

The Kyoto Protocol: verification falls into place

Molly Anderson, Trevor Findlay and Clare Tenner

.....

The period between 2000 and 2001 proved to be a dramatic one for the climate change regime. Parties to the 1992 United Nations Framework Convention on Climate Change (UNFCCC) negotiated energetically in an attempt to agree the details of the Kyoto Protocol that they had adopted in Kyoto, Japan, in December 1997.¹ Despite the US decision in early 2001 to withdraw support for the protocol as a means of tackling human-induced climate change, the remaining parties were able to reach an historic political agreement in July on a package of measures to permit the agreement to be implemented—including its verification.

The protocol obliges developed countries, listed in Annex 1 of the convention, to reduce their collective emissions of six greenhouse gases (GHG) during a first commitment period (2008–12) by 5.2 percent below 1990 levels.² Different emissions targets (assigned amounts) were agreed at Kyoto for each party. Targets for subsequent commitment periods will be agreed later. The protocol establishes complex rules and procedures that states must follow in achieving their obligations, including rules for using the three ‘Kyoto Mechanisms’—International Emissions Trading (IET), Joint Implementation (JI) and the Clean Development Mechanism (CDM)—which permit the transfer of emissions reductions between parties. IET will allow Annex 1 parties to sell their GHG emissions reductions to other Annex 1 parties.³ Under JI, Annex 1 parties will be able to set up emissions reduction projects in other Annex 1 countries, and under the CDM they will be able to do so in non-Annex 1 countries, in both cases claiming the resulting emissions reductions for themselves.

Although the basic rules for implementing the protocol were agreed in Kyoto, the negotiators failed to complete the necessary detail. For most parties, however, agreement on such detail was necessary before they would consider ratifying. The

Fourth Conference of the Parties (COP4), held in Buenos Aires, Argentina, in November 1998, agreed to aim to resolve the outstanding issues by COP6 in November 2000. This chapter analyses the progress made in 2000 and 2001 in meeting this goal, particularly in relation to the verification system for the protocol, and considers the work that remains to be done.

Progress made in 2000–01

Negotiations intensified throughout 2000 as the parties attempted to meet the November deadline. Subsidiary bodies of the UNFCCC met twice—in Bonn, Germany, from 5–16 June, and in Lyon, France, from 4–15 September—and a number of informal workshops were convened. However, many issues remained unresolved by the time COP6 was convened in The Hague, Netherlands, from 13–25 November. In the event the meeting was unable to reach agreement on a final package deal and was adjourned until 2001.

COP6 was resumed, as COP6 bis, from 16–27 July 2001 in Bonn. Consensus was finally reached at this meeting—albeit without the US. Between the two COP6 meetings, George W. Bush was elected US president and, after reviewing US climate change policy, decided to withhold his administration's support both for the Kyoto Protocol itself and the agreement reached in Bonn. Nonetheless, the remaining participating states agreed to proceed with the agreement. The outcome in Bonn paves the way for ratification of the protocol by the states that are necessary to bring it into force.⁴ It is not yet clear when this will occur. In the meantime, the next meeting of the parties, COP7, will be held in Marrakech, Morocco, between 29 October and 10 November 2001, when further details of the protocol's implementation, based on the political agreement reached at Bonn, will be considered.

Four of the key issues resolved in Bonn, which all have profound implications for verification of the protocol, were those relating to sinks, the use of the Kyoto Mechanisms, the financial package and the consequences of non-compliance.

The 'sinks' issue

One of the most divisive issues of the post-Kyoto negotiations concerned the use of 'sinks'—Land-Use, Land-Use Change and Forestry (LULUCF) activities—to meet states' emissions reduction commitments. The protocol, as agreed at Kyoto,

already permitted countries to use net changes in GHG emissions resulting from domestic afforestation, reforestation and deforestation for such purposes.⁵ But agreement needed to be reached at COP6 on whether this list of activities should be extended and whether sinks projects could occur within the CDM.

The 'Umbrella Group'⁶ of developed countries favoured the full inclusion of LULUCF activities in the first commitment period and many stated that their ratification of the protocol would be contingent on such a provision. European Union (EU) states and some developing countries, such as the Alliance of Small Island States (AOSIS), strongly opposed the use of such activities in the first commitment period, arguing that the scale of the potential credits generated could render emission reduction commitments meaningless. They also argued that monitoring, reporting and verifying LULUCF activities would be extremely difficult.

Consensus on the sinks issue was finally reached, albeit reluctantly, in Bonn. It was agreed that afforestation and reforestation projects would be eligible under the CDM in the first commitment period. The list of sink activities that an Annex I party can undertake within its borders was expanded, subject to an individually negotiated cap on the amount of GHG absorption that can be claimed. Canada and Japan negotiated generous caps as the price of their support.⁷ The extra sinks allowances increase the importance of having an accurate, reliable and transparent monitoring and verification system. However, this could prove difficult, given the many problems associated with monitoring a carbon sink.⁸

Use of the Kyoto Mechanisms

There were deep divisions among parties about 'supplementarity'—the extent to which the Kyoto Mechanisms generally could be used to achieve national GHG emissions targets. The protocol requires that the use of IET and JI only be 'supplemental' to domestic action. Fearful that they might not otherwise be able to achieve their first commitment period targets, Umbrella Group members pressed for unrestricted use. The EU and the G77 and China group,⁹ by contrast, advocated a cap on the use of the mechanisms to ensure that Annex I parties take significant domestic action to cut their GHG emissions. Parties also disagreed on the types of projects other than sinks to be allowed under the CDM. It is now the remit of the executive board to decide whether a CDM project is valid or not.

The EU again compromised at Bonn on the issue of supplementarity. No limit was imposed on the use of the flexible mechanisms. Instead the rules now state that the ‘the use of the mechanisms shall be supplemental to domestic action and domestic action shall thus constitute a significant element of the effort made by each party’.¹⁰ The means for establishing the significance of domestic action has not yet been determined. But if parties are required to report on how their trading and overseas projects are supplemental to domestic action, the lack of criteria will make it difficult to judge non-compliance and to impose penalties.

Technology and financial transfer

Another unresolved debate in The Hague concerned the extent of, and arrangements for, technology and financial transfers between Annex I and non-Annex I parties. The protocol requires that developed countries provide new and additional resources to developing nations to help them mitigate and adapt to climate change. Given developed countries’ poor performance in relation to similar activities under the Framework Convention, the G77 and China group championed the issue to ensure that these commitments were taken seriously.

The Bonn agreement made provisions for three new funds. The first will fund adaptation projects and programmes in developing countries and will be financed from a share of the proceeds from the clean development mechanism. The second, termed the ‘special climate change fund’, will be additional to the first and complimentary to the Global Environment Facility funding. Political commitments by the EU, Canada, Iceland, New Zealand, Norway and Switzerland mean that this fund will provide an annual amount of US\$410 million. The third fund will benefit the least developed countries by helping them with their national adaptation programmes. In reporting and review discussions, the G77 and China group pressed for mandatory annual reporting on these activities, which the Annex I countries were unwilling to accept because this would have an impact on their eligibility to use the flexible mechanisms.

Consequences of non-compliance

The last and perhaps greatest hurdle for negotiators in Bonn was the issue of compliance. Parties agreed that the penalty for failing to achieve their assigned emissions targets by the end of the commitment period would be an obligation

to reduce by the amount that they have exceeded the target, plus 30 percent. However, the most contentious issue relating to the compliance regime was whether the penalties should be 'legally binding'. Despite a deal being reached in Bonn, parties continue to argue over its meaning. The EU and the G77 and China group believe that the Bonn text strongly suggests an acknowledgement by parties of the need for binding consequences, but that a decision on whether they would be adopted via an amendment to Article 18 would be postponed. In contrast, the Umbrella Group seeks to ensure that the Bonn agreement does not imply that the consequences of non-compliance should be binding. Given continued disagreement over the legal nature of the compliance regime, this will be one of the key issues discussed at COP7 in Marrakech.

The verification system: further work required

Among the implementation details for the protocol left undecided at Kyoto were those dealing with verification—the system for monitoring, reporting and reviewing implementation of parties' commitments—and the arrangements for ensuring that they comply with them.

Draft guidelines for reporting and reviewing information on implementation were successfully negotiated during 2000 and agreed in The Hague in November.¹¹ Yet they contained large gaps that could only be filled when other aspects of the protocol were resolved. As a result of the political agreement achieved in Bonn in July 2001, the details of the verification and compliance arrangements can now be finalised. The rest of this chapter describes the progress made in 2000–01 and analyses the issues that remain to be resolved.

Reporting requirements

Under the protocol, each Annex 1 party is required to provide two types of reports on implementation of its commitments. First, an annual report on compliance with its emissions reduction targets.¹² Second, a less frequent 'national communication', reporting information on implementation of all other aspects of the protocol.¹³

Annual reports

A key component of annual reports will be the annual GHG inventory which Annex 1 parties are already obliged to provide under the UNFCCC. It was agreed

at COP6 that Annex I parties should report the following additional information: GHG emissions and removals resulting from LULUCF activities; data on the assigned amount held in the party's registry, including acquisitions and transfers under the Kyoto Mechanisms; and changes in national systems and to the national registry.

These items will be reported via the UNFCCC Secretariat to the annual meeting of the parties, as well as being published on the UNFCCC website.

At COP6 the G77 and China group unsuccessfully advocated the inclusion of additional information on: implementation of Article 3.14 (requiring Annex I parties to minimise the adverse effects of climate change and to mitigate its effects on developing countries);¹⁴ and 'supplementarity' (the extent to which the use of the Kyoto Mechanisms is 'supplemental' to domestic action to reduce emissions).

Annex I parties were anxious to avoid including such details in annual reports, rather than in national communications, because the former will be subject to scrutiny by the protocol's Compliance Committee's Enforcement Branch (see below), whereas it is expected that national communications will face no such examination. The Bonn agreement explicitly excluded Article 3.14 information from being considered by the enforcement branch.

The principal purpose of annual reporting will be to permit an assessment to be made of each party's compliance with its emission reduction commitments. However, the reports will also have a unique second function: to assess whether parties are eligible to participate in the Kyoto Mechanisms. Early in 2000 it was agreed that parties not reporting their GHG emissions satisfactorily should be barred from transferring and/or acquiring emissions reductions under the Kyoto Mechanisms, and that this should happen as quickly as possible to minimise the acquisition of unreliable emissions reductions by other parties.

National communications

While negotiators paid a great deal of attention to the annual reporting process, relatively little was devoted to the guidelines for national communications—mostly because they will not be used to assess compliance with emissions reduction commitments. Although states are already obliged to submit national communications under the UNFCCC, supplementary data will be required as a result of their additional commitments under the protocol. It has been agreed that national communications under the protocol should include sections on: policies and measures implemented

to reduce GHG emissions; the legislative arrangements and enforcement and administrative procedures in place to implement the protocol; implementation of Article 3.14 (requiring Annex I parties to minimise the adverse effects of climate change and to mitigate its effects on developing countries); further action to monitor, alleviate and adapt to climate change, particularly technology transfers to developing countries; the provision of financial resources to developing countries; and the national system and registry.

Estimating GHG emissions and compiling inventories

Under the UNFCCC, parties are obliged to adhere to guidelines for estimating GHG emissions and for compiling and reporting their inventories.¹⁵ The protocol strengthens the UNFCCC reporting requirements by obliging Annex I parties to establish 'national systems' for accurately estimating their GHG emissions.¹⁶ Draft guidelines for setting up such systems were negotiated early in 2000 and adopted by the Subsidiary Body for Scientific and Technical Advice (SBSTA) in June.¹⁷ They specify the institutional, legal and procedural arrangements for estimating greenhouse gas emissions and removals and for reporting and archiving the inventory information. Some activities involved in the planning, preparation and management of inventory activities, such as devising a Quality Assurance and Quality Control (QA/QC) plan, are mandatory. However, parties are by and large left to decide how to implement the requirements.

Each party must provide a full account of its national system in its national communication and notify details of any changes in its annual reports. The incremental strengthening of the guidelines for producing GHG inventories is in recognition of the need for high quality data to make the protocol function as intended.

Estimating and reporting GHG emissions and removals from LULUCF

The verification issue was an important element in the debate on the role of LULUCF, since the protocol explicitly states that only verifiable changes in carbon stocks, which can be transparently reported, will be allowed.¹⁸

A welcome advance in promoting better calculation and reporting of GHG removals from LULUCF was the May 2000 publication of *Land Use, Land-Use Change and Forestry*, an Intergovernmental Panel on Climate Change (IPCC) special report that assessed the implications of the different options for including LULUCF

activities in the protocol.¹⁹ The document stated that measuring changes in carbon stocks will require complete soil and forest inventories, land-use surveys and data based on remote sensing and other methods. The IPCC warned, though, that ‘few, if any, countries, perform all of these measurements routinely’.²⁰

Given that biological systems can be sinks or sources of GHG, once an area of land has been counted as a sink the sequestered carbon must be monitored for the indefinite future. Furthermore, it is difficult to separate observed stock changes directly induced by humans (which can be counted under the protocol) from those caused by indirect and natural factors (which cannot be counted).

Gathering and reporting information on the ‘assigned amount’

At the start of the first commitment period, an ‘assigned amount’ of permissible GHG emissions will be fixed for each Annex I state, based on its 1990 emissions and the emissions reduction commitment agreed at Kyoto. Compliance with the latter will be assessed at the end of the commitment period by comparing the assigned amount with the party’s total emissions. However, as noted, the party will be able to use emission reduction credits—acquired through participation in the Kyoto Mechanisms or through LULUCF activities—to offset its assigned amount. In effect, these credits will increase a party’s assigned amounts. But the means of accounting are highly contentious and were not agreed in The Hague or in Bonn.

Whatever the final accounting system, parties will need to record their assigned amounts and transfers of emission credits in a national ‘registry’. Although operating guidelines for such registries are still being prepared, the draft reporting guidelines require that parties provide a description of their national registry in their national communication, and that they report on changes to the registry annually. It is likely that parties will be required to allocate a serial number to each discrete emission reduction amount and each year report both these numbers and the total quantity of emission reduction credits held, acquired, transferred, retired and cancelled.

Reviewing information: the Expert Review Teams

All reports filed by the parties will be reviewed by Expert Review Teams (ERTs), co-ordinated by the Climate Change Secretariat, located in Bonn.²¹ The ERTs will convey their findings to the annual meeting of the parties.²² As the extent of the

ERTS' tasks has become increasingly apparent, the parties have been obliged to agree on the need for a standing group of experts from which at least some members of each review team would be drawn. This is a significant step forward compared to the review system under the Framework Convention, which is carried out solely by *ad hoc* teams of experts on loan from their regular employer.

Other details relating to the ERTS, such as their size, composition, membership selection criteria, responsibilities and operational arrangements, have, however, yet to be agreed. As with the membership of other climate change bodies, the composition of both the standing group and the ERTS has proved controversial. The G77 and China group argued that the composition of the review teams should ensure equitable geographic representation of the five United Nations (UN) regional groups. Annex I parties, though, want technical competence to be the prime selection criterion. Some developed countries are also uncomfortable with the prospect of being reviewed by experts from developing countries.²³

Inventory review

Reflecting the importance of credible assessments of state party compliance with GHG emission targets and their eligibility to participate in the Kyoto Mechanisms, negotiators invested great efforts in 2000 in developing guidelines for reviewing GHG inventories. It was agreed that the GHG inventory review would involve two stages. The first will consist of automated checking of the timeliness, consistency and completeness of the inventories. A status report will be produced for every party and posted on the UNFCCC website. The Secretariat and UNFCCC parties already have experience of such a system as a result of the UNFCCC review guidelines adopted at COP5.²⁴ The Secretariat has developed software to permit storage of inventory data submitted electronically in the common reporting format and to enable initial checks to be carried out.

During the second stage the ERTS will review individual inventories. This will involve, *inter alia*:

- checking that GHG emissions and removals have been estimated according to relevant guidelines;
- comparing the inventory data with the inventory report and a party's previous submissions, to identify inconsistencies;

- contrasting activity data with authoritative external sources, if feasible;
- assessing the extent to which issues raised by previous reviews have been addressed; and
- recommending ways to improve the emissions/removals estimates and the reporting of inventory information.

The annual review will usually be a desk study, with each party being visited once during each commitment period. The ERT can also request an in-country visit if it considers a fuller investigation necessary. It is clear, however, that the ERTs will not have time to verify fully each GHG emission estimate. Instead, the onus is on the parties to implement high quality national systems.

A significant challenge for negotiators was to agree on how to recognise and deal with inventory problems. The protocol states that where a party has not followed the reporting guidelines in estimating its emissions and removals, 'adjustments' should be applied to the estimates.²⁵ Negotiators had to decide whether adjustments could be applied to all inventory problems, how they should be calculated, and who should apply them.

By the time the SBSTA met in June 2000, the parties had agreed that, where there was doubt about the veracity of estimated emissions and removals, adjustments should favour the environment rather than the party concerned. Hence disputed emission estimates for the commitment period would be revised upwards (to increase the estimated amount of GHG emitted), while for the base-year inventory (which states may tend to exaggerate) they should be revised downwards. It was agreed that adjustments should be applied when parties fail to follow the IPCC good practice guidelines or the UNFCCC inventory reporting guidelines. The flexibility provided by the reporting guidelines may, however, make it hard, in some respects, to assess non-compliance.

At the SBSTA meeting, some states, in particular Australia, argued that the party whose inventory was in question should calculate the adjustment, since they would understand their national circumstances best. But given that the party would have already had a chance to provide its own figures, it was decided that the ERTs should calculate the adjustment. The SBSTA will draft guidelines for calculating them.

Negotiators have paid less attention to drafting guidelines for the review of national systems, even though inventory problems can, in many cases, be linked to inadequate national arrangements.²⁶ GHG inventories will be used to review adherence to some parts of the national system guidelines. But compliance with most of the guidelines will be assessed using information provided by the parties, other documentation and interviews with relevant personnel. As with the inventories, review teams may find it hard to assess compliance in cases where the national system guidelines leave the exact details of implementation up to the party.

Parties have not yet discussed the review of national registries. With regard to reviewing information on assigned amounts, it was agreed that at the start of the commitment period the ERTs will check the base-year inventory and assigned amount calculation. During the commitment period, information on transfers between parties will be cross-checked to verify whether data are complete and submitted in accordance with the reporting guidelines.

The national communication reviews will always occur in-country but will be preceded by a desk study. Given the volume of information that reviewers will confront, the draft review guidelines are brief and rather vague. They state that the ERT should identify any potential problems that the party is encountering in fulfilling its commitments and in reporting its compliance. But they provide definitions of such problems only in relation to reporting—for example in regard to transparency, completeness or timeliness. It is unclear, therefore, how the ERT and the Compliance Committee will assess compliance with parties' wider commitments under the protocol.

Pre-commitment period reporting and review

An effective and efficient monitoring and verification system must be functioning properly by the start of the first commitment period (and the commencement of International Emissions Trading) on 1 January 2008. An obvious means of achieving this objective is for the relevant information to be reported by parties and reviewed by ERTs prior to this date. Yet the issue of pre-commitment period reporting and review has been one of the more controversial aspects of verification discussions.

It was agreed in The Hague that each Annex 1 party should report on the following items by 1 January 2007, or earlier if it wishes: their base-year inventory;

their calculation of assigned amount; the details of their national system; the inventory for the most recent year, and details of their national registry.

These items will be subject to an initial in-depth, in-country review by an ERT. It was agreed that such a review must be completed within one year of the date that the information is submitted.

However, it was not agreed whether parties will have to wait for the Compliance Committee to rule that they are in compliance with the eligibility criteria before participating in the mechanisms, or whether they have an automatic right to participate unless they are found to be in non-compliance after review. The EU and the G77 and China group had argued that states should not be allowed to participate automatically. Australia, Canada and Japan argued that parties should have a right to participate unless it is revoked as a result of a finding of non-compliance. They are concerned that the committee will simply be incapable of making a definitive ruling that a party is in compliance at this early stage of the protocol's implementation and that this will delay the operation of the mechanisms indefinitely.

Reporting on 'demonstrable progress'

Perhaps the most interesting verification development in 2000 related to the protocol's clause on Demonstrable Progress—the requirement that each Annex I party make 'demonstrable progress in achieving its commitments' under the protocol by 2005.²⁷ Umbrella Group members initially refused to discuss reporting guidelines, let alone review guidelines, for demonstrable progress, arguing that the fourth national communication due under the Framework Convention, the date for which has not yet been set, would provide enough information to demonstrate progress. The EU strongly advocated full reporting on demonstrable progress made in implementing domestic policies and measures to reduce GHG emissions. Umbrella Group nations contended that it would be sufficient to report on preparations made for complying with the protocol, such as setting up national systems, passing domestic legislation and establishing domestic enforcement procedures.

The agreed text simply 'urges' Annex I parties to report by 1 January 2006 to provide the basis for reviewing 'demonstrable progress'. The report must contain: a description of domestic measures, including legal and institutional steps taken

toward implementing the protocol, and any domestic compliance and enforcement programmes; trends and projections of GHGs; and an evaluation of how these domestic measures, in view of these trends and projections, will contribute to the state party meeting its emission reduction commitments.

Although the reporting obligation is not mandatory, the elements included are surprisingly comprehensive. However, no agreement was reached on whether parties will have to report on initiatives to minimise the adverse effects on developing countries, or on financial and technology transfers to these nations. Furthermore, the question of whether and how information on demonstrable progress will be reviewed has not been discussed.

Assessing compliance: the role of the Compliance Committee

The protocol provides for a Compliance Committee 'to determine and to address cases of non-compliance'.²⁸ The committee will consist of an Enforcement Branch and a Facilitative Branch, the former having the authority to impose penalties. Much of the operational detail remains undecided, including what issues fall under the mandate of each branch. The Bonn agreement determined that the composition of the compliance committee would be based on equitable geographic representation.²⁹ Yet, despite the effort that has gone into drafting the reporting guidelines, it is still unclear exactly how the Compliance Committee will assess compliance. While the ERTs' findings will inform the work of the committee, the exact division of responsibilities between them is also not yet completely clear. The guidelines for both the ERTs and the Compliance Committee must be ready for adoption at the first Meeting of the Parties to the protocol (MOP), which can only occur when the protocol has entered into force.

However, agreement was reached in The Hague that the following would constitute compliance 'problems': the failure to submit an inventory; the failure to include an estimate for a source category that accounts for (x) percent or more of total emissions; presenting an inventory for any given year that consists of (y) percent or more adjusted data; if at any time in the commitment period the sum of adjusted data exceeded (z) percent of total emissions estimates submitted; and the application of an adjustment (by an ERT) to the same key source category in three subsequent years.

No agreement could be reached on whether a failure to submit information on demonstrable progress, minimisation of adverse impacts on developing countries and technology and finance transfers would be considered a 'compliance problem'.

Moreover, the agreed 'problems' only cover inventory reporting, with no mention of compliance problems relating to national systems, national communications or information on assigned amounts or GHG emissions and removals from LULUCF activities.³⁰ The text is also not clear as to whether it is referring to annual reporting, all reporting, or simply 'questions that relate to eligibility requirements'.³¹

Conclusion

The Kyoto Protocol's verification system, while not yet complete, is starting to take its final shape. As agreed so far, its reporting and review arrangements strike a delicate balance between mandatory and discretionary elements.

The draft reporting guidelines seek to maintain a minimum standard of reporting, while encouraging parties to improve their inventories and other reports as much as possible. The flexibility allowed to states should increase the accuracy of national submissions, but could hinder the comparison of a party's submissions from year to year. It may also make assessments of compliance with the reporting guidelines more difficult and allow parties to interpret them to their own advantage.

The review process should help ensure that parties produce and report their GHG inventories according to the guidelines. It is recognised that the ERTs will not have the resources to assess the accuracy of the estimates, but will rely on the parties to verify their own emission calculations using QA/QC procedures and expert and public reviews. However, the ERTs will have significant power as a result of their right to apply adjustments to GHG inventories.

While the procedures for assessing compliance with Annex 1 parties' emissions reduction commitments are now relatively apparent, it is unclear how compliance with the parties' other obligations will be assessed. The transparency measures envisaged will certainly encourage compliance. All submissions and ERT reports will be published on the UNFCCC website. It is likely that parties will also be required to establish their own publicly accessible websites on which further information, such as on implementation of the mechanisms, will be available. In addition to the formal review process, therefore, data submitted by parties will be subject to extensive informal review, including by non-governmental organisations.

Decisions yet to be made concerning the arrangements for the ERTS will also determine the effectiveness of the review process. Agreement on the relationship of the pre-commitment period review to the eligibility of parties to participate in the mechanisms will also be important. An early, thorough review, starting by 2006 at the latest, could help parties, the Secretariat and the ERTS to iron out problems in the system before the first crucial commitment period begins.

Finally, although somewhat neglected to date, the national communication requirement could become a much more significant part of the verification system as it begins to be implemented. Given the difficulties associated with monitoring and reporting emission reductions, the value of information in national communications with regard to the steps that parties are taking to reduce their emissions should not be underestimated. Since national communications also include emission projections, they will also be invaluable for assessing whether the protocol will reach its objectives by the end of each commitment period.

Clearly there are many aspects of the Kyoto Protocol's verification system that need to be agreed, tested and adjusted in the light of experience. Nonetheless, the political agreement reached in Bonn in July 2001, paving the way for final agreement and entry into force, means that the year will be forever viewed as a watershed in the long march towards an effective climate change regime.

.....

Dr Molly Anderson is Environment Researcher at VERTIC. She has a BSc in Physics from the University of Sussex and a PhD in High Energy Physics from the University of Manchester. She was previously Senior Exhibition Developer at the Science Museum, London.

Dr Trevor Findlay is Executive Director of VERTIC. He was formerly an Australian diplomat and Project Leader on Peacekeeping and Regional Security at the Stockholm International Peace Research Institute (SIPRI) in Sweden. He has a doctorate in international relations from the Australian National University, Canberra, Australia.

Clare Tenner is International Programme Officer, Millennium Seed Bank Programme, Royal Botanic Gardens, Kew, UK. She was formerly Environment Researcher at VERTIC.

Endnotes

¹ Further detail on the foundations of the verification system is provided in Clare Tenner, 'Verification and compliance systems in the climate change regime', in *Verification Yearbook 2000*, Verification Research, Training and Information Centre (VERTIC), London, 2000, pp. 151–166.

² Annex 1 parties are Australia, Austria, Belarus, Belgium, Bulgaria, Canada, Croatia, Czech Republic, Denmark, European Economic Community, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Latvia, Liechtenstein, Lithuania, Luxembourg, Monaco, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Russia, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Ukraine, UK and US.

³ It is likely that these activities will be devolved to the sub-state level, with individual businesses buying and selling assigned amounts.

⁴ The Kyoto Protocol will enter into force on the ninetieth day after the date on which no fewer than 55 parties to the Framework Convention have ratified, including Annex 1 parties which accounted for at least 55 percent of the total carbon dioxide emitted by Annex 1 parties in 1990.

⁵ Article 3.3, Kyoto Protocol.

⁶ The Umbrella Group is a loose alliance of non-EU members of the Organisation for Economic Co-operation and Development (OECD) which have similar views on some issues. Although they negotiate individually, collectively they act as a counterweight to the EU in the negotiations. Umbrella Group states are Australia, Canada, Japan, New Zealand, Norway, Russia, Ukraine and the US.

⁷ It has been calculated that the inclusion of such sinks activities will slash Kyoto's 5.2 percent global reduction target to 1.8 percent at best and, at worst, produce a 0.3 percent rise.

⁸ See David Reed *et al.*, 'The role of land carbon sinks in mitigating global climate change', Royal Society Policy Document, no. 10/01, July 2001, available at www.royalsoc.ac.uk and Pete Smith, 'Verifying sinks under the Kyoto Protocol', *Briefing Paper*, VERTIC, no. 01/03, July 2001.

⁹ The G77 and China group comprises developing countries and China.

¹⁰ See 'Preparations for the first session of the Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol (Decision 8/CP.4): Decision 5/CP.6 implementation of the Buenos Aires Plan of Action', FCCC/CP/2001/L.7, 24 July 2001, available at www.unfccc.int.

¹¹ See 'Preparations for the first session of the Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol (Decision 8/CP.4): national systems, adjustments and guidelines under Articles 5, 7 and 8 of the Kyoto Protocol', FCCC/CP/2000/CRP.10, 25 November 2000, available at www.unfccc.int.

¹² Article 7.1, Kyoto Protocol.

¹³ Article 7.2, Kyoto Protocol.

¹⁴ The implementation of this commitment is especially hard to negotiate because it was crafted to satisfy two divergent groups of developing countries: the least developed countries, which will be most affected by climate change, and the members of the Organization of the Petroleum Exporting Countries (OPEC), which may suffer reduced oil revenue as a result of energy conservation efforts under the protocol. Annex 1 parties have always strongly objected to OPEC's demands for compensation for reduced oil revenue.

¹⁵ The 1999 UNFCCC reporting guidelines require parties to report their inventories in a common reporting format. See Decision 3/CP.5 in 'Report of the Conference of the Parties at its fifth session, held at Bonn from 25 October to 5 November 1999, part two, action taken by the Conference of the Parties at its fifth session', FCCC/CP/1999/6/Add.1, available at www.unfccc.int. The *Guidelines for National Greenhouse Gas Inventories*, released in 1996 by the Intergovernmental Panel on Climate Change (IPCC), provide advice on preparing and calculating inventories. To account for different national circumstances the guidelines offer alternative methods, ranging in complexity, for calculating emissions from each GHG source. Parties are

encouraged to use the most sophisticated procedures possible and the most accurate local data available. In recognition of the fact that some parties will have difficulties in following this advice, simple methods and default emissions factors are permitted. In 2000 the IPCC released a *Good Practice Report* to encourage states to improve the quality of their inventories, whatever method is used to calculate their emissions. In June 2000 this report was endorsed by the Subsidiary Body for Scientific and Technical Advice (SBSTA).

¹⁶ Article 5.1, Kyoto Protocol.

¹⁷ 'Methodological issues: guidelines under Articles 5, 7 and 8 of the Kyoto Protocol', UNFCCC/SBSTA/2000/L.2, available at www.unfccc.int.

¹⁸ Article 3.3 states that only 'verifiable changes in carbon stocks . . . shall be used to meet the commitments' and that these activities 'shall be reported in a transparent and verifiable manner'. Article 3.4 states that, in deciding on how and which additional LULUCF activities should be allowed, parties should take into account 'uncertainties, transparency in reporting, verifiability' (Articles 3.3 and 3.4, Kyoto Protocol).

¹⁹ Robert Watson *et al.* (eds.) 'Land-Use, Land-Use Change and Forestry', *Intergovernmental Panel on Climate Change*, May 2000.

²⁰ Watson, p. 11.

²¹ Article 8, Kyoto Protocol.

²² Parties to the Kyoto Protocol will convene in an annual Conference of the Parties/Meeting of the Parties, known as the COP/MOP.

²³ Since the meeting in The Hague, this issue has been removed from the political issues covered by the president's paper. 'New proposals by the president of COP6' (9 April 2001) contains a section on composition of protocol bodies, although this explicitly excludes the ERTs. It states that their composition will be primarily based on the technical capacity of the experts.

²⁴ Decision 4/CP.5 in 'Report of the Conference of the Parties at its fifth session, held at Bonn from 25 October to 5 November 1999, part two, action taken by the Conference of the Parties at its fifth session', FCCC/CP/1999/6/Add.1, p. 6, available at www.unfccc.int.

²⁵ Article 5.2, Kyoto Protocol.

²⁶ Anke Herold, 'National systems (Article 5.1) and reporting (Article 7.1)', paper presented at VERTIC workshop, *Developing verification systems for the Kyoto Protocol*, London, 28 July 2000. See www.vertic.org.

²⁷ Article 3.2, Kyoto Protocol.

²⁸ Article 18, Kyoto Protocol.

²⁹ The most recent draft procedures are found in 'Report of the Joint Working Group on Compliance on its work during the second part of the thirteenth sessions of the subsidiary bodies', FCCC/SB/2000/CRP.15/Rev.2, 20 November 2000, available at www.unfccc.int.

³⁰ The emissions and removals from LULUCF may be included in the inventory, but this is not yet agreed. There is agreement that activities included in Annex A to the protocol are reported on, but this does not include most activities under Article 3.3 and 3.4.

³¹ 'Preparations for the first session of the Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol (Decision 8/CP.4): national systems, adjustments and guidelines under Articles 5, 7 and 8 of the Kyoto Protocol', FCCC/CP/2000/CRP.10, 25 November 2000, available at www.unfccc.int, p. 11.

