USA Today*, 'Eco-friendly claims go unchecked: Enforcer blames lack of resources', 22 June 2009.
8. DEFRA, *Green Claims – Practical Guidance: How to Make a Good Environmental Claim* (London: DEFRA, 2003), at www.defra.gov.uk/environment/business/marketing/glc/documents/genericguide.pdf.
9. House of Commons Environmental Audit Committee, *Environmental Labelling: Second Report, Session 2008–09* (London: Her Majesty's Stationery Office, 2009), at www.publications.parliament.uk/pa/cm200809/cmselect/cmenvaud/243/243.pdf.
10. See www.rainforest-alliance.org/agriculture.cfm?id=main.
11. *Guardian* (UK), 'Advertising watchdog receives record complaints over corporate "greenwash"', 1 May 2008; ASA adjudication on Renault (UK) Ltd, Complaint ref: 46093, 26 March 2008.
12. *Guardian* (UK), 'Renault ad banned over green claims', 26 March 2008.

13. *Guardian* (UK), 'Green advertising rules are made to be broken', 23 March 2010.
14. See www.americanprogress.org/issues/2009/03/big_oil_misers.html/#2.
15. See www.treehugger.com/files/2008/12/greenwash-watch-shell-net.php and http://business.timesonline.co.uk/tol/business/industry_sectors/natural_resources/article5927869.ece.
16. *Guardian* (UK), 'Dong Energy: "clean" Denmark's dirty secret', 17 September2009.
17. See www.rwe.com/web/cms/mediablob/en/315844/data/17906/56684/rwe/responsibility/performance/energy-climate/security-of-supply/power-generation-structure/RWE-Factbook-Renewable-Energy-December-2009-.pdf.
18. See www.audi.co.uk/audi-innovation/concept-cars/detroit-showcar-audi-etron.html and *Guardian* (UK), 'Has Audi's electric dream already run out of gas?', 21 January 2010.
19. *Guardian* (UK), 'Supermarkets get cold feet over fridge doors', 1 October 2009.
20. *Guardian* (UK), 'Sir Richard Branson's green claims are running on hot air', 27 August 2009.
21. See www.easyjet.com/EN/Environment/carbon_emissions_calculator.asp. This reasoning also sidesteps the carbon footprint of the most likely alternative: the train journey will almost certainly have a substantially lower carbon footprint than the car or plane.
22. *Guardian* (UK), 'Lamborghini emits some V12-powered nonsense', 11 June 2009.
23. See www.newstatesman.com/pdf/copenhagen.pdf.
24. *Guardian* (UK), 'Are EDF trying to cut our use of energy? Surely, some mistake', 2 July 2009.
25. The carbon dioxide would be gathered into pipeline networks and buried far from the atmosphere in old oil wells or salt mines. The system and its required infrastructure, which would have a large carbon footprint of its own, is untested and several decades away from becoming commercially viable, however. Even pilot systems have not yet been built.
26. See ec.europa.eu/environment/air/transport/co2/co2_cars_regulation.htm.
27. See www.energylabels.org.uk/eulabel.html.
28. See www.fern.org/sites/fern.org/files/FERN_PindoDeli-final_0.pdf and *Guardian* (UK), 'The deflowering of the EU's green logo', 15 April 2010.
29. GAO, *Energy Star Program: Covert Testing Shows the Energy Star Program Certification Process Is Vulnerable to Fraud and Abuse* (Washington, DC: GAO, 2010), pp. 7–15.
30. See www.greenwashingindex.com.
31. Rina Horiuchi et al., *Understanding and Preventing Greenwash: A Business Guide* (Washington, DC and London: BSR and Futerra, 2009), p. 23.
32. AccountAbility, *What Assures Consumers on Climate Change? Switching on Citizen Power* (London: AccountAbility, 2007), p. 9.

4.7

Could corruption pose a barrier to the roll-out of renewable energy in North Africa?

Nadejda Komendantova and Anthony Patt[1]

Considerable attention has turned to North Africa as a promising location for the development of renewable energy sources (RES). Egypt, Morocco and Tunisia already produce energy from renewable sources[2] and are eager to increase this share.[3] The European Union (EU) has also committed itself to sourcing 20 per cent of its energy from RES by 2020, part of which is expected to come from solar and offshore wind installations located in North Africa.[4]

Several scientific studies have demonstrated the technical feasibility of developing renewable energy projects in the Sahara Desert for import into Europe,[5] and it is estimated that installations of concentrated solar power (CSP)[6] covering less than I per cent of the desert could meet all of Europe's power needs.[7]

RES projects require significant private and public investment, however. The large-scale deployment of CSP in North Africa, including the costs of electricity transmission lines to Europe, would require nearly €400 billion until 2050 to import 700TWh/y (terawatt-hours per year) of solar electricity.[8] Currently, the combination of financing from national budgets and multilateral organizations contributes the major share of investment into renewable energy development in North Africa, focused mainly on wind and solar installations and concentrated in Egypt, Morocco and Tunisia. While private companies have won deals to supply components or to construct plants, significant amounts of financing come from national governments.[9] The involvement of private capital is crucial, however; past

experience suggests that, when infrastructure projects reach a large scale, governments may lack the fiscal resources needed to continue funding them.[10]

Unfortunately, European foreign direct investment (FDI) in North Africa remains minimal compared to other regions.[11] According to the World Investment Prospects Survey 2010–2012, after sub-Saharan Africa it was North Africa that was predicted to be the lowest-priority region for FDI in 2010 and 2012.[12] Where it is present, FDI is often linked to the extraction of natural resources.[13]

Some of the challenges for attracting capital have been identified in World Bank studies of regulatory risks in North Africa. One assessment evaluated the business environment across the region and found regulatory shortcomings relating to enforcing contracts, starting a business or dealing with construction permits.[14] In another survey, over 45 per cent of companies involved in FDI in Egypt and Algeria found corruption to be a major constraint.[15]

The International Institute of Applied Systems Analysis (IIASA) conducted research to identify barriers to private investment in RES, focusing on North Africa and on determining the cost of these barriers in terms of investment volumes. IIASA used qualitative methods of research based on structured, semi-structured and in-depth interviews, and quantitative modelling.[16]

Gathering stakeholder perspectives

During the first round of interviews with experts,[17] 52 per cent of all respondents named complexity and corruption in bureaucratic procedures as significant barriers to the deployment of RES in North Africa (figure 4.6). In this context, experts understood corruption primarily as the existence of nepotism, the expectation of hidden payments or gifts to officials as the cost of doing business, or long delays in bureaucratic procedures unless bribes were given.

The following round of interviews presented stakeholders with a list of nine possible risks: regulatory, political, revenue, technical, 'force majeure' (including natural catastrophes and terrorism), financial, construction, operating and environmental. Participants were asked to value these according to the seriousness of their concern and the likelihood of occurrence. As figure 4.7 shows, three types of risk were evaluated as being a high level of concern, with 78 per cent of respondents identifying regulatory risk – defined as complexity or corruption relating to bureaucratic procedures – as a high-level concern.[18]

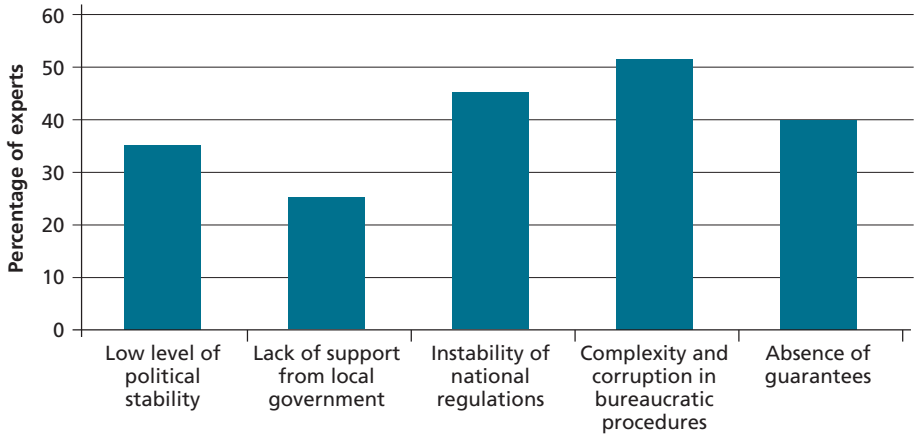


Figure 4.6 Barriers to investment in renewable energy in North Africa

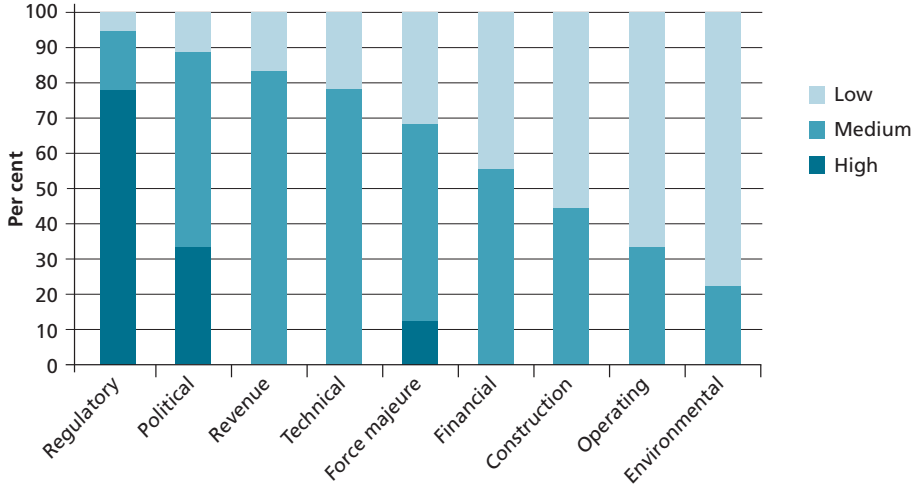


Figure 4.7 Risks perceived as most serious in relation to RES investment in North Africa

Furthermore, 67 per cent of all interviewed stakeholders considered that regulatory risk was very likely to be present in North Africa, while the likelihood of political risk and force majeure was considered to be less (figure 4.8).

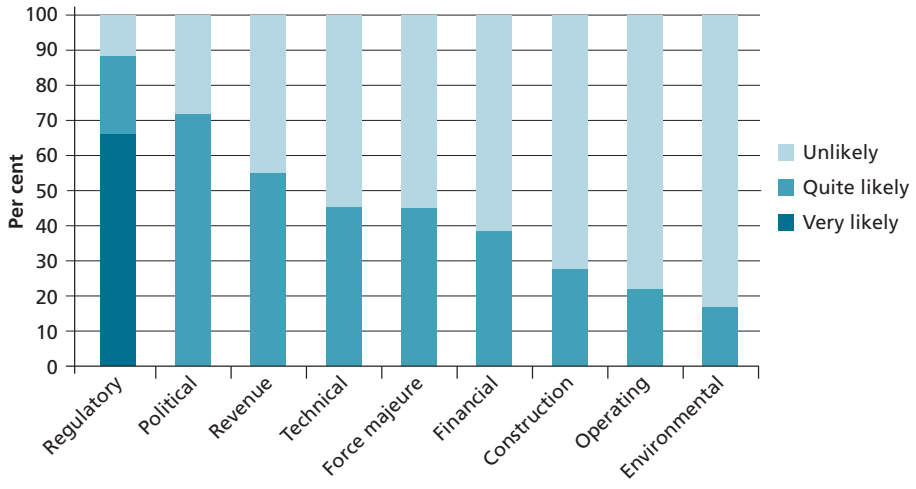


Figure 4.8 Risks perceived as most likely to happen in relation to RES investment in North Africa

Both evaluations demonstrate that the risk of poor-quality bureaucratic procedures was perceived as serious and likely to happen in relation to RES investment in North Africa. Many respondents further noted that investment often does not occur because of complex and lengthy bureaucratic procedures and uncertainty as to whether public officials will expect bribes. Such risks can create difficulties for calculating project budgets and put projects at risk of cost overruns.

The quality of bureaucratic procedures is also a concern for investors in the conventional energy sector, but here the costs of capital are lower, since banks perceive projects with pre-existing track records as less risky and therefore require lower risk premiums for their capital.[19] This is not the case with North African RES projects, and particularly not with CSP, which has no established track record.

The cost of investment

For the second stage of its research, the IIASA used its Mediterranean Area Renewable Generation Estimator (MARGE) to quantify the economic cost that risks of complex or corrupt bureaucratic procedures have on the internal rate of return (IRR).[20] The MARGE model estimated the annual cost of constructing CSP plants, using data from studies on CSP technology and variables input by users, including interest rates and industry growth rates.[21] Investors will generally require a higher IRR for projects they perceive as high-risk because of the technology or the region of operation. MARGE examined the cost of these risks in terms of the overall

investment needed between now and 2025 by inputting different IRRs commonly associated with varying levels of risk.

Project developers of conventional thermal power stations generally guarantee an IRR in the range of 6–10 per cent, while developers of large renewable power plants – such as CSP plants in Spain – need to guarantee 15 per cent, due to banks' apparent view that the technology may not yet be commercially viable. Taking into account the perception of bureaucratic risks, it is reasonable to consider that private developers of CSP projects in North Africa could face IRRs as high as 20 per cent.

Taking an IRR of 20 per cent, the MARGE model suggests that the overall investment required by European and North African governments, multilateral organizations and the private sector to develop CSP capacity (including the construction of installations and electricity grids, insurance, operation and management costs) until 2025 could reach €1600 billion (US$2000 billion) with a 20 per cent IRR,[22] in comparison to less than €100 billion (US$130 billion) with a 5 per cent IRR and €580 billion (US$750 billion) with a 15 per cent IRR.

Both the MARGE calculations and the findings of the initial interviews will need to be supported by further research to determine the extent to which perceptions of regulatory risks and complicated bureaucratic procedures reflect concerns over corruption as opposed to legal, though inconvenient, regulatory complications or bureaucratic delays. Nevertheless, the World Bank finding that a substantial percentage of companies operating in the region[23] found corruption to be a significant problem suggests that it could indeed prove an obstacle to the roll-out of renewable energy in the region.

If this is true, a failure to address corruption will result in higher quantities of investment being required for CSP deployment in North Africa. This is just one possible result; another is that investors will simply seek other regions for investment. Given the region's singular potential for solar development, however, this outcome should be avoided. By taking steps to reduce corruption and streamline bureaucratic procedures, North African governments may both fuel their economies and contribute significantly to the reduction of global emissions.

Notes

1. Nadejda Komendantova is a research scholar and Anthony Patt is a team leader of the Decisions and Governance Group at the International Institute of Applied Systems Analysis (IIASA) in Austria.
2. Observatoire Méditerranéen de l'Energie (OME), *Mediterranean Energy Perspectives 2008* (Paris: OME, 2009).

3. For example, the governments of Egypt and Morocco have committed themselves to achieving 20 per cent and 42 per cent shares of renewable energy by 2020, respectively. Climate Investment Funds (CIFs), *Clean Technology Fund Investment Plan for Concentrated Solar Power in the Middle East and North Africa Region* (Washington, DC: CIFs, 2009), p. 6.
4. Reuters (UK), 'EU sees solar power imported from Sahara in five years', 20 June 2010.
5. Gregor Czisch, *Szenarien zur zukünftigen Stromversorgung: kostenoptimierte Variationen zur Versorgung Europas und seiner Nachbarn mit Strom aus erneuerbaren Energien* (Kassel: University of Kassel, 2005).
6. Concentrated solar power is a promising method of energy generation that uses mirrors to focus sunlight, which heats a transfer liquid that, in turn, generates the steam necessary to power a turbine.
7. World Bank, *World Development Report 2010: Development and Climate Change* (Washington, DC: World Bank, 2009), p. 221.
8. By way of comparison, in 2000 Europe's total electricity demand was about 3500 TWh/y for all energy sources. Franz Trieb, *Trans-Mediterranean Interconnection for Concentrating Solar Power* (Stuttgart: German Aerospace Center, 2006), pp. 34 and 102.
9. UN Environment Programme (UNEP), *Global Trends in Sustainable Energy Investment 2009: Analysis of Trends and Issues in the Financing of Renewable Energy and Energy Efficiency* (Nairobi: UNEP, 2009), p. 56.
10. Clive Harris*, Private Participation in Infrastructure in Developing Countries: Trends, Impacts, and Policy Lessons.* Working Paper no.5 (Washington, DC: World Bank, 2003), p. 40.
11. Marion Mühlberger and Marco Semmelmann, *North Africa: Mediterranean Neighbours on the Rise* (Frankfurt: Deutsche Bank Research, 2010), p. 7.
12. UN Conference on Trade and Development (UNCTAD), *World Investment Report 2010: Investing in a Low-Carbon Economy* (Geneva: UNCTAD, 2010), p. 25.
13. UNCTAD, *World Investment Report 2008: Transnational Corporations and the Infrastructure Challenge* (Geneva: UNCTAD, 2008), p. 43.
14. World Bank, *Doing Business 2008* (Washington, DC: World Bank, 2007), at www.doingbusiness.org.
15. World Bank, 'Enterprise surveys', at www.enterprisesurveys.org. Full survey data are available for Algeria (2007) and Egypt (2008).
16. A more in-depth discussion of the research can be found at Nadejda Komendantova et al., 'Perception of Risks in Renewable Energy Projects: The Case of Concentrated Solar Power in North Africa', *Energy Policy* (forthcoming).
17. Interviews were conducted with participants at an international conference on CSP development that was held in Madrid in 2008; a meeting for the Mediterranean Solar Plan held in Paris in 2009; and a special workshop on barriers to CSP development organized by the IIASA in Austria in 2008.Twenty-three experts were interviewed: five from industry, two from government ministries, seven from the financial sector and nine from the social scientific community. All interviewees worked in Europe and were actively involved in the analysis of CSP projects in North Africa or in the realization or management of these projects.
18. The research assumed that the European feed-in-tariff would be available to support investment into CSP in North Africa for a period of 20 years.
19. See, for example, Edward Kahn, *Comparison of Financing Cost for Wind Turbine and Fossil Powerplants* (Berkeley: University of California, 1995).

20. The internal rate of return means the return on investment capital. It is closely connected with the costs of capital and risk premiums, when investors or banks require higher risk premiums or interest rates for their capital for projects that they perceive as more risky.
21. See www.iiasa.ac.at/Research/RAV/Presentations/MARGE/dist/The_MARGE_Model.html.
22. This investment does not include investment by distribution companies and governments in the purchase of RES electricity.
23. Based on figures from World Bank 'Enterprise surveys': Algeria (64 per cent in 2007), Egypt (45 per cent in 2008) and Morocco (27 per cent in 2007).

4.7.1
Spain
Can incentivizing solar energy invite fraud?

Tono Calleja[1]

In 2008 Spain was a front-runner in the solar market, thanks to a feed-in tariff that mandated that utilities would have to buy solar power at high, government-set rates.[2] The subsidy, introduced in 2007, was the most generous in the world and, with few conditions attached, attracted developers globally.[3] The promise of profits not only set the stage for a boom in photovoltaic (PV) installation, however, but, in the absence of a rigorous oversight mechanism, also proved an incentive for fraud.

By the end of 2007 Spain's goal of producing 400 megawatts (MW) of solar electricity by 2010 had already been met.[4] Hoping to curb this unexpected surge in PV installations, the Spanish government announced reduced electricity rates for solar power plants installed after September 2008 and set a cap of 500MW worth of new projects.[5] Facing the prospect of diminished profits, developers rushed to complete installations by the deadline, challenging the capacity of the regulator and the grid operator to monitor all the new projects.[6] Accompanying the scramble were reports of fraud, with developers allegedly declaring projects to be finished despite the incomplete installation of solar panels or the temporary installation of fake panels.[7]

A 2008 investigation by Spain's national energy commission (Comisión Nacional de Energía: CNE) found that over 4000 PV installations, located in 13 per cent of the country's solar parks, were falsely registered as operational and were making no contribution to the energy grid as at the end of September that year.[8]

In 2009 the government acknowledged that it had been ill-equipped to audit all the solar projects applying for inclusion in the feed-in tariff, and the CNE likewise cited the need for a supervisory mechanism to guarantee that new PV installations meet

the requirements necessary to qualify for subsidies.[9] In January of the same year the Ministry of Energy gave PV companies two months to demonstrate that their plants were in fact equipped for connection to the energy grid, with a suspension of payments for those that were not.[10]

From the beginning of investigations in 2008, and throughout 2009, Spain's photovoltaic industry association (Asociación de la Industria Fotovoltaica: ASIF) emphasized that, while completion of the installations by the September deadline was a requirement to qualify for the feed-in tariff, contribution to the energy grid by the deadline was not, and stated that installations that did not contribute to the grid by deadline were not necessarily the result of fraud; for example, some installations may have been completed, but were dependent on local infrastructure for connection.[11] The organization nevertheless welcomed legal action against those found to have committed fraud, as it felt that the ongoing allegations of wrongdoing cast a shadow over the entire sector.[12]

Developers were not the only party to come under scrutiny, however. Spain's recent history of corruption in the real estate market appeared to re-emerge in the solar industry.[13] In 2009 13 civil servants from the region of Castilla y León were found by regional administrators to have inappropriately processed and authorized licences for photovoltaic plants for companies in which they or immediate relatives had a direct stake.[14] According to press accounts, despite decisions taken by regional administrators to suspend the employment and salaries of most of these individuals for one to three years, almost two years later not one had completed these terms, either due to pending appeals or because administrators claimed that postponement of the sanctions was necessary so as not to disrupt the services provided by the employees to the industrial sector.[15] The allegations, spread across four provinces, were dealt with only by regional administrators, to whom those implicated were politically affiliated.[16] Only in the province of Zamora did the public prosecutor open a case, the results of which were pending as of mid-2010.

Such problems are not unique to the solar sector. As in any industry, though, and especially one dealing with a relatively new type of infrastructure, effective oversight is crucial. Government agencies, private sector proponents and environmental advocates cannot succeed in their efforts to introduce renewable forms of energy without strong and meaningful safeguards. In addition to squandering public resources and undermining project success, fraud has a more pernicious effect: if pervasive and persistent, it has the capacity to threaten the fragile trust the public has in the long-term viability of alternative energy.

Notes

1. Tono Calleja is a journalist and researcher specializing in environmental issues and is a member of TI Spain, for which he has contributed this report.
2. *Greentech Media* (US), 'Spain: the solar frontier no more', 29 May 2009.
3. *New York Times* (US), 'Solar industry learns lessons in Spanish sun', 8 March 2010.
4. Ibid.
5. *Greentech Media* (US), 'Solar fraud could eliminate Spanish market', 15 December 2008. Installations that were not operational by the deadline would receive €320 per megawatt-hour (MWh) of capacity for 25 years, rather than the €450 per MWh offered by the feed-in tariff; see Lisa Abend, 'Spanish solar firms accused of fraud', *Nature*, published online 19 December 2008, at www.nature.com/news/2008/081219/full/news.2008.1326.html.
6. *European Daily Electricity Markets* (UK), 'Recession turns up heat on solar subsidies in Spain', 12 March 2010.
7. *Greentech Media* (15 December 2008).
8. *European Daily Electricity Markets* (UK), 'Spanish regulator demands more photovoltaic supervision', 19 May 2009; *Nature* (19 December 2008).
9. Ibid.
10. Ibid.
11. ASIF, 'La inyección de electricidad a la red no era un requisito establecido por el RD 661/2007 para acceder a su régimen retributivo', press release, 29 January 2010; ASIF, 'Las instalaciones solares indebidamente acogidas al RD 661/2007 no deberían percibir la tarifa fotovoltaica', press release, 15 December 2008.
12. ASIF (29 January 2010).
13. Abend (19 December 2008). See, for example, Enriqueta Abad, 'Corruption fuels housing boom and water stress along Spain's coast', in TI, *Global Corruption Report 2008: Corruption in the Water Sector* (Cambridge: Cambridge University Press, 2008), pp. 35–36.
14. *El País* (Spain), 'La energía solar pasa factura al PP', 25 August 2008.
15. *El Mundo* (Spain), '14 expedientados por la trama solar siguen sin cumplir las sanciones', 13 April 2010.
16. Ibid.

4.8

Preventing a resource curse fuelled by the green economy

Stefan Bringezu and Raimund Bleischwitz[1]

Ideally, natural resources should be a boon for any country that possesses them, yet the fraught development paths of many resource-rich countries demonstrate that, under certain conditions, abundant resources can lead to destructive consequences and open the door to corruption.

There are many possible drivers of such a 'resource curse'. Governments that depend primarily on revenues earned from natural resources may not need to rely on citizens to provide a tax base, thus avoiding one important form of accountability. In the absence of accountable governance, funds generated from natural resources may be mismanaged, poorly invested or siphoned off to an elite minority that seeks to concentrate power. Despite signficant additional revenue, social inequity and poverty may rise while long-term economic growth falters. In the worst instances, these conditions can contribute to public unrest or civil war.[2]

Despite all good intentions, a transition to a low-fossil-carbon economy may place increasing demand on land, minerals and other natural resources that had not previously been sought with such intensity. It will be critical to ensure that the scramble for these resources does not trigger a replay of the resource curse. Mapping the geographical hot spots where such green economy resources intersect with weak governance zones may provide a guidepost as to where a push for transparency and public participation will be most crucial, in order to ensure that these resources are utilized properly and the resulting revenues handled responsibly.

Understanding the resources and risks of a low-fossil-carbon economy

Among the most important groups of resources related to the emerging low-fossil-carbon economy are biofuels, which can reduce transportation-related emissions, and metals and minerals that have broad applications in energy efficiency, renewable energy and other green technologies. In both cases, there are accountability concerns that could intensify with expanding markets.

Land resources for biomass

As countries around the world look to biofuels to enhance energy security and mitigate climate change, competition for land and competing land uses will increase. Although biomass cultivation can bring economic opportunity for rural communities, in the absence of transparent governance and public participation, large-scale commercial investments may threaten the security and livelihoods of local landholders.

Many governments, including those in the European Union (EU), China, India, Brazil and the US, have established targets and mandatory quotas for biofuels in transportation.[3] Some calculations suggest, however, that using first-generation biofuels – derived from crops otherwise used for food and feed – to provide a 10 per cent biofuel share towards transport by 2030 would require an additional 118–508 million hectares.[4] For regions such as the EU, models demonstrate that an increased use of biofuels would lead to an overall increase in absolute global cropland requirements.[5] This means that if biofuels are produced on existing cropland, other production – especially for meeting growing food demand – will be displaced to other areas, carrying with it a range of impacts on local communities.

Advanced, or second-generation, biofuels, derived from non-food biomass such as agricultural or forestry residues, or from non-edible plants, may avoid direct competition with food production. Brazil seems to be the only country with considerable potential to produce second-generation biofuels, however, by converting pasture land. In many other countries (such as Cameroon, India, Tanzania and Thailand), significant investments into technological improvements, new infrastructure and capacity-building are necessary to enhance agricultural productivity. If acres of natural or degraded land are eventually cultivated, these too could probably be used for food, again presenting land competition issues.

In 2009, Thailand, Indonesia and Colombia ranked among the most attractive markets for biofuel investment, with Brazil topping the list. African nations, including Egypt, Kenya and Sudan, have notable levels of sugar cane production that

could also develop into attractive biofuel markets.[6] Many of these countries rank poorly in governance assessments. Sudan, Egypt, Kenya, Indonesia and Colombia all fall at or below global averages of World Bank indicators measuring the control of corruption, the rule of law, political stability, and voice and accountability.[7] Such indicators could suggest that there is a risk that the influx of substantial revenues from biofuel production or land concessions may not necessarily benefit most citizens of these countries.

Indeed, as the scale of biofuel projects grows, local communities may find themselves increasingly disadvantaged. In recent cases in Asia, Africa and South America, governments and community officials have facilitated land deals with foreign companies that plan to produce crops for export, with limited economic and social value for local communities. A World Bank report on foreign investment in farmland suggests that following the 2008 spike in commodity prices, foreign investors were particularly interested in countries that failed to formally recognize land rights.[8] Biofuel production in countries including Tanzania, Mozambique, India and Colombia has generated reports of land acquisition through illegitimate land titles, water access being denied to local farmers, inadequate compensation agreements and the displacement of local communities by force.[9]

In Indonesia, palm oil production has been linked not only to unsustainable resource management but also to loss of land access for local groups.[10] In February 2010, Sierra Leone signed a US$400 million land deal with a Swiss bioenergy company to cultivate sugarcane for bioethanol production; despite assurances from a project manager that only 'marginal' lands would be used, a visiting reporter cited the pending displacement of dozens of villages.[11]

Mineral resources for microelectronics and large-scale, low-fossil-carbon infrastructure

Mining, a second activity necessary to support the green economy, carries significant opportunities for corruption. The industry is believed to be one of the business sectors most likely to bribe public officials or to influence political processes unduly.[12] The industry is characterized by opacity and confidentiality, which enable companies to conspire with government officials to rig the bidding process. By developing personal relationships with influential members of the political elite, or offering bribes, corporate representatives may secure contracts or political decisions in their favour.[13] Host governments may launder money offshore or direct funds towards spending that benefits the interests of the political elite.

The scaling up of renewable energy will require significant mineral resources for new supply facilities and energy distribution, however. Telecommunication and

other information technologies, increasingly used to reduce the need for global travel and transportation, depend on microelectronic devices that require speciality metals. As these and other solutions for reducing greenhouse gas (GHG) emissions are more widely embraced, demand will increase for many types of minerals.

Lithium ion batteries, currently used in electronic devices, are expected to play a growing role in future demand for electric cars. Although forecasts are sensitive to public policy, Credit Suisse's estimate of annual growth rates for lithium demand of about 10 per cent[14] seems conservative but reliable. Increased demand for lithium will lead to additional extraction activities at a limited number of salt lakes, such as in Argentina, Bolivia and Chile. In Bolivia, the government's early planning for joint exploitation projects with international companies and governments has been met with much public approval, but it has also raised concerns from some civil society and environmental organizations regarding the transparency of negotiations and the reliability of environmental assessments[15] (see the Bolivia case study following this section).

Photovoltaic cells for solar arrays and LED-dependent energy-efficient lighting[16] rely on the aluminium by-product gallium. Gallium demand for green technology development is forecast to exceed current total world production by a factor of six by 2030.[17] This could lead to enhanced bauxite mining[18] in countries such as Guinea, China, Russia and Kazakhstan. Mining for tantalum, which is used for capacitors in microelectronics such as mobile phones and PCs, has increased in the Democratic Republic of the Congo (DRC), where the militarization of mining is well documented[19] and illegal trade revenues have been linked to the financing of civil war activities.

Platinum group metals (PGMs) are important chemical catalysts used for pollution control, such as in exhaust catalysts in cars and fuel cells. PGM mining and refining is concentrated in a few regions in the world, though supply is not sufficient to meet expected demand. Platinum is mined in South Africa, and PGMs are produced as a by-product of nickel and copper mining in Russia and Canada.

The market for rare earth metals, used in defence technologies and also crucial for low-fossil-carbon technologies such as wind turbines and hybrid cars, is worth some US$1.3 billion annually. China, one of the few countries currently mining rare earth metals, has considered significantly curbing or ending their export altogether, prompting a rush on mines in Russia, Kazakhstan, South Africa, Botswana, Vietnam and Malaysia.[20]

Rising demand for many of these mineral resources will probably coincide with a shifting pattern of mining activity. Emerging economies such as Brazil, China and India are expected to reach a period of high metal intensity as their development

approaches the levels of Organisation for Economic Co-operation and Development (OECD) countries. As mining companies from these countries transition from trading into production, they can be expected to meet domestic demand for raw materials through direct investment throughout the world, and particularly in Africa.

This new buying power may not be matched by high standards in business integrity. In 2008 companies from Brazil, Russia, India and China were perceived by the business community to be among the most likely to engage in bribery when doing business abroad.[21] Indeed, China and India have no law making foreign bribery a criminal offence.[22] With the exception of Brazil, the adoption of international anti-corruption standards is weak. India has ratified neither the UN Convention against Corruption (UNCAC) nor the OECD Convention on Combating Bribery of Foreign Public Officials, while China and Russia have ratified only the former.[23]

Country	Relevance	Use in a low-fossil-carbon economy	ICRG 'Quality of government' indicator[24] 2008 (0–1)
Bolivia	Huge reserves of lithium, antimony and other minerals.	Lithium: used in batteries for electric cars.	0.44
China	Strategic supplier of steel, indium, antimony, molybdenum, neodymium, germanium, tantalum and rare earth metals (more than 90% of world production).	Rare earth metals: used in hybrid cars and wind turbines. Tantalum: used in microelectronics.	0.55
Colombia	Among the most attractive markets for biofuel investment.	Biofuels: used to reduce transportation-related GHG emissions.	0.42
DRC	Large mineral supplier of cassiterite (tin), cobalt, coltan (tantalum) and germanium.	Minerals: used in microelectronics, specifically mobile phones, pagers, PCs, automotive electronics and photovoltaic energy technologies.	0.11
Egypt	Significant sugar cane production; possible future market for biofuels.	Biofuels: used to reduce transportation-related GHG emissions.	0.47
Guinea-Bissau	Largest supplier of bauxite; also important for gallium.	Gallium: used in energy-efficient light infrastructure.	0.38

Country	Relevance	Use in a low-fossil-carbon economy	ICRG 'Quality of government' indicator[24] 2008 (0–1)
Indonesia	Important supplier of biomass (timber and palm oil).	Biomass: used in biofuels to reduce transportation-related GHG emissions.	0.53
Kenya	Significant sugar cane production; possible future market for biofuels.	Biofuels: used to reduce transportation-related GHG emissions.	0.30
Peru	Important supplier of gold and many other minerals, including tellurium.	Minerals used for microelectronics, specifically mobile phones, pagers, PCs, automotive electronics and photovoltaic energy technologies.	0.47
Sudan	Significant sugar cane production; possible future market for biofuels.	Biofuels: used to reduce transportation-related GHG emissions.	0.27

Table 4.3 Selected hot spots of future critical resource supply (in alphabetical order)

Note: scores from *International Country Risk Guide* (ICRG) data (the mean value of the ICRG variables 'Corruption', 'Law and order' and 'Bureaucracy quality', scaled 0–1; higher values indicate higher quality of government).

Source: Authors' compilation.

Towards greener pastures: avoiding a new resource curse

If the resource curse can re-emerge in a low-fossil-carbon economy, so can solutions to prevent it. Various initiatives currently aimed at the oil, gas and mining industries are applicable to the resources necessary for a green infrastructure. Organizations including Publish What You Pay, the Revenue Watch Institute and the Extractive Industries Transparency Initiative promote the public disclosure of industry payments and host government earnings for oil, gas and mining concessions. Such initiatives provide a model that is also applicable to high-demand resources in the green economy. Civil society actors can also make efforts to ensure that mining and land concessions are granted through open bidding processes, with transparent contract design and prior informed consent from affected communities.

The private sector also plays a role. Codes of conduct that commit employees and corporate directors to meet high standards of sustainability and transparency in the mining industry can be used as a model for companies seeking land allocation for

biofuel and biomaterial production. Such codes should promote adherence to social and environmental standards, and emphasize the importance of continued consultation with and oversight by affected local communities. While private companies involved in land acquisition thus far have proved to be reluctant to sign up to principles or codes of conduct,[25] multilateral groups and non-governmental organizations (NGOs) should continue to push for this minimum effort and for greater transparency through company reporting on a range of corporate responsibility issues, including anti-bribery measures and governance.

Voluntary efforts can be supported by international legal instruments. The UNCAC calls for criminalizing the bribery of public officials and commits ratifying countries to assist in locating, freezing and confiscating money generated through corruption, making it more difficult to hide stolen resource-related revenues.[26] Encouraging all countries, especially those with growing economic power, to commit themselves to signing and enforcing anti-corruption conventions will help deter gaming by businesses and government officials alike.

National governments are also taking a second look at their legislation. In 2010 Brazil limited the amount of land that foreign investors could purchase by closing a loophole that had allowed foreign investors to operate via Brazilian subsidiaries.[27] The same year, Australian lawmakers debated the merits of an audit or registry of foreign-owned commercial agricultural land.[28]

Regulations aimed at enhancing transparency in the extractive industries will also have an impact. In July 2010 the US government passed legislation requiring oil, gas and mining companies registered with the US Securities and Exchange Commission to disclose tax and revenue payments made to host governments in the countries of operation.[29] This law will affect eight of the world's 10 largest mining companies. One month earlier the Hong Kong stock exchange introduced a similar regulation for listed mining companies, affecting major players on the Asian market.[30]

Also included in the US law is a requirement that companies that manufacture products containing cassiterite, coltan, wolframite or gold disclose whether these are sourced from the DRC or surrounding countries, and to demonstrate what steps are being taken to avoid sourcing from armed groups.[31] Taken together, these legal requirements set a minimum global standard of transparency for extractive companies and manufacturers. If properly enforced and complemented by expanding civil society initiatives, these could set a precedent for greater transparency in mineral and land acquisition for the low-fossil-carbon economy. Improved supply chain management and materials stewardship across industries will further strengthen these efforts.

Consumption and production habits also matter. In 2012 the Rio+20 Earth Summit will provide an opportunity to address open trade for critical metals and recycling. It could facilitate action by establishing an international covenant on improving the recycling of resource-intensive consumer goods. Such a covenant should include the leading countries in terms of the production and final consumption of vehicles and electronic devices, and establish principles of materials stewardship, certification and responsibility. By providing investment opportunities and stability, it could also offer incentives for developing countries to participate. In the long term, the growing strain on many natural resources may be best addressed by an international agreement on sustainable resource management.[32] Such an agreement should be binding, to prevent the circumvention of environmental, social and economic standards, and address the need to reduce demand for natural resources through conservation and efficiency. Any international agreement will be years in the making, but the demands of a green resource economy are already upon us. Enforcing legal requirements, stepping up civil society oversight and demanding business commitments to high governance standards and transparency should help prevent a resource curse in a low-fossil-carbon future.

Notes

1. Stefan Bringezu is director of material flows and resource management at the Wuppertal Institute, Germany, and a member of the International Panel for Sustainable Resource Management; Raimund Bleischwitz is co-director of material flows and resource management at the Wuppertal Institute and professor at the College of Europe, Bruges, Belgium.
2. Macartan Humphreys et al., 'Introduction: What Is the Problem with Natural Resource Wealth', in Macartan Humphreys et al. (eds), *Escaping the Resource Curse* (New York: Columbia University Press, 2007), pp. 1–20; Thorvaldur Gylfason, 'Development and Growth in Mineral-Rich Countries', in Raimund Bleischwitz et al. (eds), *Sustainable Growth and Resource Productivity* (Sheffield: Greenleaf Publishing, 2009), pp. 42–85.
3. Stefan Bringezu et al., *Towards Sustainable Production and Use of Resources: Assessing Biofuels* (Paris: UN Environment Programme [UNEP], 2009).
4. This is between 1.2 and 5 million square kilometres – that is, anywhere from the size of South Africa up to an area twice the size of Sudan. N. H. Ravindranath et al., 'GHG Implications of Land Use and Land Conversion to Biofuel Crops', in Robert Howarth and Stefan Bringezu (eds), *Biofuels: Environmental Consequences and Interactions with Changing Land Use* (New York: Island Press, 2009), pp. 111–125.
5. Bas Eickhout et al., *Local and Global Consequences of the EU Renewable Directive for Biofuels: Testing the Sustainability Criteria*, MNP Report no. 500143001/2008 (Bilthoven: Netherlands Environmental Assessment Agency, 2008); Stefan Bringezu et al., 'Global Implications of Biomass and Biofuel Use in Germany: Recent Trends and Future Scenarios for Domestic and Foreign Agricultural Land Use and Resulting GHG Emissions', *Journal of Cleaner Production*, vol. 17 (2009), pp. 57–68.

6. Ernst & Young, *Biofuels Country Attractiveness Indices*, no. 6 (London: Ernst & Young, March 2009).
7. Daniel Kaufmann et al., *Worldwide Governance Indicators 2008* (Washington, DC: World Bank, 2008).
8. Klaus Deininger et al., *Rising Global Interest in Farmland: Can it Yield Sustainable and Equitable Benefits?* (Washington, DC: World Bank, 2010), p. 55.
9. Lorenzo Cotula et al., *Fuelling Exclusion? The Biofuels Boom and Poor People's Access to Land* (London: International Institute for Environment and Development [IIED], 2008).
10. Ibid.
11. Shepard Daniel and Anuradha Mittal, *(Mis)Investment in Agriculture: The Role of the International Finance Corporation in Global Land Grabs* (Oakland, CA: Oakland Institute, 2010), p. 24.
12. TI, *2008 Bribe Payers Index* (Berlin: TI, 2008).
13. TI, *Corruption and the renegotiation of mining contracts* (Bergen: TI and the Chr. Michelsen Institute, 2007); Global Witness, *Digging in Corruption: Fraud, Abuse and Exploitation in Katanga's Copper and Cobalt Mines* (Washington, DC: Global Witness Publishing, 2006).
14. John McNulty and Alina Khaykin, *Extracting the Details of the Lithium Market* (New York: Credit Suisse US, 2009), p. 18.
15. Rebecca Hollender and Jim Schultz, *Bolivia and Its Lithium: Can the 'Gold of the 21st Century' Help Lift a Nation out of Poverty?* (Cochabamba, Bolivia: Democracy Center, 2010), pp. 42–46.
16. LED stands for light-emitting diode.
17. Gerhard Angerer et al., *Rohstoffe für Zukunftstechnologien* (Stuttgart: Frauenhofer IRB Verlag, 2009)
18. Bauxite contains trace amounts of gallium.
19. Global Witness, *Faced with a Gun, What Can You Do? War and the Militarization of Mining in Eastern Congo* (London: Global Witness, 2008).
20. *Foreign Policy* (US), 'China's ring of power', 9 September 2009; *New York Times* (US), 'China: Earth-friendly elements, mined destructively', 26 December 2009.
21. TI (2008).
22. TI, *Progress Report 2009: Enforcement of the OECD Anti-Bribery Convention* (Berlin: TI, 2009).
23. TI, *Global Corruption Report 2009: Corruption and the Private Sector* (Cambridge: Cambridge University Press, 2009).
24. Jan Teorell et al., *The Quality of Government Dataset Codebook*, version 27 May 2010 (Gothenburg: Quality of Government Institute, University of Gothenburg, 2010), at http://www.qog.pol.gu.se; PRS Group, *International Country Risk Guide* (Syracuse, NY: PRS Group), time series: 1984–2008, N: 3271, N: 145, N: 131, T: 23).
25. AllAfrica.com (Mauritius), 'Africa: Land grabs continue as elites resist regulation', 13 April 2010.
26. Joseph Siegle, 'Governance Strategies to Remedy the Natural Resources Curse', *International Social Science Journal*, vol. 57 (2009), pp. 45–55.
27. Reuters (UK), 'Brazil curtails land sales to foreigners', 24 August 2010.
28. Senate Select Committee on Agricultural and Related Industries, 'Food Production in Australia' (Canberra: Department of the Senate, 2010), p. 21; ABC (Australia), 'Coalition backs Greens' call for register of foreign farm ownership', 29 July 2010.
29. See Dodd–Frank Wall Street Reform and Consumer Protection Act, HR 4173, US Congress.

30. Publish What You Pay (UK), 'Landmark US legislation sheds light on billions in payments from oil and mineral companies', press release, 16 July 2010; Revenue Watch Institute (US), 'Hong Kong: Stock exchange to require greater transparency', 28 May 2010.
31. Global Witness, 'US passes landmark reforms on resource transparency', press release, 15 July 2010.
32. Raimund Bleischwitz et al., 'Outline of a Resource Policy and Its Economic Dimension', in Stefan Bringezu and Raimund Bleischwitz (eds), *Sustainable Resource Management. Trends, Visions and Policies for Europe and the World* (Sheffield: Greenleaf Publishing, 2009), pp. 216–296; Raimund Bleischwitz and Stefan Bringezu, 'Global Governance for Sustainable Resource Management', *Minerals and Energy*, vol. 23 (2008), pp. 84–101.

4.8.1
Bolivia's lithium
Opportunities and challenges

Marco Octavio Ribera, in collaboration with Cecilia Requena[1]

Because of its potential to serve as a substitute for oil and its role as a promising element for climate change mitigation, interest in lithium is growing. As a widespread technological shift to vehicles that run on lithium batteries would help reduce global greenhouse gas (GHG) emissions, in the coming years global demand for lithium is expected to increase in step with an expanding market for electric vehicles.[2] A boom in lithium demand would carry both the promise of financial prosperity and socio-economic challenges for Bolivia, whose estimated 5 million tonnes of lithium[3] in the Uyuni salt lake may represent up to half of the world's known reserves.[4]

Bolivia's plans for lithium extraction are still in their early stages, but the ultimate success of these plans will depend heavily on the level and quality of civil society participation, the extent to which the government shares information on its development plans, the degree to which there is clarity in how the government grants mining or production contracts, and how it manages revenues derived from lithium exploitation.

As the government seeks to earn revenues from lithium to expand social services[5] (for example, by providing cash incentives to mothers who fulfil requirements for pre- and post-natal care), the legacy of inequity and poverty that accompanies so many resource-rich nations continues to pose challenges. The United Nations Development Programme (UNDP) in Bolivia notes, 'With a long history of dependence on silver, tin, rubber and hydrocarbons, there is a development pattern based on few actors and sectors.'[6] Indeed, with an economy based largely on exporting extractive and raw materials,[7] the country has struggled to transform resource wealth into long-term benefits.

Following a 20-year period characterized by market-driven

economic policies, the Bolivian government has aimed since 2006 to reform the country's extractive policies in order to re-establish state control of the sector and increase public revenues. When his second term started in January 2010, Bolivian president Evo Morales reiterated his desire to develop the country's lithium industry and export value-added lithium products rather than just the raw material. He also referred to the need for foreign investment, emphasizing that these investments should come from 'partners, not patrons'.[8]

While any joint initiative between the Bolivian state and international capital should involve civil society to ensure sustainability and maximize public benefit, early discussions with transnational companies and foreign governments generated little public information. The Bolivian government met with representatives from the automotive and electronics industries and delegations from France, Japan and South Korea[9] yet the outcomes of these events were outlined only generally in press releases.

Nevertheless, the government has made encouraging statements about the importance of public participation and has sought community involvement during the planning phase of a pilot project for lithium exploitation.[10] Despite this, some community groups have claimed that the government reserves its consultation to groups linked to the administration or to Morales' political party.[11]

As plans for lithium exploitation continued to develop at the time of publishing,[12] questions of environmental sustainability, public access to information, public debate and participation remained. These issues will have to be carefully addressed. For example, the new Bolivian constitution refers to mining and hydrocarbons but makes no mentions directly related to environmental precautions, though references to environmental considerations are scattered throughout the rest of the text. Moreover, although the constitution establishes a mechanism for prior consultation with indigenous peoples, the mechanism lacks procedures to ensure transparency. State oil companies run in association with public and private partners, for instance, do not always adhere to public procurement processes[13] and have in some cases failed to consult with indigenous groups prior to oil exploration.[14] Civil society groups in Bolivia are intent on making sure that the same does not happen with lithium exploitation.

Some groups have enjoyed initial victories in response to local and regional concerns: in mid-2010 the government reversed a decree to create a state-owned lithium extraction company after a civic group in Potosí, where the Uyuni salt lake is located, complained that the company had been established without citizen consultation and was intended to

be based in the country's capital rather than in the affected region.[15] Still, these organizations need to significantly improve their existing capacities to build a network and mobilize a wider spectrum of citizens by developing a clear and shared vision of common good.

Establishing clear and consistent regulation and incorporating public consultation in the negotiations for and operation of lithium exploitation is especially important given the potential environmental and social impacts. Lithium-processing could threaten local communities and damage the surrounding ecosystem. If not managed properly, mining could affect the growing and promising tourism industry in what is one of Bolivia's poorest areas and also threaten scarce water supplies.[16] Lithium exploitation in Argentina, for example, has led to complaints of chemically contaminated water.[17] In Bolivia, some local environmental groups are doubtful that the government has seriously considered these risks.[18]

Creating the infrastructure necessary to make Bolivia a leading provider in lithium and lithium-based products will take considerable financial resources and technical expertise. This ambitious project will have a much greater chance of sustainability and providing long-term benefits to the Bolivian population if it has buy-in from local communities – especially from indigenous communities – and broader citizen participation. The government can take a number of steps to ensure that lithium exploitation is undertaken responsibly and with public support. Among these steps is the need to clarify and enforce mining and environmental regulations and to provide greater information on the criteria that will be used to assess public and private sector partnerships for lithium-related projects. The public dissemination of high-quality, interpretable information relating to financing and contracting should be matched by proactive moves to engage a wide spectrum of civil society to contribute to the process.

To create a transparent process for lithium exploitation is one of the most significant challenges Bolivia will have to surmount in order to benefit from its lithium in a sustainable manner.

Notes

1. Marco Octavio Ribera is an environmental researcher with the Liga de Defensa del Medio Ambiente, Bolivia. He has written this article in collaboration with Cecilia Requena, technical secretary at Transparencia Bolivia.
2. *Financial Times* (UK), 'Surge in lithium demand expected', 22 May 2010.
3. US Geological Survey, *Mineral Commodity Summaries 2007* (Washington, DC, US Government Printing Office, 2007).
4. Lawrence Wright, 'Lithium dreams', *The New Yorker* (US), 22 March 2010.
5. *Guardian* (UK), 'Lithium: The gift of Pachamama', 8 August 2010.

6. UNDP, *Human Development Report: The Other Frontier: Alternative Uses of Naturales* [sic] *Resources in Bolivia* (La Paz: UNDP, 2008), p. 3.
7. World Bank, *Strengthening Bolivian Competitiveness: Export Diversification and Inclusive Growth* (Washington, DC: World Bank, 2009).
8. Reuters (UK), 'Morales to firm state grip, exploit Bolivia lithium', 22 January 2010.
9. In August 2010 the Bolivian and South Korean governments agreed to work jointly on developing the Uyuni's lithium.
10. Rebecca Hollender and Jim Shultz, *Bolivia and Its Lithium: Can the 'Gold of the 21st Century' Help Lift a Nation out of Poverty?* (Cochabamba: Democracy Center, 2010), p. 46.
11. Ibid.
12. In mid-October 2010, President Morales delivered a formal public presentation on the Bolivian Strategy for Lithium Exploitation. According to this presentation, the Bolivian State will assume all the investment costs related to the production of lithium carbonate and potassium chloride in the pilot phase (2010–2011) as well as the second phase (2012–2014) and will only look for joint ventures in order to gain access to technology for the production of lithium batteries during the third phase of the process, announced to begin in 2014. See *La Razón* (Bolivia), 'Bolivia inicia sola el proceso para industrializar el litio' (22 October 2010).
13. *La Prensa* (Bolivia), 'Petroandina firma contratos que eluden el control de la Ley Safco', 4 October 2009.
14. *La Prensa* (Bolivia), 'Las organizaciones señalan que aún no existe un rechazo a la exploración porque no se consultó', 22 July 2009.
15. *Latin American Herald Tribune* (Venezuela), 'Bolivian government backs off plan to create state lithium firm', 22 March 2010.
16. Robert Moran, *Minando el Agua: La Mina San Cristóbal, Bolivia* (La Paz: FRUTCAS, FSUMCAS and CGIAB, 2009).
17. Hollender and Shultz (2010), p. 41.
18. Ibid., pp. 41–43.

4.9

Engineering the Earth

Considering accountability and the last resort

Graeme Wood[1]

Geoengineering – the intentional alteration of the Earth and its atmosphere on a planetary scale – first appeared on the climate change agenda in 1965.[2] Since then, however, no efforts to develop geoengineering have moved past the early experimental phase. Scientists – even those who support geoengineering research – have been reluctant to consider the technology because it could distract from reducing emissions and lull the public into a false sense of security about a technology that is untested and has significant drawbacks.

As carbon reduction programmes have proved to be politically difficult, however, geoengineering has emerged as an undesirable but possible tool if the climate reaches a catastrophic tipping point. Although geoengineering projects could be undertaken locally, the consequences would be global. The near-total lack of a regulatory apparatus presents significant accountability challenges.

Potential geoengineering technologies fall into two categories. The first and most technically feasible today would be to blot out or dim the Sun with a haze of sulphur dioxide,[3] artificially enhanced cloud cover[4] or ceramic discs suspended in space between the Earth and the Sun.[5] Scientists claim that the swiftest of these proposals could arrest global temperature increases in a year or less.[6] The stratospheric sulphur proposals have the most traction, in part because we already understand the similar effects of volcanic eruptions on global temperatures (Mt Pinatubo's 1991 eruption lowered them by 0.5°C in a matter of months). Obstacles remain, however. The intentional dispersion of sulphur dioxide could potentially increase acid rain[7] or exacerbate ozone depletion. Moreover, none of the Sun-dimming schemes would

have any effect on atmospheric CO_2 levels or the vast array of chemical problems (such as ocean acidification) that they present for the biosphere.

A second category involves removing and storing atmospheric carbon, often by changing the ecosystem and enlisting plants to assist with the removal. Efforts are already under way to stimulate blooms of marine phytoplankton, which constitute a significant natural carbon reservoir. It is difficult, however, to predict the consequences of depositing, for example, nitrogen or iron into a complex oceanic ecosystem. While some scientists believe the consequences would be minimal, or even positive, others have expressed concern that harmful algae could thrive or that more CO_2 may ultimately be released than sequestered.[8]

Even though geoengineering remains a 'break glass in case of emergency' response to runaway climate change, its consequences must be considered. Unlike emissions mitigation, geoengineering responses could be speedy and unilateral. If optimistic efficacy and cost estimates hold true, many proposed projects would be within the financial capability of small countries or wealthy private actors.

This raises a number of accountability challenges. First, there is no distinct controlling authority for geoengineering projects. Some multilateral institutions and agreements that have tangential jurisdiction over the effects of geoengineering[9] contain the beginnings of an international control structure. There are no institutions or agreements to govern geoengineering per se, however, and, on the very few occasions when law and geoengineering have intersected, the results have been messy. In 2009 rival German government ministries clashed over whether to stop Lohafex, a pilot effort to fertilize phytoplankton blooms with iron salts.[10] The experiment proceeded, although less CO_2 was sequestered than expected.

The lack of public oversight raises a second area of concern, which is the unclear role of private enterprise in climate engineering. Private companies have developed business plans to try to profit from iron fertilization by earning and selling carbon credits.[11] These activities, which currently involve substantial externalities and occur in an environment of extreme regulatory ambiguity, have the potential to give private entities substantial roles in developing geoengineering technologies, and to distort the research environment in ways that favour private entities over public interest.[12]

The third challenge is still theoretical. Many have pointed out that the effects of climate change will be uneven, with some regions expected to profit from a general rise in temperatures.[13] Since only one country is needed for geoengineering to work, there will be significant incentives for any adversely affected country to pursue geoengineering even if it is to the detriment of other countries. Depending on the type of geoengineering pursued, the global effects could be extremely varied, with some areas experiencing worse climatic effects than they suffer in a warming but

ungeoengineered world. Central Africa, for example, is likely to experience drought in the case of stratospheric sulphur injection, and Asian monsoons will probably decline in intensity, with negative effects on agriculture there.[14]

Avoiding such outcomes by introducing a global moratorium on geoengineering would require verification of a country's compliance. Some geoengineering projects, such as constructing a space shade or the mass planting of crops with large root mass, would be easily detectable. Others, such as sulphur aerosol dispersion or iron fertilization, require very few special materials, however, and in principle could be deployed very quickly.

Although a governance regime for geoengineering is essential, its precise form is difficult to predict, in part because the technology and science are relatively young, and the appropriate form of regulation depends on still unknown scientific facts. UN-based, unilateral and consortium-based scenarios are all possible,[15] but each carries significant downsides. The UN-based approach would enjoy broad-based legitimacy and probably have more success at ensuring responsible research. The need for consensus could slow action in the face of an immediate climate crisis, however.[16] Unilateral approaches or cooperation between a small number of countries would allow more scientific exploration, but without international legitimacy and with less chance of preventing irresponsible or egoistic geoengineering by an individual private or national actor.[17]

It is important to acknowledge that because of the significant risks it poses, some civil society groups are calling for research into and consideration of geoengineering to stop altogether. Yet if geoengineering research moves forward – as it likely will – it is important for the foundations of transparent regulation and the highest research standards to be laid out now. Principles are starting to be considered. In early 2010 the UK's House of Commons Science and Technology Committee explored the need for geoengineering to be regulated as a public good, with the following requirements: public participation in decision-making; the disclosure of research and publication of results; independent assessment of impacts; and a robust governance structure prior to any deployment.[18]

These early principles will require greater discussion and development, and should be based on debate that involves not just governments and scientists, but a broad representation of civil society. Regardless of one's belief in the dangers or benefits of geoengineering, a future without clear rules governing research and implementation leaves society ill-prepared to ensure that, if climate change induces acute catastrophes, geoengineering takes place – or is prevented from taking place – in an accountable way.

Notes

1. Graeme Wood is a correspondent and contributing editor at *the Atlantic*, based in Washington, DC.
2. President's Science Advisory Committee (PSAC), *Restoring the Quality of Our Environment: Report of the Environmental Pollution Panel* (Washington, DC: US Government Printing Office, 1965).
3. Paul Crutzen, 'Albedo Enhancement by Stratospheric Sulfur Injections: A Contribution to Resolve a Policy Dilemma?', *Climatic Change*, vol. 77 (2006), pp. 211–219.
4. Stephen Salter et al., 'Sea-Going Hardware for the Cloud Albedo Method of Reversing Global Warming', *Philosophical Transactions of the Royal Society A*, vol. 366 (2008), pp. 3989–4006.
5. Roger Angel, 'Feasibility of Cooling the Earth with a Cloud of Small Spacecraft near the Inner Lagrange Point (L1)', *Proceedings of the National Academy of Sciences*, vol. 103 (2006), pp. 17184–17189.
6. Jason Blackstock et al., *Climate Engineering Responses to Climate Emergencies* (Santa Barbara, CA: Novim, 2009).
7. Ben Kravitz et al., 'Sulfuric Acid Deposition from Stratospheric Geoengineering with Sulfate Aerosols', *Journal of Geophysical Research – Atmospheres*, vol. 114 (2009), pp. D14109.1–D14109.7.
8. Brandon Keim, 'Enviros challenge dumping urea in ocean to sink carbon', *Wired*, 7 November 2007.
9. These are the UN Environmental Modification Convention and the UN Convention on Biological Diversity.
10. *Sydney Morning Herald* (Australia), 'Germany OKs Atlantic global warming experiment', 26 January 2009.
11. *Washington Post* (US), 'Iron to plankton to carbon credits', 20 July 2007.
12. David Victor et al., 'The Geoengineering Option: A Last Resort against Global Warming?', *Foreign Affairs*, vol. 88 (2009), pp. 64–76, p. 72.
13. Gregg Easterbrook, 'Global Warming: Who Loses – and Who Wins?', *the Atlantic*, vol. 299 (April 2007), pp. 52–64.
14. Alan Robock et al., 'The Benefits, Risks, and Costs of Stratospheric Geoengineering', *Geophysical Research Letters*, vol. 36 (2009), pp. L19703.1–L19703.9.
15. See John Virgoe, 'International Governance of a Possible Geoengineering Intervention to Combat Climate Change', *Climatic Change*, vol. 95 (2009), pp. 103–119.
16. Ibid.
17. Ibid.
18. House of Commons Science and Technology Committee, *The Regulation of Geoengineering* (London: Stationery Office, 2010), pp. 29–35; see also Steve Rayner et al., 'Memorandum on Draft Principles for the Conduct of Geoengineering Research' (Oxford: Saïd Business School, 2009).