INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE

NATIONAL GREENHOUSE GAS INVENTORIES PROGRAMME

WMO UNEP

ESTABLISHMENT OF A DATABASE ON GREENHOUSE GAS EMISSION FACTORS

Report of the Second Expert Meeting

Bratislava, Slovakia

23-24 April 2002

ACKNOWLEDGEMENTS

This report was prepared by Tinus Pulles, Katarina Mareckova, Taka Hiraishi, Joe Mangino, Branca Americano, Tleussen Temertekov, Riitta Pipatti and Kiyoto Tanabe with assistance from Stephanie F. Finn, Chia Ha, Todd Ngara, Leandro Buendia and Kyoko Miwa. We are grateful to many experts who contributed to this report and attended the expert meeting. We also thank the staff of the Slovak Hydrometeorological Institute (SMHU), the SPIRIT a.s., and the Institute for Global Environmental Strategies (IGES) who assisted in organising the expert meeting.

Table of contents

Summary

In January 2002, a prototype database on greenhouse gas emission factors (prototype EFDB) was constructed under the IPCC National Greenhouse Gas Inventories Programme (IPCC-NGGIP) in accordance with the functional design agreed at the expert meeting held in Paris, France, on 2-4 July 2001. The steering group for this project (EFDB Steering Group [1]) decided to proceed with pilot testing of this prototype database for 8 weeks, from 11 February to 8 April 2002.

Subsequently, the IPCC-NGGIP organised an expert meeting on Establishment of a Database on Greenhouse Gas Emission Factors in Bratislava, Slovakia, on 23-24 April 2002. The objectives of this meeting were to:

- Review the results of the pilot testing of the prototype database;
- Identify problems to improve the prototype database;
- Discuss the design and functions of the database based on the result of the pilot testing;
- Discuss the procedure and schedule for improvement of the prototype database and its release to the public; and
- Discuss the modalities and procedures to manage and populate the database.

At this meeting, the participants considered 119 comments from 26 experts obtained through the pilot testing. The participants agreed on recommendations to the EFDB Steering Group to improve the design, structure, data content, data input process and data output format of the prototype database.

The participants also considered the future development of the EFDB and agreed on a proposal to the Task Force Bureau (TFB) on modalities and procedures to manage and populate it.

[1] The EFDB Steering Group was established by the Task Force Bureau (TFB) for the IPCC-NGGIP, at its 6th session, in order to oversee the development of, to ensure good management of, and to assure usability of the emission factors database (EFDB) under the IPCC-NGGIP.

1. Introduction

1-1. Background

The quality of national inventories of anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol (GHG inventories) depends substantially on reliable emission factors and activity data. Although it is preferable to use emission factors that reflect national circumstances, emission factor development is expensive, time consuming and necessitates a wide degree of expertise. The *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories* (*IPCC Guidelines*) and the report on *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* (*Good Practice Report*) provide default emission factors for the majority of source and sink categories. Some of these default emission factors are region or country specific, but in general not all regions or countries are covered.

Sharing of research information would enable countries to use or develop emission factors that are more applicable to the circumstances in question than the IPCC default emission factors without having to bear the associated research costs. For this reason, many countries have indicated (e.g. in the Expert Group Meeting on National Feedback on the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories, Havana, Cuba, September 1998) that an easily accessible public database on GHG emission factors with supporting scientific information would help improve the quality of GHG inventories in a cost-effective way. A database on GHG emission factors (EFDB) with supporting scientific information would also support the future review and update of the *IPCC Guidelines* under the IPCC National Greenhouse Gas Inventories Programme (IPCC-NGGIP).

With this background, a project to establish a database on GHG emission factors was initiated with a scoping meeting held in New Delhi, India, on 24-25 July 2000. After this meeting, a strategic implementation plan (SIP) for the establishment of an Emission Factors Database was prepared by the Technical Support Unit (TSU), and endorsed by the Task Force Bureau (TFB) for the IPCC-NGGIP at its 5th session on 14 March 2001 in Geneva.

In accordance with the SIP, the first expert meeting on this EFDB project was held in Paris, France, on 2-4 July 2001. The Paris meeting agreed upon the required information categories and data fields, the functional design, and some aspects of the EFDB management. Subsequently the TFB, at its 6th session held in Geneva on 9 August 2001, considered the outcomes of the Paris meeting and endorsed the update of the work plan in the SIP including the draft call for tender to produce a database as well as establishment of the EFDB Steering Group and its Terms of Reference.

1-2. Pilot testing of the prototype database

A prototype database was constructed in January 2002 in accordance with the functional design agreed at the Paris meeting, and was subject to pilot testing by a number of inventory experts from different countries for 8 weeks, from 11 February

to 8 April 2002. Through the pilot testing, the selected reviewers were invited[2] to examine every aspect of the prototype database including the structure and the data input, output procedures according to the guidance prepared by the EFDB Steering Group. The objectives of the pilot testing were to:

1) Examine the functional design embodied in the prototype database and consider how to improve its utility.
2) Examine the contents (data records) contained in the prototype database and elaborate "influencing factors" or critical pieces of information for searching the necessary emission factors or other parameters.
3) Collect data to input into the database.

The prototype database experienced more than 700 visits during the pilot testing. In the end, the Technical Support Unit (TSU) of the IPCC-NGGIP received 119 comments[3] and 11 data items from 26 experts.

Table 1 Grouping of Countries/organisations who reviewed and submitted comments or data

Category	Reviewers (Comments/Data)
Developing countries	17 (67/9)
Countries with economy in transition	3 (12/0)
Developed countries	4 (31/2)
Intergovernmental organisations	2 (9/0)
Total	26 (119/11)

The 119 comments and 11 data submissions can be categorised as shown in Table 2.

1-3. Objectives of the meeting

The second expert meeting in Bratislava was convened to:

- Review the result of the pilot testing of the prototype database;
- Identify the problems to improve the prototype database;
- Discuss the design and functions of the database based on the results of the pilot testing;
- Discuss the procedure and schedule for improvement of the prototype database and its release to the public; and
- Discuss the modalities and procedures to manage and populate the database.

[2] The invitation to the pilot testing was sent to about 130 experts all over the world.

[3] Such comments as just complimenting the TSU or just informing of some typos are not included here.

Table 2 Type of comments obtained through the pilot testing

Type of comments	**Relevance to the objectives of the pilot testing**
(A) Comments on the search/input process (A-1) Comments on the IPCC category selection (A-2) Comments on gas selection (A-3) Comments on the influencing factors selection (A-4) Comments on the other aspects in the search process (A-5) Comments on the other aspects in the input process	Relevant to the objectives #1 & #2
(B) Comments on the output process	Relevant to the objectives #1
(C) Comments on the existing data records	Relevant to the objectives #2
(D) Comments on the possible data sources, Data submitted through "Single Input"	Relevant to the objectives #3
(E) Comments on other technical issues	---
(F) Miscellaneous	---

1-4. Participants

This meeting was attended by 38 participants from 17 countries as well as from the Secretariat of the United Nations Framework Convention on Climate Change (UNFCCC), the International Energy Agency (IEA), the Organización Latinoamericana de Energía (OLADE), the SPIRIT a.s. (EFDB Designer), the Task Force Bureau of the IPCC National Greenhouse Gas Inventories Programme (IPCC-NGGIP/TFB), the IPCC Secretariat and the Technical Support Unit of the IPCC National Greenhouse Gas Inventories Programme (IPCC-NGGIP/TSU). The meeting was co-chaired by Tinus Pulles from the Netherlands and Katarina Mareckova from the Slovak Republic.

The meeting was kindly hosted by the Slovak Hydrometeorological Institute (SMHU).

2. Recommendations to the EFDB Steering Group on how to improve the prototype database

2-1. Introduction

During the second IPCC Expert Meeting on the Establishment of a Database on Greenhouse Gas Emission Factors, the participants discussed and identified areas of the EFDB that require further development to finalise the prototype database (Phase I of the IPCC EFDB project).

This report contains conclusions and recommendations to improve the design, structure, data content, data input process and data output format of the prototype database based on comments provided during the pilot testing (Background Paper No.1 and Addendum: see Annex 1 to this report). In this chapter, the recommendations follow the format, structure and headings given in background paper No.1 as provided for the discussions during the second IPCC EFDB meeting.

2-2. Discussions and Recommendations

(A) Comments on the search/input process

(A-1) Comments on the IPCC category selection (STEP1)

<Amend the IPCC category> [No. 1-2, 106-107] [4]

Participants agreed that IPCC standard categories should not be modified or changed.

- In regards to irrigated rice cultivation, such detailed classification as proposed by comment No.1 should be included in the information on "properties".
- The amendment of the IPCC source categories should be considered in future work when revising the current *IPCC Guidelines.*

The list of the IPCC source categories set up in the prototype database should be in conformity with the *IPCC Guidelines*[5].

<Treat some IPCC sub-source categories as influencing factors> [No.3]

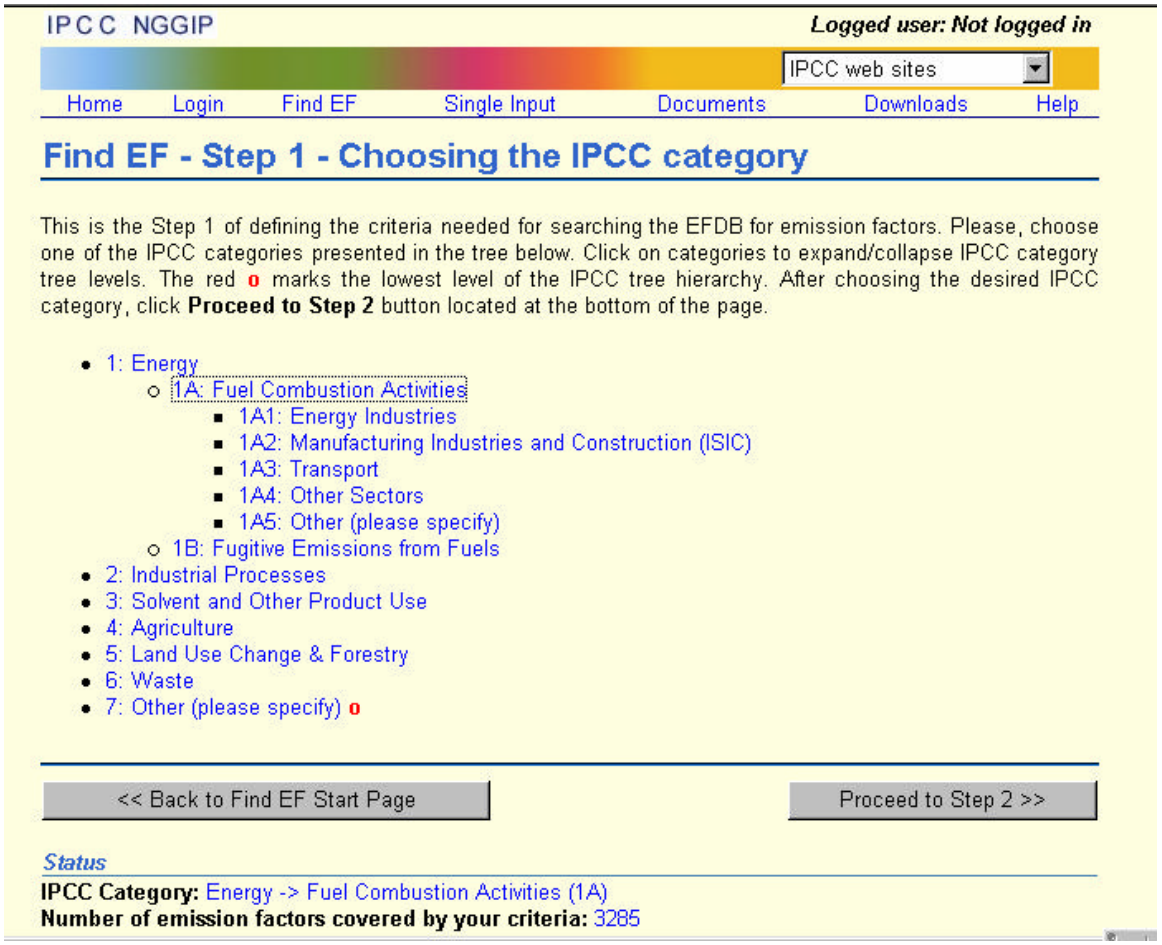
As agreed above in <Amend the IPCC category> [No. 1-2].

[4] These numbers refer to the comment numbers listed in the background paper No. 1 (see Annex 1 to this report).

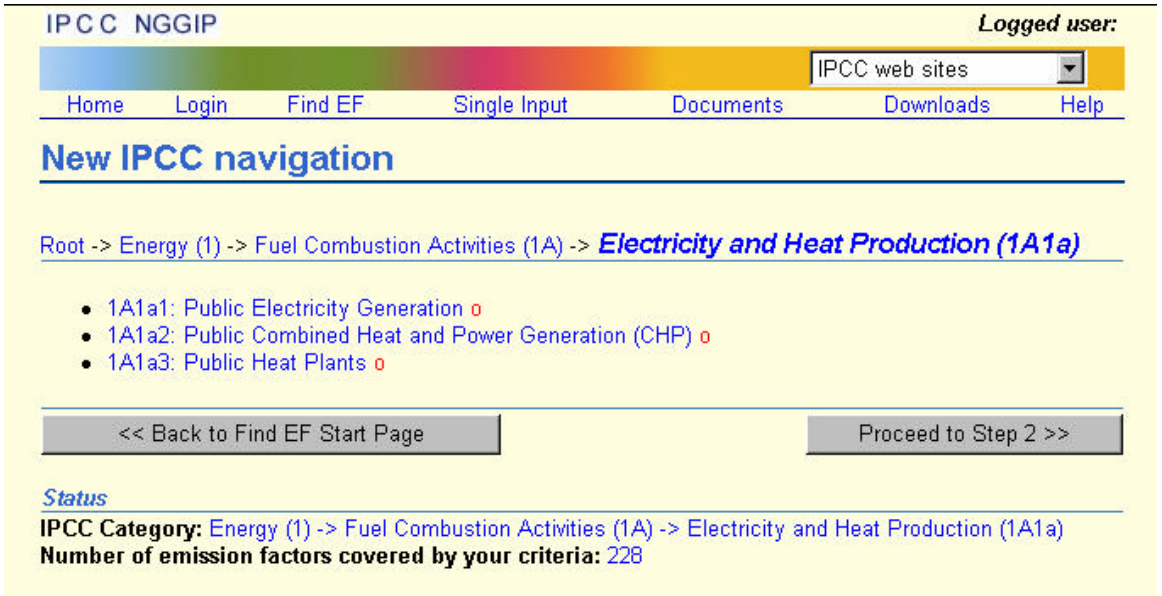
[5] After the meeting, the TSU identified some inconsistency between the category list in the prototype database and that in the *IPCC Guidelines*. For example, sub-source categories 4D1-4D4 are listed in the prototype database although there are no such sub-source categories in the *IPCC Guidelines*.

Figure 1. Current style and new style for EF search navigation

Current style: All sectors remain on the screen even after the user has selected a particular sector.



New style (proposed by SPIRIT): User's selection is shown simply in one line.



<Highlight only the selected IPCC category on the screen> [No. 4]

Participants accepted the new EF search display option as proposed by Mr Peter Gregus (SPIRIT). (See Figure 1)

(A-2) Comments on gas selection (STEP2)

<Enable to choose plural gases at a time> [No.5]

It was agreed that SPIRIT should explore the feasibility of allowing users the ability to query the database for more than one gas per search by each of the following options:

1) Add reasonable gas groupings to drop-down box (e.g. CO_2, CH_4, and N_2O);
2) Add a table where the user can select one or more gases (i.e. checkboxes).

(Option 2 was widely preferred by participants.)

<Improve indication of record count in "status" statement> [No. 6]

Participants agreed that this was a low priority issue, but the SPIRIT should resolve this technical issue so that the record count shown should not be misleading.

<Improve user-friendliness> [No. 7-8]

Participants agreed to the proposed changes as given in Comment No. 7 and 8 of Background paper No. 1. Namely:

- Greenhouse gas selection list should be in the following order: CO_2, CH_4, N_2O, HFCs, PFCs, SF_6 and others;
- "SEARCH" button should be made more accessible and more visible.

<Change NOx to NO_2 in the list> [No. 108]

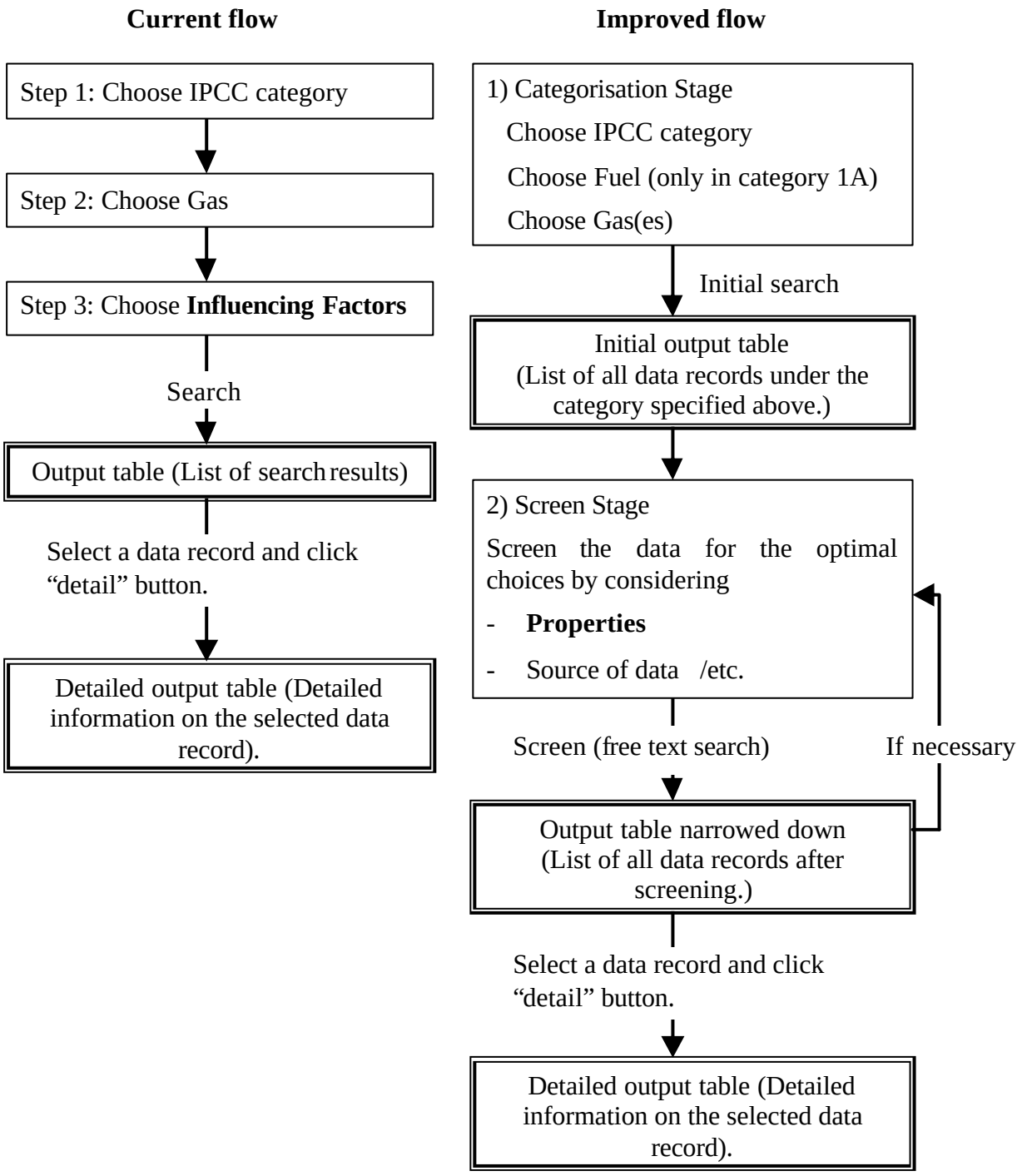
This issue was regarded as a low priority, since both NOx and NO_2 are not direct greenhouse gases. The TSU reminded participants of the convention in the *IPCC Guidelines* that NOx ($NO+NO_2$) emissions from fossil fuel combustion are expressed on a full molecular basis assuming that all NOx emissions are emitted as NO_2. Therefore, the molecular weight should be changed to 46 but the gas should be indicated as "NOx". A brief explanatory note may be needed in this case.

(A-3) Comments on the influencing factors selection (STEP3)

During the course of discussion on the influencing factors (Comments No. 9-34, 109), participants came to recognise the necessity to re-consider the definition of the influencing factors in conjunction with the flow of search/input process. Intensive discussions and considerations were given to this issue, which resulted in the following conclusions:

- The flow of search/input process should be modified so that it could be more practical. The categorisation stage should be clearly distinguished from, and followed by, the screen/input stage (see Figure 2).
- Most of 'Influencing Factors' should be renamed 'Properties' and defined as what EFDB users might see as important information after the categorisation stage in searching or inputting data. Only "Fuel (type)" for Energy Sector, however, should be considered as essential information to specify at the categorisation stage. (See Box 1).

Figure 2. Improvement of the flow of search process



Box 1: Main Identifiers and Properties

At first in this discussion, participants proposed that 'Influencing Factors' could be grouped into two types, i.e. 'Main Identifiers' and additional 'Properties'.

- ✓ 'Main Identifiers' define what EFDB users must specify as essential information at the categorisation stage in searching or inputting data. 'Main Identifiers' should be regarded as mandatory entry fields and should be selected from pre-defined lists (drop-down lists).
- ✓ 'Properties' define what EFDB users might see as important information after the categorisation stage in searching or inputting data. 'Properties' would be given in memo fields with full text search function.

After giving consideration to each IPCC Sector, however, the participants agreed that it was only "Fuel (type)" for IPCC category 1A (Fuel Combustion) that would fall under the classification "Main identifiers".

Besides the "Fuel (type)" for Fuel Combustion, there is a variety of essential information that should be specified for sub-source category levels such as "Production of: conventional oil/heavy oil/crude bitumen … (and so on)" for sub-source categories under IPCC category 1B (Fugitive Emissions from Fuel). The meeting concluded, however, that the information for sub-source category levels should be considered as "Properties" rather than "Main Identifiers".

- ➢ Information to be included as properties varies from one source category to another, but the meeting agreed in the end that all this could fall into one of five different types presented in Table 3.

Table 3. Properties

Technologies/ Practices	Parameters/ Conditions	Region/ Regional Condition	Abatement/ Control Technologies	Others
Example: ✓ Combustion technology ✓ Fertiliser dosage ✓ Manure management system	Example: ✓ Soil type ✓ Land Use	Example ✓ Country, continent, etc. ✓ Climate (zone)	Example: ✓ CO_2 capture ✓ Catalyst type	Any additional information that does not fit into the other four

- ➢ The "Abatement / Control Technologies" are treated as a separate "property" because of their specific consideration in emission reduction and control analyses. In some cases the distinction between "Technologies / Practices" and "Abatement / Control Technologies" might be subtle or difficult to differentiate. For example in

the Agriculture Sector, "anaerobic lagoon" is a manure management system and falls under "Technologies / Practices", but "covered anaerobic lagoon with biogas collection" would fall under "Abatement / Control Technologies". The EFDB guidance manual should make clear that the latter is explicitly intended to make GHG abatement information more easily retrievable.

- EFDB user manual should be made available to assist users in searching and inputting data, in particular when inputting appropriate properties. The user manual should clearly guide EFDB users in what each data field means, indicating concrete examples of "Properties".
- The output table should look like Figure 3 and Table 4.
- EFDB users can screen the data records presented in the initial output table (Figure 3) to narrow them down to the optimal choices by:
  - ✓ Using filter function on the webpage, or
  - ✓ Exporting the table to MS-Excel and using its functions.
- Filter function on the webpage should be applied to each column in the output table. For example, when searching for new data from a source other than the *Revised 1996 IPCC Guidelines*, the user would filter out all the data records with data source = "*Revised 1996 IPCC Guidelines*", by applying the filter function to the column for "Source of Data".

Figure 3. Image of the output table which should appear after the categorisation stage

IPCC Source Category: Agriculture (4) -> Manure Management (4B) -> Cattle (4B1) -> Dairy Cattle (4B1a)

Gas: Methane (CH_4)

Displaying 11 to 20 records out of 31 total records.

Previous 10 < | > Next 10

EF-ID	Gas	Description of parameter	Technologies/ Practices	Parameters/ Conditions	Region/ Regional Conditions	Abatement/ Control Technologies	Others (Other Properties)	Value	Unit	Data Provider	Data Provider Country	Source of data	
42021	CH_4	Manure Management Emission Factor	About half of cattle manure is used for fuel with the remainder managed in dry systems.		Region: Asia, Climate: Warm			27	kg/head /yr	IPCC	–	Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories	Detail
43171	CH_4	Manure Management Emission Factor	Almost all livestock manure is managed as a solid on pasture and ranges.		Region: Latin America, Climate: Warm			2	kg/head /yr	IPCC	–	Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories	Detail
43199	CH_4	Manure Management Emission Factor			Region: Eastern Europe, Climate: Temperate			19,000	g/animal /yr	EEA/ CITEPA	France	CORINAIR94	Detail
44212	CH_4	Manure Management Emission Factor	Anaerobic lagoon		Region: Asia, Climate: Warm	Covered anaerobic lagoon with bio gas collection		10	kg/head /yr	Kiyoto Tanabe	Japan	Journal of animal husbandry ***/****	Detail
...	...	...	...	...	...	...	...	...	...	...	...	...	Detail
...	...	...	...	...	...	...	...	...	...	...	...	...	

filter | filter | filter | filter | filter | filter | filter | filter | filter

Export to XLS

Table 4. The detailed output table which should appear when "detail" button is clicked

Emission Factor Detail (ID: 44212) <N.B., This is a hypothetical data record.>

Administrative information		
Data Provider:		Kiyoto Tanabe
Data Provider Country:		Japan
Data Provider Contact: [a]		
Date calculated:		08/05/1999
Date received:		23/05/2002
Date posted to EFDB		25/07/2002
Technical information		
Gas:		CH_4
IPCC Category:		Agriculture (4) -> Manure Management (4B)-> Cattle (4B1) -> Dairy Cattle (4B1a)
Fuel		-
Properties		
	Technologies/Practices	Anaerobic lagoon
	Parameters/Conditions	
	Region/Regional Conditions	Region: Asia, Climate: Warm (Average temperature above 25°C)
	Abatement/Control Technologies	Covered anaerobic lagoon with bio gas collection
	Others	
Description:		Manure Management Emission Factor
Value: [b]		10 kg/head/yr
Value in common units:		10 kg/head/yr
Equation:		See Page **** of the 1996 IPCC Guidelines
IPCC Worksheet Number:		Worksheet 4-1, Sheet 1 of 2.
Source of data:		Journal of animal husbandry. ***/ ****
Technical Reference:		K. Tanabe (2000), "Methane Emissions from Livestock Manure." In International Methane Emissions, Society of animal husbandry, …….
Reference language:		English
Abstract in English:		The manure management is one of the major sources of CH4, …….
Upper confidence limit:		12 kg/head/yr
Lower confidence limit:		8 kg/head/yr
Data quality:		****
Distribution shape:		****
Data quality reference:		****
Other info on data quality:		****
Usage/Review information [c]		
Type of emission factor:		Measured
Measurement standard:		****
Periodicity of measurement:		****
External quality control performed:		****
Date of measurement:		08/05/1999
Comments from the data provider:		****
Comments from others:		

a) This information will not be shown to users. It will be kept to the EFDB manager.

b) In the excel output, figures and units should be put in separate cells.

c) Information on applicability (such as country of applicability, year of applicability) was removed since this information can be delivered in the "properties" fields.

Recommendations on the specific issues listed in the section (A-3) are shown below.

<Improve/change the way to indicate "CORINAIR-split"> [No. 9-11]

Participants agreed that "CORINAIR split" should not be used as 'Influencing Factors'. CORINAIR data should be properly mapped to the IPCC sector and be re-imported into the EFDB. Any additional detail as contained in the CORINAIR Split should be translated into the 5 groups of properties, though this would be a time-consuming task.

<Enable inclusive search rather than exclusive search> [No. 12]

It was agreed that EFDB users should be provided with the ability to perform an "AND" or an "OR" search within each property group, but an "AND" search for searches defining entries in different property groups only.

<Seek better use of the "Ignoring the influencing factors" option> [No. 13-15]

Participants accepted the proposed changes as given in the "Possible solutions" to Comment No. 13 in Background paper No. 1. The new output table shown in Figure 3 was proposed in accordance with this change.

<Make the lists of influencing factors for specific sources more appropriate> [No. 16-34, 109]

Participants agreed to reorganise fuel categories so that the fuels will be ranked by types, keeping the use of IPCC fuel terminology. In this regard, the IPCC Fuel categories presented in the *IPCC Guidelines* should be followed. (See page 1.19 of *Vol.1 Reporting Instructions, the Revised 1996 IPCC Guidelines*.) Suggested examples (main fuel category, sub fuel category, specific fuel) are:

1) Solid – Coal – Coal type

2) Liquid – Gasoline – Motor Gasoline

The importance of technical information was emphasised in the meeting, and it was agreed that the Editorial Board should need to further consider this issue (in Phase II).

It was suggested that published papers, scientific journals and other documents should be made available. Technical references will need to be traceable to a scientific library. Participants also agreed on the importance of abstracts to be available in English. Live links to other databases or reports, however, will not be feasible since links may not be maintained or may be moved to other web addresses without notice.

(A-4) Comments on the other aspects in the search process

<Doubt the necessity of options 2 & 3> [No. 35]

Participants agreed that search options 2 & 3 are useful and there is no need to remove them.

<Clarify what the EF-ID is and why it is needed> [No. 36-38]

It was agreed that SPIRIT should define and sort EF-ID into appropriate IPCC Categories so that it would be easily identifiable with major IPCC categories and of use to EFDB users. It was suggested to link the initial figure of EF-ID to the IPCC major sector where that EF belongs. (For example, EF-ID 1xxx for Energy, 4xxx for Agriculture, etc.)

<Enable inclusive search rather than exclusive search in the Find EF option 2> [No. 39]

It was agreed that users should be given the capability of performing an "AND" or an "OR" search also in the Find EF option 2.

<Improve drop-down lists in the Find EF option 2> [No.40]

Participants agreed that this was a low priority issue, but the SPIRIT should resolve this technical issue in line with the Comment No.40 in Background Paper No.1.

(A-5) Comments on the other aspects in the input process

<Improve user-friendliness of "Single Input" process > [No. 41-43]

As regards the "self-creating catalogue" for production technology etc. proposed by the Comment 41 in Background Paper No.1, it is not acceptable any longer because it was agreed that the "properties" should be given by memo fields with full text search, not by drop-down lists.

Participants recommended that the SPIRIT highlight mandatory data entry fields so that data providers can easily recognise them.

The issue on change/update of submitted data should be considered by the Editorial Board in future. The tasks of the Editorial Board will include reviewing the proposed entries in the "property" fields by the data provider.

<Include a unit which is missing from the drop-down list > [No. 44]

It was agreed that the EFDB should include the EF unit as proposed by Comment No. 44 in Background Paper No.1

<Refine the format for data submission > [No. 45-47]

The problem with data fields on "possible applicability" (Comment No.45) no longer matters in the new structure of data fields. (See Table 3, footnote c.)

Participants agreed to the recommendation and possible solutions as provided within Comments No.46 and 47 in Background Paper No. 1. The necessity of a user manual for data providers was recognised.

(B) Comments on the output process

<Improve the "Find EF – Results" table > [No. 48-57]

The new output table was suggested as shown in Figure 3.

Some additional proposals were made as follows:

- EFs will not be presented in a hierarchical manner (rank) – users to judge applicability of EF data.
- Screen sorting capabilities (of initial EF results) will be incorporated as to improve output tables (exportable to Excel).
- Detail sorting shall be performed outside the database by users.
- *IPCC Guidelines* and IPCC *Good Practice Report* should be correctly referenced.

<Improve indication of record count in "status" statement> [No. 58-59]

Participants agreed that this was a low priority issue. The SPIRIT (programmer) should resolve this technical issue so that the record count shown should not be misleading.

<Indicate the reason of no matching> [No. 60]

Participants felt that it would neither be easy nor useful to give reasons for "no matching" search results, but the following suggestions were made on possible solutions.

- Refine search process (steps) - electronic 'HELP" guidance available to users.
- Notify users via a message that data may not exist.
- Provide users with EFDB manual (electronic or hardcopy format).

<Rectify technical errors> [No. 61-62]

It was agreed that these technical issues should be addressed by SPIRIT and resolved as discussed in comments 61 and 62 of Background Paper No.1.

(C) Comments on the existing data records

<Address data gaps/data deficiency> [No. 63-68, 110-118]

It was agreed that these issues should be addressed by the Editorial Board (or the Steering Group).

Other suggestions were:

- Not all Default IPCC EFs have yet been entered into present EFDB system. Import of Default data should be completed as early as possible.
- Data entry errors should be corrected (erroneous data).
- EF Duplication – review all properties and references to ensure duplication – if differences exist – should maintain and support both (or more) records since it will be up to the user to decide the applicability of each emission factor.
- New EFs, based on new research or technology will be added but will not replace other EFs within the specific sector.
- EFDB users should be informed semi-annually of the EF update list.
- EFDB users should also be alerted on the HOME page as to EF update list (flag changes on website)
- An ON-LINE User Manual should be included.

(D) Comments on the possible data sources/Data submitted through "Single Input"

<Explore possible data sources> [No. 69-77, 119]

It was agreed that these issues should be addressed by the Editorial Board (or the Steering Group).

Other suggestions were:

- Data input page should be automated to ensure that mandatory fields are entered prior to the submission of EF for review.
- Steering Group or future Editorial Board will identify a list of 'registered' data providers and other data providers, if necessary.

(E) Comments on other technical issues

<Set "Back" buttons as appropriate on pages> [No. 78-87]

Various suggestions were made as follows, among which the SPIRIT is encouraged to seek the best solutions in consultation with the Steering Group and the TSU.

- Revise search option by allowing users to address (via check box for step 1 to 3) search criteria (i.e. fuel type and additional properties) on one screen, therefore reducing the need to use the back button.

- BACK button should be made more visible – presently dynamic page search, therefore pages are rebuilt when using the designed BACK button rather than the browser's back button (need to inform the users of the BACK button's function).
- SPIRIT will address the issue of the browser closing when EFs are exported to DOC, XLS and other data export format.
- Provide ON LINE assistance and quick search guidance to users.

<Assist users in selecting appropriate browsers> [No. 88-94]

Participants agreed that the EFDB users should be encouraged to use an appropriate browser (appropriate version of Internet Explorer or Netscape Navigator), and that the access to the browser software should be provided in IPCC EFDB CD ROM or through the internet.

- Note to users on required browsers – WARNING ON REQUIRED VERSION – On Line.
- EFDB access speed is dependent on host location of EFDB server.
- User manual to be made available in a hardcopy and an electronic format.

(F) Miscellaneous

<Use appropriate terms > [No. 95-97]

The Steering Group and/or the Editorial Board may wish to identify appropriate 'emission factor' terminology (emission parameter, leakage rate, conversion factors etc.) However, it was agreed that the term "emission factors" should be used to cover all data to be included in the EFDB with clear explanation about it. In order to avoid confusion, each data record should clearly indicate what the data represent and what the dimensions are[6].

Suggestions were made as follows:

- Use a general term (i.e. Emission Parameter) in description and provide a more specific definition for relevant sectors.
- Include in EFDB user manual relevant terminology for 'factors' available in the EFDB.

<Enhance accessibility of developing country experts to the EFDB> [No. 98-102]

Production of CD-ROM version was supported by the participants. Besides, another suggestion was made to the effect that the establishment of mirror sites might deserve consideration.

<Others> [No. 103-105]

The issues raised here were beyond the scope of this project (IPCC-EFDB).

[6] If there is no dimension, "No dimension" should be indicated.

3. Proposal to the TFB on modalities and procedures to manage and populate the database

3-1. Introduction

During the second IPCC Expert Meeting on the Establishment of a Database on Greenhouse Gas Emission Factor, the participants also discussed the future development of the EFDB, namely how to manage and populate the EFDB after its release to the public at COP8 (Phase II of IPCC EFDB project). The database should contain as many default emission factor as possible as its first release. Bulk upload of default data presented in the *IPCC Guidelines* and *Good Practice Report* should be done in Phase I.

The discussion resulted in a proposal to the Task Force Bureau (TFB) on the IPCC-NGGIP on modalities and procedures to manage and populate the database.

3-2. Proposal to the TFB on modalities and procedures to manage and populate the database

(A) Management arrangements

(A-1) Boundary conditions

The EFDB is developed under the work plan endorsed by the TFB. The final responsibility of the system and its data is with the IPCC. The Management Plan for the maintenance of the EFDB is meant to fully recognise this responsibility, through defining a pragmatic and cost-effective management structure to ensure the following:

a. A sustained availability of the information available in EFDB through
    i. The Internet;
    ii. Distribution of the information contained in EFDB on CD-ROMs for users with limited Internet access.
b. A sustained inflow of new emission factors and other parameters that supports estimation of emissions of greenhouse gases, primarily at national level
c. Appropriate presentation, publication and dissemination of information on the EFDB and its contents

A goal of the EFDB is to grow towards a recognised library, where users can find emission factors and other parameters with background documentation that can be used for estimating greenhouse gas emissions in national submissions of inventories to the UNFCCC. The responsibility of using this information appropriately will always remain with the national expert using it.

The EFDB shall be open to any relevant proposals on emission factors or other related parameters. Acceptance of such proposals will be subject to assessment by an editorial board using well-defined criteria. This means proposals will not be automatically accepted or rejected but will be checked for possible technical errors by the editorial board prior to publication in the EFDB.

Different values of emission factors for a particular source category can be accepted at the same time, even if those values are contributed by the same provider. A provider might make several measurements and obtained different results, or the data provider has collected scientific literature and is merely reporting the various results of different researchers for the same emission parameter. In either case, "properties" field of the data in the EFDB must clearly differentiate between the values reported. This process will thus facilitate the distribution of alternative values for emission parameters from which end users can then make informed choices about the most appropriate applications.

(A-2) Management plan – Role of the EFDB Steering Group

Figure 4 presents an overview of the proposed management structure for the EFDB.

The TSU will be responsible for the technical maintenance (system management) of the EFDB.

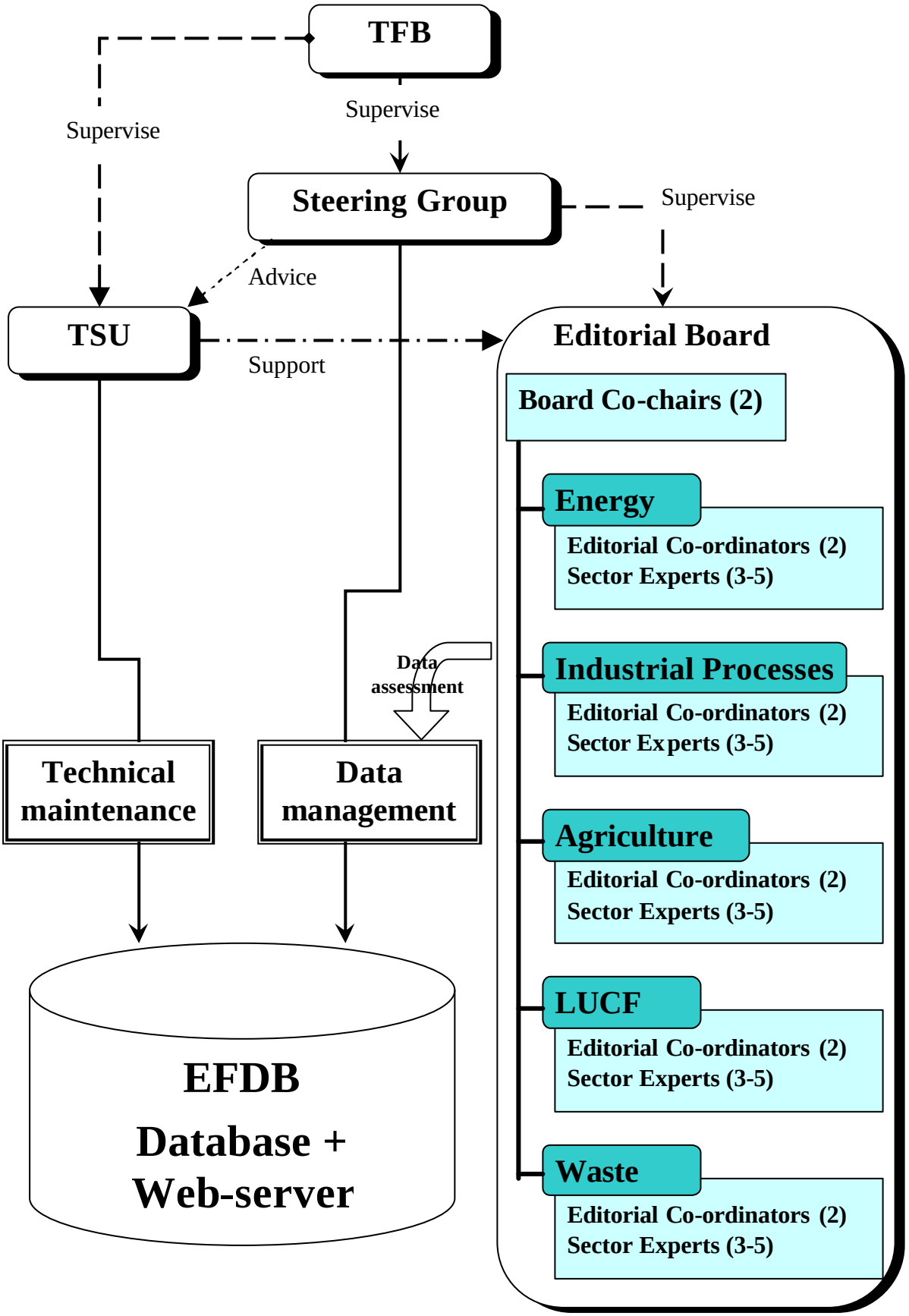
The steering group for this EFDB project (EFDB Steering Group) established by the Task Force Bureau at its 6th session will continue to be responsible for the data management of EFDB[7]. The EFDB Steering Group will produce an annual work plan to be submitted to the TFB for its consideration and approval, describing the following:

i. The statistics of usage of EFDB in the past year;
ii. Proposals for members of the Editorial Board that will assess all proposals for new emission factors or updates of existing ones before inclusion in the EFDB;
iii. Any plans for modifications of the database structure or the user interface, including the budget needed for such changes.

In future, responsibilities of the Steering Group may be merged or be absorbed by the Editorial Board, subject to the decision by the TFB.

[7] According to the terms of reference (TOR) of the EFDB Steering Group endorsed by the TFB at its 7th session, "the objective, responsibilities and membership of the EFDB Steering Group should be reviewed by the TFB subsequent to the completion of the first version of the EFDB which is planned for at the end of 2002 (by COP8)."

Figure 4. Management structure for the EFDB



(A-3) Draft Terms of Reference of the Editorial Board

Objective

1. The objective of the EFDB Editorial Board is to ensure all emission factors and other parameters contained in the emission factors database (EFDB) under the IPCC National Greenhouse Gas Inventories Programme (IPCC-NGGIP) are scientifically sound according to the criteria[8] endorsed by the Task Force Bureau (TFB) on the IPCC-NGGIP.

Responsibility

2. In order to achieve the objective mentioned in paragraph 1 above, the EFDB Editorial Board should assume the responsibility to assess whether the proposed new emission factors or other parameters are acceptable or not. The EFDB Editorial Board will not evaluate the quality of the data already published by the IPCC and/or in the open literature, but determine whether the newly submitted data are scientifically sound and documentation is sufficient.

Membership

3. The Editorial Board will consist of the following members:
    a. Two experts as Editorial Co-ordinators[9] for each of the sectors:
        i. Energy
        ii. Industrial Processes
        iii. Agriculture
        iv. Land-Use Change and Forestry
        v. Waste
    b. Three to five additional experts as Sector Experts for each of the sectors above.
    c. Two Board Co-chairs[10] who will have overall responsibility of assessment of emission factors for the EFDB. They will also be responsible for assessment of emission factors and other parameters in Solvent and Other Product Use and any other source category not covered by the experts listed above.
    d. A representative of the Technical Support Unit (TSU) to represent data and system management.
4. The members of the Editorial Board other than the representative of the TSU will be selected by the NGGIP TFB upon recommendation by the Steering Group from the experts officially nominated by governments/IPCC National Focal Points for this purpose.[11] In this selection, geographical balance as well as balance of

[8] Well-defined criteria should be developed by the Steering Group or at an expert meeting involving the Steering Group as well as the Editorial Board.

[9] There are some other names proposed, such as "lead facilitators" and "lead sector editors"

[10] Member(s) of the Steering Group may become the Board Co-chair(s) if the TFB deems it appropriate.

[11] Another option is to select the members from the experts who participated in the previous meetings of this project (New Delhi meeting in 2000, Paris meeting in 2001, and Bratislava meeting in 2002). The final decision on this matter is up to the TFB or the IPCC Bureau. In either case, the slate of initial members of the Editorial Board will be prepared by the TSU in consultation with the current EFDB Steering Group, and submitted to the TFB for its consideration and endorsement.

expertise should be ensured.

5. The selected experts will serve the Editorial Board for two years. There will be an option for another 2 years to ensure continuity of the work of the Editorial Board.
6. The TSU will maintain the actual membership lists of the Editorial Board. The e-mail lists will be maintained on the EFDB server to facilitate communication among the Editorial Board members.

Procedure for assessment

7. The procedure to assess a proposed new emission factor or other parameter will be performed using both the functionality of the EFDB web site and e-mail.
8. The procedure for assessment should follow the flow chart below, resulting in a decision on including the new information in the EFDB within 9 weeks after proposal:

Task	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10
Data provider proposes new data	★									
TSU notifies Editorial Co-ordinators and Sector Experts	■									
Editorial Co-ordinators and Sector Experts assess the proposed data		■	■	■	■					
Editorial Co-ordinators prepare draft decision						■				
Board Co-chairs, Sector Experts, [and Data provider] comment on the draft decisions							■	■		
Board Co-chairs make a final decision in consultation with Editorial Co-ordinators									■	↴
Publish the new information in the EFDB	Web publication 2-4 times a year									

a. When a proposal on new data is submitted to the EFDB (by using Single Input menu for example), the TSU will:
   i. Send the proposal to the Editorial Co-ordinators and Sector Experts for the relevant sector by e-mail within 1 week, and ask them to make a decision within 8 weeks from the notification.
   ii. Notify the data provider who submitted the new data that the proposal has been sent to the Editorial Board and that a decision is to be expected within 8 weeks from the notification.
b. Each of the Editorial Co-ordinators and Sector Experts for the sector will assess whether the new information should be accepted, rejected or subjected to revision for acceptance. A short rationale for the decision is essential[12]. Each assessment should be communicated to Editorial Co-ordinators. This must happen within 4 weeks after the notification by the TSU.
c. Subsequently, the Editorial Co-ordinators responsible for the sector will prepare a draft decision on the basis of the assessments by the Sector

[12] A uniform check sheet would be helpful for this purpose.

Experts and themselves within 1 week. The decision will in principle be based on consensus. If the decision is not based on consensus, this must be clearly stated.

d. The Editorial Co-ordinators will send the draft decision to the Board Co-chairs and the Sector Experts [and to the data provider][13] for comments within two weeks.
e. One week later the Board Co-chairs will make a final decision in consultation with the Editorial Co-ordinators for the sector. If the decision is positive the Editorial Board will request the TSU to make the new data available to all on the EFDB web site.
f. The TSU will send a message by e-mail to the data provider, indicating the decision of the Editorial Board.
g. The TSU will publish (upload) the new information onto the web site and will place a notification on the changes on the home page of the web site two to four times a year.
h. The TSU will also publish the new information by CD-ROMs annually or semi-annually.

9. A periodic process for uploading data on the EFDB will be established in future. However, due to the need to populate the EFDB effectively, participants recognised the need for a temporary continuous process during the initial data submission period. The switch from a continuous to a periodic process will be proposed by the Editorial Board, Steering Group and the TSU and determined by the TFB. The process switch may also depend on quantity of submitted data.

Annual meeting

10. To ensure consistency of the decision criteria over time and between Editorial Co-ordinators and Sector Experts, an annual meeting of the Editorial Board will be organised in late spring or early summer of each year.
11. All members of the Editorial Board, and a limited number of experts nominated by governments will participate in this meeting. Governments are encouraged to nominate their national inventory experts to represent the primary users of EFDB.
12. The agenda of the meeting will contain, amongst others, the following elements:

a. An overview of the achievements of the past year;
b. A presentation of the work plan by the EFDB Steering Group;.
c. Identification of weak points in the database and proposals for improvement of emission factors and other parameters in specific sectors, sub-sectors and source categories.
d. Other issues relating to EFDB functionality, review procedures and process, data collection, data dissemination, administrative issues, etc.

13. A smaller meeting of only the EFDB Steering Group, the Board Co-chairs and Editorial Co-ordinators for each sector is encouraged, once a year, in order to ensure good management of the EFDB.

[13] Some participants in the meeting questioned the necessity of this process. On the other hand, some other participants stressed the necessity of this process to demonstrate that the assessment is implemented in a transparent and open manner. This issue was left to the decision by the TFB.

(B) Populating the database

During the pilot testing of the prototype database, the TSU received some information on possible data sources. Also, some data were submitted to the TSU for inclusion into the database.

The EFDB Steering Group and the TSU will make efforts to collect those data and consider whether they could be included into the database or not. Also, it was agreed that the participants at this meeting will serve as a temporary Editorial Board and provide any additional input to assist the TSU and the EFDB Steering Group with the finalisation of Phase I of the IPCC EFDB project.

In the future, some procedures and criteria to continuously promote populating the EFDB should be developed. For example, the annual meeting as suggested above will identify weak points in the database content and encourage relevant experts to explore or develop necessary emission factors and other parameters in specific sectors, sub-sectors and source categories.