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METHODOLOGICAL ISSUES

Experience in the use of the UNFCCC reporting guidelines on annual inventories by Annex I Parties and alternative formats for sectoral background data tables 5A-D on land-use change and forestry of the common reporting format

Submissions from Parties

Note by the secretariat

1. At its fifth session, by its decision 3/CP.5, the Conference of the Parties decided to invite Parties included in Annex I to the Convention to submit separately, by 1 July 2001, information to the secretariat on experiences with using the UNFCCC reporting guidelines on annual inventories, in particular the common reporting format, in the years 2000-2001 (FCCC/CP/1999/6/Add.1).
2. At its tenth session, the Subsidiary Body for Scientific and Technological Advice requested Parties included in Annex I to the Convention that are not using the sectoral background data tables 5A-D on land-use change and forestry of the common reporting format to specify alternative formats, and to submit them to the secretariat by 1 July 2001 (FCCC/SBSTA/1999/6, para. 27 (g)).
3. The secretariat has received six submissions* on experiences using the UNFCCC guidelines on annual inventories and two submissions on alternative formats for sectoral background data tables 5A-D on land-use change and forestry of the common reporting format. 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.

* In order to make these submissions available on electronic systems, including the World Wide Web, these submissions have been electronically imported. The secretariat has made every effort to ensure the correct reproduction of the texts as submitted.

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on annual inventories, in particular the common reporting format**

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PAPER NO. 1: AUSTRALIA

COMMENTS ON THE INVENTORY REPORTING GUIDELINES AND TRIAL COMMON REPORTING FORMAT TABLES

At the fifth Conference of Parties, Annex I Parties were invited to submit, separately, by 1st July 2001, information to the secretariat on experiences with using the Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part 1: UNFCCC reporting guidelines on annual inventory, in particular the CRF, in the years 2000-2001 [Decision 3/CP5]. This submission is Australia's response to this request.

Inventory Reporting Guidelines

Generally, the Guidelines are easy to follow and provide clear instructions on the reporting requirements. Two issues have been identified in relation to the content of the National Inventory Report.

Common reporting format (CRF) tables and Calculation sheets

FCCC/CP/1997/7 paragraph 33 (a,b) indicate that Parties should include the common reporting format tables and calculations sheets for all years from the base year to the current annual inventory submission in the national inventory report. As most Parties now have inventories for tens years, and will continue to produce inventories, this is a significant amount of information to produce each year. Provision of this information as a printed document will also become impractical.

Detailed information on emissions (by subsector by gas) is now available for all years in the trial common reporting format (CRF). There is little value in providing the CRF tables and calculation sheets for every year when there had been no change in methodology.

Australia suggests that:

- Provision of CRF tables and calculation sheets should be limited to years where there has been a recalculation.
- Calculation sheets should only be provided for those sectors where the methodology or data has been changed.
- Tables should be provided to the Secretariat in electronic format only.

Description of Methodologies

FCCC/CP/1997/7 paragraph 33 (c,d,e,f) indicates that the national inventory report should contain a description of the specific methodologies and assumptions used in each sector. Australia predominantly uses Tier 2 level country specific methodologies, which are documented in a series of methodology workbooks. The national inventory report refers readers to the workbooks rather than repeat the methodology. Australia's methodology workbooks have been provided to the Secretariat and are available on the Australian Greenhouse Office website.

Australia suggests that the following footnote be added to 33(c)

- Where methodologies and assumption are described in a separate report the national inventory report should reference the methodology report and include a brief description of the methodology (level of complexity, IPCC default or country specific and anticipated improvements).

Trial Common Reporting Format Tables

Overall the trial common reporting format (CRF) tables were relatively straight forward to use and are a major improvement on the previous templates. A number of issues have been identified which effect the reporting and management of the CRF.

1. Land Use Change and Forestry

1.1 Table 5

Forest and Grassland Conversion

Both the IPCC and Australian methodologies for estimating emissions from Forest and Grassland Conversion require an estimation of the net emissions. This involves estimating CO₂ emissions from cleared biomass and the CO₂ removals associated with regrowth of vegetation (crops, pasture and woody regrowth) after clearing. However, the trial CRF tables prevent reporting of net emissions under this subsector (cells are shaded and are locked). All other LUCF subsectors allow transparent reporting of emissions, removals and the net emissions/removals.

Footnote 2 on CRF Table 5 states only emissions of CO₂ from F&GC are to be included in 5B, while associated removals should be reported under 5D (CO₂ Emissions and Removals from Soil). The regrowth sink is not a removal from soils. Thus the trial CRF tables obstructs reporting emissions and removals associated with Forest and Grassland Conversion in a transparent manner.

The UNFCCC reporting guidelines on annual inventories [FCCC/CP/1999/7 Paragraph 14] indicate that greenhouse gas emissions and removals should be presented on a gas-by-gas basis in units of mass *with emissions by sources listed separately from removals by sinks*. We should, therefore, do this for all subsectors where possible.

Australia recommends the removal of the shading from the CO₂ removals and net emissions/removals columns to enable transparent reporting of emissions and removals associated with forest and grassland conversion. This will make it consistent with the reporting of the remaining subsectors of the Land Use Change and Forestry Subsector and the IPCC Guidelines.

These modification were made to the CRF in Australia's 1999 Greenhouse Gas Inventory (2001 Submission).

Indirect Greenhouse Gases

When biomass is burnt, emissions of NMVOC may occur. Table 5 does not include a column for reporting of NMVOC emissions but Summary 1.A requires reporting of MNVOC for LUCF. For consistency with other Sectoral Tables, an NMVOC column should be included in Table 5 with links to Summary 1.A.

1.2 Tables 5A-D

The sectoral background tables for the Land Use Change and Forestry sector have not been completed as Australian uses a country-specific methodology.

2. Energy

2.1 Table 1.A(a)s3

The fuel types used in Table 1.A(a) sheets 1,2 and 4 differ from those used in Sheet 3. This causes problems when the emissions/activity data are totalled. For example, as Liquid Petroleum Gas is not explicitly listed as a fuel under *b. Road Transportation*, it is inserted under “*Other Fuels*”. This means it sums in the wrong place in Table 1.A(a)s1, being attributed to “*Other Fuels*” rather than “*Liquid Fuels*”. There are two options to resolve this problem:

1. Make all fuel types consistent with those in the other sheets. This would however, result in a loss of the detailed information currently available
2. *b. Road Transportation* include either “*Liquid Petroleum Gas*” or “*Other liquid fossil*”.
c. Railways include “*Gaseous Fuels*”
d Navigation include “*Gaseous Fuels*” and “*Gasoline*”

2.2 Tables 1.A(b), 1.A(c) and 1.A(d) (Reference Approach)

Reconciliation of the Reference and National approaches

Energy consumption cannot be reconciled between the National and Reference approaches as the CRF tables do not allow for the subtraction of the energy content of the fuels whose carbon is sequestered, combusted or otherwise emitted for non-energy purposes.

Under the National approach, greenhouse gas emissions from fossil fuels combusted or otherwise emitted for non-energy purposes are reported elsewhere in the inventory. Thus energy consumption reported for the Reference approach includes the energy from the following sources which are netted out in the National approach:

- liquid fossil carbon emitted as CO₂ and methane from flaring at refineries, after the carbon has been counted in crude oil (reported in Table 1.B.2);
- liquid fossil carbon in the form of petroleum coke emitted as CO₂ from the oxidation of carbon anodes at aluminium smelting plants (reported in Table 2(I)s1);
- liquid fossil carbon in solvents emitted as CO₂ at waste disposal facilities (reported in Table 3.A-D if not combusted and Table 6.C if combusted).
- gaseous fossil carbon in natural gas emitted as methane and NMVOCs in gas transmission and distribution leakage (also reported in Table 1.B.2).

Tables 1.A(b) and 1.A(d) should be modified to enable full reconciliation of the National and Reference approaches. This could be achieved through the addition of three rows to table 1.A(b), namely:

- Liquid Fossil Totals – Adjusted
- Solid Fuels Total – Adjusted
- Gaseous Fossil Total – Adjusted.

Total apparent energy consumption would be adjusted using the data on feedstock and non-energy use of fuels reported in table 1.A(d). Table 1.A(d) would need to be modified, with

two sections 1) feedstock fuels and 2) non-energy use fuel, recording the quantity of fuel and carbon grouped and totalled for liquid fossil fuels, solid fuels and gaseous fossil fuels.

Additional fuel types

The list of liquid fuel types in Table 1.A(b) is insufficiently disaggregated. Additional fuel types required include:

- Liquid Fossil Primary Fuels
 - Disaggregate Natural Gas Liquids into LPG and Condensate
- Liquid Fossil Secondary Fuels
 - Solvents
- Gaseous Fossil Fuels
 - Ethane
 - Coal seam methane (both mine waste and “virgin” coal seam methane)

2.3 Table 1.B.2

Table 1.B.2 does not allow for reporting of emissions of N₂O under source category *1.B.2.a Oil*. Minor emissions of N₂O do occur from flaring under *iv. Refining/ Storage* and to a minor extent under *i. Exploration*.

3. Agriculture

The sectoral background tables for 4A and 4B(a) ask for additional information disaggregated to the split actually used. If Australia were to supply information at the finest level of classification used the number of tables would become impractical (eg. 7 States, by 7 beef cattle classes, by 4 seasons). To circumvent this we have presented weighted averages. The fully disaggregated information is supplied in Australia’s inventory methodology workbooks.

4. Industrial Processes

4.1 Reporting of SF₆

The CRF summary tables report HFCs and PFCs as CO₂-e emissions, whereas SF₆ is reported as the amount emitted. Given the small quantities of SF₆, consideration should be given to reporting SF₆ in CO₂-e. The current reporting format could cause confusion with SF₆ emission appearing to be zero in table 2(I) and summary 1.A and 1.B but with emission being recorded in summary table 2.

4.2 Alumina Sink

Under aluminium in the background table 2(I)A-G, entering of the alumina sink should be permitted.

5. Trends

A new table with a similar level of disaggregation to sheets 1-3 of Table 10 reporting CO₂-e emissions would be a useful addition.

Consideration should to be given to the presentation of the trend tables in the long term, particularly for production of hardcopy inventories. The current period covered by the tables

(1990 to 1999) already requires adjustment to fit the table to a page. Further reductions in size will make the font difficult to read.

6. General Comments

6.1 File Management

- The CRF file is very large. This caused some problems when e-mailing or saving the file to disk. This problem will only increase over time if methodology changes result in recalculations (Table 8(a)) back to 1990.
- Making changes to the front end dialogue box (inventory year, contacts and submission year) frequently caused the computer to lock up. The only way to resolve the problem was to reboot the computer and keep trying to make the changes until it worked.
- The CRF sometimes advises run time errors. Our consultant believes one of these errors is associated with the country, year and submission routine, but has been unable to identify the cause of other error messages. While these errors do not appear to pose a problem (simply hit End the Debug session) it is worth addressing.
- “Other” buttons started moving around the spreadsheet during the compilation of the inventory. It was not clear what was causing this to happen or how we could fix it.
- Duplication of the Recalculation sheets does not allow entering of the appropriate year. The final year entered on sheet 2, seems to override all other entries. We overcame this problem by making a copy of the table in a new document and then moving it back in once completed.
- We experienced significant problems printing tables where the Submission 2001 text extended past the last data column. Although these pages were set to print to one page, the last couple of digits would print on a second page. We either had to extend the last column or move the text to a different column.
- Documentation boxes- some, particularly for the agriculture sector, would be improved if they were extended across the page.

6.2 Gases without GWPs

Sectoral background data sheets do not always cover all gases emitted (eg. NMVOC, NO_x, SO₂) but these gases are required in the summary tables. Therefore, there is no record of the implied emissions factors.

6.3 Shading

Now that a number of countries have used the tables to complete their inventories, the shading in the tables should be re-evaluated. In some cases, cells for which emissions estimates are available are shaded, while in others where no estimate is likely there is no shading.

6.4 Other – inserting a blank line

As countries are required to fill in all cells, it would be very useful if the blank line was removed from all “other” categories, as this will reduce the number of NA’s Parties need to fill in. Additionally the insert line button should just add a blank line rather than require you to add text. This made it difficult to remove or change the order of items and often resulted in a blank line at the bottom which needed to be deleted or have NA’s inserted.

6.5 Implied emission factors

As the implied emission factor columns are listed before the emissions it suggests that the emissions were calculated using the emission factors, which in many cases is incorrect. Consideration could be made to moving these EF columns to the end.

There is a general problem relating to the in-built formulae used to display implied emission factors. In some instances, particularly in the fugitive subsector, it is possible to report an activity figure but not an emission estimate; instead a NE or IE is reported. Where this occurs the implied emission factor cell returns an error and displays: VALUE!. Overwriting the formula in the relevant cell seems to be the only way to rectify this problem. Is there any way to remove the error statements automatically?

6.6 Carriage of NE and NA through to totals

A significant amount of time was spent filling in NE and NA into totals. Is an automated process available to do this?

PAPER NO. 2: CANADA

EXPERIENCES USING GUIDELINES FOR THE PREPARATION OF NATIONAL COMMUNICATIONS

As requested by Decision 3/C.P.5, Canada would like to offer its views on experiences using the reporting guidelines for National Communications as contained in document FCCC/CP/1999/7, in particular those related to the Common Reporting Format (CRF).

The current reporting guidelines, as outlined in FCCC/CP/1999/7, require a National Inventory Report (NIR), which includes disaggregated emission factors (EF's), activity data, calculation sheets and the CRF. Canada views the NIR as the key document for ensuring transparency of emission reporting while also permitting flexibility to accommodate country specific methods and data collected according to country circumstances. While the reporting of inventory information in the CRF has proven to be useful in ensuring Parties report in a consistent and comparable manner, it is clear that the National Inventory Report is necessary for conducting an in-depth inventory review.

Canada's experience over the last two years following the new reporting guidelines is generally positive. The new guidelines have improved the standard for reporting greenhouse gas information. Canada has discovered during the trial period that the reporting burden is large, but there may be opportunities to reduce this.

Canada recognizes the importance and supports the need for detailed emission information to ensure completeness, comparability, consistency and transparency. According to paragraphs 27 and 33 of the guidelines Parties are required to submit complete inventory information in the CRF format for all years from the base year to the current year. These guidelines and the way in which the CRF tables are structured and packaged results in a very large reporting burden. For example Canada's 2001 submission consisted of over 600 pages of CRF tables. This did provide a complete database of CRF information including implied emission factors and aggregate activity data for all years. Given this volume of reporting and the tight timelines for submission, it is very difficult to perform rigorous quality control before submission. One way in which to improve the ability to undertake QA/QC would be to eliminate duplicate information reporting.

Many of the CRF tables submitted in accordance with the guidelines are duplicates or near duplicates of other tables within the submission. This is because the CRF is designed for one years' data and when multiple years of data are submitted there is a large amount of repetition of information. It is estimated that in a submission including data for all years, about 20% of the tables are duplicates. Canada feels the following tables are repetitive or duplicate information when submitting multiple years of data:

Summary 3 - Summary Report for Methods and Emission Factors Used (two pages)
Table 7 - Overview Table for National Greenhouse Gas Inventories (three pages)
Table 8b - Recalculation- Explanatory Information (at least one page)
Table 9 - Completeness (two pages)
Table 10 - Emission Trends (five pages)
Check list - (one page)

It is Canada's experience that the level of detail required in the tables on the CRF affected the ease of reporting. Generally the reporting of aggregate activity data, used to derive implied emission factors, was relatively straight forward, but methodological details such as MCF's, numbers of coal mines and gas wells were often not available or not relevant to the Canadian method. For example the fuel combustion section of the tables was relatively simple to complete while the waste section required significant amounts of information that were not relevant to the current Canadian methods or were not readily available. In fact some of the CRF tables such as the Agriculture tables almost duplicate calculation sheets for an IPCC tier 2 method. This information is required in detail in the NIR in a format consistent with a countries national circumstances.

Recommendations

To ease and encourage complete reporting, Canada would like to see the CRF reporting streamlined, by eliminating reporting of duplicate information within the submission. This could be done by making available a complete CRF package which includes all the tables required for all years rather than what is currently available (i.e. individual year by year CRF table sets) and thus eliminate duplicate tables such as the trends table and others listed above. This should minimize duplication within the CRF and provide Parties with one complete CRF package.

Canada would like to propose that the CRF component of the national inventory submission be modified to reduce duplication with the information in the National Inventory Report. The CRF should include aggregate activity data and emissions for the purpose of providing emission data and implied emission factors, which are comparable among Parties, methodological details should not be included in the CRF. Given that Parties agreed to provide an annual NIR that describes methods, changes to methods, disaggregated emission factors and activity data, detailed background information on the specific methods used is unnecessary and should not be duplicated in the CRF section of the inventory submission.

It is Canada's view that these minor suggestions will improve the quality of national submissions, and their transparency as well reduce the reporting burden.

PAPER NO. 3: NEW ZEALAND

**NEW ZEALAND SUBMISSION ON
ANNUAL INVENTORY GUIDELINES INCLUDING THE CRF
AND
REPORTING TABLES FOR LUCF**

Parties included in Annex I to the Convention have been invited to submit, by 1 July 2001, information to the secretariat on experiences with using the UNFCCC reporting guidelines on annual inventories in the years 2000 and 2001, in particular the common reporting format. In addition, Annex I Parties not using the sectoral background tables 5A-D on land-use change and forestry of the Common Reporting Format, are invited to submit alternative formats by 1 July 2001. This submission provides some general comments on the guidelines and the CRF as well as some specific comments on areas for change/improvement.

General comments

New Zealand has submitted two annual inventories (submitted in April 2000 and April 2001) using the UNFCCC reporting guidelines and the Common Reporting Format (CRF). In these submissions, New Zealand did not use the sectoral background tables 5A-D on land-use change and forestry.

New Zealand's experience with the reporting guidelines and the CRF has generally been positive overall. We recognise the need to assist Annex I Parties with their greenhouse gas inventory reporting to improve the reporting of inventory information under the UNFCCC and to prepare the way for the increased reporting requirements under the Kyoto Protocol. The UNFCCC reporting guidelines together with the CRF have provided a major step forward in this respect.

The CRF provides a solid reporting framework, which although somewhat daunting on first exposure, is (with a few exceptions) reasonably logical in its approach. Particularly useful within the CRF are the recalculation tables (Tables 8(a) and 8(b)) which greatly assist in the ease and transparency of reporting recalculated estimates, and the trends tables (Table 10, sheets 1 to 5) which provide useful summary level information. In New Zealand's experience, it is these trends tables which are of most interest to people seeking inventory information from the government.

Specific comments

- Although the UNFCCC reporting guidelines request calculation tables for all sectors for all years from the base year, and CRF tables for all years from the base year in each annual National Inventory Report, this is beginning to amount to a very large amount of data. We suggest that Parties might re-examine the need for all of this information to be supplied annually. One approach might be to only provide the full set of calculation tables and CRF tables in electronic format, with the hard copy being limited to data for the current year. Another approach would be for Parties to report the full set of data from the base year only when it has changed as a result of revisions/recalculations. Perhaps as well as reporting the current year, the previous year should also be reported. This would be moving towards the current year being viewed as "provisional" and the previous year (current year - 1) becoming "finalised".

Any subsequent changes to it would then be viewed as “revisions”. This is along the lines of accepted official statistics treatment of time series when changes occur.

- The CRF tables for reporting emissions of HFCs, PFCs and SF₆ combine emissions from the use of these gases with emissions of these gases from industrial processing. In particular, this means that trends information regarding PFC emissions from aluminium smelting is combined with trends information from the use of PFCs (mainly as replacements for ozone depleting substances). One approach might be to report industrial process emissions of PFCs in the *Industrial Processes* sector and report emissions from the use of HFCs, PFCs and SF₆ in the *Solvent and other Product Use* sector.
- In the CRF **Table Summary 2**, the GWP for SF₆ needs to be removed from the formula for cells G20, 21, 23, 24, and 25 as SF₆ data imported into this table is already in CO₂ equivalents.
- The order of source categories is not consistent in the *agriculture sector* **Tables 4.B(a) and 4.B(b) Sectoral Background Data for Agriculture**.
- **Table 4.B(a) Sectoral Background Data for Agriculture** makes no provision for adding “other”.
- More clarity could be provided in the UNFCCC guidelines on the use of the standard indicators (NO, NE, NA, IE and 0).
- It might also be useful for Parties to have some guidance on “rounding” numbers that go into the CRF, and also guidance on how many significant digits to enter into the tables (given that the CRF rounds most numbers to two decimal places).
- In **Table 1.A(a)s3 Fuel Combustion Activities-Sectoral Approach**, currently, a link is set up to include civil aviation fuel use under **Transport Gasoline** total. Similarly, the **Transport Diesel** total includes all other liquid fuels not included under the Transport Gasoline total. This partial separation could be improved/altered, in particular, keeping the aviation fuels separate since they have different fuel specifications to automotive gasoline.
- Currently New Zealand's fugitive emissions from geothermal activities (electricity generation) are recorded in **Table 1.B.2 Fugitive Emissions from Oil and Natural Gas**, as there is no sheet titled "Fugitive Emissions from Other Sources". Although the “other” category for fugitive emissions was added expressly at the request of New Zealand to enable us to continue to report fugitive emissions from geothermal activities, it is a little misleading to have such emissions included on a table dealing with oil and natural gas. Perhaps the most straightforward solution would be to change the title to “Fugitive Emissions from Oil, Natural Gas and Other Sources”.
- The total CO₂ equivalent emissions without LUCF in Table 2 differs from the total CO₂ equivalent emissions (without CO₂ from LUCF) in Table 10 (Sheet 5 of 5) because of the inclusion of the non-CO₂ emissions from LUCF being included in one

total and not in the other. Also, if the numbers in the sector table of Table 10 (Sheet 5 of 5) are totalled, they do not equal the total in the “by gas” table above it. Although footnotes are provided to both Table 2 and Table 10, perhaps it could be made clearer that the totals will be different if Parties have reported non-CO₂ gases in the LUCF sector.

Reporting Tables for Land Use Change and Forestry

New Zealand has reported LUCF data using CRF Table 5 together with a series of calculation sheets presented in the National Inventory Report.

In their current form, New Zealand could fill in sectoral background tables 5A-D, but this would require taking the numbers produced by the New Zealand methodology, and applying a “back-calculation” to make the data fit the tables. Putting data into these tables would not be representative of the method used to derive the estimates, would not bear much relationship to the actual calculations used, and it is likely that the resulting tables would be incomplete.

At this stage we do not have an alternative format to suggest as a replacement for sectoral background tables 5A-D. We note that the work on good practice guidance for the *Land Use Change and Forestry* sector has yet to begin. Redevelopment of tables 5A-D should take place in the context of good practice. Also, the objectives for these tables should be the same as for other tables in the CRF i.e. that they provide a minimum subset of data necessary for the process, but do not just provide steps in the calculations used.

New Zealand is willing to work with the other Parties and the secretariat to redevelop these tables into a form which meets the objectives of the CRF and but that also reflects national circumstances.

PAPER NO. 4: NORWAY

COMMENTS FROM NORWAY TO COMMON REPORTING FORMAT (CRF).

We hereby send our remarks to the Common Reporting Format (CRF). Most of them have already been given in our report Greenhouse Gas Emissions in Norway 1990-99 – Reporting according to the UNFCCC Guidelines (SFT 2001).

In addition to our remarks to the CRF we also enclose adaptations of the CRF done in (SFT 2001). These are adaptations that can be of universal validity and therefore ought to be considered in the revision of the CRF.

General

It is quite complicated and time-consuming to fill in all CRF tables. Still, countries with a well-established inventory system should be able to fill in the CRF tables. But even these countries may face some difficulties delivering all the requested data. Consequently, one should evaluate which data are actually needed in for example a review of the reported national data to the UNFCCC.

The reporting guidelines should clarify the requirements for reporting a full data set for all years since 1990. At this stage of the protocol one should consider requiring full data set for the party's basis year and for last year reported i.e. today for 1999. It's essentially for all reporting that data are well documented and calculations are made in accordance with Good Practice Guidelines.

It should be clarified in the reporting guidelines what is considered as recalculations.

We also propose that UNFCCC each autumn forward to all parties reporting requirements for next year's report to UNFCCC. The guidelines could be sent to the ministry responsible for the reporting. In addition UNFCCC could establish a web page where all reporting requirements were gathered.

Remarks to the CRF

- Data format: Norway has a well-established inventory system that allows reporting at different levels of detail. The CRF, however, demands that all data be entered manually into individual cells. Norway would have preferred to report "flat files" (e.g. comma separated) according to a specified format. This would substantially reduce the time needed for preparing the CRF.
- Our general impression is that the workbook is rather big and somewhat cumbersome to use. It takes time to open and save it. It is also a problem that it is not possible for more than one person to enter data at the same time.
- The CRF does not allow reporting of data without some changes in cells and formulas. In some of the shaded cells, Norwegian emission calculations are filled in and in some cases cell formulas are amended. Explanations are then given as cell remarks and put in documentation boxes in the associated table. (These remarks are only visible in the electronic version of the tables). Such changes are now and then necessary to make in order to report properly.

- Summary 3: Summary reports for methods and emission factors used. The countries should have the opportunity to inform whether they have used Tier 1, 2 or 3 emission factors when estimating the emissions.
- Recalculation - Table 8: Since all emissions are in CO₂-equivalents, it might be considered to also express the differences in Gg or difference scaled to total emissions. This will highlight the recalculations that are most important.
- Recalculations - Table 8: This table could be made automatically with current and previously reported data (from Table 10 Summary).
- Recalculations – Table 8: It is a question of definition what is defined as recalculation. Is every minor change from the previous national report to UNFCCC recalculation? This should be clarified in the UNFCCC reporting guidelines.
- The data in Table 10s1 to 10s4 should be linked to the relevant cells in the reporting tables for the years where this is possible (at least the last year).
- The level of comparison between the Reference approach and the Sectorial approach should be clarified.

Adaptations of the CRF tables in Norway's last report to UNFCCC. Adaptations to be considered in the evaluation of CRF tables.

1. Land-use change and forestry (LUCF), we have used our own reporting format for LUCF. See Appendix _Table 5.A. The reason is that the CRF does not reflect our calculation methodology. It is based on forest area, while the results from the Norwegian forest inventory are given directly in volume terms. It might be necessary considering whether a new standard reporting table is to be made i.e. if several parties are in the same situation as Norway.
2. Table 4.B(a) Sectoral background data for agriculture. In Table 4.B(a) additional background data are given. , see remarks in ballpoint above.
3. Table1s2: B35: formula changed. The original formula reads only the parts of national total, the number we have included is total CO₂ from biomass. CO₂ from biomass have not been reported in the sectorial tables to avoid confusion.
4. Table1.A(a)s1: H8, H20: includes biomass in formula. The CO₂ emissions reported are a small fraction of incinerated waste (fossil part).
5. Table1.A(a)s4: H8, H14: includes biomass in formula. The CO₂ emissions reported are a small fraction of incinerated waste (fossil part).
6. Table1.A(c): E12: includes biomass in formula. The CO₂ emissions included are a small fraction of incinerated waste (fossil part).
7. Table2(I)s1: K22: shaded cell. However, Norway considers carbide production to be a source of NO_x.
8. Table3: B10: shaded cell. However, this source may lead to emissions of CO₂, direct and indirect from NMVOC.
9. Table4s1: B25: Animals not included in this list have been added. The reporting does not allow reporting of emissions from all animals. (The module for enteric fermentation allows users to add animals.)

References

- SFT 2001 Greenhouse Gas Emissions in Norway. Reporting According to the UNFCCC Guidelines. The Norwegian Pollution Control Authority. Report 1801:2001

PAPER NO. 5: SWEDEN
(ON BEHALF OF THE EUROPEAN COMMUNITY AND ITS MEMBER STATES,
CZECH REPUBLIC, SLOVENIA, SLOVAK REPUBLIC, LATVIA, BULGARIA,
ESTONIA, LITHUANIA, POLAND, RUMANIA, HUNGARY AND CROATIA.)

METHODOLOGICAL ISSUES
GUIDELINES FOR PREPARATION OF NATIONAL COMMUNICATIONS

Sweden, on behalf of the European Community and its member states, Czech Republic, Slovenia, Slovak Republic, Latvia, Bulgaria, Estonia, Lithuania, Poland, Rumania, Hungary and Croatia, welcomes the opportunity to send its views on experiences with using the UNFCCC Guidelines on Annual Inventories (UNFCCC Guidelines), in particular the Common Reporting Format (CRF) in accordance with decision 3/CP.5 (see document FCCC/CP/1999/6/Add.1, page 7 paragraph 3).

The EU and the Parties mentioned above believe that the UNFCCC Guidelines (FCCC/CP/1999/7), is an important step for improving Parties' annual inventories. A common reporting format for all Parties improves transparency, completeness, consistency, accuracy, comparability and verifiability, and makes the review process easier.

The EU will also give specific comments regarding sector 5, Land Use Change and Forestry in a separate submission on this sector in accordance with a decision at SBSTA 10 (see document FCCC/SBSTA/1999/6 paragraph 27 (g)).

General Comments on the Guidelines and the Common Reporting Format (CRF)

National Inventory Report and Good Practice Guidance

According to the Guidelines, Parties shall submit to the Conference of the Parties, through the secretariat, a national inventory report containing detailed and complete information on their inventories for all the years from the base year to the year of the current annual inventory submission, in order to ensure the transparency of the inventory.

The EU and the Parties mentioned above recognizes the need to make the UNFCCC Guidelines clearer with regard to the National Inventory Report (NIR). The UNFCCC Guidelines should list which information should be included in the NIR and describe the structure that the Report should have. This would be helpful to Parties when compiling the NIR as well as to experts that will review a Party's inventory.

The EU and the Parties mentioned above suggests that Parties included in Annex I to the Convention on Climate Change shall submit, to the Secretariat, by February 1st 2002 their views on the contents of a National Inventory Report, to be considered at SBSTA16. Experiences gained during the trial period should be taken into account when the content of the National Inventory Report is elaborated.

The CRF is not fully compatible with the IPCC Good Practice Guidance report.

Mandatory character of the CRF

The EU and the Parties mentioned above notes that the UNFCCC Guidelines and the CRF do not clearly indicate which tables are mandatory and which are not. Clearer guidance regarding the strictness of reporting obligations related to the table categories should be elaborated.

The tables in the CRF provide two basic options. In shaded areas Parties do not have to report data, in non-shaded areas Parties have to report data or information. In the revised UNFCCC Guidelines, reporting on some greenhouse gases is strictly mandatory (e.g. CO₂, CH₄, N₂O, HFC, PFC, SF₆) whereas Parties are only encouraged to report other emissions (e.g. SO₂, NO_x). It would be useful if the tables or the notes to the CRF would reflect this difference.

The effort needed to fill in the background tables depends on methodologies used. In order to keep the extra effort small the mandatory information to be provided in the CRF should be carefully selected. The EU and the Parties mentioned above believes that this should be acknowledged more clearly in the CRF document in the future as inventory guidelines under the Kyoto Protocol will include the mandatory use of the CRF. A clearer indication of the mandatory character of the information provided seems necessary under a stricter review and compliance regime under the Kyoto Protocol.

Notation Keys

The use of the notation keys is sometimes confusing and more clarification on their use would be desirable. The importance of the use of the notation keys may in the future become more important.

- The CRF requires that all cells relating to a source (information on activity data and emissions) be filled. When certain emissions do not occur in a Party, the use of the notation key "NO" (not occurring) is recommended. If the notation key "NO" is used then there should not be any requirement for filling in activity data and emissions for that source.
- The notation key "0" is to be used for small sources (emissions or removals smaller than half of the unit being used in the inventory table). The amount should still be included in national totals. The UNFCCC Secretariat interprets a zero in a cell as "missing data". This interpretation makes it difficult for Parties to use the notation key "0".

The term "standard indicator" should be substituted by "notation key" throughout the whole CRF (e.g. necessary in table 9: indicator NE).

Implied Emission Factors

The concept of implied emission factors is best suited to tables where the emission estimates appear along with activity data i.e. the logic would be to consistently have the three basic parameters together on the same table (especially when viewed in hard copy). This is currently not the case in some of the sectoral background data tables (3.A-D, 4.A, 4.B) and therefore it is not clear to the user what "implies" the particular value of emission factor.

The sectoral background data tables make up a large part of the CRF. These tables appear more like calculation sheets than reports of the basic items (emission estimates already

computed elsewhere, activity data and emissions) that comprise the inventory. If implied emission factors are to be generated then the logical entry of these three items in the tables is emissions first, followed by activity data and then the emission factors implied by the first two parameters.

Submission of the annual inventory

According to the UNFCCC Guidelines for reporting the CRF data should be submitted in both electronic and hard copy for all years. The electronic version should include all CRF tables for the whole time-series, including recalculations, if any, for previous years. Regarding the hard copy version an alternative could be to only submit a subset of tables. These should include the annual tables 7A per compound, the trend tables 10 per compound and for all gases/sectors in CO₂-eq., and documentation sheets on methods and emission factors (CRF summary 3), tables on recalculations and explanations for the recalculations (tables 8a and b), the CRF overview table 7 (IPCC 8A) on completeness/allocation and data quality and on completeness (CRF table 9). The latter two would only be needed for the base year, unless the data for the most recent year would be different. The submission of this selective printout could be included in the NIR.

Comments on the CRF software

The EU and the Parties mentioned above believes that Excel sheets are well suited for presentation of data and for some, simple data analyses. However the CRF reporting tool takes up a lot of storage in the computer although the amount of data stored is modest.

The CRF reporting tool often triggers virus detection on the e-mail systems, which causes delays when copies are sent by e-mail.

Several experts, working with different parts of the CRF, are involved in the process when an inventory is compiled. Experts may use only one or two tables but have to use the whole spreadsheet. This process is time-consuming when one expert in the end has to put together different parts of the CRF.

The EU and the Parties mentioned above would prefer an option to split the file, so that there is one file for each sector and separate files for summary and for trend tables. The tables including data from more than one sector could be produced through links to the sector files. Such a structure would have several advantages:

- a reduction of workload on the computer also through a reduction of macros that might not be necessary in this structure,
- a clearer process when several emission inventory experts work in parallel,
- production of the trend tables by linkages to the file for each year,
- avoiding redundancy and risks of incorrect data insertion.

The results of sectoral background tables are not always linked to the sectoral emissions tables; the latter are not always linked to the overview and summary tables. This makes it more difficult to guarantee the completeness and consistency of both emission estimate data as well as notation keys at all levels as the data is filled in and checked manually. To be able to do this the corresponding sheets have first to be changed into the “unprotected” mode.

Some facility for data checking could also be built in to the CRF with either error messages or obvious comparisons so that users could see, for example, whether the sum of animal numbers multiplied by N excretion is equal to the N excreted in all AWMS.

When calculating implied emissions factors (several tables) the if-statements of the formulas should also take into consideration the cases in which the activity data is known (>0) but the corresponding cell(s) for emissions have notation keys.

There could be an easier way to handle those tables, which are irrelevant for a Party. For example, if there is no rice cultivation or savanna burning in a Party, one cell in the CRF Table could give information if the source is relevant for that Party or not and linked cells could produce correct notation keys in other tables.

The cell protection is important information when using macros in copying user-filled cells from several workbooks to a certain workbook (the links between the tables and the huge amount of area names in the Excel-program makes it difficult to copy whole tables when sectoral tables are filled by several people).

The cell protection (locked/unlocked) is not complete in all tables. In several tables (e.g. in Summary3) the end of the Excel-table after the actual table section is unlocked and also those cells should be locked.

The same units should be used throughout all the tables e.g. tons should be substituted by Megagrams, kt by Gg, and 1000 heads by kilo heads.

The numbering of the tables and boxes should be made more consistent. The mixed use of numbers, capital and small letters should be changed to another system being more user friendly, readable and suited for oral presentations. The labeling of the tables 7-11 should be changed since tables 1-6 correspond to the sectors of the IPCC Reporting Format whereas tables 7-11 do not.

The sequence of tables is different in the software version compared to the hardware version and in table 8 the shaded areas differ between both versions.

The calculation of totals and subtotals may be misleading if in the background tables only notation keys have been used because the software may change the notation key into "0.00" which is a different notation key. The software should be changed accordingly.

Some data relating to emission factors (e.g. table 5B, emission factor for N₂O) need more significant figures for correct presentation.

Specific comments on the Common Reporting Format by Sector

Energy

The implied emission factors for fuel groups (liquid, solid, gaseous, biomass and other) in Tables 1.A(a)s1 through 1.A(a)s4 may be of very limited use for comparison purposes due to the potential number and diversity of fuels in these categories. In addition, the input here requires substantial preparatory aggregation and checking of activity data with consequent risk of error and a need for notes and explanations. It would be better if all sectoral background data tables for energy were structured to accept the data on the basis of individual fuels in the various sectors. Drop-down menus could be used to select the fuels relevant to a particular Party. The current form gives little or no information on the actual emission factors used.

The background tables require a fuel breakdown in terms of solid, liquid, gas and biomass. Some Parties' inventories are not compiled in this fashion and it is necessary to calculate these categories from the data on individual fuels. This does not present a problem in itself, however the classification used for certain fuels may differ between Parties (e.g. coke oven gas - gas or solid? LPG - gas or liquid?). The Guidelines require that the classification used be stated; however if Parties use different classifications, this will reduce transparency. It is recommended that a general rule on classification of fuels into fuel categories be developed.

CO₂-emissions from the use of biomass should be included in Tables 1.A(a) in a separate row and clearly separated from national totals in order to increase transparency and make the CRF more user-friendly.

For checking the inputs of the combustion sector an additional energy balance table could be quite helpful to crosscheck the correctness of the activity data and the proper sectoral allocation. This would require no additional work from the Party, as the data could be generated automatically from the Sectoral Background Tables for energy.

In the present sheet for Feedstock and non-energy use of fuels the amount of carbon stored is calculated, but not summed (this can be found, however, in the CO₂ Reference Approach table). What is missed is a calculation and summation of the total amount of CO₂ from non-energy use, which is included as emitted CO₂ in the CO₂ Reference Approach. Both sums could be provided easily in this sheet.

Some tables, (i.e. Coal Mining, Oil & Gas Production) require supporting data that are not used to calculate emissions. A small proportion of this data is either unavailable or ambiguous. For example, the coal mining tables require data on numbers of active coal mines, number of mines with drainage, methane utilization data. Data on the number of active mines, depends on the definition used (e.g. number of sites, number of shafts, the definition of active) and varies depending on which source of information is used. Similarly data on the number of oil, gas installations are rather subjective since a major proportion produce both oil and gas. The outcome is that although this data can be provided, it may not be comparable with data provided by other Parties. In order to make the comparisons between Parties easier the EU and the Parties mentioned above recommends that a fixed unit for reporting activity data be used, e.g. TJ.

The order in which the emissions from international bunkers are presented should be consistent throughout the whole CRF, e.g. in Table 1s2 aviation comes before marine bunkers whereas in Table 1C, Sectoral background data for energy, marine comes before aviation bunkers.

The structure of the software version of sheets 2 and 3 for table 1A do not exactly correspond to the hardware version of that table with respect to footnotes. The software version should be changed accordingly.

The cells B9:C10 and D9:E12 in table 1.A(c), should be locked as well as the cells A21:B22 in table 1.B.2.

Industrial Processes, F-gases

Problems with confidentiality of information on individual chemical species in table 2(II) related to the sub-categories still exist. The evaluation of the CRF should assess the reporting in the sub-categories (e.g. aerosols, fire extinguishers etc.) and analyze whether the information contained in the current sub-categories should be kept at this disaggregated level. If most Parties provide information only on a higher level of aggregation, it should be discussed whether sub-categories could be merged.

Table 2(II) F: the disaggregation of activity data, implied emission factors and emissions is not convenient for all sectors. A distinction has to be established between categories where fluorinated gases remain in the manufactured products and categories where fluorinated gases are used and released only during the process (e.g. semiconductors, solvents).

Mixtures of different HFCs and PFCs are sometimes used without a clear indication of which species these mixtures are composed of. The CRF tables do not contain a column where such mixtures could be included nor is information always available about the composition of all mixtures. There should therefore be a possibility of including additional mixtures of fluorinated gases in the CRF. The user should as far as possible include the GWP value, if not officially available.

In Tables 2(II)s1 and s2 the automatically calculated sums are not visible (with two decimals) when the numbers get too large. In order to be able to check the figures it is necessary to “unprotect” the sheet in order to increase the width of the columns.

In Table 2(I)s2 the sum of the potential emissions is only calculated from the sectoral data in this Table. These cells are then copied into the Summary Tables. If information by sector is not available, the information on the total potential emissions from Table 2(II)s2 should be included.

The cells F13:F15, H14:H15 and J14:J15 in table 2(I)s2, should be locked.

Solvent and Other Product Use

In table 3 the cells for CO₂ and NMVOC should be shaded for the source categories relating to N₂O use. Vice versa, the cells for N₂O should be shaded for paint application and other typical NMVOC sources.

A footnote explaining why CO₂ emissions from Chemical Products, Manufacture and Processing are not to be included in “Solvent and Other Product Use” but under “Industrial Processes” should be included.

Agriculture

In the current Table 4s2 the cell B21 (2. Animal production) should be shaded for CH₄ as these emissions are reported in Table 4s1 (enteric fermentation and manure management).

The Tables 4s1 and 4s2 (Total agriculture and 4D Agricultural soils, direct soil emissions) should include a column also for CO₂ as it is allowed for the party to choose reporting of these emissions also in the Agriculture sector (see footnote in Table 4s2). This would also be consistent with the fact that the CO₂ emissions from agricultural soils have activity data in common with e.g. N₂O emissions from the same source (e.g. area of cultivated organic soils).

The headline in table 4.A, sheet 1 should be changed from “additional information for Tier 2” into “Additional information” because this information should be provided also if Tier 2 method has not been used.

The common reporting format does not entirely correspond to the methodological changes made to the estimation of the emissions in the IPCC Good Practice Guidance (GPG). E.g. the new concept “mature animal weight” and the different approach for estimating energy needed for pregnancy should be incorporated in the CRF. This might also have some impact on the Table Summary3s1 (clarifications may be needed whether the Tier 1 or 2 method corresponds to the IPCC Guidelines or the IPCC Good Practice Guidance).

Table 4.A sectoral background data for agriculture is not consistent with the chapter on enteric fermentation of IPCC Good Practice Guidance. New livestock sub-categories have been developed in the IPCC Good Practice Guidance (p. 4.10 and table 4.1 of the GPG) and the indicators in the additional information box have changed (p. 4.12 of the GPG). The background tables should be adapted to allow Parties to report according to IPCC Good Practice Guidance.

In Table 4.A sectoral background table for “Enteric Fermentation” it is possible to include other types of animals. This is not the case in Table 4.B sectoral background table for “Manure Management”. The EU and the Parties mentioned above suggest that the possibility to include other animal types should exist in Table 4.B as well.

Table 4.B sectoral background data for agriculture – manure management, modifications of livestock sub-categories apply as described above. In addition, the IPCC Good Practice Guidance provides different animal waste management systems, which are no longer consistent with those, contained under additional information.

Table 4.C in the CRF software tool, the unit for “Harvested area” should be “10⁺⁹ m²/yr” instead of “10⁻⁹ m²/yr”.

Waste

Table 6A it would be more transparent if DOC degraded would be given as a fraction (percentage) instead of mass units (Gg).

In table 6.B the following cells should be merged:

N12:O12, N15:O15, N16:O16, N17:O17, P12:Q12, P15:Q15, P16:Q16, P17:Q17,
P17:Q17

Summary 3, Summary Report for Methods and Emission Factors

This table is requested for every (annual) CRF-file. If filled in the same in all files, this means a lot of duplication. Although the table could be different from year to year, it seems more efficient if it would be taken out of the individual annual CRF-files and placed in a separate file, if necessary with additional notes specifying changes of items for different time periods. This would also more clearly mark any changes per source category of these aspects during the reported period.

Table 7, Overview table for national greenhouse gas inventories (IPCC table 8A)

The header of Table 7, “Overview table for National greenhouse gas inventory (IPCC table 8.A)” should be changed to “ Overview table for national greenhouse gas inventories – completeness and quality of estimates”. The headline should be changed correspondingly.

Table 8, Recalculation – Recalculation data

The hardcopy version of table 8 includes in the header "year" as well as "recalculated year" whereas the electronic version of table 8 also includes "submission". The EU and the Parties mentioned above proposes to make both versions consistent and to provide clear guidance which year should be identified where.

If a Party has done recalculations it would be helpful if the columns for “latest submission” are linked from the corresponding table. This would decrease the possibility to make unnecessary input errors.

When summarizing the total, this table includes both emissions and removals. Emissions and removals should be separated to make the table consistent with other tables, e.g. Summary 1A and 1B.

In the software-version of Table 8, sector 4 Agriculture, the cells in the column “Latest submission” are not shaded as the corresponding ones in the column “Previous submission” or the corresponding sectoral tables.

In sector 5, Land-Use Change and Forestry (net), the heading is not correct with regards to CH₄ and N₂O. A footnote indicating that net is not applicable for CH₄ and N₂O should be added.

Table 9, Completeness

Table 9 “Completeness” should be changed to “Supplementary information on notation keys”.

No explanation has to be provided when the notation keys “NA” is used, or if a cell is left blank. Explanations should be given and this should be added to the completeness table.

In table 9s1 the alignment formats of cells B7:C18 should be wrapped text as in cells B21:C32.

Table 10, Emission Trends

Since the table “Emission Trends” also provides an overview, it is proposed that this table should follow Summary Table 3 as Summary Table 4.

Trend tables are requested for every year. However, when a Party makes recalculations of the entire time-series, the EU and the Parties mentioned above is of the opinion that trend tables only are necessary for the most recent year.

The Trend Tables should at least be linked automatically/electronically to the most recent year.

In table 10s3, Emission Trends (N₂O), the cells that should be shaded for sector 5 and 6 are not.

In table 10s4 the cells should be in Mg instead of Gg as in sectoral report as the unit Gg makes it impossible to see the values in the cells without changing the layout manually.

PAPER NO. 6: UNITED STATES OF AMERICA

UNITED STATES SUBMISSION ON THE UNFCCC REPORTING GUIDELINES FOR ANNUAL INVENTORIES AND THE COMMON REPORTING FORMAT (CRF)

Recognizing the need to enhance the consistency, transparency, and comparability of greenhouse gas emission inventory submissions, the Conference of Parties decided at its fifth session (decision 3/CP.5) to adopt new reporting guidelines for annual inventories (FCCC/CP/1999/7, Part I). Parties were invited to submit information to the Secretariat on their experiences with using these new guidelines, in particular the common reporting format (CRF) in the years 2000 and 2001. The United States endorses the use of a common standard approach to reporting inventory data under the UNFCCC. The CRF is an extremely useful tool for reviewers and other users of inventory data. The improvements suggested in the comments below strive to provide clarification, consistency with IPCC Good Practice guidance, and flexibility in reporting country-level details on national methods while preserving transparency and standardization in the CRF. The significant effort required to revise the CRF is recognized, but the improvements in utility and precision make this effort extremely worthwhile for preparers and users of inventory data worldwide.

These comments provide a list of recommendations for improvements to the CRF tables. General comments and recurring issues are provided first, followed by comments that are specific to a particular sectoral table or CRF sheet. Note that no comments are being provided at this time on the structure of the Land-Use Change and Forestry pages of the CRF.

General Comments on the CRF

1. The Secretariat should develop a clear description of the use and purpose of the CRF data to accompany the release of the CRF tables. Such a description should indicate that the CRF tables are not intended to reflect all pieces of data used in an inventory and do not necessarily reflect the level at which the inventory was developed. In essence, this would serve as an overarching caveat to users of the CRF tables that there may be additional details to each methodology used in the inventory than are reflected in the CRF tables, and that they should refer to a given country's national inventory report for these particulars. This description of the CRF should be developed as a statement that could be posted at the UNFCCC website where CRF data are ultimately released, or as standard text that precedes the CRF table templates. The data presented in the CRF tables should be sufficient to provide a first level screening of data. Users of the CRF tables, including reviewers and other inventory developers, should be aware of this in order to prevent misuse of some CRF-calculated parameters (e.g., implied emission factors, calculated average values for other emission parameters). Instead of accepting these calculated values, results should direct them to national inventory reports for further elaboration on methodologies.
2. The note in paragraph 2 of the "Common Reporting Format (Annex to the UNFCCC reporting guidelines on annual inventories), Notes on the common reporting format," FCCC/SBSTA/1999/7, should be revised to include parameters beyond just 'implied emission factors'. That note states that 'implied emission factors' are intended solely for the purposes of comparison. There are potentially other emission parameters for which

calculated average values are presented in the CRF sectoral background tables. For example, if Tier 2 methods are utilized for the manure management source category, emission parameters for MCF, VS excretion rates, and typical animal mass may need to be presented as average values for the purpose of CRF reporting. Similar to 'implied emission factors,' these calculated average values may not actually be the values used in the development of the original estimates. The United States suggests that the note in paragraph 2, page 15 of FCCC/SBSTA/1999/7 simply be revised to include reference to implied emission factors **and** other emission calculation parameters.

3. It is difficult to compare parameters from year to year. The United States requests that the Secretariat investigate the feasibility of developing a software tool for countries to use to evaluate their CRF tables prior to submission, which would highlight outliers or abnormalities in CRF data. A true database platform might ultimately be a better format than the current spreadsheet format for this purpose. It would allow an easy query to compare implied emission factors, production, and indicators/parameters across years for one country and from one country to another. Such a database format would also facilitate use of the CRF for review purposes.
4. The United States recommends that the Secretariat investigate the feasibility of developing a separate input data format - not necessarily identical to the formatted CRF table - based either on a spreadsheet or database, which would then feed the data into the CRF tables. Such an intermediate input format could facilitate data input by Parties as well as the upload of submitted data into the Secretariat's database, allow Parties the possibility of using a software preprocessor to check their data prior to submittal, and could allow data providers and users opportunities for using a report generator to develop customized reports.

Comments on All Tables

5. The general problem of performing calculations on text inputs should be corrected. Any mathematical calculations performed on cells containing text (e.g., NA, NE, NO, IE) cause problems in pre-calculated (i.e., shaded) cells. These calculations either result in a false zero or an error message (#VALUE). Any such errors "roll-up" and permeate throughout the CRF Table, and are emphasized in particular on sheets such as the summary tables where much of the data are rolled up from other sheets. These error messages can easily be misunderstood. At a minimum, calculations should begin with a check (@IF statement) to determine whether text or data is provided in the cells. Additionally, any division calculations must check to ensure that values are not being divided by zero.
6. Directions are not provided on how to sum a series of cells labeled with text (e.g., NA, NE, NO, IE). This problem also exists in the summary tables where a value for the quality of our estimates is needed. If the estimate was either NE or NO, should the quality of that code be NE or NO (i.e., the same as the estimate label), or NA because it's not applicable? The United States proposes that the UNFCCC reporting guidelines indicate that the quality of an estimate labeled with text be NA in all cases. Similarly, in Table 7 (Overview Table), sector rows should be shaded grey, so that countries are not forced to sum or aggregate a group of quality estimates.

7. Information in the top left corner (country, year, and submission) of some of the CRF sheets is not properly aligned when the CRFs are printed.
8. Instructions specify to leave no cells blank, but specific instructions do not exist for instances when there are “other” rows that are not used. Many of them have been labeled NA. Also, if there was only one "other" that needed to be added, it was not clear whether or not to put it in the white cell below the "other" or to click on the button next to the word "other" and have the CRF add an additional row. To resolve this problem, any cells that have an “other” button should not have any blank white cells beneath them. That way, the only way to add an “other” category will be to click on the button that inserts a new row.
9. Documentation boxes should be available on every page. It would also be beneficial to provide some more direction on how to use the documentation boxes. Currently, the Annex to the UNFCCC reporting guidelines on annual inventories (page 15, paragraph 4, of FCCC/CP/1999/7) states that “parties should use the documentation boxes provided at the foot of the sectoral background tables to improve clarity.” Additional instructions on the use of the documentation boxes should be added here. Suggestions for additional text include: “Documentation boxes can be used, inter alia, to explain the derivation of average values for CRF reporting, to report additional background data, and to provide descriptions of aspects of the country-specific methodologies that would be useful to interpreting the CRF data.” The documentation boxes are extremely important to reviewers examining the tables, particularly as a means for the inventory preparers to convey information about source methodologies and CRF preparation where country-specific and non-default methodologies are used.
10. Where a model or method that did not explicitly conform to an IPCC method was used, the input sheets were not designed to accommodate the amount of data that the United States could have provided; rather, input cells were only available for the IPCC method variables. Examples of this situation in the United States are included in the Sectoral table comments that follow. It is probably worthwhile to summary evaluate requests for additional data after there has been an opportunity to review more CRFs. This will give a better indication of what can be standardized and transparent in the CRF for all countries to utilize.
11. In some cases, the CRF tables request data that parties do not use in calculating emissions. Parties should be given guidance with regard to data that is requested in the CRF but not in fact used in national calculations. When possible, it is desirable that this data be reported for informational purposes and so designated in comment boxes.

Comments on Summary Tables

12. Summary 1.A.s2 – Cell P19 is white, and therefore this table allows for reporting of NMVOC emissions from burning associated with “Forest and Grassland Conversion.” However, the sectoral tables for LUCF (Series 5 tables) do not allow for reporting of NMVOC emissions – should not the Summary tables be consistent with the sectoral back-up tables (i.e., should cell P19 be gray instead of white)? Conversely, if cell P19 is left white, should not cell Q19 be white so that SO₂ emissions from burning may be reported?
13. Summary 1.A.s2 – Cell P22:Q22 – should these be gray as well, or should columns for NMVOCs and SO₂ be added to Table 5?
14. Summary 1.A.s2 – The labels for columns C and E in Summary 1.A.s2 are the same as the labels for columns B and C in Table 5, but the data in Summary 1.A.s2 represent net (rather than gross) flux, while the data in Table 5 represent gross flux. This is explained in footnote 5, but could still cause some confusion. Should the labels for columns C and E in Summary 1.A.s2 be changed to “Net CO₂ emissions” and “Net CO₂ removals”? Otherwise, it is not obvious how to report agricultural soil CO₂, especially since footnote 5 is not in cells B13 and D13. This is complicated by the NA, NE, IE abbreviations: the United States inserted NA, rather than IE, in cell C13 because net rather than gross flux is supposed to be reported in this table, and U.S. agricultural soil net flux is negative, so does not get reported in this column. Another country with the same scenario might report IE here.
15. Summary 2 – Cell H64 calculates “total emissions without LUCF;” however, because CO₂ flux from agricultural soils can be included in *either* the LUCF sector or the Agriculture sector (see footnote 4 on Summary 1.As1), the value reported in this cell may not represent the same set of activities across all countries. The value could either exclude or include net CO₂ flux from agricultural soils. To avoid misinterpretation of the value reported in cell H64, one of two following sets of revisions should be made: 1) change the formula in cell H64 and add a documentation box and instructions to Summary2 so that whichever reporting procedure is used will be documented, or 2) change the reporting procedure so that net CO₂ flux from agricultural soils may only be reported in one sector.
16. Summary 3 "Summary Report for Methods and Emission Factors Used" should be revised to provide more detailed information on the choice of method selected for each sector and gas. The Secretariat should consider how to allow Parties to provide more useful & detailed information for reviewers and other users of this data, following the approach for methodological choice (and decision trees) provided in the Good Practice Guidance.
17. Summary3s2 – Cells referring to methane emissions from agricultural soils should be shaded, as there is no IPCC method for estimating emissions from this source.
18. Summary 3s2 – The definitions provided for the abbreviations used in this table are not very precise, so countries may interpret them differently. What is the difference between a CS (country-specific) method and an M (model) method? The term country-specific could be used to characterize a model. Is not every method essentially a model, and are not some models country-specific and others not (or are CS and M not mutually

exclusive)? Similarly, are a CS emission factor and an M emission factor mutually exclusive? Additional guidance is needed to introduce the various codes and provide more information on selecting the appropriate code. And if there is no clear difference between a CS and M, then a new term such as "alternate method" should be introduced to indicate that a default approach was not used.

19. Summary 3s2 – The United States suggests adding explanations of the various abbreviations on this table as has been done in the footnotes on Summary 3s1 in order to make this table easier to use.
20. Summary 3s2 – Definitions of NO, NE, NA, and IE, as they relate to this table, should be provided. These terms could be interpreted differently by different countries. For example, if the LUCF rows below cell B16 are completed, should NA or IE be inserted in cell B16 (i.e., “not applicable” because different methods are used for each component of LUCF and therefore one cell for reporting all of LUCF is not applicable, or “included elsewhere” because the information is provided in the rows below)? Note that the definitions of NA and IE on pages 15-16 of FCCC/CP/1999/7 do not capture this situation, so a strict interpretation suggests that neither term is appropriate here.
21. Summary 3s2 – Why is the comment "Make sure that your entries are consistent with those made in Summary 1A" attached to cell D11? There are no rice entries for Summary 1.A – there are only formulas in the rice row.

Comments on Energy Tables

22. Table 1.A – For Oil and Gas entries, the United States suggests that there exist both separate line items for oil and gas, as well as retaining the combined oil/gas line item as an option.
23. Table 1.A(b) – The fuel types provided in the CRF tables differ from the fuel types as defined in the United States, and no "other" options are offered in the CRF table. The U.S. suggests revising the table to allow for additional fuel types, and provides a Reference Approach in a separate Excel spreadsheet in more detail than the CRF table allows.
24. Table 1.B.1 – This table should explicitly state whether flaring/use should be subtracted from the methane emissions estimates or not. The format should also be the same across sources. Sometimes flaring/use has its own column under activity data, as in the Waste sector tables. However, for coal, it is included under “additional information.” Also, calculation of the implied emission factor is calculated with recovered methane subtracted. This methodology skews the emission factor. If the simple methodology remains as [(activity data * emission factor) - recovery], the implied emission factor calculation needs to be changed.
25. Table 1.B.1 – There is no logical place in Table 1.B.1 to report information on CO₂ from flaring. Similar to the question on how many mines have recovery systems, there should be a question on how many mines flare. With this additional indicator, reviewers would know to look for the associated CO₂ emissions.

26. Table 1.B.2 – This table is designed mainly for Tier 1 calculations. It might be useful to have more tables (or options for data inputs) if other Tiers are used. For example, to better report on subcategories of fugitive emissions, an additional table of fugitive emission sources similar to the list in Table 2.17 of the IPCC Good Practice Guidance could form the starting point. Such level of reporting would help reviewers determine if the emission factors and activity data for a Tier 2 or 3 methodology are reasonable.

Comments on Industrial Process Tables

27. Tables 2(I).A-Gs2 and 2(II).C,E – Activity data for primary aluminum production is requested in units of *kilotons* in Table 2(I).A-Gs2 (Emissions of CO₂), but is requested in units of *tons* in Table 2(II).C,E (Emissions of PFCs). Requiring different units for the same piece of data in two different places complicates data entry and potentially confuses the reader. The United States suggests that the same units are required in both areas.
28. Table 2(II).s1 – A column should be added for “other,” or “sum of emissions labeled confidential.” Currently, the United States converts all confidential emissions into HFC-41 equivalents because there is no “other” column available and no mechanism by which to add one. Adding another column for handling confidential information would be consistent with IPCC Good Practice Guidance.
29. Table 2(II).Fs1 – Row 31, cells B through J (foam blowing) should be shaded because foams are separated into soft foam and hard foam.

Comments on Agriculture Tables

30. Tables 4.s1 and 4.s2 – The reporting guidelines for the CRF indicate that the emissions entries in the Sectoral Report Table will be automatically filled out based on the results from the Sectoral Background Tables. Since emissions are not reported for enteric fermentation, manure CH₄, or manure N₂O, they cannot be transferred to the Sectoral Report Table. A footnote should be included indicating that the emissions for these sources should be entered manually.
31. Table 4.s2 – The table indicates that CH₄ emissions for Agricultural Soils should be reported; however, there is no IPCC methodology to estimate this number and no reference to it in Table 4.D. The United States suggests that this cell should be shaded grey, and parties who choose to report these emissions should do so within the documentation box.
32. Table 4.s2 – Rows 18, 24, and 32 (the blank rows below the “Other (please specify)” should be deleted since the “specify” button in the “Other (please specify)” cell inserts new blank rows below.
33. Table 4.s2 – This table allows for reporting of NMVOC emissions, but if these emissions are reported, there is no avenue for reporting on the information used to derive the estimates. There is neither a documentation box on this table, nor is there space on Tables 4.C and 4.F for reporting NMVOC emissions. A place to include back-up information on NMVOC estimates should be added.

34. Table 4.s2 – This table (below row 33) allows for reporting of emissions from sources other than the 6 in the IPCC Guidelines. However, there is no sub-sectoral reporting table for “Other.” The United States recommends adding a documentation box on this table for the back-up information for estimates of “Other” emissions.
35. Table 4.s2 – The label in cell A21 should be changed to “Pasture, Range, and Paddock Manure.” Also, the United States suggest adding a footnote to the table that explains which manure N₂O emissions should be reported under D. Agricultural Soils, and which should be reported under B. Manure Management.
36. Table 4.s2 – Cells B20:B22 and F20:F22 should be gray. Since there are no methods for estimating CH₄ and NMVOC emissions from these sub-sources, the taxonomy of sub-sources is not relevant to these gases.
37. Table 4.A – The term “Average Daily Feed Intake” in column 3 of the first table should be termed “Average Gross Energy Intake (GE),” to match the IPCC Guidelines and Good Practice Guidance.
38. Table 4.A – The term “CH₄ Conversion” in column 4 of the first table should be called “Average CH₄ Conversion Rate (Ym).”
39. Table 4.A – For the enteric fermentation, manure CH₄, and manure N₂O Sectoral Background Tables, there are no spaces to input the actual emissions. There should be a footnote on each of the Enteric and Manure Sectoral Background Tables stating that for these tables, the emissions are entered directly into the Sectoral Report Table, and that the implied emission factor will not be calculated until the emissions are entered.
40. Table 4.B(a) – The instructions "copy the above table as many times as necessary" are too vague. Because it is assumed that data is pulled from the CRF tables automatically when the Secretariat evaluates and summarizes country data, it should be specified where precisely to copy and place the table on the page such that no data is missed. The United States suggests adding a button that would perform this action. However, per the comment below, it is suggested that the table of additional information be simplified, which would eliminate the need for this footnote.
41. Table 4.B(a) – The inclusion of the climate region divisions (“cool,” “temperate,” and “warm”) should be removed from both the activity data and additional information boxes. These climate divisions appear to be correlated back to the original data source on which the default emission factors for this source category are based. The use of these divisions is somewhat arbitrary and does not add significantly to the usefulness of the CRF data in terms of a review tool. In the case of the additional information box in Table 4.B(a), the use of these divisions can actually create a matrix set of data that becomes too cumbersome to be of useful value to CRF reviewers (see comment below for suggestion on simplifying the additional information box for Table 4.B(a)).
42. Table 4.B(a) – The “Additional Information (for Tier 2)” box should be simplified. The matrix as it exists now contains more data than is necessary for the CRF, and the format is not necessarily appropriate for countries using detailed Tier 2 methods. For example, the difficulties with filling out the additional information table for the United States is that the

U.S. performs a state-level analysis for cattle and swine, which includes a climate factor, not a climate region analysis, so it is very difficult for this information to be entered as it is requested. The option to list the existing matrix table with 50 states, grouped by 3 climate regions and six animal categories would create an extremely large matrix set for the CRF that would not add much value to the CRF reviewers. It is suggested that the existing box for additional information be simplified by utilizing the format suggested in Table 1, below. Instead of trying to duplicate precisely what values are used in a country-specific, Tier 2 method, the suggested box of additional information would contain the weighted average values for parameters used in the methodology. This simplifies the data to a point that better matches the intent of the CRF tables, and also is still representative of the values used in the methodology.

Table 1.

Additional information (for Tier 2)							
Animal category	Indicator ^(a)	Animal waste management system					
		Anaerobic lagoon	Liquid Slurry or Deep Pit	Daily spread	Solid storage and dry lot	Pasture range paddock	Other
Swine	MCF	0.6	0.3	0.015	0.015	0.015	
	Allocation (%)	50	25	5	10	10	
Dairy Cattle	MCF						
	Allocation (%)						
Beef Cattle	MCF						
	Allocation (%)						

(a) The average national value should be provided for MCF and percent allocation for each animal waste management system. For countries that develop their MCF data at a sub-national level, the national weighted average MCF and percent allocation values should be provided. Weighted averages can be based on animal populations or similar surrogate value at the sub-national level.

43. Table 4.B(a) – It should be indicated that average values for Typical Animal Mass, VS, and Bo are requested across these broad categories of animals. The United States provides this information on the assumption that average values are requested in cases where there are subcategorizations of animals. For example, the U.S. has various classifications of swine and cattle, whose values for typical animal mass and VS production rates vary. Currently, a weighted average is used to report these values in the U.S. CRF table, where the population of animals in each of these subclasses is used to develop the average values for typical animal mass and VS production rates. Similar instructions may be useful to include as a footnote to the tables where average values are requested.
44. Table 4.B(a) – In footnote 4, dairy is misspelled. Also, “available” should be on the same line as the rest of the footnote.
45. Table 4.C – The unit label in cell C7 ($10^{-9} \text{ m}^2/\text{yr}$) is incorrect, and does not agree with the unit label in the UNFCCC document that contains the CRF tables (FCCC/CP/1999/7). The unit label in FCCC/CP/1999/7 ($10^9 \text{ m}^2/\text{yr}$) is correct. If the area data are entered in the incorrect units, the calculated implied emission factor (column F) will be incorrect. The unit label in cell C7 needs to be corrected to $10^9 \text{ m}^2/\text{yr}$. The United States suggests that areas be properly requested in units of $10^9 \text{ m}^2/\text{yr}$.

46. Table 4.C – The transparency of emission estimates would be increased in this table if rows 8 through 17 could be disaggregated further. In the United States, all rice fields are continuously flooded, but within this water management system, there are two cropping seasons (primary and secondary). The United States uses different emission factors for these two seasons. The table structure does not allow for reporting of emissions from these two seasons separately, so the implied emission factor, which is a weighted average, is somewhat misleading.
47. Table 4.C – More explicit instructions in the Documentation Box regarding disaggregation would be useful. Specifically, what "additional information" is requested, actual data or a description of the disaggregation? Also, the United States suggests revising the first sentence in the instructions to “When disaggregating by more than one region within a country, and/or by growing season, provide ...”
48. Table 4.D – This table needs to be revised to be consistent with the Good Practice guidance. Specific comments include:
- The option to add additional rows for other types of N inputs under Direct Soil Emissions needs to be added. If this option is not available, the calculated total direct soil emissions in cell F8 will not be correct. For example, the United States includes soil application of sewage sludge and commercial organic fertilizers. The U.S. listed these other materials in column B under “Other” (below row 18), but in order to ensure that the calculated total direct emissions and implied emission factors were correct, included these N inputs in cell C9 and relabeled cell B9.
 - The label in cell A10 should be changed to “Animal Manure Applied to Soils”
 - The label in cell A14 should be changed to “Pasture, Range, and Paddock Manure”
 - The labels in cells B9 and B10 should be consistent; e.g., Nitrogen input from application of synthetic fertilizers”
 - The unit label in cell B13 should be ha/yr.
 - The text in cells B16 and B17 should be changed to allow for inclusion of other materials such as sewage sludge.
 - What data are intended to be input to cell C12? It may be more beneficial to report the amount of residue applied, rather than crop production. Also, what are “other” crops? Might not residues from some leguminous crops be applied to soils?
 - The “Additional Information” needs to include **all** the variables listed in Good Practice, and should be set up so that additional variables can be added. It also should be reorganized so that related variables (e.g., those for crop residues) are together. $Frac_{GRAZ}$ will vary by animal type, so should be in a entire separate table or have animal types listed below. Also, the data needed are fraction of each population on pasture, range, and paddock. Many of the crop variables, such as $Frac_{BURN}$, may vary significantly among crop types, so these too warrant a separate table. The definition of $Frac_{NCRBF}$ is “fraction of total aboveground dry biomass of N-fixing crop that is N.” The definition of $Frac_{NCRO}$ is “fraction of residue dry biomass that is N.” The definition of $Frac_R$ is “fraction of total aboveground crop biomass that is removed from the field as crop product.”

49. Table 4.D – Under the implied EF Units column, the footnote “2” should be superscripted.
50. Table 4.D – Under the additional information table, there are many other fractions that could be listed, which are now included in the Good Practice guidelines. The term $\text{Frac}_{\text{GRAZ}}$, should be called Frac_{PRP} , to correspond with these guidelines. Also, footnote “a” indicates that the IPCC Guidelines should be used to specify the fractions, but a better reference would be the IPCC Guidelines as elaborated by the Good Practice Guidance.
51. Table 4.F – Footnote 1 refers to Table 4.D, but it is not clear what is meant.
52. Table 4.F – Cells B27:K27 should not be bold.
53. Table 4.F – The blank rows that are below the “Other (please specify)” rows should be deleted since the “specify” button in the “Other (please specify)” cells inserts a new blank row below, or the blank rows should be made gray.
54. Table 4.F – This table is missing data and some column headings are not as precise as they should be in order to ensure consistent reporting across countries. There is a large potential for inconsistent reporting if one does not keep track of which part of the plant is being reported (residue versus product versus aboveground biomass) and whether weights are in dry matter units or otherwise:
- The label for column D should be “Dry matter fraction of residue.”
 - A column for fraction oxidized (i.e., combustion efficiency) needs to be added. Note: in the United States, we also incorporate a burning efficiency into our calculations, which accounts for the fraction of biomass exposed to burning that actually burns (the “fraction burned in the fields” only accounts for the fraction exposed to burning).
 - The term “biomass burned” needs to be clarified. For the United States, should this include the burning efficiency and exclude the combustion efficiency?
 - A column for carbon fraction needs to be added, and it should be labeled “Fraction of residue dry biomass that is carbon (mass of C/mass of dm).”
 - The label for column G should be “Fraction of residue dry biomass that is nitrogen (mass of N/mass of dm).”

Comments on the Land-Use Change and Forestry Tables

The United States suggests that it may make more sense to hold off on any major modifications to the LUCF tables until after the conclusion of the Good Practice work which is about to be initiated. Not only may the methods be modified and factors added or changed, but entire sources are missing from the forest methodology (soils, litter, wood products) that should be included in the CRF.

55. Table 5 – Cell C33 should be gray since liming does not result in CO_2 removals.
56. Table 5 – Cell C32 should be gray since cultivation of organic soils does not result in CO_2 removals.

57. Table 5 – Cells in which text, rather than numbers, are input, sum to zero in pre-calculated cells (e.g., cells B16 and B23). This results in misleading results in columns B and C.
58. Table 5 – The blank rows that are below the “Other (please specify)” rows should be deleted since the “specify” button in “Other (please specify)” cells inserts a new blank row below.
59. Table 5.A – The blank rows that are below the “Other (specify)” rows should be deleted since the “specify” button in the “Other (specify)” cells inserts a new blank row below, or the blank rows should be made gray. Also, the cells that are in columns D, E, and G and in the “Other (specify)” rows should be gray, since nothing should be input into these cells.
60. Table 5.A – Row 32 should be removed.
61. Table 5.A – Flexibility to add rows to both the tropical and the temperate plantation types should exist.
62. Table 5.B – Should columns for NO_x and CO be included? These gases are included in Table 5.
63. Table 5.B – Row 28 should be removed, and the white cells in row 27 should be made gray.
64. Table 5.C – Row 25 should be removed, and the white cells in row 24 should be made gray.
65. Table 5.D – This table should be constructed to allow for mineral soil data time intervals that are different from 20 years. The formulas in column D and the Additional Information table require data for t-20yrs. The United States does not have mineral soil data that far back in time, and therefore uses data with 10- and 15-year intervals.
66. Table 5.D – Organic soil data for 20 years prior to the inventory year is irrelevant. Cells N10:N15 should be gray.
67. Table 5.D – Cells A17:D17 should be removed.

Comments on the Waste Tables

68. Tables 6.C – Options for specifying the type of Waste Incineration activity data should be designated by the user, and not limited to the exclusive categories or sub-categories of “biogenic” or “non-biogenic.” U.S. Inventory methodologies use different sets of activity data for different waste incineration emission calculations. Some of these activity data categories include both biogenic and non-biogenic wastes (in these cases, the emission factor has been calculated to only include the emissions from non-biogenic sources). For example, the N₂O estimation method uses total municipal solid waste and the calculation of CO₂ from synthetic fibers is based on total textile disposal, both of which would include biogenic and non-biogenic waste.

Comments on the "Other" Tables (Recalculations, Check-list, etc.)

69. Table 7 – Table 7 “Overview Table” should be revisited in light of IPCC Good Practice methods. The table could be improved to better record and convey the indicators of quality, and uncertainty. The existing Table 9 already covers ‘completeness’ so it is not necessary to replicate this indicator through the overview table. It is suggested that there be two new tables developed to replace the current Overview table. There should be a table for Quality Assurance/Quality Control and one for Uncertainty Estimates. The tables can be set up using primary indicators and elements for QA/QC and uncertainty as outlined in the IPCC Good Practice guidance. Suggested examples for QA/QC and Uncertainty tables are contained in Table 2 and 3, respectively..

The suggested table for QA/QC (Table 2, below) shows indicators for Tier 1 QC, Tier 2 QC, and QA, each of which correspond to the activities defined under Chapter 8 of the IPCC Good Practice guidance. The coding for each indicator is assigned to match the level of activity performed by the country. The coding is set up so that a cumulative score could be summed for each category, and in turn, the entire inventory, with high scores indicating a high level of QA/QC activity performed. This makes the table much less subjective in terms of assigning quality ratings as was done in the existing overview table. The suggested formative focuses on the level of performance of QA/QC activity as performed relative to the Good Practice guidance.

The suggested table for Uncertainty (Table 3, below) summarizes the level of uncertainty analysis performed and the percent value for uncertainty as a percentage of category emissions below and above the inventory values. The Tier 1 and 2 uncertainty analysis levels correspond to the Tier levels as outlined in Chapter 6 of the IPCC Good Practice guidance. The values for percent below and above as a percentage of category emissions is suggested for this summary table since it is one of the most common and recognized uncertainty indicators. There are other uncertainty values that are described in the IPCC Good Practice guidance that could potentially be included on the table.

Table 2.

TABLE 7a QUALITY ASSURANCE/QUALITY CONTROL TABLE FOR NATIONAL GREENHOUSE GAS INVENTORIES							
GREENHOUSE GAS SOURCE AND SINK CATEGORIES		CO₂			all other gases...		
		Tier 1 QC^(a)	Tier 2 QC^(b)	QA^(c)	Tier 1 QC	Tier 2 QC	QA
1 Energy							
A.	Fuel Combustion Activities	(1or 2)	(1,2,or 3)	(1, 2, or 3)			
	Reference Approach						
	Sectoral Approach						
	1. Energy Industries						
	2. Manufacturing Industries and Construction						
	3. Transport						
	4. Other Sectors						
	5. Other						
B.	Fugitive Emissions from Fuels						
	1. Solid Fuels						
	2. Oil and Natural Gas						
2 Industrial Processes							
A.	Mineral Products						
B.	Chemical Industry						
C.	Metal Production						
D.	Other Production						
E.	Production of Halocarbons and SF ₆						
<p>^(a) Indicate a "1" if none or only a portion of the Tier 1 QC checks from Table 8.1 in the the IPCC Good Practice and Uncertainty Management were performed; indicate a "2" if all Tier 1 QC checks from Table 8.1 were performed.</p> <p>^(b) Indicate a "1" if Tier 2 emissions data QC was performed, a "2" if Tier 2 activity data "QC" was performed, or a "3" if both Tier 2 emissions data and activity data QC were performed.</p> <p>^(c) Indicate a "1" if expert peer was performed as a QA activity, a "2" if an independent audit of the inventory was performed as a QA activity, or a "3" if both expert peer review and an independent audit were performed as QA activities.</p>							

Table 3.

TABLE 7b UNCERTAINTY TABLE FOR NATIONAL GREENHOUSE GAS INVENTORIES						
GREENHOUSE GAS SOURCE AND SINK CATEGORIES		CO₂			all other gases...	
		Tier Level^(a)	Uncertainty^(b)			
			% below	% above		
1 Energy						
A.	Fuel Combustion Activities	(1,2 or 3)	(value)	(value)		
	Reference Approach					
	Sectoral Approach					
	1. Energy Industries					
	2. Manufacturing Industries and Construction					
	3. Transport					
	4. Other Sectors					
	5. Other					
B.	Fugitive Emissions from Fuels					
	1. Solid Fuels					
	2. Oil and Natural Gas					
2 Industrial Processes						
A.	Mineral Products					
B.	Chemical Industry					
C.	Metal Production					
D.	Other Production					
E.	Production of Halocarbons and SF ₆					
<p>^(a) Indicate "1" if a Tier 1 level uncertainty analysis was performed, a "2" if a Tier 2 uncertainty analysis was performed, or a "3" if both a Tier 1 and Tier 2 uncertainty analysis have been performed. The Tier 1 and 2 uncertainty analysis are as defined in the IPCC Good Practice guidance.</p> <p>^(b) Indicate the values as a percentage of the category emissions for % below (2.5 percentile) and % above (97.5 percentile)</p>						

70. Table 7 – The United States suggests adding the notation key to this and the other sheets of Table 7 to make completion easier.
71. Table 7.s2 – This table allows for reporting on SO₂ estimates (cells V19 and W19 are blank), which is inconsistent with Summary 1.As2 and Table 4s2 (i.e., these tables do not allow for reporting of SO₂).
72. Table 7.s2 – The United States suggests making rows 22 and 23 one row (as is done in other tables) so there are no cells left blank. The United States entered data in cells D23 and E23 and left cells D22 and E22 blank.
73. Table 7.s2 – The United States recommends adding the notation key to this and the other sheets of Table 7 to make completion easier.
74. Table 7.s2 – Should not cells V24 and W24 be blank (as are T24 and U24)?
75. Table 7.s3 – What do the estimate assessment terms mean for Other in row 10? For example, does PART mean that a partial accounting of emissions from the other activity should be included, or that the other activity estimated is one of all possible other activities that would be included in an ideal world? What if there are several components of Other?
76. Table 8(a).s1 – The United States recommends adding the notation key to this and the other sheets of Table 7 to make completion easier.
77. Table 8(a).s1 – Cell D32 should be gray.
78. Table 8(a).s2 – Because CO₂ flux from agricultural soils can be included in either the LUCF sector or the Agriculture sector, the value reported in row 33 may not represent the same set of activities across all countries.
79. Table 8(b) – Recalculation tables should be strictly for recording recalculations and not for reporting errors in filling out the tables in previous years. Alternatively, the table name could be revised to reflect recalculations and simple “Corrections” to previous CRF tables. The term ‘recalculation’ implies changes to the methodology or underlying parameters, when in some cases it was merely a transcription error in creating the tables that required a new version.
80. Table 9.s1 – The definition of “Source/sink category” for the purposes of completing this table is not obvious. For example, is “Changes in Forests and Other Woody Biomass Stocks” a category, or is “Changes in Forests and Other Woody Biomass Stocks-Boreal Forests” a category? Is each row in Tables 5.A, 5.B, 5.C, and 5.D a separate category? Some guidance based on the disaggregation in the sectoral tables would be helpful.
81. Table 10.s1 – Because CO₂ flux from agricultural soils can be included in either the LUCF sector or the Agriculture sector, the value reported in row 48 may not represent the same set of activities across all countries.
82. Table 10.s1 – Row 29 should be gray in order to be consistent with the Summary tables.

83. Table 10.s2 – Cells B36:L36, B38:L38, and B39:L39 should be shaded.
84. Table 10.s3 – Cells B36:L36, B38:L38, and B39:L39 should be shaded.
85. Table 10.s3 – Row 30 should be gray in order to be consistent with the Summary tables.
86. Table 10.s5 – Because CO₂ flux from agricultural soils can be included in either the LUCF sector or the Agriculture sector, the value reported in rows 8, 23, and 24 may not represent the same set of activities across all countries.
87. Table 11 – The “Tables” section calls out a table labeled “Uncertainty,” but this table actually refers to “Table 7 Overview” (i.e., IPCC Table 8A, or CRF Tables 7s1, 7s2, and 7s3). These table names should be consistent, and based on the CRF manual, it seems as though the proper name should be “Table 7 Uncertainty.”
88. Table 11 – In the CO₂ section, the “Percentage of Difference” category is a calculated cell, but this cell results in a #VALUE error message because of “IE” values that were entered in Table 1.A(b) for the Reference Approach information.

PAPER NO. 7: AUSTRALIA

COMMENTS ON LUCF SECTORAL TABLES

The 10th session of the Subsidiary Body for Scientific and Technological Advice requested those Parties included in Annex I to the Convention, that are not using the sectoral background data tables 5A-D on land-use change and forestry of the common reporting format, to specify alternative formats and to submit them to the secretariat by 1 July 2001 [Document FCCC/SBSTA/1999/6, paragraph 27(g)]. This submission is Australia's response to this request.

The UNFCCC reporting guidelines on annual inventories [FCCC/CP/1999/7] confine use of the Land Use Change and Forestry sectoral background tables to Parties using the IPCC default methodologies and leaves open the form of reporting for Parties using country-specific methodologies. Australia uses a country-specific methodology in compiling inventory estimates for this sector, consequently in accordance with the reporting guidelines Australia does not complete the sectoral background tables.

Australian information on forests and grasslands are currently unavailable in a format that allows allocation of emissions according to the particular forest and soil categories given in the common reporting format (CRF). However, Australia is developing a spatially explicit National Carbon Accounting System (NCAS) to provide estimates of emissions from the Land Use Change and Forestry sector. When the NCAS is operational, Australia should be able to produce summary information, which is consistent with the CRF forest and soil categories. Australia may have later views based on experiences with the NCAS program once it becomes fully operational.

While the NCAS should provide the possibility of allocating emissions to the CRF categories, there remains a number of basic design problems with the CRF, in particular:

- The Sectoral report table does not allow for separate reporting of emissions and removals associated with the Forest and Grassland Conversion subsector
- Table 5A uses inconsistent forest categories
- Table 5B should report post burning regrowth separately and include decay of below ground biomass and soil organic carbon.

Australia considers that the proposals set out in this submission would facilitate universal utilisation of the CRF tables for inventories derived using both IPCC default methodologies and those derived from most country specific methodologies.

It should be cautioned, however, that using the sectoral background tables of the CRF to present emissions, may result in the loss of transparency in methodological practice as some of the information presented will be in the form of weighted averages rather than the actual values used to estimate emissions. For example the country specific-methodology may estimate emissions from five eucalyptus species each with different average annual growth rates; however, the CRF will only present a single weighted average growth rate for eucalyptus species. The SBSTA should give attention to suitable arrangements for cross-referencing the summary information in the sectoral background tables with the source of the fully detailed methodologies.

1. Sectoral Report

1.1 Forest and Grassland Conversion

Both the IPCC and Australian methodologies for estimating emissions from Forest and Grassland Conversion (F&GC) require an estimation of the net emissions. This involves estimating CO₂ emissions from cleared biomass and the CO₂ removals associated with regrowth of vegetation (crops, pasture and woody regrowth) after clearing. However, the trial CRF tables prevent reporting of net emissions under this subsector (cells are shaded and are locked). All other LUCF subsectors allow transparent reporting of emissions, removals and the net emissions/removals.

Footnote 2 on CRF Table 5 states only emissions of CO₂ from F&GC are to be included in 5B, while associated removals should be reported under 5D (CO₂ Emissions and Removals from Soil). The regrowth sink is not a removal from soils. Thus the trial CRF tables obstructs reporting emissions and removals associated with Forest and Grassland Conversion in a transparent manner.

The UNFCCC reporting guidelines on annual inventories [FCCC/CP/1999/7 Paragraph 14] indicate that greenhouse gas emissions and removals should be presented on a gas-by-gas basis in units of mass *with emissions by sources listed separately from removals by sinks*. We should, therefore, do this for all subsectors where possible.

Australia recommends the removal of the shading from the CO₂ removals and net emissions/removals columns to enable transparent reporting of emissions and removals associated with forest and grassland conversion. This will make it consistent with the reporting of the remaining subsectors of the Land Use Change and Forestry Subsector and the IPCC Guidelines.

In addition, it is important for F&GC (and other LUCF subsectors) that the emissions and removals from the soil pool should be reported under the relevant subsector (see section 2.3 of submission).

These modifications were made to the CRF in Australia's 1999 Greenhouse Gas Inventory (2001 Submission).

2. Sectoral background tables

2.1 Table 5.A Forest and Other Woody Biomass Stock

The table should use consistent headings for both temperate and tropical forests. The trial CRF tables describes the tropical and temperate forest categories using different classes of activity. Australia suggests the use of standardised activity classes for tropical and temperate forests under the headings:

- Plantations
- Other Harvested Forests
- Other (specify)

2.2 5.B Forest and Grassland Conversion

There are two problems with Table 5.B:

1. Carbon uptake by post burning regrowth should be reported separately.
2. It does not allow for the reporting of the decay of below ground biomass and soil organic matter

Australia suggests that Table 5.B be modified as follows to address these problems (see attachment):

- On and off site burning:
 - change 'Annual net loss of biomass' to 'Annual loss of biomass'.
 - Insert new column 'Regrowth - post burning regrowth on site'.
- Decay of biomass:
 - change title to 'Decay of biomass and soil organic carbon'
 - Remove 'Average quantity of biomass left to decay' column
 - Insert new columns 'Average area converted' and 'Average annual net loss' for both above- and below-ground.
- Emissions and Implied Emission Factors
 - Remove CH₄ and N₂O columns and insert additional decay columns

The trial CRF table conforms with the IPCC method that calculates the net change in biomass following conversion (including post burning regrowth). Subsequently decomposition and burning factors are applied to the net difference. However, the burning and decomposition factors should be applied to the gross amount of biomass affected by clearing. The emissions from clearing should then have the gross amount of regrowth subtracted to give the true net emissions. The modifications suggested above should assist in accurate reporting of burning and decay emissions.

Significant quantities of carbon dioxide can be released from the decay of roots and soil organic matter following clearing. Australia's position is that all emissions and sinks associated with land clearing should be reported under 5B. The modifications suggested above will enable transparent reporting of both above- and below-ground emissions.

2.3 5.D CO₂ emission and removals from Soil

Careful consideration should be given to whether the table in its current format will provide the Secretariat and Parties sufficient information on which to make meaningful inter-country comparisons.

Each of the sectoral tables need to make explicit that CO₂ emissions and removals from soils associated with the LUCF activities are to be reported within the relevant subsector (ie. 5A, 5B and 5C). It should also make clear that 5D provides the facility for reporting CO₂ emissions and removals from soils not otherwise covered by the other subsectors.

TABLE 5 SECTORAL REPORT FOR LAND-USE CHANGE AND FORESTRY
(Sheet 1 of 1)

Country
Year
Submission

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ emissions	CO ₂ removals	Net CO ₂ emissions/ removals	CH ₄	N ₂ O	NO _x	CO
	(Gg)						
Total Land-Use Change and Forestry	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A. Changes in Forest and Other Woody Biomass Stocks	0.00	0.00	0.00				
1. Tropical Forests			0.00				
2. Temperate Forests			0.00				
3. Boreal Forests			0.00				
4. Grasslands/Tundra			0.00				
5. Other (please specify) ...	0.00	0.00	0.00				
Harvested Wood ⁽¹⁾			0.00				
			0.00				
B. Forest and Grassland Conversion	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1. Tropical Forests			0.00				
2. Temperate Forests			0.00				
3. Boreal Forests			0.00				
4. Grasslands/Tundra			0.00				
5. Other (please specify) ...	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			0.00				
C. Abandonment of Managed Lands	0.00	0.00	0.00				
1. Tropical Forests			0.00				
2. Temperate Forests			0.00				
3. Boreal Forests			0.00				
4. Grasslands/Tundra			0.00				
5. Other (please specify) ...	0.00	0.00	0.00				
			0.00				
D. CO₂ Emissions and Removals from Soil	0.00	0.00	0.00				
Cultivation of Mineral Soils			0.00				
Cultivation of Organic Soils			0.00				
Liming of Agricultural Soils			0.00				
Forest Soils			0.00				
Other (please specify) ⁽²⁾ ...	0.00	0.00	0.00				
			0.00				
E. Other (please specify) ...	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			0.00				

⁽¹⁾ Following the IPCC Guidelines, the harvested wood should be reported under Changes in Forest and Other Woody Biomass Stocks (Volume 3. Reference Manual, p.5.17).

⁽²⁾ Include emissions from soils not reported under sections A, B and C.

Note: See footnote 4 to Summary 1.A of this common reporting format.

TABLE 5.A SECTORAL BACKGROUND DATA FOR LAND-USE CHANGE AND FORESTRY
Changes in Forest and Other Woody Biomass Stocks
 (Sheet 1 of 1)

Country
 Year
 Submission

GREENHOUSE GAS SOURCE AND SINK CATEGORIES			ACTIVITY DATA		IMPLIED EMISSION FACTORS	ESTIMATES
			Area of forest/biomass stocks (kha)	Average annual growth rate (t dm/ha)	Implied carbon uptake factor (t C/ha)	Carbon uptake increment (Gg C)
Tropical	Plantations	<i>Acacia spp.</i>			0.00	
		<i>Eucalyptus spp.</i>			0.00	
		<i>Tectona grandis</i>			0.00	
		<i>Pinus spp.</i>			0.00	
		<i>Pinus caribaea</i>			0.00	
		Mixed Hardwoods			0.00	
		Mixed Fast-Growing Hardwoods			0.00	
	Other Harvested Forests	Mixed Softwoods			0.00	
		Moist			0.00	
		Seasonal			0.00	
Other (<i>specify</i>)	Dry			0.00		
	---			0.00		
Temperate	Plantations				0.00	
					0.00	
	Other Harvested Forests	Evergreen			0.00	
		Deciduous			0.00	
Other (<i>specify</i>)	---			0.00		
				0.00		
Boreal					0.00	
			Number of trees (1000s of trees)	Annual growth rate (kt dm/1000 trees)	Carbon uptake factor (t C/tree)	Carbon uptake increment (Gg C)
Non-Forest Trees (<i>specify type</i>)			---			0.00
					0.00	
Total annual growth increment (Gg C)						0.00
Gg CO ₂						0.00
			Amount of biomass removed (kt dm)	Carbon emission factor (t C/t dm)	Carbon release (Gg C)	
Total biomass removed in Commercial Harvest					0.00	
Traditional Fuelwood Consumed					0.00	
Total Other Wood Use					0.00	
Total Biomass Consumption from Stocks ⁽¹⁾ (Gg C)						0.00
Other Changes in Carbon Stocks ⁽²⁾ (Gg C)						
Gg CO ₂						0.00
Net annual carbon uptake (+) or release (-) (Gg C)						0.00
Net CO ₂ emissions (-) or removals (+) (Gg CO ₂)						0.00

⁽¹⁾ Make sure that the quantity of biomass burned off-site is subtracted from this total.

⁽²⁾ The net annual carbon uptake/release is determined by comparing the annual biomass growth versus annual harvest, including the decay of forest products and slash left during harvest. The IPCC Guidelines recommend default assumption that all carbon removed in wood and other biomass from forests is oxidized in the year of removal. The emissions from decay could be included under Other Changes in Carbon Stocks.

Note: Sectoral background data tables on Land-Use Change and Forestry should be filled in only by Parties using the IPCC default methodology. Parties that use country specific methods and models should report information on them in a transparent manner, also providing suggestions for a possible sectoral background data table suitable for their calculation method.

Documentation box:

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Country
Year
Submission

TABLE 5.B SECTORAL BACKGROUND DATA FOR LAND-USE CHANGE AND FORESTRY
Forest and Grassland Conversion
(Sheet 1 of 1)

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA AND OTHER RELATED INFORMATION										IMPLIED EMISSION FACTORS						EMISSIONS					
	On and off site burning		Regrowth		Decay of biomass and soil organic carbon ⁽¹⁾		Burning		Decay		Burning		Decay		Burning		Decay					
	Area converted annually (kha)	Annual loss of biomass (kt dm)	Quantity of biomass burned On site (kt dm)	Off site (kt dm)	Post burning regrowth On site (kt dm)	Average area converted Above-ground (kha)	Average area converted Annual net loss (t dm/ha)	Average annual net loss Above-ground (kt dm/ha)	Below-ground (kha)	Below-ground (kt dm/ha)	On site CO ₂	Off site CO ₂	Above CO ₂	Below CO ₂	On site CO ₂	Off site CO ₂	Above CO ₂	Below CO ₂				
Vegetation types																						
Tropical																						
West/Very Moist																						
Moist, short dry season																						
Moist, long dry season																						
Dry																						
Montane Moist																						
Montane Dry																						
Tropical Savanna/Grasslands																						
Temperate																						
Coniferous																						
Broadleaf																						
Mixed Broadleaf/Coniferous																						
Grasslands																						
Boreal																						
Mixed Broadleaf/Coniferous																						
Coniferous																						
Forest-tundra																						
Grasslands/Tundra																						
Other <i>(Please specify)</i>																						
Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				

⁽¹⁾ Activity data are for default 10-year average for biomass and 20-year average for soil organic matter. Specify the average decay time which is appropriate for the local conditions, if other than the defaults specified.

Additional information		
Emissions/Removals	On site	Off site
Immediate carbon release from burning	0.00	0.00
Total On site and Off site (Gg C)	0.00	0.00
Delayed emissions from decay (Gg C)	0.00	0.00
Total annual carbon release (Gg C)	0.00	0.00
Total annual CO ₂ emissions (Gg CO ₂)	0.00	0.00

Additional information		
Fractions	On site	Off site
Fraction of biomass burned (average)		
Fraction which oxidizes during burning (average)		
Carbon fraction of aboveground biomass (average)		
Fraction left to decay (average)		
Nitrogen-carbon ratio		

Note: Sectoral background data tables on Land-Use Change and Forestry should be filled in only by Parties using the IPCC default methodology. Parties that use country specific methods and models should report information on them in a transparent manner, also providing suggestions for a possible sectoral background data table suitable for their calculation method.

Documentation box:

PAPER NO. 8: SWEDEN
(ON BEHALF OF THE EUROPEAN COMMUNITY AND ITS MEMBER STATES)

**METHODOLOGICAL ISSUES - GUIDELINES FOR THE PREPARATION OF
NATIONAL COMMUNICATIONS**

Sweden on behalf of the European Community and its Member States welcomes the opportunity to provide views on the tables 5A-D on land-use change and forestry. The submission follows the request by the SBSTA at its 10th meeting (1999) asking for submissions by Annex I Parties not using the sectoral background data tables 5. A-D. on land-use change and forestry of the common reporting format to specify alternative formats. (*Document FCCC/SBSTA/1999/6, para. 27 (g)*).

General comments on the Guidelines and the Common Reporting Format (CRF) are given by the EU in a separate submission on experiences with the use of the UNFCCC reporting guidelines on annual inventories, in particular the common reporting format as requested by the SBSTA. (*Document FCCC/CP/1999/6/Add.1, page 7, para. 3*)

Tables 5.A-D on land-use change and forestry of the common reporting format cover information on greenhouse gas sources and sink categories. The amendments we propose draw on our experiences with using the existing CRF, bearing in mind the importance at this stage of keeping our proposals within the scope of the IPCC 1996 revised Guidelines, since further work by IPCC is likely to start later this year.

Table 5. A Changes in forest and other woody biomass stocks

An amended format is proposed which the EU thinks can better serve as a basis for the UNFCCC review teams. Compared to the existing table the main changes proposed are listed below:

- (1) Parties should be able to specify relevant biome type (boreal, temperate, tropical) and then enter appropriate tree species in relation to that.
- (2) Plantations should be included in the box for forest management system. An additional box labelled "other" gives Parties opportunity to report coppice, biomass stocks from woody lands etc that are not defined as managed forests.
- (3) Under the heading "activity data" the EU sees the need for clarification that the area reported should be the forest area as defined by FAO or by national definitions of managed forest area. The main column "Average annual growth rate" should be divided into four so as to increase transparency. In the first column the measured wood-volume ("stemwood over bark") is to be given. The conversion factor for converting biomass to dry matter should be given in the second column. The expansion factor for scaling up from stemwood to total tree biomass should be defined separately in the third column in order to get information on which parts of the tree are included in the calculations (specified according to footnote 1). If root-biomass is included, it should include all material down to a certain specified minimum root-diameter. The resulting total tree biomass increment in tons of dry matter per hectare should be given in the fourth column.
- (4) Similarly, in the next main column dealing with implied emission factors, the conversion factor from dry matter to weight of carbon should be given for transparency reasons.

- (5) For convenience when comparing figures with other data given in carbon dioxide, the "Total annual growth increment" should be indicated both as Gg carbon and in Gg carbon dioxide in the bottom lines of the first section of the table.
- (6) The EU suggests that the central part of the table, dealing with harvest/removals, be expanded. Four categories of wood harvest categories should be listed, allowing Parties to select an appropriate wood-harvest category according to their availability of data. The difference between roundwood volume and stemwood volume indicates a possible volume left after harvest as woody debris. As for the growth data, conversion and expansion factors should be given, the latter equally specified according to foot-note 1.
- (7) In the third row on harvest/removal other wood use should be specified.
- (8) In the fourth row the EU suggests that harvesting residues and natural loss etc be specified, in addition, also including wood losses from fires without land use change, if any.
- (9) The signs in the net annual carbon uptake/release rows should be made consistent with the CRF in general (i.e. + for release/emissions and - for uptake/removals).

The EU also suggests amending the box at the lower right corner of the table so that it allows Parties to give a range or value for the uncertainty of calculated amounts or estimates. The EU sees this information as important and the errors should if possible be given as a statistical standard error of the mean (SEM).

Table 5.B Forest and grassland conversion

For the time being the EU proposes only a few minor amendments to this table and the next one (5.C), recognising the work that will be done in the near future by the IPCC - Good Practice Guidance in order to develop improved tools for this sub-sector.

- (1) We propose to delete the row "On- and off-site burning" which is irrelevant for many Parties. We suggest instead inserting "Annual loss of area and biomass". This makes it clearer that the columns below this row should be used to provide data on other types of conversion of land as well as data on burned areas.
- (2) We suggest deletion of the first sentence of the text in the note above the documentation box. A revised or amended version of the table should be used by all Parties. Proposed country specific methods and models should be those described in the National Inventory Report (NIR). A new sentence should be added at the end of the note, reading "Double accounting with tables 5.A and 5.D has to be avoided".
- (3) In the column "Annual net loss of biomass" a footnote is suggested to be added (2) for clarification: The foot note should read "If not reported as harvest in table 5.A".

Table 5.C Abandonment of managed lands

See the general comment on table 5.B.

We propose similar amendments to the note above the documentation box as suggested for table 5.B(2) above.

Table 5.D CO₂ Emissions and removals from soil

The EU proposes a new format for this table in order to better cover current needs, that is to provide a comprehensive coverage of all different soil types and land use changes, which is

easier to complete for Parties who do not use the IPCC default method, and which allows for the inclusion of non-CO₂ greenhouse gases affected by changes in land use.

Table 5. Sectoral report

The sectoral report is a summary table for tables 5.A-D. With the proposals for amendments etc. which are included in this submission the EU has the opinion that the existing format of table 5. still is adequate.

We note that wood harvest as reported in table 5.A for the time being is reported according to the IPCC default method in the sectoral report table 5. The harvested wood module needs further elaborative work and ought to be covered in a separate format under this sector. If a new approach or methodology is developed and approved by Parties to the Convention the new format should be developed accordingly. For further information on current EU views on this matter see EU submission of 16/03/2001: LULUCF9/"Estimates of emissions of carbon dioxide from forest harvesting and wood products".

Conclusions

These proposals are intended as a first step towards a more significant improvement of the monitoring and reporting in the LULUCF sector. The EU notes that a comprehensive carbon reporting (full carbon accounting) might correspond much better to the obligations given by the UN Framework Convention on Climate Change (art.4, para.1 (a); art.4, para.2 (c)). The EU would welcome if the coming IPCC work on Good Practice Guidance follow these lines in order to fill the gaps of the existing work-book and reporting instructions.

The EU recognises that any CRF - tables would have to be amended in view of the results of the ongoing work by the IPCC.

The EU finally wants to stress that the following points will be important principles towards an improvement of the CRF for carbon sinks.

- (1) The CRF should be developed further towards a full carbon accounting including all lands of a Party, where - if necessary- emission/removal figures for specific activities are reported as part of the figures for the carbon removals and emissions from all land categories (e.g. forests, grasslands, arable lands, wetlands, others; data for forest management could be reported under and as a part of the category forests; data for tillage could be reported under and as a part of the category arable land; etc.).
- (2) The CRF should be sufficiently general to allow for a comparison of reported figures and to avoid the reporting of figures for specific categories of activities which have a different meaning in each country and, hence, cannot be compared.
- (3) The CRF should, on the other hand, be sufficiently detailed to allow for an understanding, a brief check for plausibility and a comparison of key emission/removal - and expansion/conversion- factors.
- (4) The CRF should give a clear structure to avoid any possibilities for double accounting or that important greenhouse gas emissions/removals from land units are not counted or forgotten.
- (5) Cooperation with other relevant international efforts (e.g. FAO/TBFRA) should be part of the process in developing the reporting under UNFCCC.

TABLE 5.D - SECTORAL BACKGROUND DATA FOR LAND USE CHANGE AND FORESTRY

Soil Carbon Emissions and Removals from Soils

(Sheet 1 of 1)

Soil Carbon Emissions and Removals from Soils													Year
A	B	C	D	E	F	G	H	I	J	K	L	M	
GREENHOUSE GAS SOURCE AND SINK CATEGORIES					ACTIVITY DATA AND OTHER RELATED INFORMATION			IMPLIED EMISSION FACTOR	ASSOCIATED DATA ON EMISSIONS ⁽¹⁾				
Climate	Soil type	Current management system	Previous management system ⁽³⁾	Other activities (eg liming of agricultural soils)	Area with soil carbon changes (net emissions/removals) and/or other GHG emissions	Time to reach new equilibrium	Carbon gain or loss ⁽⁴⁾	Implied average uptake or loss rate	Associated CH ₄ emissions	Associated N ₂ O emissions	Implied CH ₄ emission factor	Implied N ₂ O emission factor	
					ha	Years	Gg CO ₂ /yr	Mg CO ₂ /ha/yr	Gg/yr	Gg/yr	Mg/ha/yr	Mg/ha/yr	
<i>Specify a climate type used by IPCC ⁽²⁾</i>	<i>eg mineral, organic or classification used by Party</i>	<i>forest/tillage/grassland /semi-natural/upland crops/pasture/others</i>	<i>one of entries in col C.</i>		<i>Enter area</i>	<i>Enter 20 yrs as default OR national value assumed for linearised transition OR time for 99% change under exponential curve OR specify 'Continuous' for organic soils undergoing sustained loss or liming</i>	<i>from default assumptions or national model</i>	<i>=1000H/F</i>	<i>from default assumptions or national model</i>	<i>from default assumptions or national model</i>	<i>=1000J/F</i>	<i>=1000K/F</i>	
					Totals:		=sum(colH,net)	=1000*sum(colF)/sum(colH,net)					
<p>⁽¹⁾ For greenhouse gases not already reported in Table 4 or 4.D (if available)</p> <p>⁽²⁾ Eg cold temperate dry, warm temperate dry, tropical moist or other type described in the IPCC 96 Guidelines, see pp5.31 ff of Workbook.</p> <p>⁽³⁾ For organic soils where sustained loss/increase of soil carbon is occurring enter the same agricultural or forestry use (eg upland crops, pasture/forest) in this column and the previous column.</p> <p>⁽⁴⁾ Net annual carbon release (+) or uptake (-) [Gg C] ; Net CO₂ emissions (+) or removals (-) [Gg CO₂].</p> <p>Note: Parties not using the IPCC default should fill in the background tables to the extent possible. Parties using country specific methods and models should report them in a transparent manner, i.e. used methodology should be described in the National Inventory Report (NIR). Double accounting with tables 5.B and 5.C has to be avoided.</p>													
Documentation box:													

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