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Parties to the UNFCCC in compiling and
reporting national greenhouse gas inventories****Urban Development**Princetonlaan 6
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Number of pages 20
Number of
appendices -
Customer Ministerie van Infrastructuur en Milieu
Cluster Internationale Zaken
Project name Verk. haalbaarheid Gereedskapskist NA-1
Project number 054.01413

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Samenvatting

Dit rapport presenteert de resultaten van een snelle analyse naar de mogelijkheden om een gereedschapskist te ontwikkelen waarmee niet-Annex I landen op relatief eenvoudige en kosteneffectieve wijze kunnen voldoen aan de rapportage-afspraken zoals gemaakt in Cancun in december 2010. Deze analyse is uitgevoerd op verzoek van het Ministerie voor Infrastructuur en Milieu (opdrachtbrief d.d. 12 april 2011, bestelnummer 4500001460).

Dit rapport is gebaseerd op:

- de ervaringen en resultaten van een eerder door het Ministerie aan TNO opgedragen project voor ondersteuning van een ontwikkelingsland (Columbia) bij het rapporteren van (twee-)jaarlijkse broeikasgasemissie inventarisaties.
- interviews en gesprekken met
 - ✓ Het Europees Milieuagentschap
 - ✓ De ontwikkelaars van het CollectER III systeem en de IPCC software tools
 - ✓ Vertegenwoordigers van het secretariaat van het Klimaatverdrag.

Dit rapport komt tot de volgende conclusies:

- Een samenhangende set gereedschappen kan worden ontwikkeld op basis van de bestaande tools als CollectER III en de verschillende gereedschappen die door IPCC zijn ontwikkeld.
- Deze gereedschapskist kan bestaan uit de volgende stukken gereedschap:
 - ✓ Een of meerdere gespecialiseerde rekenprogramma's voor de verschillende sectoren en brongroepen, zoals gehanteerd in de nationale emissierapportages; er kan wellicht gebruik worden gemaakt van de IPCC 2006 guidelines software
 - ✓ Een centraal database systeem dat vrijwel alle benodigde functionaliteit kan overnemen van het EEA systeem CollectER III; er zijn nog enkele reparaties aan dit systeem nodig, waarover met EEA kan worden overlegd.
 - ✓ Een hulpmiddel om op een gestructureerde manier een National Inventory Report (NIR) te schrijven, bijvoorbeeld via een speciale "wiki".
 - ✓ Een set ondersteunende documenten, waaronder in ieder geval de IPCC Richtlijnen en de IPCC EFDB, de handleidingen bij de gereedschappen, de TNO-brochure "The Art of emission Inventorying" en een zelf-trainings document, vergelijkbaar met Trainer III, welke door EEA voor de gebruikers van CollectER III is geschreven.
- De gereedschapskist kan zó worden ontwikkeld dat de keuze voor 1996 of 2006 Guidelines, of een eventuele aanpassing daarvan relatief eenvoudig kan worden ingebouwd.

Het rapport concludeert dat voor de ontwikkeling van dit pakket gereedschappen op basis van bestaande hulpmiddelen een budget in de orde van grootte van € 150.000 tot € 250.000 nodig zal zijn. Uit de gesprekken met EEA bleek dat binnen het werkpakket van EEA in de komende jaren wellicht een deel van de benodigde budgetten gevonden zal kunnen worden.

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1 Introduction

At the COP16 in Cancun it was decided that

The Conference of the Parties,

[...]

60¹. Decides to enhance reporting in national communications, including inventories, from Parties not included in Annex I to the Convention on mitigation actions and their effects, and support received, with additional flexibility to be given to the least developed country Parties and small island developing States:

- (a) The content and frequency of national communications from Parties not included in Annex I to the Convention will not be more onerous than that for Parties included in Annex I to the Convention;*
- (b) Parties not included in Annex I to the Convention should submit their national communications to the Conference of the Parties, in accordance with Article 12, paragraph 1, of the Convention, every four years or in accordance with any further decisions on frequency by the Conference of the Parties, taking into account a differentiated timetable and the prompt provision of financial resources to cover the agreed full costs incurred by Parties not included in Annex I to the Convention in preparing their national communications;*
- (c) Developing countries, consistent with their capabilities and the level of support provided for reporting, should also submit biennial update reports containing updates of national greenhouse gas inventories, including a national inventory report and information on mitigation actions, needs and support received;*

The Dutch Ministry of Infrastructure and Environment asked TNO to assess the possibilities to develop a toolkit for non-Annex I Parties that could support their compliance with the above decision in a cost-effective and efficient way.

So, at the Cancun COP the non-Annex I Parties agreed to a regular reporting (bi annual) of their national emission inventories. However the reporting guidelines for this reporting have not yet been established.

It is expected that the emission inventories as reported by the non-Annex I Parties should comply with the basic quality criteria as defined in the UNFCCC Guidelines.

These requirements are similar to, but might be interpreted as less demanding, than the ones now applied for Annex I reporting. In the analysis below we will try to provide tools that allow compliance with these requirements at a minimal level.

¹ paragraph 60 of Decision 1/CP.16 The Cancun Agreements: Outcome of the work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention
<http://unfccc.int/resource/docs/2010/cop16/eng/07a01.pdf#page=2>

This document derives from the above a possible toolkit that could be developed as part of Annex I Parties' support of the non-Annex I Parties in building their capacity to indeed bi-annually report national greenhouse gas inventories of sufficient quality in terms of TCCCA and fit for used in all monitoring processes under the Convention.

The proposed toolkit shall be available to all, free of charge, and will not preclude on decisions yet to be made on the exact technical guidelines to be applied. The system should work both under the IPCC 1996 and the IPCC 2006 Guidelines and allow for easy adaptation to any changes or additions to these that could be decided by the COP.

2 Approach

In 2010 and 2011 the Dutch Ministry of Infrastructure and Environment (I&M) funded a project that allowed TNO to support the compilation of a national greenhouse gas emission inventory in Colombia. This project was executed in close co-operation between the experts of the Colombian Hydrometeorological Institute (IDEAM) and TNO. TNO provides support, tools and advice, while the IDEAM experts do the data collection and data compilation work.

In this project the EEA software tool CollectER III (development lead by TNO²) was used. The tool follows the approach and ideas as laid down in the recent TNO brochure “The Art of Emission Inventorying”³.

With the experience of the Colombia project, we have spoken with representatives of the UNFCCC Secretariat (Rogier van der Haagen, members of the Review and Data Analysis group), EEA (Martin Adams, Ricardo Fernandez) and the software company Spirit. Their views and opinions are used to develop the ideas and proposals in this document. The conclusions and recommendations in this document however do not necessarily reflect the views and opinions of these organisations.

This report presents the following:

An analysis of minimal requirements on non-Annex I Parties' inventory submissions

- The tasks that should be performed when compiling such inventories and reporting them to UNFCCC;
- The tools within a toolkit that could support these tasks;
- A preliminary estimate of the resources needed for the development.

The report concludes with a series of recommendations.

² http://acm.eionet.europa.eu/country_tools/ae/CollectER_III.html

³ <http://www.tno.nl/EmissionInventoryBook>

3 Results

3.1 Compiling and Reporting (bi-) annual greenhouse gas emission inventories

Parties to the UNFCCC report national greenhouse gas emission inventories to comply with the obligations they have agreed within the convention and any of its protocols with a view of showing progress towards compliance with emission limitations. For Annex I Parties the UNFCCC Guidelines for Reporting and Review⁴ provide detailed guidance on these inventories.

At the Cancun COP the non-Annex I Parties also agreed to a regular reporting of their national emission inventories. However the reporting guidelines for this reporting have not yet been established. In this feasibility study we assume the following:

1. The emission inventories as reported by the non-Annex I Parties should comply with the basic quality criteria as defined in the UNFCCC Guidelines. The inventory should be:
 - a) *Transparent*: external users and reviewers should be able to understand the methods and underlying data used in the inventory compilation;
 - b) *Consistent*: the approach should show time series consistency for all sources and gases;
 - c) *Comparable*: the inventory should be organised in the source categories that are defined in the appropriate IPCC Guidelines, following the relevant decisions of the COP;
 - d) *Complete*: estimates should be included for all sources and sinks that occur in the country. Where such sources do not occur, these should be indicated as *NO* (not occurring); in addition, notation keys *NE* (not estimated) and *IE* (included elsewhere) may be used;
 - e) *Accurate*: the inventory should not be biased and over- and underestimations should be avoided as much as possible.
2. The data submission to the UNFCCC should include at least:
 - a) Total emissions for each relevant gas at the level of the most detailed source category as defined in the appropriate guidelines;
 - b) Activity data for each relevant sector;
 - c) A national inventory report explaining the data sources (activity data) and assumptions (mainly emission factors) used.
3. The data, submitted to the UNFCCC will be included in a central database system, run by the secretariat. Data import at the secretariat will follow generally the same procedure and formats as now used for Annex I reporting (XML-file with a predefined structure).

⁴ <http://unfccc.int/resource/docs/2006/sbsta/eng/09.pdf>

The above requirements are similar to, but might be interpreted as less demanding, than the ones now applied for Annex I reporting. In the analysis below we will try to provide tools that allow compliance with these requirements at a minimal level.

3.2 Comparability and the IPCC Guidelines

One issue that is not decided yet by the Parties is which set of technical guidelines are to be used in reporting by non-Annex I Parties, neither for reporting by Annex I Parties under the second commitment period. This complicates the development of a toolkit to a limited extent only. The 1996 Guidelines, now used for the reporting of inventories (both annual inventories by Annex I Parties and inventories in the national communications by all Parties) and the 2006 Guidelines have a different set of source category definitions. Although for many source categories the conversion from one set of definitions into the other is rather straight forward, the situation for some source categories is more complicated. These occur mainly in the Forestry and Land Use part of the AFOLU sector in the 2006 Guidelines.

Since no final decision is made on which set of IPCC Guidelines are to be used we aim at designing the toolkit such that it is independent on the exact Guidelines to be used. Given the discussions that still take place on the forestry, land use and land use change source categories we propose to not include the sectors at this point in time.

3.3 The toolkit

3.3.1 The tasks

Compiling and reporting an emission inventory includes four successive tasks (Figure 1):

1. Calculating (or estimating) the emissions for each relevant source category and each relevant gas;
2. Compiling the resulting emission estimates in a national emission inventory database;

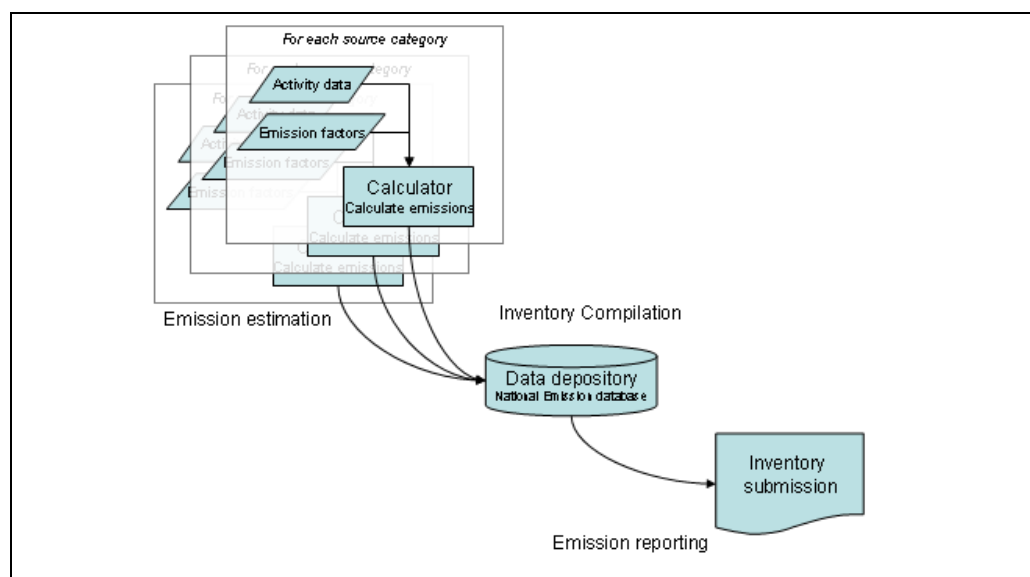


Figure 1 The three major tasks of GHG Emission Inventory reporting; data flow from the calculators into the dataset and from there to the Submission

3. Extracting the data, needed for the submission and loading them into the data submission format as required by the UNFCCC;
4. Drafting a national inventory report describing the assumptions, origin of activity data and emission factors used in the estimation.

We propose to make use of this distinction to define the different tools within the toolkit.

Since the tasks to regularly submit a GHG emission inventory involves a broad range of expertise, we feel that the toolkit should be accompanied by supporting material. We propose the following:

1. The TNO brochure "The Art of emission Inventorying", providing back ground information and contextual knowledge on the science and practice of emission inventorying;
2. A self training document that provides practical step-by-step explanations for the use of the tools within the toolkit. This document could be comparable to the one that is available for the EEA inventory software tool CollectER.

3.3.2 *The tools*

Following the idea of a "toolkit" we propose to develop the system as indeed a collection of tools that can be used separately or in combination to perform all or part of the tasks mentioned above for part of or all of the sectors and all of the gases.

1. A number of dedicated "emission calculators" supporting emission calculations based on statistics as they can be available within the country or in international data sets (IEA UNStats, FAO, etc.).
These tool would generate electronic output files that can be directly imported into the emission inventory compilation tool;
2. An emission inventory compilation tool, which in our view could be derived from the present version of the EEA Emission Inventory tool CollectER III;
3. Tools for submission of the inventory:
 - a) An export file in a format that can be directly loaded into the data systems of the UNFCCC. This file should be generated by the emission inventory compilation tool;
 - b) A tool to support the preparation of the National Inventory Report.

A crucial issue here is that the different tools need to be able to exchange data and results without too much trouble. At the same time the format for data exchange between the tools should be open and available for developers that design and develop their own tools. One could imagine that the new IPCC software could be equipped with a function that generates one or more files that can be directly imported into the emission inventory compilation tool.

We also note that the direction of the transfer of data and results is a one way road: from the "calculators" to the inventory compilation tool to the submission tool. This means that in this transfer in principle detail can be lost without any technical problem. The transfer routines can include some kind of aggregation, when needed. In other words, the tool earlier in the transfer route can include details that are not strictly needed later in the procedure.

3.4 Developing the toolkit

We believe that the toolkit should be demand driven in the sense that it should deliver the data sets as requested by the UNFCCC processes. From this the specifications of the inventory compilation tool and the generic specifications of the “calculators” will be derived.

3.4.1 *Submission tools*

a) Data transfer

Since the toolkit is primarily aimed at use by non-Annex I Parties with, in most cases, limited resources and national inventory systems that are not well developed yet, we assume that the numerical data requirement by the UNFCCC process will be limited to:

1. Total emissions for each relevant gas at the level of the most detailed source category as defined in the appropriate guidelines;
2. Activity data for each relevant sector;
3. A National Inventory Report with a prescribed outline;
4. Time series overviews;
5. Key category analysis results;
6. Some kind of completeness check.

The latter three could be used to automatically complete the relevant tables that now are included in the CRF.

The above list of data to be exported is for a number of sectors limited in comparison with the data required by the present CRF Reporter, used by the Annex I Parties. The data required basically only include the resulting emission estimates and (aggregated) activity data, allowing for calculating “implied emission factors”. With this the UNFCCC can perform almost all more or less automated quality checks needed for the first steps in a review process, very similar to the “initial check” and the “synthesis and assessment”. If any issues arise from such tests, a review team can always dive deeper into these by requesting further details of the estimation methods and assumptions from the national experts.

b) Drafting a national inventory report

In the Colombia project we used a free Wikidot account to allow selected experts drafting a national inventory report. In this project this seems to work well.

This free Wikidot account has some disadvantages:

- The site presents advertisements on the wiki pages; a license to Wikidot (50€/year) solves this issue;
- All information in the wiki is stored in databases on the Wikidot servers; data security and access management might be difficult;
- Stability of the site is not guaranteed; if Wikidot crashes or goes bankrupt, the system would not survive;
- It is relatively difficult to have the site password protected and open to a limited number of contributors/editors.

It would be better and safer if a dedicated wiki could be developed, running on a server that is under full control of either the Party concerned or a still to be established help and user support centre for the toolkit.

3.4.2 *Inventory Compilation tool: CollectER*

At the national level this tool is the core of the system. It provides a database structure and import and export functionality, including some level of data screening. We propose to use the EEA CollectER III software tool as the basis of this tool. The application of the CollectER III tool in Colombia and earlier in Macedonia has shown that the tool indeed supports a national team in compiling the database and reporting emissions.

The following is needed to have CollectER III included in the toolkit:

1. Several tables with codes ("SourceDetails", "fuels", "units", other tables?) might need some clean-up;
2. The CRF Reporter export must be completed. Now the only activity data that are exported are the fuel use data in the energy sector. Activity data should also be exported for all other source categories;
The CRF Reporter export from CollectER III should include (aggregated) activity data and emissions at the most detailed level required by the appropriate guidelines;
3. The tool will need to be expanded with an import function, using a standardized XML format, linking to any dedicated calculator, used to estimate emissions.

Since the CollectER III tool stores the source categories in a special table in the database, adapting the system to either the 1996 or the 2006 IPCC Guidelines, or any other set of technical guidance, will be merely to populate this table with the correct definitions and source category codes. The tool therefore is largely independent on the exact technical guidance used in the inventory submission. Obviously, when the guidance changes recalculation of an already submitted series of inventories, using the new guidance, might be difficult. But this is independent of the database and compilation tool used.

3.4.3 *Dedicated calculators*

The core of our thinking here is to more clearly make a distinction between the three steps in the emission inventory reporting: calculating, compiling a database and reporting. The dedicated calculators will perform the estimate and, in the ideal case, store and document all necessary input data and parameters.

The only real requirement to any calculator in the system would be that it can generate the XML import file for the CollectER III tool. There are two routes forward here:

1. Identify existing calculators and try to add or include an XML output function into such tools.
A possible candidate here is the software developed by Spirit for the IPCC 2006 Guidelines. This tool follows the IPCC 2006 worksheets for each sector. To add the CollectER XML export to this tool, again two options are possible:
 - a) Build the export tool into the IPCC software;
 - b) Build a separate extraction tool that directly reads the IPCC tool's database and extracts the data as needed for CollectER III inventory.

This route could be further explored and discussions and possibly agreements with the IPCC (NGGIP TSU) would be needed, especially when the first option is used.

2. Build new calculators.

This has in principle been done in the Colombia project, using MS Excel to manipulate input data received from data providers in the country. Data have been imported using MS Access, linking to the Excel spreadsheet. XML was not used for data import and relatively advanced experience in both MS Access and MS Excel is needed for this.

We propose to develop these calculators for the different sectors or subsectors separately. In principle such calculators do not need to be all available at the same time. It could be decided to develop them over time, starting with the most important ones. This could be as follows:

a) Energy sector: a tool that would:

- Read a more or less generic energy statistics table (by fuel: energy supply balance to read the fossil fuel exploitation data for mining etc.; energy transformation data for power plants, refineries etc.; final energy use for all final energy sectors); energy statistics follow in most cases to a large extent the same structure and apply similar or the same definitions; a good starting point could be the definitions and structure of the IEA energy database, but national energy statistics might deviate in some details, as was the case in Colombia;
- Provide easy access to relevant emission factors (from IPCC's EFDB ?), allowing the user to select the most appropriate ones and, if needed modify them according to national circumstances;
- Calculate emissions and export them into the XML format.

b) Agriculture sector: a tool that would:

- Read animal numbers and crop production data from external datasets, possibly comparable to datasets from FAO;
- Provide easy access to relevant emission factors (from IPCC's EFDB ?), allowing the user to select the most appropriate ones and, if needed modify them according to national circumstances;
- Calculate emissions and export them into the XML format.

These two tools will be rather straight forward and will support the emission inventory compilation for the major sources in most non-Annex I Parties (apart from land use, land use change and forestry).

c) Industrial Processes and Product Use sectors:

Within this sector several tools might be needed:

- a tool to estimate process emissions of CO₂ (iron and steel), N₂O and CH₄ in industry; this tool could probably be built on the basis of internationally available industrial production data in a way similar to the energy and agriculture calculators;
- a tool to estimate emissions of the high GWP gases (F-gases); production and use of F-gases is probably not a very important source in non-Annex I Parties at this moment; however it might gain importance quickly when these countries enter a higher level of development;

d) Waste sector;

- The most simple tool here could be based on population data and default emission factors derived along the lines of the Tier 1 and Tier 2 approaches in both the 1996 and the 2006 IPCC Guidelines;

e) Land Use, Land Use Change and Forestry sector.

- This tool will be the most complicated one and will be quite dependent on the exact technical guidance to be applied. We propose to, for the time being, leave this tool out of the system and decide in a later stage on whether or not and how to develop this tool.

3.4.4 *Supporting documents*

Supporting documents include:

1. Guidance documents from both UNFCCC and IPCC: available through the UNFCCC and IPCC Webs sites;
2. Emission factor collections (EFDB, available through the IPCC website);
3. General information on emission inventories ("The Art of emission Inventorying" and possibly other similar books and/or reports): available through the TNO website; (printed copies are not available anymore);
4. Manuals of all electronic tools; these are in principle integral part of the tools and should be developed together with these tools;
5. A self training document, providing step by step guidance through a GHG emission inventory submission task at a national level; this document could be similar in idea and structure as the TrainER III document that accompanies the CollectER III tool.

For this toolkit the self training document would need adaptation to the specific issues in a GHG inventory and examples should be relevant for most, if not all, non-Annex I Parties.

3.5 Availability of the toolkit

3.5.1 *Freeware*

It is absolutely essential that the toolkit is available to anybody, free of charge. We propose to place all tools and documentation in electronic form on a dedicated website, possibly at EEA. A copy of the website, including all downloads, should be made available off line through a CD-ROM.

It might be that printed copies of the supporting documents would also be required by some users.

3.5.2 *Language*

The CollectER III tool and all other tools are available in English only. It might be necessary to have different language versions available.

3.6 Resource requirements

3.6.1 *Developing the toolkit*

The following table provides an overview of the resources needed to develop each of the tools in the toolkit. Please be aware that the budgets are our preliminary first estimate only and have not been discussed with anybody. They are based on my gut feeling only and I expect that a real budget will not deviate more than a factor of two in either direction. This could mean that the total costs of developing this toolkit could amount to k€ 150 to 250.

In our view, the CollectER III tool as it is now should be able to export all numerical data in the database into the CRF Reporter XML file. Since this would be helpful to all users of the tool, EEA could be approached to support this part of the development.

A similar reasoning could be valid for the XML data exchange between the CollectER tool and the calculators. This could be of value for both users of the CollectER system and for users of the IPCC 2006 tool.

| Tool | | Tasks | Estimated budget (*) |
|--|--------------------|---|------------------------------|
| Calculators | IPCC 2006 software | Either include an CollectER XML export function into the IPCC tool or develop a stand alone importer tool | 15 k€ (discuss with IPCC) |
| | Energy | Develop a calculation tool, using a generic energy statistics data set and linking to the IPCC EFDB emission factors | 40 k€ |
| | Agriculture | Develop a calculation tool, using FAO or similar statistics and linking to the IPCC EFDB emission factors | 25 k€ |
| | IPPU | Industrial Processes | 20 k€ |
| | | F-gases | 15 k€ |
| | Waste | | 15 k€ |
| | LULUCF | | ??? |
| CollectER III | | Data compilation: develop an XML format that allows import of information (emissions and activity data only) from the calculators | 15 k€ |
| | | Data submission: complete the present CRF Reporter XML export to include all activity data | 15 k€ (discuss with EEA) |
| Drafting a NIR | | Develop a dedicated Wiki | ??? (**) |
| Supporting documents | | Manuals | Pm |
| | | Self training document | 25 k€ |
| <p>(*) <i>Estimated budgets for the calculators</i></p> <ul style="list-style-type: none">✓ <i>assume that they are developed in the order indicated and that parts of the tools can be re-used in other tools. The first tool to be developed therefore will be the most expensive</i>✓ <i>include both domain expertise and programming</i>✓ <i>include a technical manual</i> <p>(**) <i>The costs of developing a dedicated wiki are not clear yet. In principle a free Wikidot account could be used that would provide the main functionality, similarly to what was used in Colombia.</i></p> | | | |

3.6.2 Maintenance and user support

Once the toolkit is available, some maintenance and a help desk will be required.

Maintenance will include:

1. Repairing any bugs, when detected;
2. Ensuring compatibility with new versions of computer operating systems;
3. Further development of the toolkit following requirements of the users;

User support will include:

4. Managing a user group;
5. Responding to user questions on technical aspects of the tools;
6. Responding to user questions on contents (interpretation of activity data, selection of emission factors etc.);
7. Possibly regional or global user group meetings for training and mutual support and exchange of experiences.

The budget needed for user support and maintenance could be in the order of magnitude of 5 to 10 k€ (base load) + 1 to 1.5 k€ per user (responding to questions etc.). If user group meetings would be organised, additional budgets for travel and meeting costs (translation?) would be needed.

3.7 How to continue

3.7.1 *Stepwise approach*

The above analysis shows that in principle a toolkit is feasible, to be built around available tools. But at the same time some additional work is needed to ensure a better and more user friendly data flow through different tools within such a toolkit. From the rough estimate of resources we expect the costs of a toolkit, excluding a LULUCF calculator, to be in the order of magnitude of 150 to 250 k€, assuming that the CollectER III tool can largely be reused as is and only slightly adapted to the toolkit requirements as discussed above.

From our consultations with EEA we understand that EEA is very interested in this activity. We also understand that the European Commission is interested in supporting non-Annex I Parties in this field and might be interested in providing funds / contracts for capacity building on emissions reporting.

It might therefore be worthwhile to assess whether a joint project, funded by both the Netherlands and European institutions (Commission and/or European Environment Agency) could be developed. If necessary, support from other EU Member States could be sought.

As soon as budgets are available, the development of the toolkit can be started. The toolkit can in principle be developed in a stepwise approach. However for the toolkit to be useful three tools should be available:

1. An updated CollectER III tool, with:
 - ✓ a complete export to the CRF Reporter XML format;
 - ✓ an XML import function, linking to at least one available calculator.
2. At least one calculator, preferably for the Energy sector; we expect that the energy sector will be responsible for at least 60% of the greenhouse gas emissions in almost all non-Annex I Parties (excluding LULUCF);
3. An updated self-training document.

A first rough estimate of the costs of such a development amounts to about k€ 100.

3.7.2 *Using the internet*

The above analysis implicitly assumes that a reasonably fast internet connection is available for all users:

- To enable a Wiki type of functionality for the NIR drafting;
- To link to web based emission factor collections and for support and help;
- To submit the inventory to UNFCCC.

IPCC is for the development of its tools rather reluctant to require internet connection to use its tools. IPCC provides stand alone versions on CD ROM for both the EFDB and the 2006 Guidelines software.

In this proposal we assume that users will have internet access.

3.7.3 *Language support*

CollectER III uses English for both all text strings in the interface and the tables defining source categories and fuels. One could imagine implementing a language management function, allowing specific users to define additional languages and a function to translate all text strings in the interface in this additional language. A similar functionality is implemented in the IPCC EFDB and in the IPCC 2006 Guidelines and could be added to the CollectER III tool. This would minimize the costs of translation of the electronic tools, since users would be able to translate it themselves. This would also require a mechanism to offer available translations to other users. A user group would be instrumental for this.

The IPCC source categories (both 1996 and 2006) and general fuel definitions are available in all official languages of the UN. These could be implemented in the relevant CollectER III definition tables.

Any texts entered by the user could be any language. This is helpful wherever the user will define his or her own specific detailing information (additional fuels, "source details", locations). The tool is in this respect language independent. This obviously also holds for the use of the broadly available comment fields in the database.

4 Recommendations

4.1 International co-operation

The availability of a toolkit for estimating, compiling and reporting is seen as an important opportunity for non-Annex I Parties to cost-effectively report their national emissions inventories with sufficient quality in terms of TCCCA to the Convention. Several institutions have expressed interest in these developments and might be willing to contribute to the developments in some way or another.

- The unit at UNFCCC who is responsible for the submission tools and the development thereof will be interested in the exact formats the toolkit will be able to deliver. UNFCCC staff has indicated that the data submission tool will most probably be based on a standardized XML format that might be compatible with the existing XML format, used in the present CRF Reporter tool. UNFCCC is considering an update of this tool, reflecting the requirements of a new set of reporting guidelines to be used for the next commitment periods;
- The European Environment Agency (EEA) now provides the CollectER III tool on its website and provides a limited amount of help desk functionality via its European Topic Centre for Air Pollution and Climate Change Mitigation (ETC/ACM). EEA is interested in expanding its support to include non-Annex I Parties and could possibly provide a website where the toolkit could be placed;
- IPCC has developed its own software, based on the work sheets of the IPCC 2006 Guidelines. This tool could be equipped with functionality to export emissions and activity data into the database compilation tool of the new toolkit;
- Other Annex I Parties, including the European Union, might wish to join in in this development.

From this we conclude that the development of the toolkit would benefit from a close link to and co-ordination and consultation with these international organisations and possibly individual Annex I parties.

4.2 Developing the toolkit

As indicated in Chapter 3, we believe that a stepwise approach would be possible.

However for a first version of the system the following tools would be needed;

- The TNO brochure “The Art of Emission Inventorying”;
- A fully functioning CollectER III export to a well defined XML format that would include:
 - ✓ all emissions
 - ✓ all activity rates
 by source category and fuel as defined in the relevant reporting formats of UNFCCC.
- A well defined import XML format with examples on how to export such data from frequently used calculation tools (MS Excel sheets);
- At least one calculator that will implement a relatively simple calculation of emissions from readily available activity statistics;
- An updated self training document, based on the present TrainER III document, accompanying the set of tools.

Over time the toolkit could be extended with additional calculators.

4.3 Maintenance

An important issue is maintenance of the toolkit, once it has been developed. This issue will need further discussion between institutions that could be interested in this activity. The resources needed for this obviously depend on the number of users.

5 Authentication

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