24 February 2000

ENGLISH ONLY

UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE

SUBSIDIARY BODY FOR SCIENTIFIC AND TECHNOLOGICAL ADVICE
Twelfth session
Bonn, 12 - 16 June 2000
Item 8 (b) of the provisional agenda

METHODOLOGICAL ISSUES

GUIDELINES UNDER ARTICLES 5, 7 AND 8 OF THE KYOTO PROTOCOL

Views from Parties on national systems, adjustments and guidelines under Articles 5, 7 and 8 of the Kyoto Protocol

Submissions from Parties

Note by the secretariat

1. At its eleventh session, the Subsidiary Body for Scientific and Technological Advice (SBSTA) invited Parties to submit initial views on supplementary information pursuant to Article 7 and methodological and technical aspects related to this article, as well as on Article 8, particularly on the relationship between the review process and the compliance procedure, by 1 February 2000. The SBSTA requested Parties to submit further views on approaches for considering adjustments referred to in Article 5.2 of the Kyoto Protocol and any methodologies for their application, by 1 February 2000.

2. Submissions have been received from seven Parties.[*] In accordance with the procedure for miscellaneous documents, these submissions are attached and are reproduced in the language in which they were received and without formal editing.

3. The secretariat has also received a submission on adjustments under Article 5.2 of the Kyoto Protocol from the Natural Resources Defense Council. It is the practice of the secretariat not to reproduce documents from non-governmental organizations. However, Parties may wish to request copies of this submission directly from the Natural Resources Defense Council, Ms. Susan Subak, 1200 New York Ave., N.W., Washington D.C. 20005, United States of America, Tel: 1-202-289-2417, email: SSubak@nrdc.org.

[*] In order to make these submissions available on electronic systems, including the World Wide Web, these contributions have been electronically scanned and/or retyped. The secretariat has made every effort to ensure the correct reproduction of the texts as submitted.

CONTENTS

PAPER NO. 1: AUSTRALIA

MODALITIES FOR THE APPLICATION OF ADJUSTMENTS UNDER ARTICLE 5.2 OF THE PROTOCOL

Conclusion FCCC/SBSTA/1999/L.14, which was the result of an initial discussion of Article 5.2 adjustments by SBSTA in November 1999, calls upon Parties to submit further views on approaches for considering adjustments referred to in Article 5.2 of the Kyoto Protocol. Under paragraph 9 of this conclusion, adjustments should only be applied when inventory data submitted by Parties are incomplete and/or are calculated in a way that is not consistent with the IPCC 1996 Revised Guidelines and by any good practice agreed upon by the Conference of the Parties.

It is a key requirement for the operation of the Protocol that Parties with Article 3.1 target commitments submit inventories that provide the best possible estimates of emissions and sequestration. There are a number of processes underway to enhance this outcome, including the ongoing preparation, submission and review of inventories under the Convention, as well as preparatory work for inventories to be submitted under the Protocol. But it is to be expected that difficulties with estimating emissions and sequestration, and reporting this information, will continue to be experienced.

In accordance with conclusion FCCC/SBSTA/1999/L.14 adjustments would result in substitution of a revised technical estimate for the purpose of accounting for Parties' emissions and assigned amounts. The key principle behind the making of an adjustment under Article 5.2 of the Kyoto Protocol is that it would facilitate the completion of an inventory that provides the best available estimates of emissions and sequestration.

Australia considers that adjustments may be applied in cases where an Article 8 expert review team finds one of the following circumstances:

- a Party has not followed the IPCC 1996 Revised Guidelines
- a Party has not followed IPCC good practice guidance.

If either or both of these circumstances apply, then review teams need to assess whether the approach that has been used is likely to have arrived at a better estimate of emissions than might otherwise be the case. If so, then the review team could accept this inventory data. Where the review team judges that this situation does not apply, then it may request the Party to apply an adjustment.

Adjustments may also, in certain circumstances, be recommended by review teams and applied by Parties where there is a gap in inventory data. The key relevant gap would be activity data, as default emission factors exist which can be employed by Parties through following the IPCC 1996 revised inventory guidelines. Minor gaps in activity data may be addressed using the adjustment procedure, through the use of expert opinion to arrive at best estimates. Major gaps in activity data may not, however, be able to be filled through expert opinion, particularly if there are few alternative sources of data upon which expert opinion may be based. Issues of this nature may need to be referred to the compliance body/bodies. To maximise the clarity of guidance to review teams, these definitions should be expressed in

quantitative terms in relation to the overall inventory. A number of these issues will require further consideration by Parties, including the definitions of 'minor' and 'major'.

In making and reviewing an adjustment, Parties and review teams should normally follow IPCC and good practice guidelines. Exceptions to this practice would arise in situations where Parties are able to demonstrate an alternative that would result in a better estimate of emissions or sequestration.

Australia does not consider that adjustments should be applied by Parties in preference to the procedures laid down in the first sentence of Article 5.2. Accordingly, adjusted inventory data should be conservative in its estimation of emissions. "Conservative" would mean that the emissions baseline estimate would be low, that commitment period emission estimates would be high and that sequestration estimates would be low. The intention behind using conservative estimates would be to avoid any incentive for Parties to rely upon the adjustment procedure to generate emissions estimates.

However, adjustments should not be punitive. It will be the role of the compliance body/bodies to consider issues related to the application of consequences.

Adjustments should be distinguished from corrections that may be made to inventories. Corrections are made to address oversights or to repair errors. Adjustments are applied to improve emission estimates. If an expert review team has identified a correctable problem, a Party should always have a first chance to correct the problem.

It will not be necessary to create new institutions to apply adjustments. Adjustments should be considered, along with other parts of a Party's inventory, by Article 8 review teams and, if necessary, by the compliance body/bodies.

Adjusted inventory data would result in a revised inventory that would be used for the purpose of accounting for a Party's emissions and assigned amounts.

The Adjustment Process

This section outlines a process for the application of adjustments. In doing so it traces the decision tree contained in Appendix I.

Once the Party has submitted its inventory it would then be assessed by an Article 8 review team. If the inventory was accepted by the review team, no further action would be required. However, if the review team assessed the inventory as being inadequate, and the issue was adjustment related, the review team would recommend that the Party adjust its inventory. In making this recommendation, the review team would clearly specify the area(s) of the inventory that it considered required adjustment, together with the reasons for its concerns.

If the Party disagreed with the review team's recommendation as to the need for adjustment to its inventory, the issue would be referred to the compliance body/bodies which could then determine whether an adjustment was in fact required.

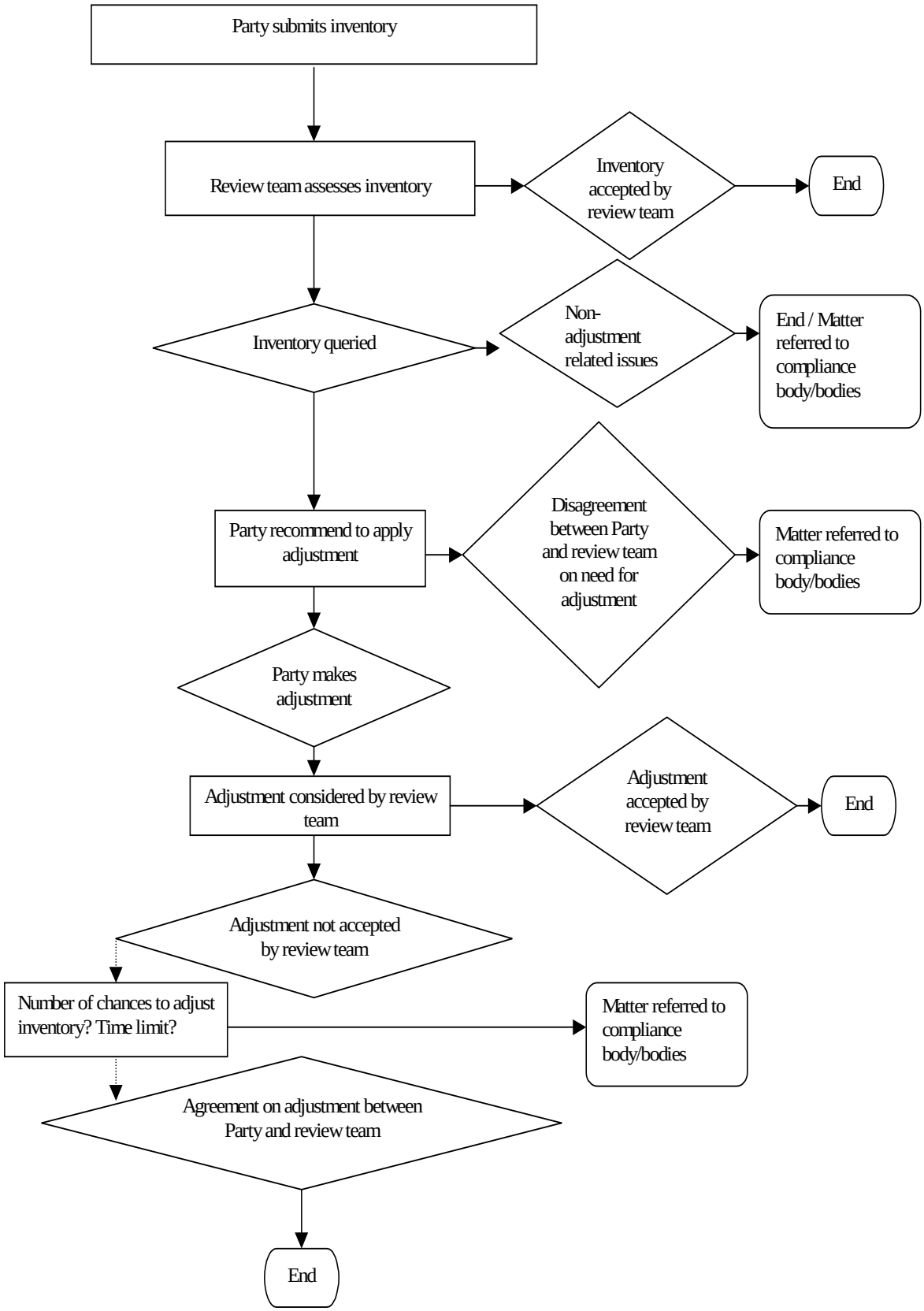
If there was consensus between the review team and the Party as to the need for adjustment, an adjustment would be made and the inventory would then be resubmitted to the review team. If at this stage the adjusted inventory was accepted by the review team then no further action would be required.

If an adjustment that was requested by the review team was made, but the proposed adjustment was not accepted by the review team, then the issue would be referred to the compliance body/bodies.

Two further issues remain to be resolved:

- The number of opportunities that a Party should be given to adjust its inventory. While it may be desirable to grant Parties a second chance in applying an adjustment that is acceptable to review teams, the matter might best be referred to the compliance body/bodies if these two opportunities are exhausted.
- The time frame for the completion of the adjustment procedure. The time permitted would depend upon the exact procedures adopted, including the number of opportunities for revision. While the process should be rapid, it must not be rushed. A preliminary estimate might suggest that the procedure take no more than one month at each stage.

Appendix I: Adjustment Decision Tree (note that this decision tree does not cover all issues relevant to the consideration of inventories)



AUSTRALIAN SUBMISSION
PROVISION OF SUPPLEMENTARY INFORMATION UNDER ARTICLE 7

Articles 7.1 and 7.2 of the Protocol call for the provision by Parties of supplementary information to ensure (Article 7.1) and to demonstrate (Article 7.2) compliance with Article 3. Under Article 7.4, guidelines for the preparation of supplementary information should be adopted by COP/MOP-1.

The secretariat has previously outlined five possible classes of supplementary information: a) information on transfers and acquisitions of parts of assigned amounts, emission reduction units or certified emission reduction units resulting from the work on mechanisms; b) information related to activities from land-use change and forestry; c) information which may be required as a consequence of the adoption of guidelines and modalities under Article 5; d) additional information required as a consequence of any good practices in inventory management and uncertainty which may be adopted by the SBSTA; and e) any additional information required to facilitate the assessment of implementation and the identification of potential compliance related problems. Australia agrees that all five classes are important for reporting under Articles 7.1 and 7.2.

However, Australia considers that, at this point in time, it is too early to determine to what extent Parties should be required to provide supplementary information in the classes of land-use change and forestry and the adoption of good practices in inventory management. On both issues Parties are awaiting major inputs from the Intergovernmental Panel on Climate Change. It will be necessary for Parties to reach agreement on the matters considered in these reports before Parties can agree what - if any - additional information should be reported as 'supplementary information'.

Australia has previously noted its views on the process for the application of adjustments under Article 5.2. Information that should be reported in relation to the application of adjustments includes:

- The fact that an inventory has been adjusted
- The part(s) of the inventory that has/have been adjusted
- The nature of the adjustment(s)
- The rationale for the adjustment(s).

As far as possible, the supplementary information provided may be kept relatively brief, provided that it ensures transparency in relation to the adjustment. This information should be provided at the same time as the adjustment is applied.

In relation to supplementary information on the transfer and acquisition of assigned amounts, Australia considers that only annual net transfers and acquisitions of AAUs, CERs and ERUs should be reported. The reporting period for this information should be the same as for the annual inventory, to facilitate the annual compilation and accounting of emissions inventories and assigned amounts under Article 8.1.

Once the extent to which Parties are required to provide supplementary information is resolved, it would be beneficial if the requirements were integrated into a standard reporting format. Thus information related to land use, land use change and forestry, good practices in inventory management and adjustments under Article 5.2 should, in the next cycle of

consideration of the guidelines for the submission of annual inventories and of the guidelines for national communications, be fully incorporated into a single consolidated set of reporting requirements. This would help minimise any ambiguity in relation to what Parties will be required to report, as well as facilitate the work of Parties in meeting their reporting obligations.

Australia suggests that the finalisation of guidelines for the preparation of supplementary information is not a priority for resolution at COP-6.

AUSTRALIAN SUBMISSION ON ARTICLE 8, PARTICULARLY THE RELATIONSHIP BETWEEN THE REVIEW PROCESS AND THE COMPLIANCE PROCEDURE (FCCC/SBSTA/1999/L.14, para 5)

Decision FCCC/CP/1999/L.11/Add.1 adopted guidelines for the technical review of Annex I Party inventories. These guidelines form a useful basis upon which to develop a more detailed approach to the operation of Article 8, particularly during the period 2000-2001 when they will be trialed by Parties. They do, however, leave open a number of issues relating to the operation of Article 8, some of which are addressed in this submission.

The role of the review process is to provide quality control so that all Parties can be assured of the adequacy and integrity of Annex I Party inventories and to identify any potential problems in Parties' fulfilment of their Protocol commitments. Its method of proceeding should be facilitative where a technical solution is possible. The review teams should proceed cooperatively with Parties, aiming to resolve matters in a manner that avoids the need to invoke the compliance procedure. In the event that unresolvable differences arise between a review team and a Party, or the question of implementation is more than technical, these differences should be forwarded to the compliance body/bodies for resolution.

What is to be reviewed, and when

The work of expert review teams will need to be focussed upon several types of information, not all of which will need to be reviewed each year:

Article 5.1: national systems

Article 5.1 of the Protocol states that each Party included in Annex I of the Convention shall have in place a national system no later than one year prior to the start of the commitment period. National systems should be reviewed by review teams as part of their consideration of all aspects of the implementation by a Party of the Protocol. Once guidelines for national systems have been adopted by COP/MOP-1, it may be necessary to consider the provision of guidance to review teams on how they should approach the review of national systems. This is not, however, an issue that needs to be determined at this stage.

Once expert review teams have conducted a technical assessment (prior to the start of the first commitment period) of each Annex I Party's national system and assessed that it meets the requirements of Article 5.1, national systems should not need to be reviewed annually. Rather, national systems should be reviewed as part of the review of national communications, or they should be reviewed on some other periodic schedule. There should be, however, provision for review teams to consider any aspect of a national system in their annual review of inventories if they consider that circumstances should warrant their attention.

Article 5.2: adjustments
Australia considers that Article 5.2 adjustments should be applied only as a result of a question raised by expert review teams. As outlined in our submission on adjustments, they should be developed by Parties and agreed with expert review teams. Adjustments would not therefore be presented to review teams as part of the initial information that they would be required to review, but review teams would review adjustments should the need arise for them to be applied.

Review teams should have available to them both adjusted data (which constitutes a revised technical estimate for the purposes of accounting a Party's emissions and assigned amount), as well as the originally provided data that had required adjustment.

Article 7.1: inventories, assigned amounts, and supplementary information
Inventories, supplementary information, and transfers and acquisitions of assigned amounts, certified emission reductions and emission reduction units would be reviewed annually by review teams.

If it becomes apparent that the performance of this task for the requirements of the Protocol is likely to be overly large, or elements of the task are routine and alter little from year to year, it may be appropriate for review teams to narrow the focus of their work in any one year. Options in this respect may include:

- regular focus upon sectors or sub-sectors which constitute a large percentage of a Party's emissions, or which are particularly fast-growing
  - particularly if these sectors or sub-sectors are subject to high levels of uncertainty
- combined with a rotational focus upon sectors or sub-sectors which are less important, are proportionally declining, or for which confidence levels in estimates are high.

Australia looks forward to information on the possible benefits of such a focussing approach emerging from the two-year pilot phase of review that has been initiated under decision FCCC/CP/1999/L.11/Add.1.

Article 7.3 provides that the first inventory under the Protocol shall be submitted from the first year of the commitment period. Australia considers that it would be preferable for Parties to gain as much experience as possible in the preparation of inventories, and for inventories prepared according to the requirements of the Protocol to be submitted as far as possible in advance of this date. This would enable inventories to be reviewed in accordance with the procedures to be followed for the first commitment period. This will be important for engaging Parties in facilitative means to help them ensure that they can be in compliance with the requirements of the Protocol during the commitment period.

Experience with the submission of inventories to date indicates that the majority of Parties have difficulties in submitting inventories by the due date. It will need to be considered what procedure might be followed in such cases during the first commitment period. It may be that a short grace period be granted for the first instance of late submission.

Once an inventory has been submitted, the review process may identify a number of issues that would require investigation or resolution:

- simple arithmetical errors
- gaps in the inventory (eg a sector missing or incomplete)
- failure to properly follow the common reporting format
- inadequacies in documentation that lead to a lack of transparency
- apparent data inconsistencies (eg with previously submitted inventories, or between different parts of the inventory)
- apparently inconsistent or inappropriate emission factors, activity data, or methodologies
- failure to follow IPCC good practice guidance

In each case, the review team should in the first instance contact the Party to attempt to resolve the issue at a technical level. Only if this process is unsuccessful, or exceeds a certain time limit, should the matter be referred to the compliance body/bodies. Criteria on the movement of questions relating to Parties' Article 3.1 target obligations from the technical review stage to the compliance body/bodies are likely to be necessary and might be included in Article 8.4 guidelines.

The review team may also identify parts of an inventory which are fully acceptable as they are, but which might reasonably be improved. For example, a higher tier of the inventory guidelines might be followed, or an improved emission factor from a neighbouring country might be employed. In these instances the review team may be free to make a recommendation, but this would be viewed as facilitative and not binding.

Article 7.2: national communications and supplementary information
The schedule for the submission of national communications to date is that they have been or, are required to be, submitted every 3-5 years. It would be desirable for the timing of future Annex I Party national communications to be determined so as to facilitate the submission of national communications, including information required by the Protocol, prior to the commencement of the first commitment period.

Review teams should only consider national communications in those years when they are required for submission. In the event that a review team holds concerns relating to information in national communications, or relevant supplementary information, these concerns should first be discussed with the Party. If this resolution is not possible, they should then be directed to the compliance body/bodies. However Australia considers it relatively unlikely that significant concerns should arise out of the consideration of national communications or supplementary information.

As outlined in our submission on supplementary information, Australia considers that information supplied as a requirement for 'supplementary information' should be integrated with the guidelines for national communications, so that Parties and review teams have a single, clear set of instructions regarding obligations for the contents of national communications.

Other
There are a number of other obligations under the Protocol that could be reviewed by expert review teams, including Articles 2 and 10. To the degree relevant, these obligations should be reviewed as part of the review of national communications.

Composition of expert review teams

Under the two year trial period for the review of inventories, Parties have been requested to update their nominations to the roster of experts, to ensure that appropriate expertise exists for the new, more intensive, review of inventories. Australia considers that it would be appropriate to await the outcome of this trial before considering whether the new nomination procedures have resulted in the availability of sufficient expertise for the needs of the Protocol.

Relationship with compliance procedure

Article 8 outlines the basic roles the expert review team. Teams are to:

- Undertake a "thorough and comprehensive technical assessment of all aspects of the implementation by a Party of this Protocol" (Article 8.3)
- Review information submitted under Article 7 (Article 8.1)
  - annually, for inventory information
  - as part of the regular review of national communications for non-inventory information
- Prepare a report to COP/MOP "assessing the implementation of the commitments of the Party and identifying any potential problems in, and factors influencing, the fulfilment of commitments" (Article 8.3)
  - these reports will be circulated by the secretariat to all Parties to the Convention
  - the secretariat will list questions of implementation indicated in these reports for consideration by COP/MOP

The role of the review team is to perform technical assessments of Annex I Parties' implementation of the Protocol. Review teams should not pass judgements, and they should not reach conclusions other than of a technical nature. They will, however, prepare reports to the COP/MOP in which they raise questions of implementation and identify any problems in, and factors influencing, the fulfilment of commitments. It will be the role of the compliance body/bodies to determine whether these questions raised are compliance issues and, if so, what the appropriate response might be.

Guidelines will be adopted under Article 8.4 for the technical review of implementation of the Protocol by expert review teams. Aspects of these guidelines are under development, as noted earlier. An issue that requires consideration is how questions of implementation might be referred from expert review teams to the compliance body/bodies. Australia considers that, as noted in our submission on compliance, questions of implementation referred to the compliance body/bodies should be limited to matters related to the fulfilment of legally binding obligations undertaken individually by Parties to the Protocol. The key obligations would be the fulfilment of Article 3.1 target commitments, and other Articles important to the substance of these commitments (Articles 3.3, 3.4, 4, 5, 6, 7, 12, 17). Criteria included in the Article 8.4 guidelines might guide this movement from the technical review process to the compliance body/bodies. Questions of implementation should not be forwarded from review teams to the compliance body/bodies in relation to the collective and hortatory provisions of the Protocol.

It would, however, be desirable to review the collective and hortatory provisions of the Protocol. Australia considers that these provisions should be reviewed as part of the review of national communications undertaken by review teams.

Australia has attached to our submission on compliance a chart to outline the operations of the compliance body/bodies, which indicates the role of the review process in this procedure. Australia has developed another chart to outline the process for the application of adjustments under Article 5.2, which should also be considered in this context.

PAPER NO. 2: CANADA

CANADIAN SUBMISSION ON ARTICLES 5.2, 7 AND 8

1- VIEWS ON APPROACHES FOR CONSIDERING ADJUSTMENTS REFERRED TO IN ARTICLE 5.2 AND ON METHODOLOGIES FOR THEIR APPLICATION

At the eleventh session of the SBSTA, as per document FCCC/SBSTA/1999/L.14, Parties were invited to provide further views on adjustments referred to in Article 5.2 and on methodologies for their application. Canada's submission is articulated around two issues:

A) Cases for the application of adjustments; and
B) Methodologies for their application.

A) Cases for the application of adjustments

In Canada' view, adjustments under Article 5.2 should be applied to promote the environmental integrity of the Protocol and should favour a facilitative and cost-effective approach. Adjustments should be used to complete and correct inventories that are judged inadequate in order to improve confidence in the assessment of compliance with commitments under Article 3.1 of the Protocol. Canada believes there are two general cases where adjustments could or should be made :

Case A1 :

- when inventory data submitted are incomplete (omission of sources, data not documented, data not submitted on time…). By " inventory data submitted " we mean inventory data submitted under Article 5 as well as supplementary information necessary to ensure compliance with Article 3 transmitted under Article 7 (e.g. supporting documentation on adjustments, information on the net contribution from land-use,land-use change and forestry…).
- when such methodologies referred to in the 1996 IPCC Guidelines have not been used or incorrectly applied; and
- when any good practices agreed to by the CoP have not been followed.

Case A2 :

- when the uncertainty of the estimates is judged to be unacceptably high to assess compliance with the target, even if the criteria of case A1 have been satisfied. A high uncertainty could be caused by the use of poor activity data even if it might be the best data available to the Party and even if an IPCC method has been followed.

These cases are not mutually exclusive and linkages between them are certainly worth exploring. The following elaborates on these two cases.

Case A1

Modalities for adjustments should allow enough flexibility to take into account the capabilities and national circumstances of each Party. Adjustments should at the same time correct for better estimates and be easily implementable, in a non artificial or arbitrary manner. Assessing whether the IPCC Guidelines have been followed is likely to prove very difficult given the degree of flexibility already permitted in the Guidelines and in any Good practices that might be adopted. For example, there might be many reasons why a source may not be reported by a Party (e.g. difficulty in allocating emissions to categories provided in the Guidelines or the Common reporting format, constraints imposed by existing national models, etc…). Further, the IPCC Inventory Guidelines permit countries to use what they feel is a better method than the default IPCC method for estimating emissions. Unfortunately, in the absence of statistical validation, extensive documentation, or quantitative estimates of uncertainty, it is difficult to determine if these so-called better methods are in fact " better ".

Finally, a significant challenge in the technical development and application of adjustments will also be to agree on specific and appropriate adjusted values by sector/source/sinks/gas and/or methodology in a way that is meaningful for the country in question.

Case A2

The fact that an inventory has been prepared and submitted in conformance with the IPCC Guidelines and good practices does not ensure that the inventory is accurate. Adherence to the IPCC Guidelines and good practices will likely reduce uncertainties but it does not necessarily preclude the uncertainty of the overall inventory (or that of its components) from being unreasonably high and inadequate to assess compliance with Article 3. Greater confidence and verifiability in emissions estimates in such cases are therefore required. It is Canada's view that this too would require the application of some form of adjustments. These adjustments may not need to be governed by rules developed under Article 5.2, but perhaps in certain cases by those prepared under Article 7.

The inventory may not be judged adequate to assess compliance with a reasonable doubt because the uncertainty associated with some specific sources or the overall inventory is higher than an agreed value or range. A high uncertainty could be caused by the use of poor activity data and inadequate emission factors, even if it might be the best data available to the Party and even if an IPCC method has been followed.

In October 1998 Canada submitted views on a technical proposal on how uncertainty analysis and uncertainty benchmarks could be utilised to adjust the emission estimate if the sector or source does not meet an agreed range or value of uncertainty. In light of the recent work of the IPCC on Good Practice Guidance and relevant conclusions of SBSTA, this approach is summarized below in section B) *Methodologies for the application of adjustments* and in more detail as an attachment to this submission.

Finally, Canada sees a third situation where adjustments may need to be applied. It deals with estimates that enter the accounting of the assigned amount, such as the net emissions and removals from LULUCF activities under Articles 3.3. and 3.4 over the commitment period.

Whether or not adjustments are required will depend on the modalities, rules and guidelines developed for accounting for these activities. In all likelihood, the methodologies and verification systems will be more rigorous than those associated with the current inventory guidelines, in which case adjustments may not be required. Nevertheless, , it will be necessary to consider whether modalities for any adjustment should be adopted under 5.2 or under the modalities for calculating the assigned amount under 7.4, or under a decision on Article 3.

B) Methodologies for the application of adjustments

Case A1

Canada notes the preliminary thoughts on possible methodologies for adjustments contained in FCCC/SBSTA/1999/MISC.9. These methods include recalculation based on source activity data; indexing based on Party's baseline emissions; and indexing based on Annex B norms. In our view, each of the three methods mentioned could entail differences in cost and accuracy. Indeed, recalculation based on source activity data may be the most accurate estimation method, but it also could be the most costly. In order to promote the accuracy and environmental integrity of the inventory, while at the same time adhering to the principle of cost-effectiveness, Canada believes that the "key source" categories determined by IPCC Good Practices could provide some guidance on methodological choice. For instance, data gaps in "key source" categories could be estimated based on source activity data; non "key source" categories could be estimated according to an indexing methodology.

Generally speaking Canada believes adjustments should be " conservative " i.e. an overestimate, so as to ensure that a Party is meeting its commitments and to provide an incentive for Parties to improve their national systems. We believe the degree to which a source estimate is " biased " should be flexible, potentially reflecting the chosen methodology for estimation (more accurate = lower bias) and/or the importance of a source within a Party's inventory (key source=higher bias, non-key source=lower bias).

To a large extent, the accuracy of the methodology for performing adjustments and, by extension, the degree of bias, will be dependent on the quality of the data set (e.g. emissions factors and/or activity data) used in its application. As a result, in order to promote consistency, transparency and comparability in adjustments, the data chosen to perform adjustments will be important and merits further consideration.

Case A2

Canada continues to doubt that improvements in methods and data alone will resolve the concerns surrounding the large inequities and verification difficulties that characterise the single basket approach embraced by the Kyoto Protocol. The so-called best methods recommended in the IPCC guidelines may not have similar uncertainties among countries regardless of the sector and source. Furthermore, the quality of the data may be more important than the "method". An appropriate adjustment methodology would examine all methods and provide a means of ensuring that equitable adjustments are indeed made.

Method, by itself, is not a sufficient indicator of inventory quality, but the statistical uncertainty of emission estimates, in conjunction with the knowledge of methodology, provides a very good measure of quality.

The approach offered by Canada is one possible way in which to deal quantitatively with the significant differences in the accuracy of various emission estimates. It proposes that emission estimates for a Party be adjusted according to an agreed formula if they do not meet minimum standards of confidence.

Attached is a revised version of a technical paper submitted by Canada in October 1998. The paper proposes that Parties would each provide an estimate of statistical uncertainty, by gas, for all categories and subcategories within their inventory. This would, in turn, allow the establishment of a quantitative estimate for the total uncertainty of the inventory. Given the fact that the draft UNFCCC Guidelines encourage Parties to report their uncertainties, and the IPCC Good Practice Guidance now recommends a similar method for doing so, it is Canada's view that this issue deserves consideration.

The paper then suggests how an equitable system, capable of confidently comparing inventories of differing uncertainty levels, could be established. It can be achieved through the use of adjustments, based on inventory precision, which could be applied at the total inventory level or on a gas-by-gas basis at any sectoral level. A formula, which has been developed on the assumption of *normal* ('Gaussian') statistical uncertainty distribution, is shown. It is recommended that an adjustment formulae of this type be applied to emission estimates which do not meet a minimum uncertainty level. An example is given which demonstrates the application of an adjustment to emission inventories with more than 10% uncertainty. A table is given which shows the magnitude of the adjustment for differing levels of inventory precision.

In the example given in the paper, 10% represents the *benchmark* uncertainty level, above which adjustments would be applied. International benchmarks would be established for all sources and sectors. If benchmarks were established by gas and subsector, the system could be used to apply adjustments differentially to the various components of a country's inventory. This would be useful for comparisons between gas and sectors, across which uncertainty levels shown high variability. For example, the benchmark uncertainty for an estimate of N_2O emissions from agricultural soils would be much higher than that for CO_2 emissions from combustion sources.

While this uncertainty proposal is offered as food for thought, it is Canada's view that it would benefit from further consideration and elaboration. Moreover, it is necessary to explore further the linkages between adjustments under 5.2 for data gaps etc. (Case A1) and adjustments for uncertainty (Case A2).

Views on the process for application of adjustments can be found in section 3 of this submission.

2- VIEWS ON SUPPLEMENTARY INFORMATION PURSUANT TO ARTICLE 7 AND METHODOLOGICAL AND TECHNICAL ASPECTS RELATED TO THIS ARTICLE

SBSTA at this eleventh session invited Parties to submit initial views on supplementary information pursuant to Article 7 and methodological and technical aspects related to this article (FCCC/SBSTA/1999/L.14).

Article 7 is articulated around two key provisions related to the inventory and the accounting of assigned amounts:

a) Article 7.1 requires Parties to incorporate in their annual GHG inventory the supplementary information necessary to demonstrate compliance with Article 3, in accordance with guidelines to be developed under paragraph 7.4.; and

b) the last part of Article 7.4 provides for an agreement on modalities for the accounting of assigned amounts.

Canada would like to offer its views on possible elements for inclusion in the guidelines under Article 7 related to demonstrating compliance with Article 3 .

First, the revised FCCC inventory reporting guidelines adopted at CoP5 (decision 3/CP.5) provide for a significant step forward. They could form the basis for reporting under Article 7 the annual GHG emissions and removals estimates required under Article 5.1, according to any additional guidance under Article 5.1 guidelines, including uncertainty analysis and how good practices in inventory management would be applied.

In Canada's view, the supplementary information that Parties will need to submit annually should cover, at a minimum, the following elements and may require the development of a specific reporting format for its transmittal:

1. *Article 5.2 adjustments*: Any adjustments made under 5.2 should be fully documented. It should apply to the current year inventory and could also apply to previous years. More specifically, it should indicate the rationale for applying the adjustment (incomplete data, inadequate methods, high uncertainty…), methodologies, and report both unadjusted and adjusted values) . To remain consistent with the active work program envisaged for adjustments under 5.2, Canada believes it will be important to reach agreement at CoP 6 on the necessary information required under 7.1 to report on such adjustments. Having suggested this, it also is apparent that not all the technicalities with adjustments need to be resolved by then. If quantitative uncertainty analysis on each source is not required under guidelines for national systems under 5.1, this information should be requested under article 7.1 in accordance with any modalities, rules and guidelines (MRG) adopted by the CoP, as necessary information to assess compliance with Article 3.

2. *Transfers and acquisitions of AAUs, CERs and ERUs (for participating Parties):* In our view, the maintenance of a national registry should be a prerequisite for participation in the Kyoto Mechanisms (KM). It is hoped that guidelines for national registries for the KM

will be agreed to at CoP 6. Given that this information would be transmitted under 7.1 (and accounted for under 7.4), in the interests of consistency it will be important that elements for 7.1 which are agreed to at CoP 6 reflect the state of progress on registries under 6,12 and 17.

3. *Recalculation of assigned amount* : Based on the initial assigned amount, which in turn would be based on the 1990 inventory, the recalculation of the assigned amount should incorporate any changes made to the initial assigned amount and the transfers and acquisition of units mentioned under point 2 above. Such information is critical in order to anticipate potential compliance problems and to make publicly available the information on the amount of units a Party may have to sell. Canada would like the rules for calculating the assigned amounts (both initial and recalculated assigned amount) to be known fairly early in the process. This would assist Parties in developing their national programmes and potentially help them to ratify the Protocol.

4. *Identification of potential compliance related problems :* Early detection of problems that may potentially lead to non-compliance is a desirable goal. Parties should be asked to provide an annual self-assessment of issues related to compliance with Article 3 commitments, and of problems they are experiencing with inventory development and management, uncertainty analysis, adjustments, land-use, land-use change and forestry and the use of registries for Kyoto Mechanisms that may lead to compliance issues.

5. *Land-use, land-use change and forestry* : Given a decision is expected at CoP6 on Articles 3.3 and 3.4, an agreement on the transmittal of LULUCF information may also be desirable at CoP6 and should be consistent with any rules, modalities and guidelines (MRG) that will be adopted for 3.3 and 3.4. Parties' submission should include a demonstration that their changes in stocks during 2008-2012 are verifiable, according to agreed MRG.

6. Compliance with Article 3 cannot be ensured and demonstrated until the last submission of information for the year 2012. At the time of the submission of 2012 information, Parties should submit a compiled (adjusted or not) emission inventory for the entire period 2008 to 2012 and a final recalculation of its assigned amount incorporating both the transfers and acquisition of units and the change in C stocks from LULUCF. After the grace period, further corrected estimates for the inventories and the assigned amount can be resubmitted under a similar format. The compiled information should allow the review process to assess whether the Party is in compliance. They shoud also report on how they responded to any inventory issues identified the previous year by the review team and how they addressed any technical recommendations that were made then.

It is Canada's opinion that at a minimum CoP 6 should reach decision on the necessary supplementary information for items 1 to 6 above, as well as on the preparation of information by Parties acting jointly under Article 4. While it may seem obvious that these types of supplementary information will be required, it is Canada's view that wherever possible, clarity should be provided to Parties on what their commitments are. As such, we recommend that general guidelines specifying the types of information required under Article 7 be prepared for CoP6 to facilitate decisions on other issues.

Finally, Canada would like to comment on the timing of a decision on adjustments (Article 5.2) versus a decision on modalities for the accounting of the assigned amount (Article 7.4). It seems to us a decision on modalities for the accounting of the assigned amount under Article 7.4 is critical and key to many other issues under 5, 7 and 8 as well as for the compliance regime and therefore should be made sooner rather than later i.e. at CoP6. In fact, it is Canada's view that modalities for calculating assigned amounts under Article 7.4 can be separated into two distinct cases : 1/ initial Assigned Amount, and any relevant adjustments and 2/ the calculation of the assigned amount in the commitment period, coupled with any relevant adjustments in relation to LULUCF. In Canada's view, in order to come to a decision at CoP6 on which additional activities within the land-use, land-use change and forestry categories are to be added to, or subtracted from the assigned amounts of Parties, clarity must be provided on what the initial assigned amount is. At a minimum, it is Canada's view that Parties must agree on the exact meaning of Article 3.7 and define " aggregate greenhouse gas emissions ".

3- VIEWS ON ARTICLE 8, PARTICULARLY ON THE RELATIONSHIP BETWEEN THE REVIEW PROCESS AND THE COMPLIANCE PROCEDURE.

Regarding the process for the application of adjustments, Canada believes that incentives need to be built-in for Parties to improve their inventory quality and their use of good practice and provide a complete inventory. Canada would like to echo some views expressed in previous submissions by Parties whereby the Party should be first given a chance to remedy any inventory problem identified by the review process. A key question to resolve will be when adjustments under 5.2 and/or under Article 7 become a compliance issue, or the degree to which they can be used to avoid a situation that qualifies for a non-compliance procedure. This will depend, among other things, on when adjustments are applied, and by whom. The linkages between the timing of the adjustments and any compliance procedure need to be thoroughly examined.

In Canada's view, the Protocol is quite clear that expert review teams provide a thorough, impartial and comprehensive assessment of the implementation of the commitments of the Party under review and identifies any potential problems in, and factors influencing, the fulfillment of commitments.

The mandate of the review process is to review the information submitted under Article 7. With respect to the potential application of adjustments, such cases could include any which have been outlined within part A) of this submission. Once these problems have been identified by the review team, (i.e., the review team raises a question of implementation) Parties should be given the opportunity to resolve them in accordance with the modalities for adjustments developed under Articles 5.2 and/or 7.4. A grace period would be alloted during which time adjustments could be applied. Following the grace period, the question of implementation raised by the expert review team would go through an initial screen by a Compliance Body (a more comprehensive account of the possible role and structure of such a Compliance Body may be found in Canada's January 31, 2000 submission on further proposals on procedures and mechanisms relating to a compliance system under the Kyoto Protocol). The Compliance Body would determine whether the Party in question had, during

the grace period, taken adequate steps to resolve the question of implementation. In the affirmative, the Compliance Body would confirm that the Party in question is in compliance with their commitments under Articles 5 & 7.

Those questions of implementation that are answered in the negative could go to a hearing of a panel composed of members of the Compliance Body, where the Party under review would have the opportunity to offer information and legal arguments. This part of the process could also provide a time limited opportunity for the exploration of facilitative approaches, such as advice and assistance.

In Canada's view such assistance could include a second round of adjustments under the provisions of Articles 5.2 and/or 7.4, possibly by an ad-hoc technical body. Canada believes that the merits of such a facilitative approach and the institutional nature of such a body are worthy of further consideration and will provide further views on this over the year.

Thereafter, the Compliance Body would confirm whether the Party concerned is in compliance, or non-compliance, with its obligations under Articles 5 and 7. The latter determination would likely be made, all other things being equal, if adjustments of a sufficient level of accuracy for assessment of compliance with Article 3.1 could not be made, or if the relevant Party does not accept the adjustments.

If found to be in non-compliance with target-related commitments under Articles 5 and 7, the compliance body will recommend that as of [x days/weeks] after the non-compliance finding, the party in question loses access to those elements of the Kyoto mechanisms that do not affect a Party's ability to get back into compliance or to meet its Article 3.1 commitment; recommend that the CoP/moP publicize the non-compliance and issue a caution if it is a recurrence of non-compliance with Articles 5 and 7. However, the Party concerned could appeal the finding to an appeal body. The final step in the process is a decision by the CoP/MoP on the recommendations of the Compliance Body or the appeal body. This would apply only to recommendations concerning findings of non-compliance with target related obligations under Articles 5 & 7 and consequences to such non-compliance. However, it could be appropriate to treat mechanisms eligibility questions separately and leave such questions to the Compliance Body (subject to appeal).

ATTACHMENT TO THE CANADIAN SUBMISSION ON ARTICLES 5.2, 7 AND 8:

METHODOLOGICAL ISSUES RELATED TO ENSURING CERTAINTY IN INVENTORY ESTIMATES

Introduction

This paper is a revised version of a submission made by Canada in the fall of 1998 on methodological issues related to inventories. It is Canada's view that one way in which to deal with the inherent uncertainties in greenhouse gas inventories is through adjustments. It is in this light that this attachment is submitted.

Canada believes that greenhouse gas inventories are a key element in measuring progress towards achieving the ultimate goal of the UNFCCC. As such, Canada believes that comprehensive, accurate, and reliable estimates of emissions and removals of all greenhouse gases are more important than ever, and efforts to improve these estimates must continue.

As agreed to in Kyoto, the current 1996 IPCC methodological guidelines, which are flexible and encourage parties to use their own data and methods, should be used as the basis upon which to develop emission estimates.

While Canada has always supported this view, we also feel, along with many other Parties, that future changes in the Guidelines are necessary. We anticipate that the current program of work of the IPCC on Good Practice guidance will lead to further improvements in methodologies and data.

Currently, determinations of compliance will be based on each Party's emissions inventory, which should be prepared using methods designed specifically for this purpose, i.e., the 1996 Revised IPCC Guidelines. As always, the emphasis must be on ensuring that the emission inventories are transparent, comparable and complete. Nevertheless, given the variety of methods currently available within the Guidelines themselves for preparing inventories for each anthropogenic source and sink, and the different uncertainties associated with each method, the issue of uncertainty[1] needs to be addressed prior to the start of the first commitment period.

Prior to Kyoto, Canada provided suggestions on dealing with uncertainties. Some of those suggestions have been incorporated into the UNFCCC inventory reporting guidelines and the IPCC good practice guidance. To reiterate, Canada had proposed that Parties provide a quantitative estimate of the uncertainties associated with their greenhouse gas inventories using appropriate methodologies to be developed based on the work of the IPCC and other expert Groups and that the Parties adopt these methodologies as soon as practicable.

---

[1] Defined as "*A statement of a range of values of the quantity in question, usually expressed as a number to be added to or subtracted from the basic value, or simply as a pair of numbers expressing the limits of the range*." In either case, the range so described expresses the set of values in which the true value of the estimated quantity is felt to be fairly sure to fall, which can be at a probability level of 95%, but not necessarily so.

These revised methodologies and guidelines could be used to establish an approach in which all Parties could be assured that those estimates for which a measure of is less precise can in fact, demonstrate compliance. Ideally, it is hoped that a table of scaling factors by source, gas and methodology would be developed by the IPCC, or other expert group along with appropriate uncertainty values for each of the methods.

These scaling factors would then be applied against country emission estimates in much the same way GWPs are used now. In effect, the weighting or scaling of emissions would not only recognize and deal with the significant differences in the accuracy of estimates and the measurement/verification of emissions and reductions, it would also provide an equitable way in which to offset emission increases from well defined sources with reductions made in less well defined areas, as well as ensure that a country is meeting its stated commitment. Ideally, such a weighting system could also be used for point or project level sources and in a trading system.

Comparability

In order to compare emissions of different GHGs on an equivalent basis, the IPCC has developed the Global Warming Potential (GWP) concept. This allows all direct greenhouse gases to be expressed in terms of a mass of carbon dioxide with an equivalent heating effect by means of the GWP conversion ratio. A fairly large uncertainty is associated with GWP numbers - recently, it has been estimated that the uncertainty averages about 35%.

Though conversion to CO_2 equivalence via the GWPs increases estimate uncertainty, it is not the only inequity introduced when comparing greenhouse gases.

At a recent IPCC Expert Group meeting on GHG data quality, estimates were provided on the likely confidence of international inventories. Considering only energy sources, CO_2 emissions were estimated to have an overall uncertainty of better than 10%, CH_4 about 30% and N_2O between 30 and 70%.

Uncertainties in emission estimates do not necessarily follow a normal, Gaussian distribution for random variables. Thus, specialized statistical analysis techniques must often be used to determine the accuracy of emission estimates.

Uncertainty in emission inventories do not only vary considerably from gas to gas and sector to sector. The confidence in estimates associated with ”biological” emissions is generally much lower than that associated with man-made processes. For instance, the overall estimate for CO_2 uncertainty within the Canadian Inventory is 4%, a typical value for fossil fuel combustion processes. Carbon dioxide emissions from the burning of biomass have been estimated to have an uncertainty ranging from 30% for industrial wood waste to 40% for residential fuel wood combustion. Estimates for worldwide carbon dioxide release from biomass burning range from 0.4 to 2.9 billion tonnes per year in the 1980's, an even greater confidence interval.

The 1996 Revised IPCC guidelines contain methodologies for determining carbon dioxide emissions and sequestration by managed forests, land-use changes and biomass burning, as

well as significant additional sources of N_2O emissions from agricultural activities. Rough estimates on the uncertainty associated with the CO_2 sources and removals place them at 50%, while agricultural N_2O is considered to have a likely uncertainty of between 60 and 80%.

The introduction of these sources increases the comprehensiveness of coverage and adds flexibility for Parties to the Convention to meet targets. In particular, adding biological sinks to the portfolio of emission reductions options offers the possibility of utilizing cost-effective measures such as planting trees and improving soil carbon dioxide uptake. Unfortunately, the flexibility is added at the risk of increasing uncertainty in inventory estimates and heightening the difficulty of verifying their accuracy. On the other hand, the inclusion of all sources and sinks provides incentives to improve the accuracy of estimates.

The question which then arises is this - can emissions and sinks of vastly differing uncertainty be made *comparable* on an equal footing in legally-binding commitments between the Parties to the Climate Change Convention?

Given the timeframes involved, it is doubtful that improvements in methods and data alone will resolve the concerns surrounding the large inequities and verification difficulties that characterise the single basket alternative embraced by the Kyoto Protocol. Canada would like to re-state one possible way in which to deal quantitatively with the significant differences in the accuracy of various emission estimates.

In dealing with uncertainties, suggestions have been made to simply discount estimates where "best methods" and "best practices" have not been used. It is Canada's view, however, that this is not the most appropriate manner in which to deal with uncertainties because it makes incorrect and unverifiable assumptions, namely:

1/ That all so-called best approaches have similar uncertainties, regardless of the sector and source, and;

2/ All best approaches are detailed in the IPCC methodologies and are similar, when in fact, the IPCC methodologies are designed to be flexible thereby permitting a country to use what it considers to be a better method for estimating emissions. Unfortunately, not all these so-called better methods are well documented.

It is Canada's view that a technically and scientifically valid method should be used when adjusting estimates for uncertainty. It is envisaged that an appropriate adjustment methodology would examine all methodologies, and in so doing provide a means of ensuring that equitable adjustments are indeed made.

Given the various sources of data used to develop emission estimates, studies conducted to date conclude that there is no one '*best method*' for many sources. The uncertainty of all inventories estimated by the '*method*' may not be the same because there will be differences in underlying data sources and quality. In fact, **the quality of data may be more important than the 'method'.**

Two further points may be mentioned with respect to this first question. The same method may not be the best across all countries, and it is difficult to identify which method is the best. In addition, different levels of desegregation may be more important than the "*method*" in some cases.

Obviously, the precision of emission estimates can't be fully utilized until further quantitative assessments of inventory uncertainty have been performed. Canada proposes that such estimates be provided by all parties, based on new guidelines developed by the IPCC. These guidelines could be developed in parallel with the process of establishing benchmark uncertainties.

One of the difficulties in developing statistical uncertainties associated with emissions estimates is that some distributions may be non-normal, or even non-symmetrical. For these distributions, neither the mean (the best estimate of the emission) nor the uncertainty are as easy to evaluate. In such cases, however, Monte Carlo simulation techniques can be utilized. The use of this method is now being recommended by the IPCC under its Good Practice Guidance. Canada has utilized Monte Carlo simulation methods for its last evaluation of the uncertainty associated with its Inventory and is investigating simplified means of applying the techniques. Though the formula proposed in the following section only applies to normal distributions, it is believed that the same adjustment techniques can be developed for non-normal distributions as well.

It is important to consider the nature of uncertainty in emission estimates. It may arise from such sources as (1) failure to understand the causes of emissions/removals (i.e., imperfect understanding of the processes involved); (2) poor quality input data for activity levels and emission factors; or (3) a failure to identify all the relevant source and sink activity. Developing verifiable statistical estimates is most difficult when their imprecision arises from sources (1) and (3). Those estimates which have the least certainty, are of the emissions or removals which are most poorly understood. In these cases, quantification of the uncertainty will also be imprecise.

It is necessary to identify such cases in order to differentiate them from others for which better uncertainty information is available. A lower confidence level can then be associated with these less well-understood data. If a confidence level can be provided, even if it is determined to be much lower than 95%, an adjustment of the type discussed here can be developed for such emissions, removals or reductions. Again, this underscores the need for better quantitative uncertainty information.

An Equitable Inventory System to Deal With Estimates of Varying Accuracy

Suggested here is a set of accounting rules which attempt to address the problem of inequity between inventories of varying uncertainties. A fundamental requirement to this approach is that the statistical uncertainty (precision) associated with the estimates, by gas and by sector, be known. It is proposed that emission estimates for a Party be adjusted if they don't meet minimum standards of precision. A resulting benefit is that the system would promote improvement in data quality.

The actual uncertainty of GHG estimates is important, because it can be used to ensure that emissions are actually at or below the levels they are reported to be. In other words, a given level of precision carries with it a corresponding degree of confidence about whether or not a Party is in compliance with its commitment.

Suppose that we would like to ensure, regardless of the precision in the inventories, that reported emission estimates do not exceed actual emissions by more than 10%. Suppose further, for the purposes of this discussion only, that emission estimates are normally distributed. Investigations have shown that if a Party's emission estimates are known to have 10% uncertainty, no adjustment needs to be applied (as might be expected). On the other hand, if emissions are only known within 20%, the emission estimate must be adjusted so that a higher estimate is reported. This adjustment would ensure that the Party's actual emissions are within 10% of its new, reported figure. In fact, for this situation the following formula applies if uncertainties are known with a 95% confidence:

$$Ea = Eu\,[1+(z*x/1.96)]/(1+B) \qquad (1)$$

Where Ea = adjusted emission estimate
Eu = unadjusted emission estimate
x = uncertainty associated with the estimate, expressed as a ratio of 1
z = 1.648 (corresponding percentile of normal distribution with 95% confidence). Other 'z' values can be applied if uncertainty is known only at a lower confidence level.
1+B = the upper bound (maximum allowed quantity under any circumstance). In this case B = 0.1

From this formula, the following table can be constructed:

Ratio of Adjusted Emission Estimate to Unadjusted Emission Estimate (Ea/Eu) *

Uncertainty in Emission Estimate **	0.1	0.2	0.3	0.4	0.5	0.8
Adjustment factor	1	1.06	1.14	1.21	1.29	1.52

* Adjustment factor to ensure emissions estimates that are reported never exceed the actual emissions by more than 10%
** Assuming 95% confidence and normal distribution

Note: Equation 1) is based on tables for the normal integral. See, for example, "An introduction to Error Analysis: The Study of Uncertainties in Physical Measurement, Second Edition" (J. R. Taylor).

Thus, if a Party's estimated emissions have a 20% uncertainty level, to ensure that its actual emissions do not exceed its limit by more than 10%, the adjusted value must be 1.06 times the estimate. Though other methods of developing an adjustment are possible, it is thought that the one presented here is feasible, reasonably simple and statistically verifiable. These, Canada believes, are minimum requirements which any adjustment methodology must meet.

In general, a Party's emission target is composed of the sum of the carbon dioxide equivalent of a number of different gases. Obviously, the GWPs associated with these gases contribute to the uncertainty of the sum. However, as all Parties must use the same factors, little bias is likely to be introduced if the precision of the GWPs is ignored. The approach suggested, then, is that uncertainty calculations would be applied to emission estimates scaled by fixed GWP constants. With the constants being idealized as having perfect precision, uncertainty would be tied to the raw emissions only. This is consistent with what is currently being considered under the IPCC's Good Practice Guidance.

As discussed previously, the uncertainty associated with emission estimates varies widely, depending on the gas, sector and methodology. It is envisioned that the above adjustment could be applied at any level of aggregation within an inventory - by gas, by sector or by project.

If applied on a sector basis, the fraction used to determine the "upper bound" ('B' in equation *1*) can be redefined as a precision standard. For instance, if current estimation methodologies do not allow better than 60% precision on N_2O emissions from agricultural soils, setting a 10% standard seems highly impractical, since it will probably be impossible to achieve. In this case, it would make more sense to set 60% uncertainty as the standard, and therefore 'B' would become 0.6. Reported emissions estimates for N_2O from soils would need to be adjusted upwards only if their uncertainty exceeded 60%. 'B' of formula *1*, then, would be the benchmark.

Clearly, these benchmark uncertainties must first be established. This could be explored further by the IPCC's continuing work on inventory methodologies and good practices.. The benchmark might be an average uncertainty for worldwide emission estimates.

It is Canada's belief that the general approach outlined here would allow greater confidence, verifiability and equity in greenhouse gas estimates. These are keys to satisfying the requirements of the Kyoto Protocol (see, for example, Article 7.1).

PAPER NO. 3: CHINA

NATIONAL SYSTEMS, ADJUSTMENTS AND GUIDELINES UNDER ARTICLES OF 5,7 AND 8 OF THE KYOTO PROTOCOL

In response to the request of FCCC/SBSTA/1999/L.14, China submits following initial views, and further views may be elaborated and submitted.

I. Initial views on supplementary information pursuant to Article 7 and methodological and technical aspects related this Article, as well as on the Article 8, particularly on the relationship between the review process and the compliance procedure

1. Initial views on the supplementary information in the annual inventory of each Annex I Party

In order for Annex I Parties to ensure their compliance with Article 3 of the Kyoto Protocol, besides the inventory information, the following information may be needed:

- Detailed description of the methodologies applied to compile the inventory
- Detailed description of the selections of all emission factors and the rationale of such selections
- All the related activity data

It is very necessary to provide the source of the activity data and rationale of the selections for emission factors as detailed as possible.

2. Initial views on the supplementary information in national communication of each Annex I Party

In order for Annex I Parties to demonstrate their compliance with Article 3 of the Kyoto Protocol, besides the national communications, the following information may be needed:

- Policies and measures to meet the commitment with Article 3 of the Kyoto Protocol
- Complete information on the application of the policies and measures, and their results
- Detailed description of the change of emission factors and activity levels
- Detailed description of the acquisition of CERs from CDM projects and ERUs from projects under Article 6 of Kyoto Protocol, and the acquisition through Article 17 of Kyoto Protocol.
- Detailed description of the transfer of ERUs from projects under Article 6 of Kyoto Protocol, and the transfer under Article 17 of Kyoto Protocol.

3. Relationship between the review process and the compliance procedure

The review process as specified in Article 8 is very important and essential to ensure the quality of the national inventories and communications, and to ensure the compliance with the commitments under Article 3 of Kyoto Protocol. Such review process should not replace the compliance procedures but should focus on the technical aspects of assessing the information.

II. Views on approaches for considering adjustments referred to in Article 5.2 and any methodologies for their application

If the expert review teams raise a question on the inventory of an Annex I Party, an appropriate approach for the adjustment of inventory should be selected based on the nature of the question and the availability of the necessary data.

1. IPCC default method

This approach could be used for the case of omission of a source or a sector but availability of the necessary activity data from national statistic data or UN data, or for the case of problem methodology.

2. Estimation based on Annex I averages

If the emission factor is inappropriate, the adjusted estimate could be made by applying the average emission rate over the countries with the similar circumstances of the Annex B of Kyoto Protocol with the availability of the necessary activity data from national statistic data or UN data.

3. Extrapolation based on a growth factor

If the base year emission and the growth factor are available, this approach could work.

4. Interpolation and extrapolation

If the inventory of various categories for a specific year, together with activity data or growth factors, is not available, this approach could be applied.

The above case-approach is only for demonstration. In fact, one approach may apply to many cases, and one problem may be resolved by two or more approaches. No matter what approach is applied, the adjusted estimation should be "up-ward biased" or "conservative in a transparent manner, and the simple approach may be the best.

PAPER NO. 4: JAPAN

JAPAN'S FURTHER VIEWS ON APPROACHES FOR CONSIDERING ADJUSTMENTS REFERRED TO IN ARTICLE 5.2 OF THE KYOTO PROTOCOL AND ANY METHODOLOGIES FOR THEIR APPLICATION

In response to the request (FCCC/SBSTA/1999/L.14 of 30 October 1999) to make a submission to the Secretariat on further views on approaches for considering adjustments referred to in Article 5.2 of the Kyoto Protocol and methodologies for their application , Japan submits the following:

Japan considers that adjustments to a Party's inventory under Article 5.2 would be made in the course of the review of inventories by expert review teams under Article 8. Inventories of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol are critical information for judging compliance with the obligation under Articles 3.1 of the Kyoto Protocol. It is important to calculate GHG inventories transparently, consistently, completely and accurately in a way that is consistent with the IPCC 1996 Revised Guidelines as elaborated by any good practice agreed upon by the COP.

The IPCC 1996 Revised Guidelines allow for using country-specific methodologies and/or emission factors in cases which a country believes their methodologies better reflects their national situations. However, if a Party elects to use any country-specific methodologies and/or emission factors, the Party must provide sufficient information to support the use of such methodologies and/or factors.

If the following situations are indicated in the review process, the Party may revise the estimate of emission/removal in question according to the methodologies to be agreed upon by COP/moP:

a) the Party's inventory is incomplete (e.g. emission by a source is not estimated due to the lack of activity data); and/or
b) country-specific methodologies and/or emission factors are used but supporting documents are considered insufficient.

Such revision by the Party should be regarded as 'adjustments' under Article 5.2

In the case that the expert review team considers the Party's 'adjustment' or the Party's explanation for not having 'adjustments' to be technically inappropriate, the expert review team would develop an estimate of emission and/or removal according to the methodologies to be agreed upon by COP/moP. The Party may accept such an estimate and revise its inventory accordingly. Such a revision should be regarded as 'adjustments' under Article 5.2. If the Party did not accept the estimate, the expert review team would include its estimate in its report. At the same time the Party may provide an explanatory text to be included in the report. The report of the review process will be published, and should be forwarded through the secretariat to COP/moP and the compliance body.

Japan believes that the adjustment which is outside the IPCC 1996 Revised Guidelines as elaborated by any good practice agreed upon by the COP, such as that related to climate variations or trade patterns of electricity, shall not be applied under Article 5.2.

JAPAN'S PRELIMINARY VIEWS ON GUIDELINES UNDER ARTICLES 7 AND 8

1. Supplementary information to be incorporated in Annex I Parties' annual greenhouse gas inventories under Article 7.1

The following information would be included in the supplementary information under Article 7.1. Unified reporting format should be developed, and Parties should submit their information in hardcopy as well as electronically.

(1) Information to be submitted prior to the start of the commitment period[1]

Initial assigned amount calculated in accordance with Articles 3.7, 3.5 and 3.8 (carbon dioxide equivalent).

(2) Information to be incorporated in the annual inventory for the year immediately prior to the first year of the commitment period, and for the last year of the commitment period

a) Information on carbon stock for the activities under Article 3.3;

b) Information on carbon stock for the additional human-induced activities in accordance with the decision pursuant to Article 3.4. In the first commitment period, only those Party that have chosen to apply the decision on these additional human-induced activities for its first commitment period submit this information.

A party may elect to incorporate these items of information for each of other years of the commitment period in its annual inventory.

(3) Information for the year previous to the year of submission

The information given below on changes in the assigned amount should be submitted annually and as early as possible after the end of each year of the commitment period, possibly using the system for accounting of assigned amounts under Article 7.4 (national registries), so that the review process could cross-check that any transfer and/or acquisition reported by one Party match those reported by other Parties.

a) The serial numbers and the total amount of assigned amount units (AAUs), emission reduction units (ERUs), and certified emission reductions (CERs) held in its national registry at the start of the year;

b) The serial numbers and the total amount of any AAUs issued into its national registry during the year and the reasons for their issuances;

c) The serial numbers and the total amount of AAUs, ERUs, and CERs transferred to each other Party's national registry and specify which Party(ies);

d) The serial numbers and the total amount of AAUs, ERUs, and CERs acquired from each other Party's national registry and specify which Party(ies);

---

[1] An exact deadline should be determined

e) The serial numbers and the total amount of CERs acquired pursuant to Article 12;
f) The serial numbers of AAUs, ERUs, and CERs that have been moved into the Party's retirement account;
g) The serial numbers and the total amount of AAUs, ERUs, and CERs held in its national registry at the end of the year; and
h) Information on projects under Article 6 that have resulted in transfers/acquisitions of ERUs during the year[2], including:
   - The name of the project;
   - The project identifier of the project;
   - The location of the project;
   - The baseline as agreed between the Parties involved;
   - The calculation of the reduction in greenhouse gas emissions by sources or the enhancement of removals by sinks for the year;
   - Transfers and acquisitions of emission reduction units during the year, including for each unit, the serial number and the Party's registry to which it was transferred or from which it was acquired; and
   - Any emission reduction units (identified by serial number) that have been retired that year.

(4) Information to be submitted at the time of submission of the inventory for the last year of the commitment period

a) The total emission during the commitment period;
b) The adjustment[3] to the assigned amount based on the change in carbon stocks during the commitment period resulting from direct human-induced activities under Article 3.3;
c) The adjustment[4] to the assigned amount based on the change in carbon stocks during the commitment period resulting from human-induced activities under Article 3.4. In the first commitment period, only those Party that have chosen to apply the decision on the additional human-induced activities under this Article for its first commitment period must submit this information;
d) The total amount and serial numbers of units of assigned amount that are in the Party's retirement account at the end of the commitment period; and
e) The total amount and serial numbers of any units of assigned amount that the Party are banking forward to the subsequent commitment period pursuant to Article 3.13.

2. Supplementary information to be incorporated in Annex I Parties' national communications under Article 7.2

Such information should include the following:
a) Information on the Party's national system for the estimation of emissions by sources and removals by sinks under Article 5.1;
b) Information on the Party's system for the accounting of assigned amounts established in accordance with the modalities decided by COP/moP under Article 7.4;

---

2 This information might be submitted in accordance with guidelines under Article 6

3 The "adjustment" here does not mean the one under Article 5.2.

4 The "adjustment" here does not mean the one under Article 5.2.

c) Information on the Party's national registries established in accordance with the principles, modalities, rules and guidelines on the mechanisms pursuant to Articles 6, 12 and 17, if the Party elects to use these mechanisms (These registries could be integrated with the system for the accounting of assigned amounts established in accordance with the modalities decided by COP/moP under Article 7.4).

As for the implementation of other commitments such as that under Article 2.1, it should be considered what information is not to be reported through national communications under the Convention and to be reported supplementarily under the Protocol.

For the review of "demonstrable progress" under Article 3.2, annual inventories, national communications, supplementary information under Article 7.1, and that on Article 2.1 could be useful.

Timing and frequency of submissions of national communications in which the above items of information are to be incorporated should be decided taking into account that some obligations have specific 'due dates' (e.g. 'demonstrable progress by 2005', and as for a national system under Article 5.1 no later than one year prior to the start of the first commitment period), and that these items of information would be useful for consideration of commitments for subsequent periods for Annex I Parties to be initiated at least seven years before the end of the first commitment period pursuant to Article 3.9.

3. Guidelines for the review of implementation of the Protocol by expert review teams under Article 8

(1) The review of information submitted under Article 7.1

a) Modalities of the review process

The review process of supplementary information under Article 7.1 would be incorporated in the technical review process of inventories under the Convention. According to the guidelines for the technical review of greenhouse gas inventories from Parties included in Annex I to the Convention adopted for a trial period by COP5 (FCCC/CP/1999/7), the technical review process under the Convention comprises three stages, namely:

i) Initial check of annual inventories by the secretariat;
ii) Synthesis and assessment of annual inventories by the secretariat with the assistance of selected experts; and
iii) Review of individual inventories by an expert review team (individual review).

The first stage of the review would determine whether the submission is complete and cross-check the changes in assigned amounts among Parties.

According to the guidelines under the Convention, the second stage will be conducted by the secretariat with the assistance of selected experts. We observe, however, that comprehensive technical expertise would be required at this stage, and consider that expert review teams could be responsible for this stage as well as the third stage.

As for the third stage (individual review), three operational approaches (sending inventory information to experts, experts meetings in a single location, and in-country visits of experts) and their possible combination will be tested during the trial period of the technical review of inventories under the Convention.

For the review under the Protocol, it is important to ensure that the review be conducted not only thoroughly and comprehensively but also expeditiously for the purposes of facilitating the procedures of compliance under Article 18. From this point of view, in-country visit approach would be desirable when assessing the annual inventory for one year prior to the first year of the commitment period (2007), and for the last year of the commitment period (2012)[5]. Such review of inventory for 2007 could be effective to promote improvement of a Party's national system for the estimation of emissions/removals. However, it should also be assessed whether in-country visit might be needed annually for review of inventory- and assigned amount-related information for other years of the commitment period under the Protocol.
The guidelines for the review process should ensure that each stage of the review process be completed within limited timeframes.

b) Party's response in the review process and adjustments of estimation of emissions
During all the stages of the review process, drafts of the review report should be sent to individual Parties, and the secretariat will provide the Parties with the opportunity to clarify issues or provide additional information. If the following situations are indicated in the draft report, the Party may revise the estimate of emission/removal in question according to the methodologies to be agreed upon by COP/moP:

i) the Party's inventory is incomplete (e.g. emission by a source is not estimated due to the lack of activity data); and/or
ii) country-specific methodologies and/or emission factors are used but supporting documents are considered insufficient.

Such revision by the Party should be regarded as 'adjustments' under Article 5.2.

In the case that a Party did not make any adjustments to address the indicated situations at the first and second stages, the Party may provide explanatory text to be included in the report.
In the case that the expert review team considers the Party's 'adjustment' or the Party's explanation for not having 'adjustments' to be technically inappropriate, the expert review team would develop an estimate of emission and/or removal according to the methodologies to be agreed upon by COP/moP. The Party may accept such estimate and revise its inventory accordingly. Such a revision should be regarded as 'adjustments' under Article 5.2.
If the Party does not accept the estimate, the expert review team would include its estimate in its report. At the same time the Party may provide explanatory text to be included in the report.

---

[5] Such in-country review might be conducted in conjunction with the review of national communications and supplementary information under Article 7.2.

The report of each stage of the review process will be published, and should be forwarded through the secretariat to COP/moP and the compliance body[6].

c) Indication of "questions of implementation" under Article 8.3
When any questions are found in the review in accordance with Article 8, the Party should be provided with the opportunity to answer such questions, clarify issues or provide additional information. Such questions should not be interpreted as "questions of implementation" under Article 8.3 at this point.
If the expert review team finds the answer and any additional information unsatisfactory, and also finds that there is sufficient evidence to raise the questions officially, it should mention it in its draft report with the evidence, and send the draft to the Party. Then, the Party should have an opportunity to express its views and to provide explanatory text to be included in the report. If the team still finds that there is sufficient evidence to pursue the questions, the team should forward its report with the explanatory text provided by the Party, through the secretariat to COP/moP and the compliance body, indicating that the team still finds the questions to be pursued. Then, the questions should be considered as "questions of implementation" under Article 8.3.
"A question of implementation by a Party included in Annex I" stated in Article 6.4 should also be identified in accordance with this procedure.

(2) The review of information submitted under Article 7.2

a) General comments
The supplementary information under Article 7.2 would be reviewed as part of the review of national communications, which should be conducted by in-country visits of expert review teams.
This review of supplementary information under Article 7.2 in conjunction with that of national communications could contribute to further actions by a Party to improve its national system for estimation of emissions/removals under Article 5.1 and to enhance measures for limiting or reducing the Party's emissions, and thereby to prevent non-compliance with the Article 3.1 commitment. It is important, therefore, to ensure that this review be expeditiously completed within a limited timeframe, which is to be set out in the guidelines.
It is also important for experts of the teams to be well prepared before the visit so that they can preliminarily identify potential issues in a Party's communications in advance and can focus on these issues in their visit. The secretariat should provide assistance, e.g. by ensuring interaction between the Party and experts before the visit.

b) Indication of "questions of implementation" under Article 8.3
When any questions are found in the review in accordance with Article 8, the Party should be provided with the opportunity to answer such questions, clarify issues or

---

[6] Japan proposes the establishment of a compliance body in its submission on procedures and mechanisms relating to a compliance system under the Kyoto Protocol in response to the conclusions of the Joint Working Group on Compliance adopted during the eleventh sessions of the Subsidiary Bodies.

provide additional information. Such questions should not be interpreted as "questions of implementation" under Article 8.3 at this point.

If the expert review team finds the answer and any additional information unsatisfactory, and also finds that there is sufficient evidence to raise the questions officially, it should mention it in its draft report with the evidence, and send the draft to the Party. Then, the Party should have an opportunity to express its views and to provide explanatory text to be included in the report. If the team still finds that there is sufficient evidence to pursue the questions, the team should forward its report with the explanatory text provided by the Party, through the secretariat to COP/moP and the compliance body, indicating that the team still finds the questions to be pursued. Then, the questions should be considered as "questions of implementation" under Article 8.3.

"A question of implementation by a Party included in Annex I" stated in Article 6.4 should also be identified in accordance with this procedure.

PAPER NO. 5: NEW ZEALAND

ADJUSTMENTS REFERRED TO IN ARTICLE 5.2 OF THE KYOTO PROTOCOL

New Zealand welcomes the progress made at SBSTA 11 on the issue of adjustments under Article 5.2 of the Kyoto Protocol.

New Zealand believes that there will have to be a process for all Annex B Parties whereby, if their inventory and reporting systems and hence emissions inventories are found to be inadequate (i.e. unacceptably inaccurate or have missing data) by an Article 8 review, a process is automatically undertaken that results in the inventory being corrected or adjusted to a value that is deemed appropriate.

This process for inventory correction or adjustment is necessary because we are dealing with a legally binding agreement that has compliance consequences if emissions exceed assigned amount, and allows banking if assigned amount exceeds emissions. It thus is imperative that a number for the emissions in the commitment period be established and agreed.

It is New Zealand's view that the process for adjustments in the commitment period will need to be clearly laid out in the rules and guidelines associated with Articles 5 and 7 (and 8). In addition, any calculations undertaken to 'adjust' an inventory will need to be carried out in accordance with agreed methodologies. Any adjustments should be as accurate as possible and, recognising that they are an estimate, should be conservative (i.e. on the high side) to ensure that the environmental integrity of the Kyoto Protocol is not compromised. Importantly, given that adjustments would be conservative, they would provide an incentive for Parties to develop accurate and robust inventory and reporting systems.

New Zealand is supportive of the establishment of a technical review process for greenhouse gas inventories from Annex I Parties and welcomes the trial period for technical review adopted by COP5. We see technical review of inventories as having a fundamental role in any adjustment process under Article 5.2.

In elaborating the adjustments referred to in Article 5.2 of the Kyoto Protocol, there are a number of major issues to be addressed. There will need to be:

- an agreed process for adjustments covering how the adjustments are done;
- agreement on who makes the judgement about when an adjustment is required (Article 8 review team?) and guidelines on making that judgement to ensure consistency and credibility between individual reviews;
- agreement on who carries out the adjustment calculation (Article 8 review teams or another body?);
- a process that allows Parties the "right of reply" i.e. a iterative process for working through problems that might arise before a final number is agreed upon;

Equally important to the above is the development of a <u>separate</u> adjustments procedure for the freezing of base-year inventories (1990 or other years as appropriate for economies in transition and the fluorinated gases). Such adjustments will also need to be conservative, but in the opposite direction (i.e. on the low side) to ensure the environmental integrity of the

Kyoto Protocol. This procedure will need to be agreed to before assigned amounts can be confirmed i.e. well in advance of the beginning of the commitment period.

NEW ZEALAND SUBMISSION ON ARTICLES 7 AND 8: SUPPLEMENTARY INFORMATION PURSUANT TO ARTICLE 7 RELATIONSHIP BETWEEN THE ARTICLE 8 REVIEW PROCESS AND THE COMPLIANCE PROCEDURE

Regarding supplementary information for the purposes of ensuring compliance with Article 3 of the Kyoto Protocol, New Zealand notes the advances made with the adoption by COP5 of the reporting guidelines for greenhouse gas inventories from Annex I Parties under the FCCC. These reporting guidelines require, *inter alia*:

- well documented methodologies if these differ from the IPCC guidelines;
- consistent application of underlying activity data and emission factors;
- that where methodological or data gaps in inventories exist, information on these gaps be presented in a transparent manner;
- use of the common reporting format;
- submission of a national inventory report, which includes the rationale for selection of emission factors and activity data, information on assumptions and conventions underlying emission and removal estimates as well as the rationale for their selection, and information on uncertainties.

In New Zealand's view, the information and documentation now required as part of annual inventory reporting can be regarded as going a long way towards meeting any requirements for supplementary information pursuant to Article 7. At the end of the trial periods for both the common reporting format and the technical review of annual inventories, an assessment will need to be made as to whether or not the new reporting requirements for annual inventories are comprehensive enough to meet the requirements of Article 7.1. Recommendations for improvements are an expected outcome.

The other key component of supplementary information pursuant to Article 7.1 is that relating to the accounting of assigned amounts. We consider that registries are fundamental in this area. Details on proposed annual reporting on assigned amount are provided in the *Proposed Text for Appendix B, Part Four of the Chairman's Note: Reporting,* part of the submission on mechanisms made by New Zealand and a number of other Parties dated 31 January 2000.

We note that revised guidelines for national communication from Annex I Parties were also adopted by COP5. These guidelines are relevant to Articles 7.2 and 7.4. Development of such guidelines tends to be an evolutionary process. Application of these guidelines for third national communications will likely also result in some further improvements before subsequent national communications are due. Each revision of the guidelines should bring them closer to the guidelines that are to be adopted by COP/MOP1.

New Zealand sees the establishment of transparent and credible reporting systems under Articles 5 and 7 as the starting point for the compliance system. Confidence in inventory information must be assured by way of comprehensive reporting requirements and establishment of national systems under Article 5.1. Article 8 review provides for a thorough and comprehensive technical assessment of the information provided under Article 7. The adoption of a trial period for the technical review of greenhouse gas inventories is, in our view, the first step in the development of the Article 8 review process, acknowledging that improvements to the review process are likely after the trial period.

Another issue is the process by which base-year inventories are scrutinised and potentially adjusted, and the timing for this process to be complete well in advance of the beginning of the commitment period as this is fundamental to determining Parties' initial assigned amount. In our view, base-year inventories would undergo a type of Article 8 review as part of this process.

Technical assessment of information under the Article 8 review process is a fundamental component of the assessment of compliance. The review team process would allow factual information regarding reporting and monitoring issues to be brought forward for international consideration. It would not be appropriate, however, for the review team to make an assessment of compliance or non-compliance. We have previously suggested (see New Zealand's January 2000 submission on compliance) that an international "Compliance Body" would be needed to assess the findings of the review team. The Party concerned would need to be notified in a timely fashion of the results of the Compliance Body's assessment.

The review team could also have a role in carrying out the calculations necessary to "adjust" the inventory in accordance with agreed methodologies under Article 5.2. The decision to adjust the inventory should however rest with the Compliance Body following guidelines to be established. These guidelines should provide an appropriate process by which the Party concerned can appeal the findings and recommendations of the review team.

PAPER NO. 6: PORTUGAL
(On behalf of the European Community, its Member States and Bulgaria, Czech Republic, Estonia, Latvia, Lithuania, Poland, Romania and Slovakia)

THE ADJUSTMENTS REFERRED TO IN ARTICLE 5.2 OF THE KYOTO PROTOCOL

Portugal on behalf of the European Community, its Member States and Bulgaria, Czech Republic, Estonia, Latvia, Lithuania, Poland, Romania and Slovakia welcomes the opportunity to send further views on approaches for considering adjustments referred to in Article 5.2 of the Kyoto Protocol.

1. The European Community, its Member States and Bulgaria, Czech Republic, Estonia, Latvia, Lithuania, Poland, Romania and Slovakia would like to stress that the adjustment procedure is closely linked to the review process under Article 8 of the KP and to the compliance procedure. For a comprehensive understanding of the adjustment procedure proposed by the European Community, its Member States and Bulgaria, Czech Republic, Estonia, Latvia, Lithuania, Poland, Romania and Slovakia, both the submissions on a compliance system and on the review process (articles 7 and 8 of the KP) should be considered.

2. FCCC/SBSTA/1999/L.14 considers that adjustments referred to in Article 5.2 should only serve the purpose of a) ensuring completeness of inventories, or b) correcting non-application of agreed inventory methodologies.

3. Adjustments for completeness could be based on, for example, default or implied emission factors or indicators such as ratios to population, economic output or ratios to other emissions estimates. In principle adjustments for completeness could be made conservative, in order to provide an incentive for completeness, but a conservative adjustment would have to take into account both the slope and the absolute level of emissions. Assessing completeness is one of the functions most likely to be possible by the semi-automated review.

4. Adjustments in respect of non-application of agreed inventory methodologies would probably only be possible following an individual review, and this is one reason an individual review is necessary to assess compliance. In principle, these adjustments could be made conservative, in order to provide an incentive for applying agreed methodologies. These adjustments would need to be agreed between the review team and the Party, taking into account national circumstances on data availability.

5. If the Secretariat or the Expert Review Team (ERT) identifies problems, the Party should have the opportunity to provide corrected estimates before the Expert Review Team considers the application of adjustments. If the Party does so and the corrected estimates provided are accepted, the Party would be considered to be in compliance with article 7.1. If the corrected estimates provided by the Party are not accepted or if no corrected estimates are provided the *secretariat in consultation with the ERT* should decide if the problems are adjustable or not. If not, the case should be forwarded to the compliance committee. If, however, the problem is considered to be adjustable, the secretariat should request a small

team of experts to calculate the adjusted estimates according to agreed methodologies (Adjustment Expert Team).

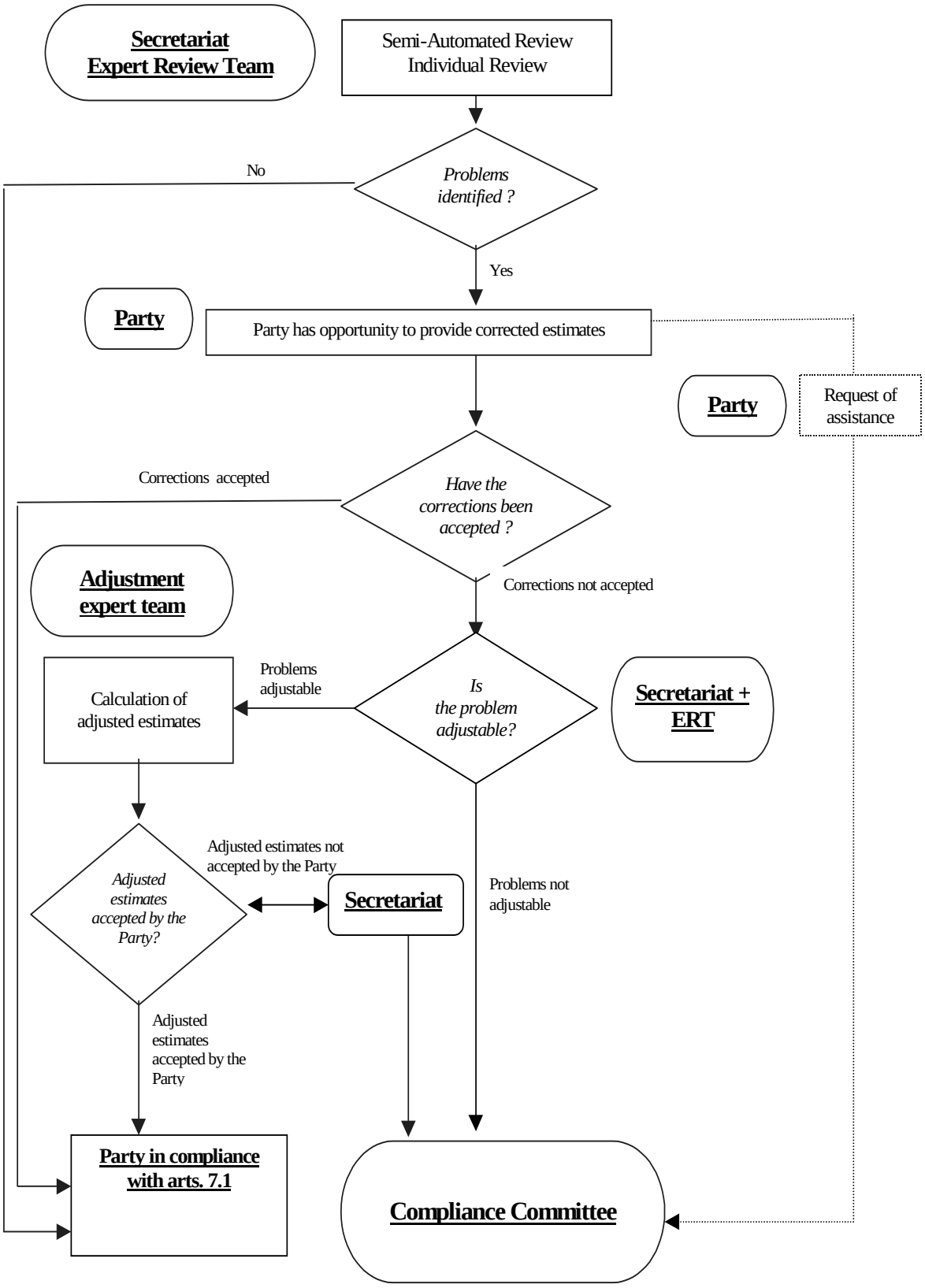
6. The Party should be entitled to request the Secretariat, in its co-ordinator function, to replace experts proposed for inclusion in the adjustment team, with others from the roster. It is expected that this request also include an appropriate justification. In addition, it should not be allowed that experts who are nationals of the Party subject to the adjustment procedure be part of the adjustment expert team conducting that procedure.

7. If the Party accepts the adjusted estimates it would be in compliance with Articles 5.2 and 7.1. If the Party rejects the adjusted estimates the case will be forwarded to the compliance committee, via the secretariat.

8. If at any moment during the review process the Party feels it will not be able to comply with its commitments, it may request, through the Secretariat, technical and/or financial assistance from the Facilitative Branch of the Compliance Committee.

9. The Chart below describes the view of European Community, its Member States and Bulgaria, Czech Republic, Estonia, Latvia, Lithuania, Poland, Romania and Slovakia on the procedure for the application of adjustments.

Chart: Procedure for the application of the Adjustments referred to in Article 5.2 KP.



SUBMISSION BY PORTUGAL ON BEHALF OF THE EUROPEAN COMMUNITY, ITS MEMBER STATES AND BULGARIA, CZECH REPUBLIC, ESTONIA, LATVIA, LITHUANIA, POLAND, ROMANIA AND SLOVAKIA) ON ARTICLES 7 AND 8 OF THE KYOTO PROTOCOL

Portugal on behalf of the European Community, its Member States and Bulgaria, Czech Republic, Estonia, Lithuania, Poland, Romania and Slovakia welcomes the opportunity to send initial views on supplementary information pursuant to Article 7 and methodological and technical aspects related to this Article, as well as on Article 8, particularly on the relationship between the review process and the compliance procedure.

Part I - Article 7

Supplementary information pursuant to article 7

1. Article 7 requests Parties to submit information to enable assessment of whether a Party is in compliance with its commitments under the Kyoto Protocol. Article 7.1 of the Protocol calls for supplementary information to be incorporated into Parties' annual greenhouse gas inventories for the purposes of *ensuring compliance* with Article 3 emissions limitation and reduction commitments. Article 7.2 of the Protocol calls for supplementary information to be incorporated into national communications, to *demonstrate compliance* with commitments under the Protocol in general.

2. Therefore, in order to demonstrate compliance with all the commitments under the Protocol, *Supplementary* under Articles 7.1 and 7.2 should be understood as the information necessary for the application of the Kyoto Protocol, which is not already requested by previous commitments under the Convention[1].

3. Article 7.4 calls for the elaboration, and subsequent periodic review, of guidelines for the preparation of the *supplementary information* requested under Article 7, with a view to adopting it at COP/MOP1.

Supplementary information to be provided annually in the inventory

4. Article 7.1 links the inventory requirements for supplementary information to ensuring compliance with Article 3. The table below summarises the commitments contained in Article 3 and the associated supplementary information that might be required.

[1] Including decision 2/CP3, the Guidelines for Annex I reporting adopted by the COP (currently under decision 3/CP5 and 4/CP5) and any guidance on good practices on the preparation of GHG inventories and the management of uncertainties agreed upon by the COP.

Table 1 – Supplementary information to be provided annually in the inventory

Article	Commitment	Supplementary information needed
3.1	Emissions not to exceed assigned amount	1)Aggregate GHG emissions in base year (s)[1], including emissions from land-use change in 1990 if land use change and forestry constitute a net source of greenhouse gas emissions in 1990 (Article 3.7). 2) +/- emissions/ removals from Afforestation, Reforestation and Deforestation (ARD) (Article3.3). 3) +/- emissions/ removals from additional human-induced activities in the agricultural soils and the land use change and forestry categories if a future COP/MOP decides to include such activities in the accounting of assigned amounts and if a Party chooses to apply such a decision for its first commitment period, consistent with the final sentence of Article 3.4. 4)+/- any emission reduction units acquired from or transferred to another Party during the current year (Article 6). 5)+/- any parts of assigned amount acquired from or transferred to another Party during the current year (Article 17). 6) + any certified emission reductions acquired another Party during the current year (Article 12). 7) Quantified Emission Limitation and Reduction Commitment as a percentage of base year emission.
3.2	Demonstrable progress by 2005	No supplementary data called for in inventory
3.3	Use of ARD activities since 1990 to help meet commitments	Verifiable changes of carbon stocks associated with ARD direct human induced activities *since 1990* according to definitions to be agreed of *direct, human induced* and *ARD*. Need for supplementary data arises, for example, because existing inventory methodology does not separately identify changes in Carbon stocks due to *since 1990* activities, and the definitions to be agreed may differ from those in the existing methodology.
3.4	Levels of carbon stocks since 1990 and use of additional human induced LULUCF activities to help meet commitments	1) Annual data to enable stock changes to be estimated consistent with formats to be agreed following consideration at SBSTA12 2) Verifiable changes of carbon stocks associated with such additional human induced LULUCF activities *since 1990* for which modalities, rules and guidelines (MRG) have been agreed by the COP/MOP. The need for supplementary data arises, for example, because existing inventory methodology does not separately identify changes in carbon stocks due to *since 1990* activities, and the MRG to be agreed may differ from those in the existing methodology 3) Any annual data relevant to linkages between Article 3.4 and other paragraphs of Art 3 of the Protocol.
3.7	Provisions of 2nd sentence of this paragraph	Covered by 3) in box above
3.10 3.11 3.12	Project based activities and emissions trading	1) Information on any part of assigned amount added to or removed from its national registry according to Article 17 KP during the relevant year, including the serial number for each unit transferred or acquired, as well as any other annual information on emissions trading according to the reporting requirements to be developed in future decisions on rules, modalities and guidelines on emissions trading. 2) Information on any certified emission reductions which a Party acquired from another Party in accordance with Article 12 KP during

Article	Commitment	Supplementary information needed
		the relevant year, including the unique serial number for each certified emission reduction unit. 3) Other annual information on CDM projects according to the reporting requirements for such projects to be developed in future decisions. 4) Information on any emission reduction units which a Party acquired from or transferred to another Party in accordance with Article 6 KP during the relevant year, including the unique serial number for each emission reduction unit. 5) Other annual information on JI projects according to the reporting requirements for such projects to be developed in future decisions and information if these emission reduction units are subject to an Article 6.4 restriction.

Supplementary information to be provided in the National Communication

5. Article 7.2 links requirements for supplementary information in National Communications to demonstrate compliance with commitments under the Protocol in general. This would include non-inventory supplementary information connected with commitments under Article 3 as well as supplementary data relevant to commitments under other Articles.

6. The table below summarises the commitments and the associated supplementary information that might be required.

Table 2 – Supplementary information to be provided in the National Communications

Article	Commitment	Supplementary information needed
2.1 (a)	Policies and measures	Identify which policies and measures have been implemented and/or further elaborated to fulfil each of the provisions of this part of Article 2.
2.1 (b)	Policies and measures	Identify steps taken to cooperate with other Parties, for example, through sharing of experiences and exchange of information with other Parties as set out in this part of Article 2.
2.2	Bunker Fuels	Identify steps taken through ICAO and IMO in order to pursue limitation or reduction of emissions of GHG not controlled by the Montreal Protocol.
3.2	Demonstrable progress by 2005	Provision of data, indices, or other information to be used together with agreed criteria to demonstrate progress on meeting commitments.
3.5	Base year flexibility	Relevant base year or period for countries with economies in transition.
3.8	Base year for F-gases	Base year chosen.
3.14	Adverse social, environmental and economic impact on developing countries	Information necessary to demonstrate the way implementation of the commitments mentioned in art. 3.1 takes into consideration the first sentence of art. 3.14.
5	National systems	Information to show that a national system with the required elements is in place.

Article	Commitment	Supplementary information needed
8.4	Response to expert review	Any information required by decisions of the COP to be included in National Communications in response to questions of implementation raised by expert review teams in accordance with guidelines adopted under the provisions of Article 8.4.
6.2; 12.7; 17	Project based activities and emissions trading	1) Any information required to show that National Registry Systems are established and operating in accordance with guidelines to be agreed by COP/MOP. 2) Web address for obtaining names and contact details of authorised legal entities within the jurisdiction of a Party that it authorises to participate in emissions trading. 3) Information to show that acquisition of parts of assigned amounts, of certified emission reductions and of emission reduction units is supplemental to Domestic actions for the purpose of meeting commitments under Article 3. 4) Any additional information on parts of assigned amounts required to be included in national communications under guidelines for the implementation of Article 17 to be elaborated by the COP/MOP. 5) Any further information required to be included in national communications under the modalities and procedures to be elaborated by the COP/MOP with the objective of ensuring transparency, efficiency and accountability through independent auditing and verification of project activities under Article 12.7. 6) Information on JI projects required to be included in national communications under guidelines for the implementation of Article 6 to be elaborated by the COP/MOP under Article 6.2.

Methodological and technical aspects related to article 7

7. Tables 1 and 2 above identify the Articles of the Protocol for which supplementary information may be required, for inclusion either in the annual inventory or in the national communication. Methodological or technical work to define information requirements is already underway for Articles 3.3, 3.4 and 3.7, and is unlikely to be needed for Articles 3.5, 3.8 and 2.1(a) and (b). The guidelines, modalities, rules and procedures being developed or planned in association with Articles 5, 6.2, 12.7 and 17 should also cover supplementary data needs associated with Articles 5, 3.10, 3.11 and 3.12, although it will be necessary to ensure that the relevant work plans cover reporting needs under Article 7.

8. This leaves the following Articles for which additional methodological and technical work may be necessary:

Table 3 – Methodological and technical aspects related to Article 7, which need further work

Article	Methodological or Technical work required
3.1	Relationship between inventory time series and the assigned amount if new inventory information becomes available.
3.2	Need to decide criteria for demonstrability of progress in meeting commitments
8.4	Need to decide any methodological or technical aspects associated with the provisions for Parties to respond to questions of implementation

9. Article 7.3 raises a question about the frequency of submission under this Article, after the first submission following the start of the first commitment period. It is clear from the Protocol text that supplementary information entering the inventory should be submitted with the same frequency as the inventory itself, i.e. annually. Provision of supplementary information is unlikely to require an increase in the frequency on national communications, except possibly if some supplementary information is requested by COP/MOP in the context of Articles 6, 12 or 17.

Part II - Article 8

10. Following Decision 6/CP5, guidelines for the technical review of greenhouse gas inventories of Annex I Parties were adopted for a trial period, covering inventory submissions due in 2000 and 2001. The experience gained and the lessons learned after the trial period is over will be directly relevant to the KP Article 8 review process. Revised guidelines for this comprehensive review process shall be adopted at COP-8 (Decision 6/CP.5) and latter by COP/MOP-1 (Article 8.4 of the KP).

Methodological and technical aspects related to Article 8

11. The Article 8 review process covers three different types of information:

1) annual compilation and accounting of emissions inventories

2) assigned amounts

3) national communications

12. GHG inventories should be reviewed separately from national communications, by different expert review teams. The review of emissions inventories and the review of national communications should include the review of supplementary information as defined above.

13. The Article 8 review process is expected to cover provisions related to the Kyoto Mechanisms, and additional guidelines for this may need to be developed under the relevant Articles.

Review of compilation and accounting of emissions inventory

14. As already established in the guidelines adopted for the trial period, the European Community, its Member States and Bulgaria, Czech Republic, Estonia, Lithuania, Poland, Romania and Slovakia believe that the review process should maintain the three-step approach (initial checks, synthesis and assessment and individual review). Therefore, the work carried out during the trial period will need to distinguish between those elements of the technical review that can be carried out annually and those elements which can be undertaken only less frequently. However the functions of these two types of review are complementary. In particular, a key function of the semi-automated annual review (initial check and synthesis and assessment) will be to maintain confidence in national inventories between individual reviews.

15. It is clear that the routine, semi-automated review will cover routine aspects (mainly compliance with Articles 5 and 7) such as:

- timeliness of submission;
- completeness by source category and gas;
- completeness of the time series;
- completeness of tables submitted.

16. Further work will need to be carried out on aspects more methodologically challenging such as:

a) outliner detection, that is to say detection of inventory data points well outside the expected range, based for example on aggregate emission factors; and

b) time series consistency based on discontinuity checks.

17. Both a) and b), above are classical problems in process control and scientific data analysis. They should be amenable to semi-automation, and the potential benefits in terms of review efficiency may be large, especially as these more sophisticated checks are likely to be the most effective in maintaining confidence between individual reviews. Therefore they merit thorough investigation at the forthcoming workshop.

18. The expert review would cover all aspects of the inventory and related activities, including:

- Adherence to methodologies and good practices agreed by the COP or the COP/MOP for estimating emissions by sources and removals by sinks.
- Adherence to agreed good practices for assessing uncertainties, methodological choice, quality assurance and quality control and verification.
- The integrity of supplementary information set out in this submission.
- The relationship of assigned amount to inventory data.

Review of assigned amounts

19. The review of assigned amounts will depend on the procedures for recalculations during the commitment period. If recalculations are allowed during the entire commitment period, the aggregate base year emissions may change every year. Such recalculations should be subject to thorough review by the expert review team in the context of the review of individual greenhouse gas inventories. If aggregate base year emissions are fixed or frozen with the start of the commitment period, the expert review team will only have to assess the base year estimate once at the beginning of the commitment period, but we will need to

ensure that the methodologies used to produce the annual estimates have not become inconsistent with the base year estimate.

20. In addition to the assessment of base year emissions, the review of assigned amounts covers acquisitions and transfers under the Protocol's mechanisms. This would mean that the information on transfers and acquisitions reported in inventories need to be consistent across Parties and consistent with information in all national registries. This could be assessed by the secretariat during the synthesis and assessment of greenhouse gas inventories and may not need to be done by an expert review team.

Review of national communications

21. The review of national communications under the Kyoto Protocol will differ from the In-depth review under the Convention, as under the Protocol inventory data and assigned amounts are reviewed separately. Guidelines for the review of national communications need to be developed as part of the guidelines for the review of implementation of the Protocol. Such guidelines should describe purposes, tasks, approaches and procedures for expert review teams to assess the implementation of commitments under the Protocol (except commitments under Article 3) and include the assessment of supplementary information.

Relationship between the review process and the compliance procedure

22. In the opinion of European Community, its Member States and Bulgaria, Czech Republic, Estonia, Lithuania, Poland, Romania and Slovakia both information gathered by the expert review teams and the complementary information collected by the semi-automated process of annual review should be the main sources of information for the Compliance Committee. The Terms of Reference for the Expert Review Teams and the definition of the semi-automated review process should take this relationship into account.

23. We believe that, with the exception of a Party's failure to submit the inventory or the inventory report, or if major/key parts of the inventory are incomplete, compliance cannot be assessed prior to an individual review, because the semi-automated annual review would require a more thorough review to become fully effective. This requirement could introduce timing difficulties, if Parties need to be shown to be compliant (at least with the provisions of Articles 5 and 7) before they can take part in emissions trading. This problem could be overcome by Parties—particularly those wishing to start trading early— agreeing voluntarily to submit inventories consistent with Articles 5 and 7 before the first commitment period, and similarly to have them subject to early individual review.

24. As outlined in the guidelines for technical review of greenhouse gas inventories, this review would start with the *initial check* performed by the *Secretariat*. In this stage, a semi-automatic check is conducted to determine if complete inventory information in the correct format has been submitted. The status report will describe cases that may be subject to the compliance procedure. The Party will have the possibility to clarify problems or to provide additional information in an agreed period of time.

25. Possible *serious problems* occurring in this stage of the review of inventories include, inter alia:

- Failure to submit the annual GHG inventory;
- Failure to submit the annual inventory report;
- Incompleteness of key or major parts[2] of the annual inventory and/or the annual national inventory report. This would mean that emission data for several key sectors for the Party have not been provided. Thus the total from the inventory data provided would be significantly lower than a complete inventory estimate.

26. In the case of these serious problems, it will not be possible to conduct the subsequent stages of the review process. Therefore, the case may be automatically subject to the compliance procedure. In particular, concerning the operation of the mechanisms, it may also be possible that provisional measures apply to the respective Party until the complete inventory information has been submitted (see the submission on compliance of European Community, its Member States and Bulgaria, Estonia, Lithuania and Romania, dated 31 January 2000).

27. *Less serious problems* during this review stage include, inter alia:

- Failure to submit on time the annual GHG inventory and/or the national inventory report. “Timeliness” of inventory submission needs to be defined under the KP.
- Incompleteness of minor parts of the annual GHG inventory and/or the annual inventory report.
- Gaps in data have occurred, but the Party has clarified the reason for these gaps and has committed itself to provide information still lacking.
- Data have not been provided in correct formats, but the Party is willing to provide the correct formats.

28. In case of the less serious problems the next review phase – the *synthesis and assessment* – which is to be conducted *by the secretariat assisted by experts*, can take place.

29. In this stage information is compared across Parties, and issues for further consideration during the next review stage are determined.

30. *Possible problems* identified during this stage of the review of inventories include, inter alia:

- Inconsistency between previous submissions and actual data,
- Irregularities or inconsistencies in emission or removal estimates, activity data,

---

[2] For example, defined using the good practice guidelines.

implied emission factors or recalculations (e.g. activity data not consistent with other sources, implied emission factors considerably different from emission factors from IPCC and other Parties, etc.),

- Inconsistency between information in common reporting format and national inventory report.

31. Before the compilation of the synthesis and assessment report, Parties will have the possibility to clarify problems or to provide additional information in an agreed period of time. The synthesis and assessment will provide useful information for the expert review teams by compiling data across Parties and by addressing obvious problems, but it is not intended to identify problems that should be dealt with under the compliance procedure.

32. Any problems not resolved would be further investigated during the next review stage: the *review of individual greenhouse gas inventories*. During the individual review, *expert review teams* will perform a detailed examination of the inventory. During the trial period for the technical review of inventories, different approaches with regard to desk review, centralised review and in-country visits will be tested. Periodicity of individual review needs to be decided taking into account the experience gained during the trial period

33. Problems identified during the review of individual inventories can be differentiated in *two categories:*

(1) Those with consequences for assigned amounts and for the assessment of compliance with Article 3 commitments.

34. Serious problems of this type would be an underestimation of total greenhouse gas emissions for individual years of the commitment period. This would be the case if expert review teams found that activity data used were likely to have been lower than real activities, that emission factors used in calculations are lower than the expected values or that methodologies which systematically result in lower emissions have been applied. Another problem of this type would be that recalculations have not been applied to the entire time series, resulting in lower emissions during the commitment period and higher emissions in the base year estimate.

(2) Those relevant to the process of inventory construction

35. In assessing whether Parties have in place a national system for inventory preparation according to guidelines, expert review teams will examine procedures and institutional arrangements for inventory development, quality assurance, quality control, record-keeping and documentation.

36. Both categories of possible problems identified during the review of individual inventories outlined above need to be treated separately with regard to compliance assessment and determination.

37. With problems of category 2, it may be possible that the Party provided an accurate inventory even if, e.g., quality assurance and quality control procedures have not been implemented. The Party should show during the reviews of subsequent years that the problems have been addressed. Only if several subsequent reports of expert review teams indicate that *procedural or institutional problems* have not been addressed, the expert review team should forward the case to the compliance committee, via the Secretariat (see the submission on compliance of European Community, its Member States and Bulgaria, Estonia, Lithuania and Romania, dated 31 January 2000).

38. The problems of category 1 and less serious cases of incomplete data constitute cases that may be resolved by applying *adjustments* as foreseen in Article 5.2 KP. The procedure for the application of the adjustments is described in the submission on this issue of European Community, its Member States and Bulgaria, Czech Republic, Estonia, Lithuania, Poland, Romania and Slovakia (dated 1 February, 2000).

PAPER NO. 7: UNITED STATES OF AMERICA

UNITED STATES SUBMISSION ON ADJUSTMENTS UNDER ARTICLES 5.2

As the United States noted previously, the provision of high-quality greenhouse gas emission inventories will be essential for verification of Parties' attainment of assigned amounts. If an inventory fails to meet the IPCC methodological requirements as elaborated by good practice, Parties may not have sufficient confidence in the quality of the submitted emissions estimates to verify compliance with Article 3.1. For this reason, adjustments under Article 5.2 will be necessary to ensure confidence that the overall inventory is not underestimated. The remainder of this paper further elaborates our views on the procedures and methodologies for adjustments. It should be read and understood in conjunction with our previous submission contained in FCCC/SBSTA/1999/Misc.9.

At the October session of the subsidiary bodies, Parties agreed that adjustments should be applied only when inventory data are incomplete and/or calculated in a way that is not consistent with the IPCC 1996 Revised Guidelines as elaborated by good practice. In the US view, adjustments should be used for any and all inventory deficiencies that fall under this category to ensure that Parties' compliance with Article 3.1 can be verified at the end of the commitment period.

Generally, the application of adjustments under Article 5.2 will prevent a Party from being in non-compliance with 5.2, provided that

- Parties can agree on methodologies for adjustments that are sufficiently conservative so as to give appropriate assurance that inventory estimates are not underestimated; and
- the inventory problems are not egregious.

For egregious inventory problems, adjustments would be calculated (to provide a number by which to verify compliance with Article 3.1 at the end of the period), but the adjustments would not be considered to resolve the compliance problem. These cases would be referred to the compliance procedure, and a Party would potentially be subject to whatever pre-agreed outcome results from such a case, such as loss of access to one or more Kyoto mechanisms because of failure to meet eligibility requirements.

To ensure consistency and objectivity in the review process and in any consequences that may arise, Parties will need to elaborate clear guidelines for distinguishing between minor and egregious inventory problems. In developing a functional definition of an egregious problem, the purpose of adjustments under Article 5.2 should be considered. Egregious problems should be narrowly defined as those that are so serious as to substantially undermine confidence in the Party's inventory. Parties should establish objective criteria for this determination. Further analysis is needed to determine the best approach to this issue and the appropriate classification of specific inventory problems.

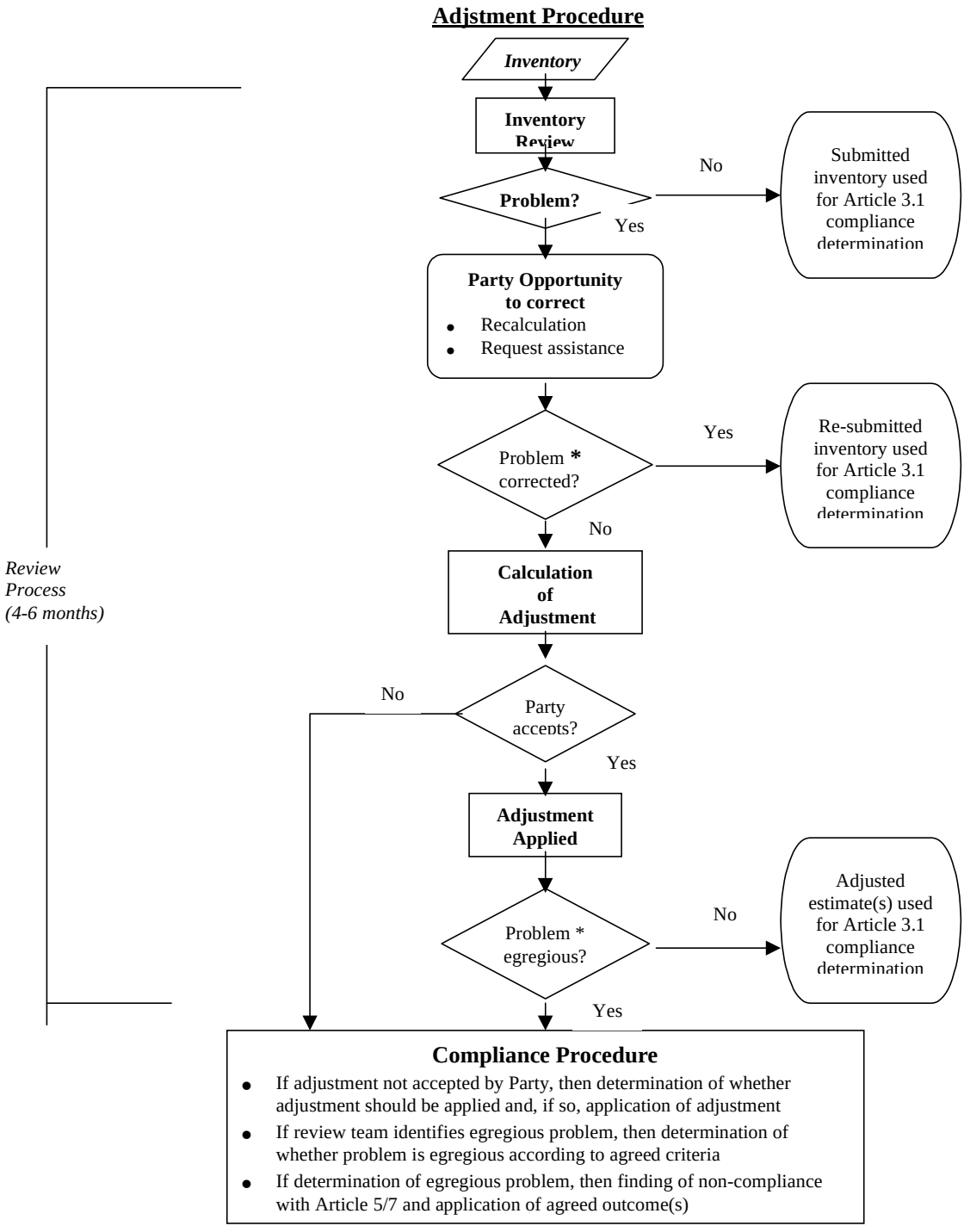
Since the adjustment procedure would occur as part of the annual inventory review process, the inventory review team should be responsible for identification of problems and the calculation of adjustments, in accordance with review guidelines. Straightforward and

detailed guidelines for identification of inventory problems and for calculation of adjustments will enable the review team to perform its task objectively and consistently, and will assist the compliance body in deciding which cases to take up, in accordance with its screening rules. Since identification of egregious inventory reporting problems (adjusted or not) by the review team could lead to the loss of a Party's eligibility to participate in the mechanisms, inventory review guidelines must leave no ambiguity about what constitutes an egregious problem. Additionally, the review team must have the necessary technical expertise to both determine the need for and calculate adjustments.

We wish to reiterate that adjustments should only be applied after the Party concerned has been provided with the opportunity to correct the problem. The adjusted estimate would be reflected in the official accounting of the Party's emissions and assigned amount, and used as the basis for verifying the Party's compliance with Article 3.1. (See related discussion in the US submission on Articles 7 and 8.) The attached flowchart (revised since our previous submission) lays out the steps in the adjustment procedure.

To ensure objectivity and consistency in their application, methodologies for calculating adjustments must be determined in advance, by type of inventory problem and by source category. The agreed methodologies must ensure that adjustments are sufficiently conservative to protect the environment and the interest of other Parties that emissions are not underestimated. The United States believes that the methodologies for adjustment should be simple and straightforward; they should not be resource intensive.

Detailed options for adjustment methodologies, as well as consideration of their applicability to specific inventory deficiencies are provided in the technical attachment to this text.



* Both the determination of whether a problem has been corrected and, if not, whether the problem is egregious would be made by the review team at the same stage of the review process. These determinations have been separated in this flowchart to illustrate two different decision points.

ATTACHMENT TO THE 5.2 SUBMISSION:

OPTIONS FOR ASSESSING AND ADJUSTING NATIONAL GREENHOUSE GAS INVENTORIES

Table of Contents

1.0 Introduction

Under Article 5.2 of the Kyoto Protocol, methodologies for estimating anthropogenic emissions by sources and removals by sinks shall be those accepted by the Intergovernmental Panel on Climate Change (IPCC) and agreed upon by COP 3 (i.e., the revised 1996 IPCC inventory guidelines). However Article 5.2 also states that where such methodologies are not used, appropriate adjustments shall be applied according to methodologies agreed upon by COP/MOP 1. The purpose of the adjustments is to address deficiencies in the completeness, reliability, and comparability of the inventory data so that Parties have confidence that emissions are not underestimated. This paper describes the options and applications for such adjustments.

The basic approach for adjustments to an inventory is to develop a conservative technical estimation of the problem section of the inventory. Conservative estimates ensure that emissions are not under-reported. This estimate would be developed by the Article 8 review team pursuant to Article 5.2. The “adjusted estimate” would be used for the official accounting of the Party’s emissions and as the basis for determining the Party’s compliance with its assigned amount. Since adjustments would only be applied with the consent of the Party concerned, the adjustment procedure would facilitate Party efforts to remain in compliance.

In analyzing adjustment options, the reviewing agency will wish to bear in mind the issue of flexibility in methods. None of the options should interfere with the flexibility of Parties to implement national methods that best represent their source categories. However, that being said, the options suggested in this paper could be considered when national or local methods are determined to be in error, are misrepresented, are incomplete, or where documentation is insufficient to enable assessment. In all cases, sufficient latitude should be given to Parties to substantiate their national methods before instituting adjustments.

2.0 Inventory Problems

There are a variety of problems that may be identified in the review of national inventories. The primary problems that could trigger adjustments include the following:

Completeness Problems—These problems include cases where the emission estimate is missing or does not fully represent the entire source category as it exists in the country in terms of source, sector, or gas coverage. This includes missing sources/sectors/gases, geographic underrepresentation, and activity/measurement data that does not fully account for the source in question. It also includes cases where estimates are misallocated among source categories or where double-counting occurs due to misrepresentation and reporting of sources.

Data Problems—This category of problems includes incorrect or misapplied emission factors, incorrect or misapplied activity levels, incorrect parameters where models are used, and cases where key components of the emission estimate are undocumented or unsubstantiated by the inventory documentation.

Methodological Problems—This category of problems includes cases where significant and unsubstantiated deviations from IPCC Guidelines and Good Practice methods occur. These problems include:

- Unsubstantiated procedures that do not follow IPCC Guidelines (e.g., estimate was not prepared using appropriate method based on the decision trees in IPCC Good Practice guidance).
- Significant time series inconsistencies in methods across the reporting period.
- IPCC reference approach for combustion sources was not utilized and national approach results in significant disparities from reference approach.
- Temperature adjustments were used in preparing inventory estimates (temperature adjustments are not allowed to be used for reported emissions for determining progress towards commitments)
- Inability of estimation method to support claimed mitigation activities, particularly where there is inconsistency in accounting for mitigation and controls throughout the reporting period.

3.0 Options for Adjustments

Options for adjustments should rely on relatively simple procedures to ensure accurate and efficient implementation in a timely and cost-effective manner. In meeting this objective, there are at least five basic types of adjustments that can be considered, none of which are overly complex; 1) a recalculation of the emissions using IPCC default methods, 2) an extrapolation of reported emissions to cover incomplete areas or sources, 3) calculation of emissions using indexing from an acceptable baseline inventory, 4) calculation of emissions using international emission indices, and 5) re-allocation adjustments between sectors and sources. Each of these options is described below.

3.1 Recalculations with IPCC Defaults and International Data Sets

An emissions estimate could be re-calculated in its entirety (e.g., because of inappropriate methods), or it could be recalculated partially (e.g., because of a deficiency in an emissions factor). In situations where it is necessary to recalculate the estimate in its entirety, , the primary option would be to use simplified, top-down approaches, specifically Tier 1 IPCC methodologies where available. This option is particularly applicable to source categories where the IPCC Tier 1 default method is commonly used by many Parties, since the adjustment will result in estimates that are comparable to other Parties.

When adjustments are necessary because one component (e.g., the emission factor) of a calculation is deficient, wherever possible, recalculations with IPCC default methods would retain the use of the acceptable components, and only replace the deficient component. This option would be most appropriate for situations where the original estimate for the source category is based on factors and activity parameters that are consistent with the IPCC default method, thereby making substitutions feasible. If for example, the activity data are deemed acceptable for a source category estimate, but the emission factor is severely underestimated, the adjustment would preferably consist of recalculating with a revised emission factor from the IPCC Guidelines or other peer reviewed source.

Other components of calculations can also be isolated for adjustments, such as control efficiencies, reduction terms, gas conversion factors, caloric values, etc. Preference should be given to this approach where viable, since it retains the use of valid and representative national data.

3.2 Extrapolation of Emissions

Where coverage problems exist within a source category, it may be possible to adjust emissions by extrapolating the available estimates to the missing or incomplete portion of the estimate. This option would be most appropriate for situations where a source category is either underrepresented in terms of the population of emissions points (e.g., for industrial point type sources) or activity data (e.g., for area type sources). For example, if a geographic portion of the country were excluded from a source category's emissions, the emissions for that category would be underestimated. An adjustment could be made by extrapolating the existing emissions to cover the missing area. The extrapolation would be based on an appropriate, and readily available, surrogate factor.

The extrapolation option is dependent on the availability of suitable surrogate factors to apply to the existing estimate. A basic formula for this calculation would be as follows:

$$E_{total} = E_{part} + (E_{part} \times S_{miss}/S_{part})$$

Where:

E_{total} = Total emissions for the country
E_{part} = Partial estimate provided in country's inventory
S_{miss} = Surrogate value for missing source representation
S_{part} = Surrogate value representing partial estimate provided in country's inventory

Surrogate values will need to be developed that reflect emission drivers for particular source categories and for which information is available at the national and, in some cases, sub-national level. For example, population data may be a suitable surrogate for extrapolating emissions for the solid waste disposal category. Other possible surrogate values will depend on the individual source category and can include such variables as earnings in a specified industry or sector, production data, consumption data, land usage data, and other forms of activity-related data. The objective is to choose surrogates that best account for the source emissions in question.

Following is an example application of the extrapolation adjustment utilizing the basic formula provided above. In this example, a country reported methane emissions from landfills for urban centers, but failed to report emissions from landfills located outside these urban centers. The emissions need to be adjusted to account for the missing areas but to also retain the partial estimate for the urban areas. The premise for the adjustment is that the unrepresented areas utilize landfill waste management practices similar to the urban centers from which the emissions are to be extrapolated.[1] Population is used as the surrogate value to perform the adjustment.

The basic equation would be as follows:

$$E_{total} = 6.0 \text{ Tg} + (6.0 \text{ Tg} \times 30 \text{ million}/100 \text{ million})$$

$$E_{total} = 7.8 \text{ Tg}$$

Where:

E_{total} = Total methane emissions for all landfills in the country
6.0 Tg = Methane emissions for urban centers included in the inventory
30 million = Population for missing areas
100 million = Population for urban centers included in the inventory

[1] This is likely to overstate emissions, thus ensuring that the estimate is conservative.

3.3 Indexing from an Acceptable Emissions Estimate

Where recalculation is not a viable option it may be necessary to adjust emissions by indexing emissions from an acceptable estimate. The premise for this adjustment is that there is an estimate for one or more years of emissions for a source category that, based on a review, is consistent with IPCC Guidelines and Good Practice methods. This acceptable estimate can then be grown or backcasted to a reporting year where inappropriate and non-consistent methods were used. This option is conditioned on the availability of a suitable growth factor for the source category in question.
Emissions growth is a function of change in activity (growth or decline) combined with changes in the emission rate or controls applicable to the source. Depending on a combination of these factors, emissions growth may be either positive (emissions increase) or negative (emissions decrease) from one year to the next. To a large extent, emissions growth is based on trends in industrial growth, population growth, changes in land use patterns, and transportation growth. Changes in the emission rate of sources can be influenced by such causes as technological advances, environmental regulations, age or deterioration, how the source is operated, and fuel formulations.

In general, emission growth calculations for adjustment purposes could be based on the following equation (STAPPA-ALAPCO-EPA, 1999):

$$E_{ay} = E_{by} \times G \times C$$

Where:

E_{ay} = Adjustment year emissions
E_{by} = Base year emissions
G = Growth factor
C = Control factor, accounting for changes in emission factors or controls

In selecting the growth factor, the most important considerations are how closely the surrogate data approximates or relates to changes in the emission-generating activity and how closely it relates to the activity indicator used to develop the base year emissions. The most common and simplistic method is through the use of extrapolations of collected historic data to develop growth factors. Historic extrapolations to project economic activity should be carried out using accepted statistical and economic techniques, such as multiple regression analysis, moving averages or autoregression.

In the above equation, the control factor is necessary only when mitigation or control activities have changed relative to the base year scenario. Estimates of control effects should be conservative (e.g., control efficiency assumed to be equal to or less than the average certification rate for the control device).

Following are four potential growth indicators that can be used to develop growth factors for source categories (STAPPA-ALAPCO-EPA, 1999):

> ***Product Output***--The most direct indicator of industrial emissions activity is product output, a direct measure of the amount of product being produced. This indicator is particularly useful for industrial sources where the activity level is defined as a

product output or for sources that are closely linked to product output. The actual output level is determined by the efficiency with which resources are being used, which is in turn a reflection of technological change.

Other Activity Level Indicators – In addition to common industrial production statistics, many source estimation methods rely on activity level data that are readily available from national or international data sets. An example is harvested acres and animal statistics for the agricultural categories. Growth factors can be developed from these activity level indicators as long as there is an historical record of the activity indicator and the record is based on consistent data collection procedures. Like production output, activity level indicators typically have a direct correlation with trends in source emissions.

Gross National Product (GNP) -- The national income figure in total GNP is both a measure of production and a measure of money income. It represents the factor costs of current output and the money earned by the factors of production. Use of GNP should only be considered when direct indicators of product output are not available.

Earnings--A measure of earnings reflects the efficiency with which labor has been used in production. Real earnings data are preferred to employment figures for an industry, because earnings data capture productivity improvements that are not apparent from employment trends. If earnings data are available for specific industries, this information may be preferable to less specific growth indicators such as GNP.

3.4 Calculate Emissions Using International Emission Indices

The basis for this option is the use of emission indices developed from acceptable inventories submitted by other Annex B countries. The emission indices would be developed based on average emission rates for countries with similar profiles for the source category in question. The average emission rates would link emissions to appropriate and readily available activity indicators or emission drivers (e.g., emissions/capita or emissions/hectare). These average emission rates would be developed for individual source categories and then applied to the country where the adjustment is needed. The emissions from other countries used to develop the indices would need to be collected from reported inventory data that follows IPCC Guidelines and Good Practice methods.

The average emission rates used for adjustments could be developed around a matrix that links source characteristics to country profiles. The primary profile types would represent groupings of countries that share commonalties in source categories, reported emissions, technology base, regulatory practices, and industry representation and employment. Average emission rates would be calculated from acceptable inventories from all countries assigned to a particular profile type, for a particular source category. First, the emission rate for each country in the profile would be indexed to the most appropriate and available surrogate factor for the source (e.g., emissions/capita for domestic wastewater treatment). Next, the average emission rate would be calculated across all countries in the profile. Lastly, this average emission rate would then be utilized to perform adjustments.

As a preliminary step, it would be necessary to map each Annex B country to a profile type for each sector/source category. This mapping would be required so that the matrix of international emission indices could be developed and that, in the event adjustments were necessary, the emission index from the appropriate profile type could be automatically selected for any given country. Table 3-1 gives a hypothetical example of how the international emission indices could be prepared.

Table 3-1 Example Matrix of International Emission Indices

Sector/Source	Country Profile A	Country Profile B	Country Profile C
Coal Mining	4.5 Mg CH_4/thousand metric ton of coal produced	5.1 Mg CH_4/thousand metric ton of coal produced	6.3 Mg CH_4/thousand metric ton of coal produced
Aluminum Production	1.48 Mg CO_2/metric ton of aluminum produced	2.5 Mg CO_2/metric ton of aluminum produced	3.3 Mg CO_2/metric ton of aluminum produced
Solid Waste Landfills	48 kg CH_4/capita	51 kg CH_4/capita	55 kg CH_4/capita

In Table 3-1 there are three country profile types (A, B, and C). Profile A is associated with country scenarios where the source is highly regulated and controlled. Profile B is associated with country scenarios where the source is not highly regulated, subject to voluntary reduction programs or limited penetration of control technologies. Profile C is associated with country scenarios where the source is not regulated and there are no mitigation practices in effect. The average emission rates shown for each category are calculated from the acceptable reported emissions from each country assigned to that profile, for that source category. Each profile may have a different and distinct set of countries assigned to it for a given source category. In this manner, the average emission rates are based on countries that share the most similarities for a given source category.

The basic formula for adjustments using emission indices would be as follows:

$$E_{adj} = R_{avg} \times S_{adj}$$

Where:

E_{adj} = Adjusted emissions
R_{avg} = Average emission rate (emissions/surrogate index) for source category and country profile
S_{adj} = Surrogate index for the country where adjustment is being applied

3.5 Allocation Adjustments Between Sectors/Sources

Allocation adjustments could be made automatically since, in most cases, these types of adjustments should have no overall net effect on a country's emission estimates (unless it involves double-counting issues). The simplest allocation adjustment consists of re-assigning reported emissions to sources so as to be consistent with IPCC guidelines. This type of

adjustment would be necessary where a country misreported emissions by assigning them to the wrong source or sector.

A more complex scenario is where emissions are misreported due to double-counting. This is particularly applicable to overlaps between some of the industrial and energy subcategories. The adjustment can be relatively simple if the emissions can be isolated within each of the sectors where it is reported. In these cases the adjustment would consist of simply removing the emissions from one of the sectors in accordance with IPCC Good Practice guidance. If the emissions can not be isolated and the quantity is considered to be significant, this problem may be classified as too severe to solve through an adjustment procedure.

4.0 Applying adjustment options to inventory problems

The following basic protocol could be followed when applying the adjustment options described in Section 3 above:

1. If the problem is only related to one component (e.g., factor or activity), adjust only the problem component (the other component may be an accurate, nationally representative piece of the equation that should be retained).

2. If the source is missing or the estimation method is determined to be entirely inappropriate (no existing components of calculation can be retained) ***and*** there is an IPCC default method available, a new calculation of emissions for the source category should be prepared.

3. If new calculations or recalculations are necessary ***and*** there is no IPCC default method available, prepare adjustments based on acceptable emissions from an historical inventory for the country.

4. Lastly, if there are no emissions available from historical inventories (e.g., if the source category is missing from the entire time series) to perform Step 3 above, prepare adjustments based on international emission indices.

The application of these adjustment options are based on several criteria that are discussed in Section 4.1. Section 4.2 provides a detailed breakdown of inventory problems and suitable options for adjustments by sector and source category.

4.1 Criteria for Choosing Options

Objectivity in Making Adjustments

The protocol for applying adjustments should be consistent across all countries and across review periods. Following the uniform protocol outlined at the beginning of Section 4 ensures objectivity in applying the adjustment and eliminates bias on the part of the body responsible for making the adjustment. Also, the procedures for adjustments as described in this report rely primarily on the use of international data sets or emission indices based on collected data

from similar Parties. In this manner, objectivity is maintained by applying adjustments based on uniform data sets.

In some cases it may not be possible to carry out a particular adjustment because of the lack of data or resources or incompatibility of the approach for a particular country. There is a need for clear guidance to indicate when a particular adjustment method should be used, and if implementation of this method is not possible, guidance on implementing alternative methods. In all cases the process for making adjustments should be clearly documented and communicated to the affected country.

Ensuring Conservative Adjustments

In determining methods for adjusting inventory estimates, it is essential to protect the interest of other Parties in ensuring that inventories are not underestimated. To satisfy this objective, the adjusted estimates should be "conservative" or upwardly biased. A conservative estimate could be achieved by a) selecting methodologies that tend to produce conservative estimates, or b) multiplying a central-point estimate by a conservative factor greater than one. The magnitude of this conservative factor would be pre-determined and set at an appropriate level to ensure confidence that the adjusted estimate does not underestimate true emissions. The prospect of conservative adjustments may provide added incentive for the use of good practice by Parties at the national level in order to ensure that they report their best available estimates in a consistent manner from the base year outward.

If conservative factors are employed, they must not be arbitrarily assigned but should be pre-determined, such as a set percentage (e.g., 10-50%) above the IPCC default factor or selected international emission index rate.

Key Sources

The majority of the options for adjustments discussed in this paper are relatively simple to apply and do not entail large resource expenditures as long as the necessary data are available. Therefore, every source that merits an adjustment should be adjusted. However, the importance of the source category's contribution to overall emissions and to the overall trend for the inventory may play a role in choosing an adjustment method, because available resources are finite. If the preferred adjustment method for a particular source category is time-intensive, it is desirable to use it only for sources that are considered key as determined through good practice. Adjusted estimates for key sources should be done well and should be conservative. The best option for non-key sources may be to choose the second preferred option for adjustment.

4.2 Summary of Inventory Problems and Adjustment Options

Table 4.1 shows how the adjustment options could be applied for each specific inventory problem described in Section 2 of this report. The adjustment options are ranked in the order that they could be considered for application. Following the hierarchy of approaches outlined in the Table 4-1, one would proceed to the next available option only if the previous option

can not be applied, either because the necessary pre-conditions can not be met or the resource demands are too high for the source under consideration.

The resource needs in Table 4.1 are identified as low to high depending on the relative man-hours and complexity to perform the adjustment. The level of resources is a secondary factor, only to be applied for sources that are not considered key. As an example, the lowest resource needs involve simple re-calculations or indexing utilizing existing or readily available data for the country. Medium resource needs are associated with most cases where new calculations have to be made with IPCC default methods or where indexing requires surrogate factors to be developed from data not normally utilized in the inventory. Lastly, high resource needs are associated with options that involve either complex calculations or where substantial research needs to be done to establish proper indexing factors.
There may be special cases where the adjustment protocol for a particular problem should not be automatically applied as outlined in Table 4-1. A possible situation could occur when a Tier 1 approach identified as the primary adjustment option significantly underestimates emissions for a given country's scenario. If, in the same example, IPCC Good Practice guidance calls for a Tier 2 or higher level approach to calculate emissions more accurately, the prospect of an adjustment that underestimates emissions may actually take away the country's incentive to calculate the estimate in accordance with IPCC Good Practice guidance. In these unique situations, the best option may be to apply a conservative factor as discussed in section 4.1 or to consider secondary adjustment options that ensure a conservative estimate. Given the importance of objectivity, Parties will need to create clear guidelines for specific situations.

In order to determine if the adjustment options listed in Table 4-1 are suitable for a given source, additional preliminary information on the availability of IPCC default methods and suitable indexing factors is provided in Table 4-2. Table 4-2 lists the availability of IPCC default methods for each sector/source, and whether the method contains default emission factors and clear references to international data sets. Sources, which have 'yes' for these three items, could at a minimum be considered for relatively simple adjustments using IPCC default data. The availability of activity data from international data sets is particularly important in cases where there is no adequate national data source.

Table 4-2 also lists suitable indexing factors that could be used for extrapolations, development of growth factors, and for indexing emissions off of other countries. In all cases the preferred indexing factor is the activity data associated with top-down estimation methods for each source. Most of the indexing factors shown in the table are therefore available from international data sets as referenced in the IPCC default methods. There are exceptions where gross national product (GNP) is shown as a possible indexing factor; however, it is recommend that adjustments based on GNP be a last resort since there may be substantial uncertainty with indexing off GNP values. If GNP values are used, it should be limited to growth factor applications within a country.

Indexing considerations are provided for each source category and should be reviewed prior to applying any of the indexing options. There are particularities associated with each source category that can affect the suitability and type of indexing. For example, the adjustment option for CO_2 from combustion sources should only consider either new calculations using

the IPCC reference approach or possibly recalculations using the IPCC reference approach with components of the national methodology that can be retained. Adjustments utilizing emission indices from other countries, extrapolations or surrogate growth factors should not be considered for CO_2 combustion sources since they may introduce unacceptable uncertainty into the estimates.

References

STAPPA-ALAPCO-EPA, Dec. 1999. Guidance on Emission Projections. Prepared for the Projections Committee of the Emission Inventory Improvement Program.

Table 4-1. Inventory Problems with Ranking of Options for Adjustments

Inventory Problem	Ranked Options for Adjustment/ Revision	Necessary Pre-conditions for Option	Resource Needs for Using Option (Low, Medium, High)	Example Application
Incomplete: Source/Sector is geographically underrepresented	1. Extrapolate estimate for underrepresented area from existing estimate using an indexing factor	Available and accurate indexing data (broken down geographically); consistency in activity across region	Low	Domestic wastewater - Use regional population data to extrapolate wastewater flow in underrepresented area
	2. Use international statistics to estimate emissions in under represented area	International activity data is available and it is possible to extract data for the under represented area	Medium - depends on level of manipulation necessary to use international data.	Agriculture sources - Compare national estimates based on FAO statistics to inventory partial estimate to determine emissions from the under represented area
	3. Extrapolate estimate from a previous year's inventory using an indexing factor	Estimates from a previous inventory are available and reliable, appropriate indexing data are available, and the activity data is consistent over time with respect to the indexing factor.	Medium	Aluminum Production - Using aluminum production data as an indexing factor, compare the emission totals from a previous year's inventory to the current year's incomplete estimate to determine the emissions in the under represented area.
Incomplete: A sector, source category or subcategory is missing	1. Use Tier I method to calculate the emissions for the source category	Tier I method is available for the source and data to make the calculations are available	Medium to high - depends on availability of necessary activity data and emission factors and the complexity of the methodology	Cement Production - Use the Tier I method to calculate an estimate based on and IPCC default factor and cement production data from the U.S. Bureau of Mines or the European Cement Association.
	2. Calculate an estimate based on data from a previous inventory	Previous inventories are available, appropriate indexing data are available, and the source is consistent across the two inventories	Low to medium - depends on availability of previous inventories	Manure Management - Using animal population data as an indexing factor, estimate emissions from this category by applying a growth factor to a previous year's inventory (assuming that the ratio of animal types remain constant)

Table 4-1. Inventory Problems with Ranking of Options for Adjustments (Continued)

Inventory Problem	Ranked Options for Adjustment/ Revision	Necessary Pre-conditions for Option	Resource Needs for Using Option (Low, Medium, High)	Example Application
Incomplete: A sector, source category or subcategory is missing (Continued)	3. Calculate an estimate based on data from other countries with a similar profile	Other applicable inventories are available, appropriate indexing data are available, and the source is consistent across the two inventories	Low to medium - depends on availability of other inventories	Natural Gas Processing - Using production data as an indexing factor, estimate emissions from this category based on the emissions from countries with similar processes
Incomplete: Estimates for a pollutant are missing	1. Use the IPCC default emission factor with the inventories activity data to calculate emissions for the pollutant	An applicable IPCC default emission factor is available for the category and can be used with the inventory's activity data	Low	Combustion - To calculate N_2O emissions, multiply the activity data from the CO_2 or CH_4 estimates by the IPCC default factor
	2. Use Tier I method to calculate the emissions for the pollutant	Activity data and an IPCC default factor are available	Medium to high - depends on availability of necessary activity data and emission factors and the complexity of the methodology	Combustion - Use the Tier I method to calculate emissions for missing pollutant based on data from IEA or the UN and default emission factors provided by IPCC
	3. Calculate an estimate based on data from a previous inventory	Previous inventories are available, appropriate indexing data is available, and the source is consistent across the two inventories	Low to medium - depends on availability of previous inventories	Enteric fermentation - Using animal population data as an indexing factor, estimate emissions from this category by applying a growth factor to a previous year's inventory (assuming that the ratio of animal types remains constant)

Inventory Problem	Ranked Options for Adjustment/ Revision	Necessary Pre-conditions for Option	Resource Needs for Using Option (Low, Medium, High)	Example Application
Incomplete: Estimates for a pollutant are missing (Continued)	4. Calculate an estimate based on data from other countries with a similar profile	Other applicable inventories are available, appropriate indexing data are available, and the source is consistent across the two inventories	Low to medium - depends on accessibility of other inventories	Nitric Acid production - Using production data as an indexing factor, estimate emissions from this category based on the emissions from countries with similar processes
Incomplete: Estimates for a source category are misallocated	1. Correctly allocate the emissions such that they are consistent with the IPCC guidelines	Emissions from the misallocated source category are easily transferred to the correct sector.	Low	Cement Production – If CO_2 combustion emissions from cement kilns are included in the industrial processes sector, transfer these emissions in their entirety to the energy sector.
Data: Incorrect, misapplied or undocumented emission factors	1. Use the IPCC default emission factor with the inventories activity data to calculate emissions	An applicable IPCC default emission factor is available for the category and can be used with the inventory's activity data	Low	Adipic acid production - Use the IPCC default emission factor and the activity data provided by the inventory to calculate emissions
	2. Use Tier I method to calculate the emissions for the source category	Activity data and an IPCC default factor are available	Medium to high - depends on availability of necessary activity data and emission factors and the complexity of the methodology	Rice Cultivation - Use Tier I method to calculate emissions based on an IPCC default factor and harvested acreage data from the FAO yearbook.
	3. If a default emission factor is not available, extrapolate an estimate based on data from other countries with a similar profile	Other applicable inventories are available, appropriate indexing data are available, and the source is consistent across the two inventories	Low to medium – depends on availability of other inventories	Wastewater Handling – Default emission factors are not available for all countries for this source category (see table 4-2). If data are not available, use population as an indexing factor and estimate emissions from this category based on the emissions from countries with similar processes.

Inventory Problem	Ranked Options for Adjustment/ Revision	Necessary Pre-conditions for Option	Resource Needs for Using Option (Low, Medium, High)	Example Application
Data: Incorrect, misapplied or undocumented activity data	1. Use readily available international data with the inventories emission factor to calculate emissions	Applicable activity data are available for the category and can be used with the inventory's emission factor	Low	Adipic Acid Production – Use activity data from the UN or the US Bureau of Mines with the default factor provided by the inventory to calculate emissions.
	2. Use Tier I method to calculate the emissions for the source category	Activity data and an IPCC default factor are available	Medium to high - depends on availability of necessary activity data and emission factors and the complexity of the methodology	Rice Cultivation - Use Tier I method to calculate emissions based on an IPCC default factor and harvested acreage data from the FAO yearbook.
	3. If international activity data is not available, extrapolate an estimate based on data from other countries with a similar profile	Other applicable inventories are available, appropriate indexing data are available, and the source is consistent across the two inventories	Low to medium – depends on availability of other inventories	Industrial Wastewater – International activity data is not readily available for all countries for this source category (see table 4-2). If data are not available, use the GNP as an indexing factor and estimate emissions from this category based on the emissions from countries with similar processes.

Inventory Problem	Ranked Options for Adjustment/ Revision	Necessary Pre-conditions for Option	Resource Needs for Using Option (Low, Medium, High)	Example Application
Methodological: Inappropriate method	1. Use Tier I method to calculate the emissions for the source category; consider applying a conservative factor if necessary.	Tier I method is available for the source and data to make the calculations are available	Medium to high - depends on availability of necessary activity data and emission factors and the complexity of the methodology	Prescribed Burning of Savanna - Use the Tier I method to calculate an estimate for prescribed burning of savanna based on FAO data and a default emission factor provided by IPCC
	2. Calculate an estimate based on data from a previous inventory; consider applying a conservative factor if necessary.	Previous inventories are available, appropriate indexing data are available, and the source is consistent across the two inventories	Low to medium - depends on availability of previous inventories	Ferroalloy Production – Using production data as an indexing factor, estimate emissions from this category by applying a growth factor to a previous year's inventory
	3. Calculate an estimate based on data from other countries with a similar profile; consider applying a conservative factor if necessary.	Other applicable inventories are available, appropriate indexing data are available, and the source is consistent across the two inventories	Low to medium - depends on accessibility of other inventories	Landfills - Using population data as an indexing factor, estimate emissions from this category based on the emissions from countries with similar waste management practices

Inventory Problem	Ranked Options for Adjustment/ Revision	Necessary Pre-conditions for Option	Resource Needs for Using Option (Low, Medium, High)	Example Application
Methodological: Time Series Inconsistency	Index the entire emissions estimate or a component of estimate (i.e., emission factor or activity data) for inconsistent years based on a factor from the most detailed and accurate data or methodology (can grow or backcast depending on most representative data or emissions estimate).	Appropriate Indexing data are available, and the source's activities are consistent across the time series	Medium - depends on level of manipulation necessary to use indexing data.	Lime Production - If a source uses a Tier I methodology to calculate emissions for each year between 1990 and 1998 and uses a Tier II methodology for 1999, use lime production as an indexing factor and recalculate the emissions for 1990-1998 based on the 1999 estimate. This ensures that the data is consistent across the time series and the most detailed data is utilized. NOTE: This method is not an option for calculating CO_2 emissions from fuel combustion.
	2. Use Tier I method to calculate the emissions for the inconsistent years	Tier I method is available for the source, data to make the calculations are accurate and available, and the source's activity is consistent over the time series	Medium - depends on accessibility of necessary activity data and emission factors	Industrial Wastewater Handling - Use the Tier I method to calculate an estimate for the inconsistent years for industrial wastewater handling using IPCC and a default emission factor provided by IPCC
	3. Use Tier I method to calculate the emissions for the entire time series	Tier I method is available for the source and data to make the calculations are accurate and available	Medium - depends on accessibility of necessary activity data and emission factors	Coal Mining - Use the Tier I method to calculate an estimate for coal mining based on data from OECD/IEA and a default emission factor provided by IPCC
Methodological: Temperature Adjustment	1. Remove the adjustment	The temperature adjustment is easy to remove, and is transparent	Low	CO_2 emissions from Fuel Combustion - If an inventory makes an adjustment to account for a year with record high temperatures, remove the adjustment, and report the unadjusted emissions

Inventory Problem	Ranked Options for Adjustment/ Revision	Necessary Pre-conditions for Option	Resource Needs for Using Option (Low, Medium, High)	Example Application
Methodological: Unsubstantiated Procedures	1. Use Tier I method to calculate the emissions for the source category	Tier I method is available for the source and data to make the calculations are available	Low to medium - depends on accessibility of necessary activity data and emission factors	Agricultural Soils - Use the Tier I method to calculate an estimate for agricultural soils using activity data from FAO and a default emission factor provided by IPCC
	2. Calculate an estimate based on data from a previous inventory	Previous inventories are available, appropriate indexing data are available, and the source is consistent across the two inventories	Low to medium - depends on availability of previous inventories	Iron & Steel Production - Using production data as an indexing factor, estimate emissions from this category by applying a growth factor to a previous year's inventory
	3. Calculate an estimate based on data from other countries with a similar profile	Other applicable inventories are available, appropriate indexing data are available, and the source is consistent across the two inventories	Low to medium - depends on accessibility of other inventories	Enteric Fermentation - Using animal population data as an indexing factor, estimate emissions from this category based on the emissions from countries with a similar ratio of animal types
Methodological: Reference Approach for combustion is not used and national estimate is unsubstantiated	1. Use Reference Approach to calculate the emissions for the source category	Fuel consumption data to make the calculations are available	Medium	Combustion - Use the Reference Approach to calculate emissions for combustion based on data from the IEA or UN and default emission factors provided by IPCC

Inventory Problem	Ranked Options for Adjustment/ Revision	Necessary Pre-conditions for Option	Resource Needs for Using Option (Low, Medium, High)	Example Application
Methodological: Inability of method to detect mitigation in base year	1. Backcast estimate for the base year based on data from a year that does reflect mitigation	Appropriate indexing data are available, the source's activities are consistent across the time series, and mitigation is constant across the time series	Medium - depends on level of manipulation necessary to use indexing data.	Ammonia Production - If a source calculates emissions that do not reflect mitigation techniques that are known to exist for the base year, 1990, and calculates emissions that do reflect mitigation techniques for each year between 1991 and 1999, use ammonia production as an indexing factor and backcast the emissions for 1990 based on a later estimate. This ensures that the mitigation techniques are represented in the base year.
	2. Recalculate emissions using inventory activity methods and data, basing all estimates on the same conservative data (i.e., no mitigation)	Data to make the calculations are accurate and available and the method used is easily replicated	Medium - depends on availability of data and level of detail of methodology	Oil & Natural Gas Production - Using data from the inventory, recalculate emission estimates for all years leaving out any adjustments due to mitigation techniques
	3. If a minimum control efficiency can be established that represents standard practice source-wide, apply the control efficiency to the final estimate	The penetration of controls in the source is known and the control efficiency value is representative	High	Adipic Acid Production - Develop a representative control efficiency factor from IPCC Good Practice Guidance and apply it to the final estimate of uncontrolled emissions.

Table 4-2. Availability of IPCC Default Methods and Suitable Indexing Factors by Sector/Source Category

Sector	Source Category	Is there an IPCC Tier I default top-down approach for this category?	Does the default method use readily available standard international activity data?	Does the default method provide a default emission factor?	Suitable indexing factor	Indexing considerations
Energy: Fuel Combustion	CO_2 Emissions	Yes (Reference Approach)	yes	yes	Not applicable	Indexing is not an option for this source category
	Non CO_2 Emissions	yes	yes	yes	fuel consumption	fuel consumption
Energy: Fugitive Emissions	Coal	yes	yes	yes	coal production	Emissions are based on both surface and underground mining. When indexing, it is important that the inventory used has a similar production breakdown between surface and underground mining.
	Oil and Natural Gas	yes	yes	yes	oil & gas production	Emissions are calculated for several production activities using different emission factors. When indexing, it is important that the inventory used has a similar activity breakdown.
Industrial Processes	Mineral Products[1]	yes	yes	yes (each category has own emission factor)	production	Emission factors for soda ash production vary depending on the type of production. When indexing, it is important that the inventory used has a similar breakdown in production type.
	Chemical Industry[2]	yes	yes	yes (each category has own emission factor)	production	Emissions from production of "other" chemicals will be specific to the chemical industries located in the country. Therefore, indexing for this particular category will be possible only if the inventory used has the same chemical industries classified as "other" in the same proportion.

Sector	Source Category	Is there an IPCC Tier I default top-down approach for this category?	Does the default method use readily available standard international activity data?	Does the default method provide a default emission factor?	Suitable indexing factor	Indexing considerations
Industrial Processes (Continued)	Metal Production[3]	yes	yes (although SF6 consumption data might be difficult to locate)	yes (each category has own emission factor)	production (or reducing agent if available)	Emissions from aluminum production vary depending on the type of production. When indexing, it is important that the inventory used has a similar breakdown in production type. Emissions from production of "other" metals will be specific to the metal industries located in the country. Therefore, indexing for this particular category will be possible only of the inventory used has the same metal industries classified as "other" in the same proportion.
	Production of Halocarbons and Sulphur Hexafluoride	yes	no	yes	Halocarbon production (preferred) or GNP[4]	It is preferable to index off halocarbon production data, but if these data are not readily available, growth factor adjustments based on GNP change from baseline should be considered.
	Consumption of Halocarbons and Sulphur Hexafluoride	yes	no	HFC/PFC emissions do not require an emission factor. Factors required for SF_6 are not provided	Halocarbon production (for HFC/PFC) and quantity of SF_6 in use (for SF_6) (preferred) or GNP[4]	Emissions from Consumption of SF_6 are based on several factors including loss factor and fraction of SF_6 remaining in equipment. When indexing, it is important that the inventory used has the same SF_6 usage patterns.

Sector	Source Category	Is there an IPCC Tier I default top-down approach for this category?	Does the default method use readily available standard international activity data?	Does the default method provide a default emission factor?	Suitable indexing factor	Indexing considerations
Agriculture	Enteric Fermentation	yes	yes	yes	animal population	Emissions are calculated for several types of animals, each with different emission factors. When indexing, it is important that the inventory used has the same breakdown in animal population or indexing is animal specific.
	Manure Management	yes	yes	yes	animal population	Emissions are calculated for several types of animals, each with different emission factors. When indexing, it is important that the inventory used has the same breakdown in animal population or indexing is animal specific.
	Rice Cultivation	yes	yes	yes	harvested area	Different types of management practices are used, each with a different emission factor. When indexing, it is important that the inventory used has the same breakdown in management practices.
	Agricultural Soils	yes	yes	yes	synthetic fertilizer consumption and production of nitrogen-fixing crops	Emissions depend on the type of soil management practices used. When indexing, it important that the inventory used has similar soil management practices.
	Prescribed Burning of Savanna	yes	yes	yes	area burned (actual)	Emissions depend on fraction of living biomass which varies from region to region. When indexing, it important that the inventory used has a similar fraction of living biomass.

Sector	Source Category	Is there an IPCC Tier I default top-down approach for this category?	Does the default method use readily available standard international activity data?	Does the default method provide a default emission factor?	Suitable indexing factor	Indexing considerations
Agriculture (Continued)	Field Burning of Agricultural Residues	yes	yes	yes	crop production	Emissions depend on the type of residue burning crops grown in each country. When indexing, it is important that the inventory used has a similar breakdown in crop production.
Waste	Solid Waste Disposal on Land	yes	yes	yes	population	Indexing is a good option as long as both inventories represent populations that generate similar types of waste and use similar waste management practices.
	Wastewater Handling	yes	yes	default values only available for some countries	population	Indexing is a good option as long as both inventories represent populations that generate similar types of waste and use similar wastewater management practices.
	Industrial Wastewater and Sludge Streams	yes	no (data on industrial output and wastewater/ sludge handling systems may be available for some countries)	default values only available for some countries	industrial output (preferred) or GNP[4]	Emissions are dependent on the types of industries and the types of wastewater and sludge handling practices used. When indexing, it is important that the inventory used has a similar industrial makeup and uses similar wastewater and sludge handling systems.
	Human Sewage	yes	no	yes	population	Indexing is a good option as long as the inventory used represents a population with similar lifestyle habits (i.e., protein consumption).

Table 4-2. Availability of IPCC Default Methods and Suitable Indexing Factors by Sector/Source Category

[1] Includes cement production, lime production, limestone and dolomite use, and soda ash production and use.
[2] Includes ammonia production, nitric acid production, adipic acid production, carbide production and the production of "other" chemicals
[3] Includes iron and steel production, ferroalloy production, aluminum production, and production of "other" metals.
[4] The use of GNP data should be limited to growth factor adjustments within a country.

- 81 -

UNITED STATES SUBMISSION ON ARTICLES 7 AND 8

Annual Reporting under Article 7.1

Article 7.1 provides that Annex I Parties shall incorporate into their annual inventories "the necessary supplementary information for the purposes of ensuring compliance with Article 3." Verification of a Party's compliance with Article 3.1 will require comparison of a Party's cumulative emissions during the commitment period with the assigned amount held at the end of the period. Therefore the information necessary to demonstrate compliance must include: a) national inventories prepared in accordance with Article 5.2 and b) information on Parties holdings, transfers and acquisitions of assigned amount. In the US view, both components should be mandatory under Article 7.1.

Since the current FCCC inventory reporting guidelines are not binding, it will be necessary to revise them for purposes of the Kyoto Protocol. We anticipate revision of the guidelines after completion of the trial period agreed at COP5, in order to incorporate IPCC good practice, and to reflect experiences gained during the trial period. Once revised, the inventory guidelines would be adopted as legally binding for the Protocol.

With respect to Parties' assigned amount, information would be reported from Parties' national registries in accordance with guidelines to be developed under Article 7.4 (see discussion of registries below, as well as our joint submission on registries). Prior to each commitment period, each Annex I Party would report the serial numbers of assigned amount units (AAUs) issued to quantify its entire initial assigned amount. (See the discussion of the base-year below.) Thereafter, each Annex I Party would be required to report under Article 7.1 the following information to the Secretariat annually in a standard electronic format:

a) Total assigned amount held in its national registry at the start of the year (i.e., serial numbers of assigned amount units (AAUs), emission reduction units (ERUs), and certified emission reductions (CERs));
b) Serial numbers of any AAUs issued into its national registry during the year pursuant to Articles 3.3 and 3.4 and the reasons for their issuances;
c) Serial numbers of AAUs, ERUs, and CERs transferred to another Party's national registry and identification of the acquiring Party(ies);
d) Serial numbers of AAUs, ERUs, and CERs acquired from another Party's national registry and identification of the transferring Party(ies);
e) Serial numbers of CERs acquired pursuant to Article 12;
f) Serial numbers of any AAUs, ERUs, and CERs that have been voluntarily moved into the Party's retirement account (see discussion under Article 7.4); and
g) Assigned Amount held in its national registry at the end of the year (i.e. serial numbers of AAUs, ERUs, and CERs).

At the end of the commitment period, additional information will be required for final verification of compliance with Article 3.1. At this time, all Annex I Parties must report the serial numbers of all units of assigned amount that have been placed in the Party's retirement account and the serial numbers of any assigned amount banked for the subsequent commitment period.

After completion of the methodological work and decisions on land use, land-use change and forestry, Parties must determine the appropriate format and timing for reporting of this information under this Article.

Modalities for the accounting of Assigned Amount

Article 7.4 requires the COP/MoP to decide upon modalities for the accounting of assigned amounts. The United States considers the development of guidelines for national registries to be necessary for the accounting of Parties' assigned amounts. Under these guidelines, each Annex I Party would be required to establish and maintain a computerized national registry to account for its assigned amount (including quantifying the initial assigned amount as serialized AAUs) and track any changes in its assigned amount. A Party's registry must contain a 'retirement account' to identify units of assigned amount set aside by the Party to meet its Article 3 commitments (i.e., to cover its emissions). A Party may choose to have additional accounts in their national registry to categorize assigned amount holdings, as long as each unit of assigned amount (AAU, ERU, or CER) held in the Party's registry appears in one and only one account within the registry. If a Party authorizes legal entities to hold assigned amount, then assigned amount held by legal entities must also be reflected in an account within the national registry. Parties' registries should be in place by the year prior to the start of the commitment period.

Guidelines for registries will ensure compatibility between national registries and standardize the accounting of assigned amount. This will facilitate compliance review and public accessibility, and ensure that transactions can occur instantaneously so that each unit of assigned amount is held in only one account, in one registry, at any given time. Any transfer of units between different accounts would be reflected in both accounts, i.e. a debit of serialized units in one account and a credit of the same serialized units in the other. These guidelines should also specify requirements for publicly accessible data to be maintained in each registry. The guidelines should require each Party to provide a publicly accessible interface that allows interested persons to query and view non-confidential information contained in the registry, including the minimum data elements. Additional views on registries are included in our joint submissions on the Kyoto mechanisms.

Because the provision of accurate inventory and assigned amount information is essential for verification of compliance with Article 3.1, the inventory, national registry and reporting (of emissions and assigned amount) obligations must be binding on all Annex I Parties. Both a regional economic integration organization (REIO) acting under Article 4 and individual Parties acting under Article 4 must meet reporting obligations with respect to national inventories and assigned amount accounting. The REIO must meet the requirements to demonstrate attainment of its total combined level of emission reductions; individual Parties of such REIO must meet the requirements because the information will be necessary to verify each Party's individual compliance with its reallocated target, in the event that the REIO fails to meet its combined target. Care will be needed to ensure that double counting of emissions or assigned amount does not occur.

Reporting of National Communications

With respect to national communications, Article 7.2 requires that national communications incorporate supplementary information "necessary to demonstrate compliance with [a Party's] commitments under this Protocol." In the US view, the supplemental information required by Article 7.2 refers to information on implementation of those elements that are unique to the Protocol, specifically:

- National systems for greenhouse gas estimation under Article 5.1;
- National registries for tracking assigned amount under Article 7.4; and
- The mechanisms and any rules thereunder.

Information on implementation of broader commitments that are already reported in national communications under the Convention would still be provided in national communications, but would not be considered 'necessary supplementary information' for purposes of the Protocol. Annex I Parties should be required to submit national communications once during the commitment period.

Since quantitative information (i.e. inventories and assigned amount) would be reported annually under Article 7.1, this information would not be reported again in detail in national communications. Rather Parties would communicate qualitative descriptions of how it is implementing these obligations. For example, we envisage that each Annex I Party would describe the institutions involved, data sources and legal authority for collecting and maintaining its national greenhouse gas inventory under 5.1, and similarly its registry under Article 7.4. Additionally, each Annex I Parties that uses one or more of the mechanisms would be required to describe its implementation of the mechanism(s) in the context of agreed eligibility requirements.

Because national enforcement will be crucial to a Party's compliance with the Article 3 targets, the United States believes that Annex I Parties should also provide information on the national compliance and enforcement programs they have in place to meet Article 3.1 commitments. Specifically, Parties should report on the legal authority for, implementation and effectiveness of these programs, as well as a description of the effectiveness of these programs and a summary of actions to identify, prevent, address and enforce against cases of non-compliance with domestic law. Parties would also describe any provisions for making public information related to compliance and enforcement.

We will provide further detail on our recommendations for national communication reporting requirements in future submissions.

Annual Review Process

Article 8 provides that information submitted under Article 7.1 is to be reviewed as part of the "annual compilation and accounting of emission inventories and assigned amount". In the US view, the annual review is composed of three sub-tasks: (1) the inventory review and

calculation of adjustments[1]; (2) the review of assigned amount information; and (3) the compilation and accounting of emissions and assigned amount.

The inventory review trial period under the FCCC will undoubtedly provide much insight into the design of the review process for the Kyoto Protocol. However, the inventory review must be intensified to provide a thorough review of the inventory methodologies and use of good practice. Additional time and resources will also be required for the calculation and application of adjustments. Depending on the timing of submission of information, the annual review process may also need to review the measurement and reporting of emissions and removals from sinks for consistency with rules to be developed under Articles 3.3 and 3.4.

Straightforward and detailed guidelines for identification of inventory problems and for calculation of adjustments will enable the review team to perform its task objectively and consistently; and will assist the compliance body in deciding which cases to take up, in accordance with its screening rules. Since a review team's identification of egregious inventory reporting problems (adjusted or not) could lead to the loss of a Party's eligibility to participate in the mechanisms and other consequences, inventory review guidelines must leave no ambiguity about what constitutes an egregious problem.

The second sub-task is the review of assigned amount information in annual reports. This should entail cross-checking of reported information across Parties to ensure that the quantity and serial numbers of units reported as transferred match those reported as acquired, and that each unit appears in only one Party's registry. The assigned amount review should also verify that no transfers or acquisitions have been made by Parties determined to be ineligible to participate in the mechanisms (by the compliance body).

If a problem with a Party's inventory or assigned amount reporting is identified during the annual review, the Party would be provided with the opportunity to provide additional information and/or correct the problem within a predetermined timeframe. If the Party concerned agrees, the review team may schedule a country-visit to gather more information, or clarify the potential problem. We envisage that completion of these two stages of the annual review process (for all Annex I Parties) would require 4 to 6 months**.**

The third sub-task of the review is "the annual compilation and accounting for emissions inventories and assigned amounts", which would occur upon completion of the inventory and assigned amount review. The Secretariat would maintain a public electronic database where emissions and assigned amount information would be compiled for each Party. This information would contain:

- The Party's initial assigned amount in serialized units (calculated pursuant to Articles 3.5, 3.7, 3.8, and reviewed as noted above);

---

[1] As noted above, the full adjustment procedure spans the review and compliance procedures. Review teams would calculate adjustments, and provide Parties the opportunity to accept these adjustments. Where Parties do not accept the adjustment, or where reporting problems are egregious, the compliance body would resolve the issue, and determine consequences, including, as appropriate, the application of adjustments or loss of access to the mechanisms.

- Annual emissions and any adjustments, calculated and applied in accordance with Article 5.2;
- Cumulative emissions (including adjustments);
- Changes to assigned amount under Articles 3.3 and 3.4;
- Annual and cumulative reported transfers and acquisitions of assigned amount (under 3.10, 3.11, and 3.12) and any discrepancies;
- Units held in the Party's retirement account; and
- Total holdings of assigned amount in the Party's registry at the end of the year (i.e., serial numbers of AAUs, ERUs, and CERs).

The review team would update the database annually. During the commitment period, this information would be used solely to track Parties' emissions and assigned amounts. However, at the end of commitment period, the review team would use this information to determine whether a Party's cumulative emissions are less than or equal to a Party's final assigned amount. This final step would occur after expiration of the preset 'true-up period' to allow Parties to make any final transfers and acquisitions. At this time, Parties would also report serial numbers of any AAUs, ERUs, and CERs that they intend to bank into the next commitment period pursuant to 3.13. This information would be reflected in the Secretariat's accounts for those Parties.

Upon completion of the annual review, and the compilation and accounting of emissions and assigned amount, all of the review team reports, in addition to the questions identified therein, would be forwarded to compliance body for consideration. The compliance body would determine which cases to pursue, in accordance with its screening rules.

The stages of the annual review process outlined here will require significant time and resources. The use of ad hoc expert review teams, as under the Convention, may not ensure the requisite technical expertise, nor the consistency and time commitment required for timely completion of the annual review under the Protocol. For this reason, consideration is needed of the structure and composition of review teams, as well as the procedures (e.g. testing or training) to ensure the technical expertise of the teams. It may be useful to consider the potential use of consultants or private sector auditors in the review process. In the US view, such outside experts could perform parts of the review process that are highly objective or that involve very routine procedures. However, outside experts should only provide input to the review teams; they should not be involved in decision making, nor in review tasks that require subjective judgement. Parties will need to resolve these questions in the guidelines for the review process.

National Communication Review Process

The US considers that the review of national communications should focus on those aspects of implementation that are unique and critical to the Kyoto Protocol. As we stated above, these aspects are the national system under Article 5.1, the national registry under Article 7.4, implementation of the mechanisms, and domestic enforcement programs. These components are critical to ensuring a Party's compliance with the Protocol. Review teams under Article 8 should not review individual Article 12 projects, as these projects, and the CERs generated by them, will be reviewed by the institutions established under the Clean Development

Mechanism. Further consideration must be given to the design of an appropriate process to audit Article 6 projects under Article 6 or 8.

The periodic national communication review differs from the annual review of quantitative information, in that it is primarily a qualitative review. We envisage that it would occur once per commitment period (although we note that problems identified during the annual review may necessitate an in-country visit to elucidate the problem). Since the quality of Parties' national inventory systems and national assigned amount registries determine their ability to accurately track and report emissions and assigned amount, we believe that the bulk of the review should focus on these aspects. As we noted with respect to the annual review process, it may be useful to consider how outside experts (consultants and auditors) might be used to expedite the review process and assist the work of the expert teams.

Guidelines for all aspects of the review process must be developed to ensure consistency and objectivity.

Baseyear Review and Establishment of Initial Assigned Amount

In closing, we note that the inventory base-year merits special consideration. In the US view, the initial assigned amounts of Annex I Parties must be formally quantified to represent tonnes of carbon dioxide equivalent to provide certainty to countries regarding the level of their Article 3 targets. To enable establishment of initial assigned amounts, base-year inventories must be reviewed prior to the commitment period in conjunction with review of Parties' national systems. Parties should also be required to designate their selection of base-year for the high GWP gases at this time. This review would occur in accordance with the guidelines for the Article 8 review. Parties would have the opportunity to correct any inventory deficiencies, and would be subject to adjustments for any deficiencies that are not corrected. Once the base-year inventory has been reviewed and, as appropriate adjusted, the Party's initial assigned amount would be established in tonnes of carbon dioxide equivalent units. This number would be recorded in the Secretariat official account for that Party. Prior to the commitment period, the Party would serialize its initial assigned amount in its national registry, and report this information to the Secretariat. Although the base-year review and establishment of initial assigned amounts could potentially occur as late as 2007 (at which time Annex I Parties are required to have their national systems in place), we recommend that the decision allow Parties to voluntarily undergo the base-year review sooner, in order to have more time to prepare for the commitment period and to correct any inventory problems that may be identified.

Technical Workshop

Finally, the United States would like to offer views on the structure and focus of the upcoming workshop on Articles 5, 7 and 8. In our view, the elements requiring the most technical elaboration are the guidelines for national systems under Article 5.1 and the methodologies for adjustments under Article 5.2. We acknowledge that there will be technical issues involved in the development of guidelines under Articles 7 and 8. However, we believe that it would be premature to address these Articles before further progress has been made in other negotiating areas (i.e., the Kyoto Mechanisms) and on Articles 5.1 and 5.2. For this reason, we recommend that the Secretariat establish two working groups at the technical

workshop: one on guidelines for national systems under 5.1 and a second on adjustments under Article 5.2. The 5.2 working group should consider options for defining objective criteria for egregious inventory problems and methodologies for adjusting specific inventory problems.

UNITED STATES SUBMISSION ON KYOTO MECHANISMS: LINKAGES WITH ARTICLES 5 AND 7

- There is an important linkage between the Kyoto mechanisms and Articles 5 and 7 in the form of mechanism eligibility requirements:

  -- Article 6 (joint implementation) denies the ability to acquire JI units to a Party not in compliance with its obligations under Articles 5 and 7.

  -- Proposals on Article 17 (emissions trading) and Article 12 (CDM) make similar linkages between mechanism eligibility and non-compliance with Articles 5 and 7.

- The substantive issue that arises is what kind/level of inconsistency with obligations under Articles 5 and 7 should trigger the full or partial loss of access to Kyoto mechanisms.

- Non-compliance with obligations under Articles 5 and 7, for the purpose of mechanism eligibility (as opposed to non-compliance with such articles generally), should be linked directly to the environmental integrity of the mechanisms.

- As such, a Party should lose full or partial access (depending on the mechanism in question) to a mechanism when it is in non-compliance with the inventory- and registry-related obligations in Articles 5 and 7.

- Recognizing that Article 5.2 is an inventory-related obligation (and would therefore be relevant to mechanism eligibility), a second issue is what role "adjustments" play in determining non-compliance with Article 5.2. Article 5.2 provides that, where IPCC methodologies are not used for estimating emissions and removals, "appropriate adjustments shall be applied" according to methodologies agreed upon by the COP/moP at its first session.

- The application of adjustments will prevent a Party from being in non-compliance with Article 5.2, provided:

  -- the Parties can agree upon methodologies that result in adjustments that are sufficiently conservative so as to give appropriate assurance that inventory estimates are not underestimated and to provide Parties with incentives to use 'good practice' in inventory preparation; and

  -- that particularly egregious cases of not following IPCC methodologies (with egregiousness being based on objective criteria) be considered cases of non-compliance with obligations under Article 5.2.

- The focus on inventory- and registry-related obligations under Articles 5 and 7 would be relevant only to mechanism eligibility requirements (and would be included in mechanism rules); the assessment generally of whether a Party is in non-compliance with Articles 5 and 7 would not be limited to inventory- and registry-related obligations.

- (The role that adjustments play in determining non-compliance with Article 5.2 would be relevant not only to mechanism eligibility requirements, but also to a general assessment of whether a Party were in non-compliance with Articles 5 and 7.)

- - - - -