UNFCCC GHG Inventory Data Management and System

CPF Task Force on Streamlining Forest-related Reporting 19-20 November 2002

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Overview

- GHG Inventories
- GHG Inventory Information System
- Dataflow: processing and consistency checking
- Dataflow: Outputs and tools
- Future Developments

GHG Inventories

- Importance of GHG inventories
  - ☞Fundamental to achieve the Convention's objective
  - ☞Essential for assessing the implementation of the Convention & Kyoto Protocol
- Secretariat's role - to ensure that credible GHG data are available to the COP by:
  - ☞Reporting periodically on GHG emissions and trends, and providing related methodological and data analysis
  - ☞Organizing and supporting the technical review process of GHG inventories

↑

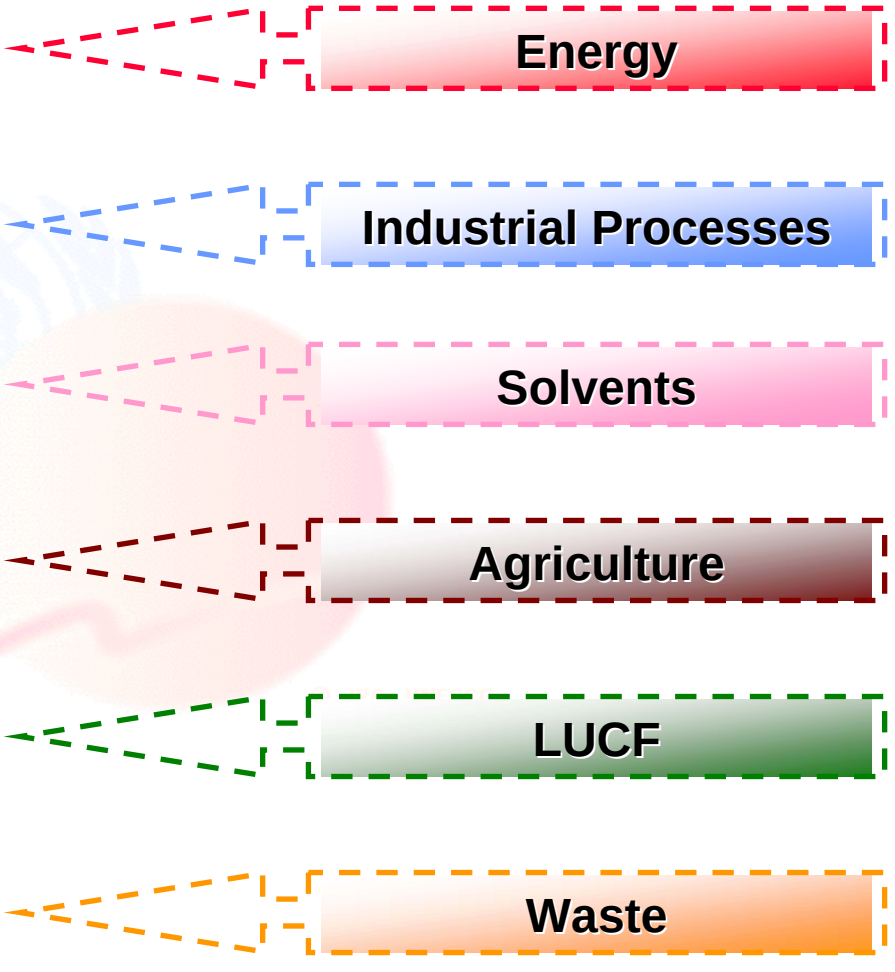
Developing and maintaining a database of GHG inventory & related software (GHG inventory information system)

GHG Inventories: CRF Data

Common Reporting Format
(42 tables)

ummary tables (IPCC)
O_2 equivalent emissions table
lethods and emission factors
ectoral tables (IPCC)
ectoral background data tables
eference approach (IPCC)
eedstock and bunkers tables
verview table (IPCC)
ecalculations table
ompleteness table
missions trends
heck-list

CCC/CP/1999/7)



GHG Inventory Information System (1999-2002)

Since adoption of decision 3/CP.5 and 6/CP.5, we have developed:

- CRF reporting software to be used by Annex I Parties
- CRF database (archive and process GHG submissions)
- Data import program / QC procedures
- Software tools for supporting the review process & provision of information to the SBs/COP

GHG Inventory Information System Basics

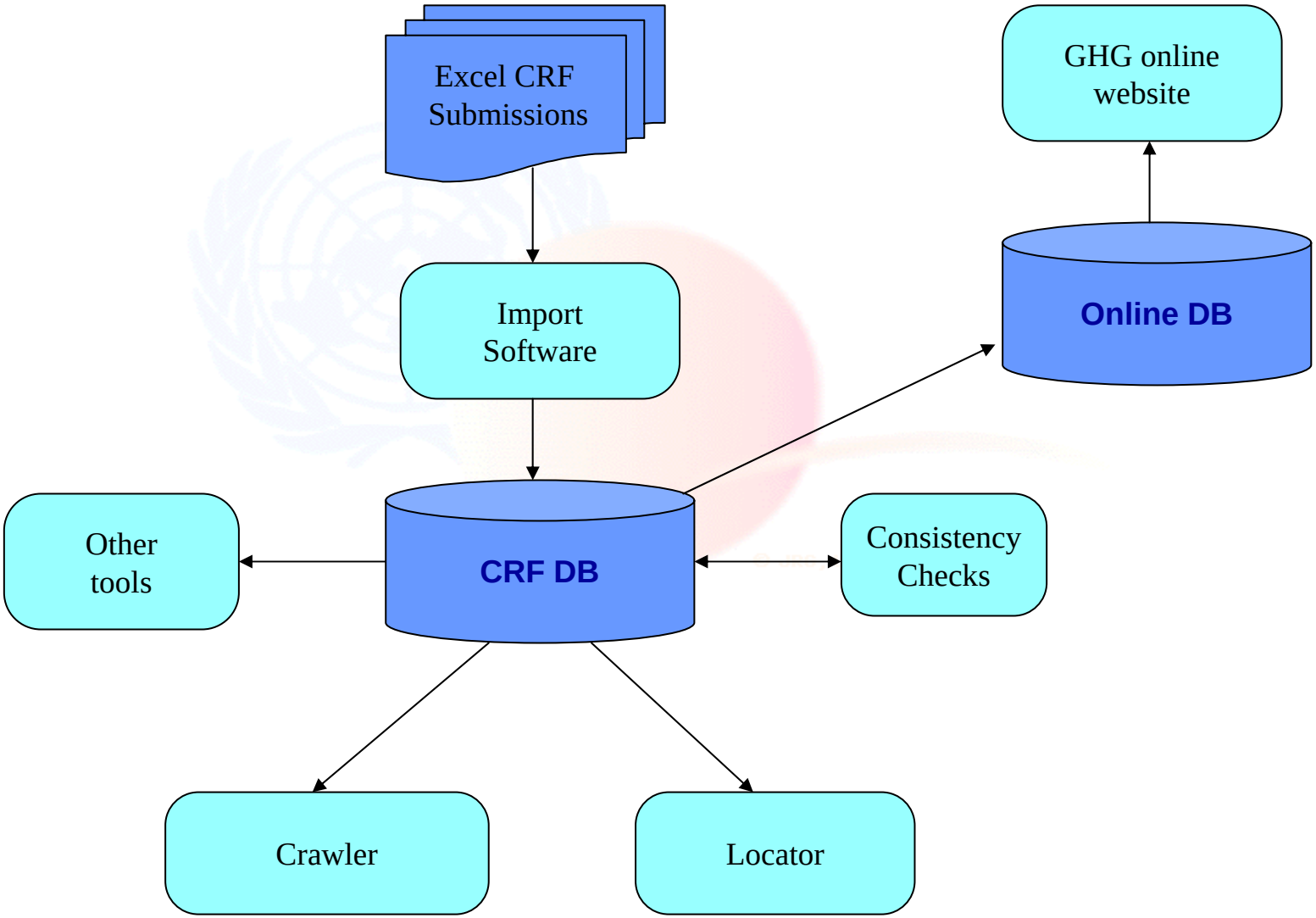
Database development started after the adoption of Common Reporting Format as a storage for the upcoming inventory submissions

The design of the database was made on the basis of the structure of CRF software

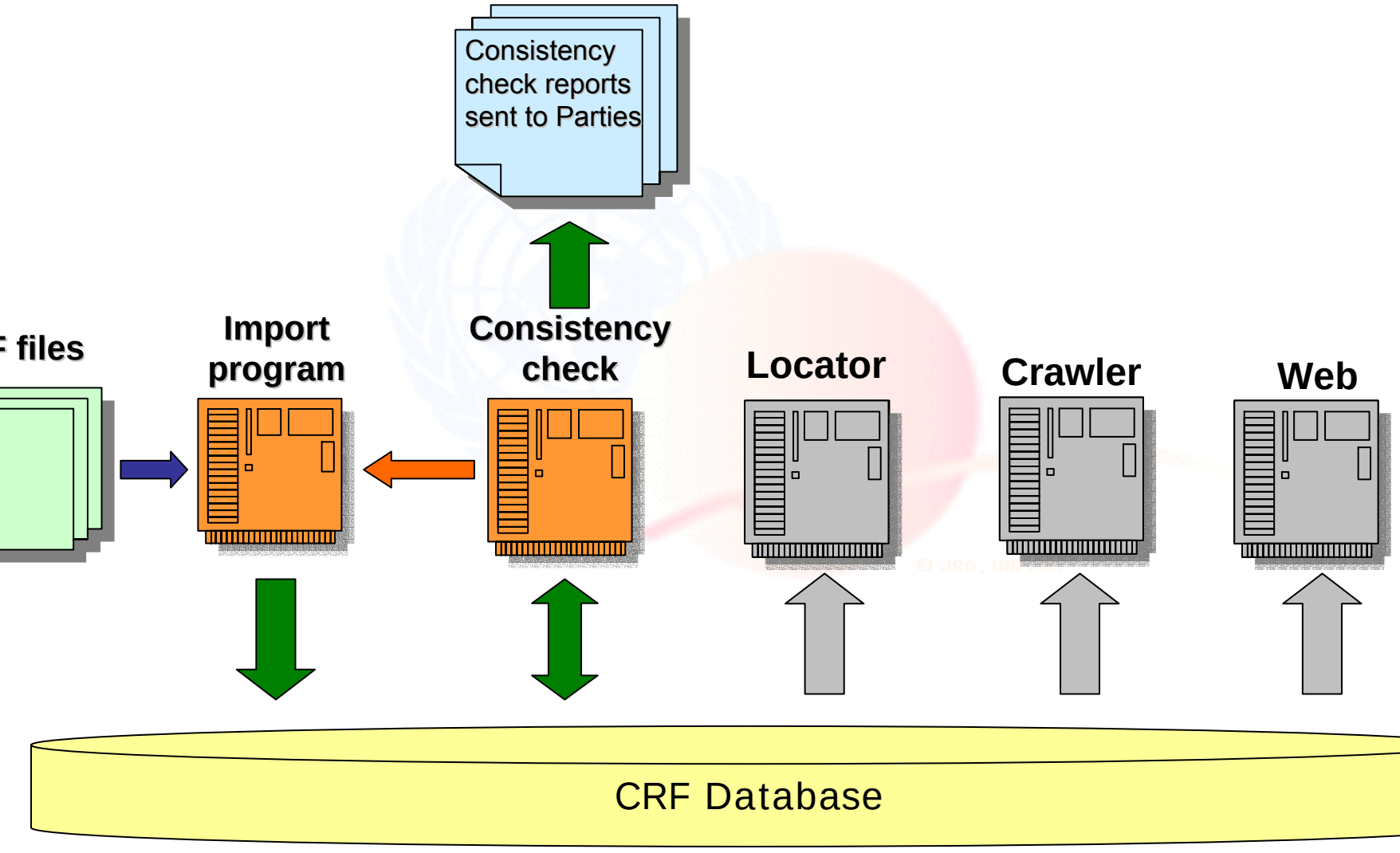
The database (CRF DB) is designed to import data from Excel tables a store all submitted national inventories

A few software tools were developed around the CRF database to impo and quality control of the inventory information and produce outputs o of the database

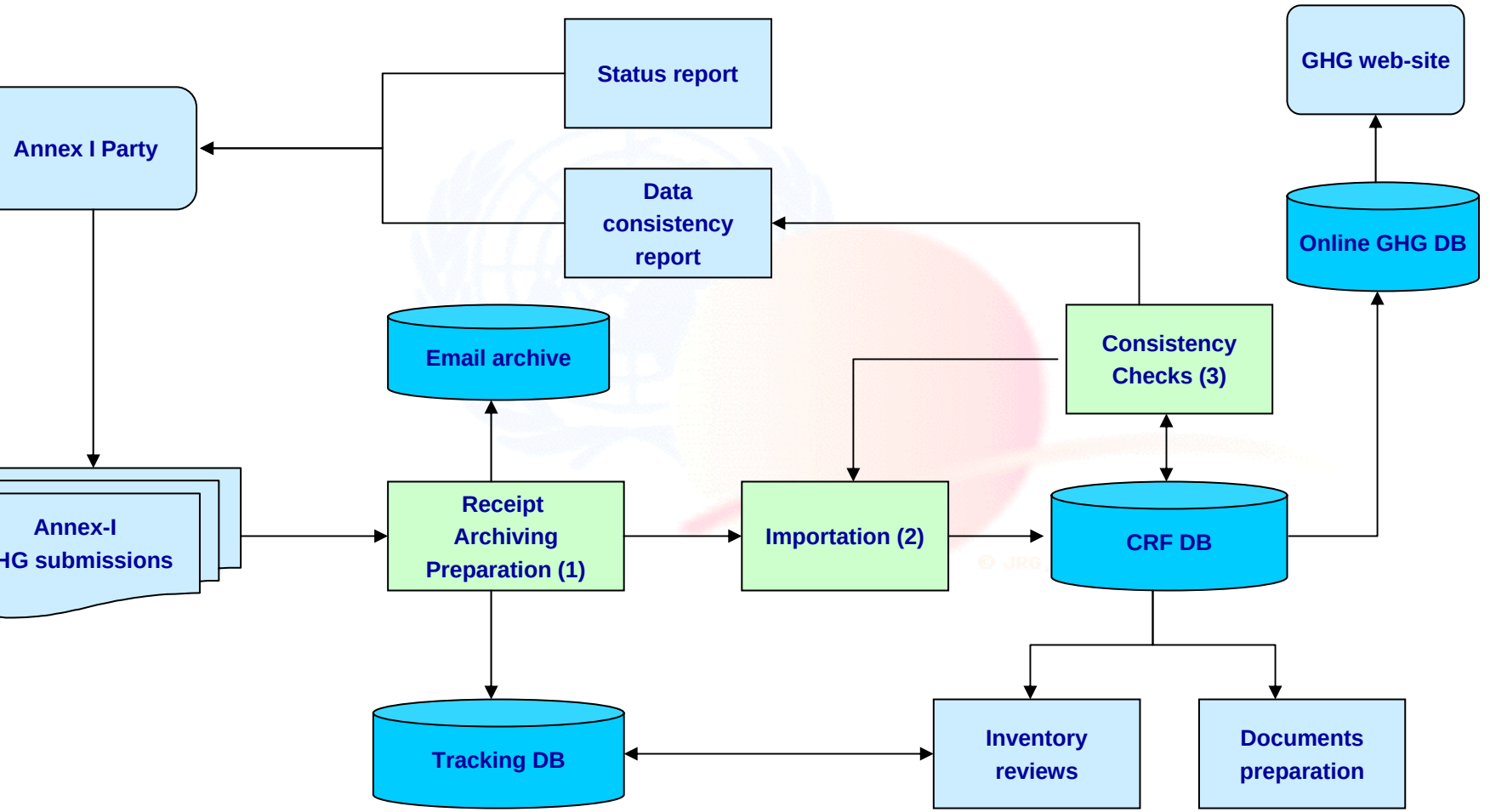
GHG Inventory Information System architecture



Dataflow: processing and consistency checking



CRF submissions processing overview



CRF submissions processing (1)

eceipt confirmation, archiving and preparation

- Sending submission receipt confirmation
- Recording of submission in tracking database
- Filing of correspondence
- Renaming of the file with the standard nomenclature
- Mapping to standard CRF format and/or making technical adjustments if necessary
- Placing files and hardcopies in a designated storage

CRF submissions processing (2)

ata importation

A complex import software has been developed to upload da into the CRF database

The software checks provided CRF tables against predefined standards and prompts the user of any deviation (due to the flexibility of MS Excel) encountered for manual adjustments

The tool has features that facilitate data processing by:

- ☞Using country-specific table templates
- ☞Defining synonyms for units of measurement
- ☞Recognition of known country-specific categories

CRF submissions processing (3)

ata consistency checks (quality control)

The Consistency Check Tool performs the following checks:

- expected equivalencies
- performs summation checks within and across certain tables
- verifies the calculation of implied emission factors
- performs a contribution analysis by gas and sector (i.e. ensurin values aggregate to 100%)
- and allows for the plausibility verification of data point consistency in specific tables, inventory years and submissions

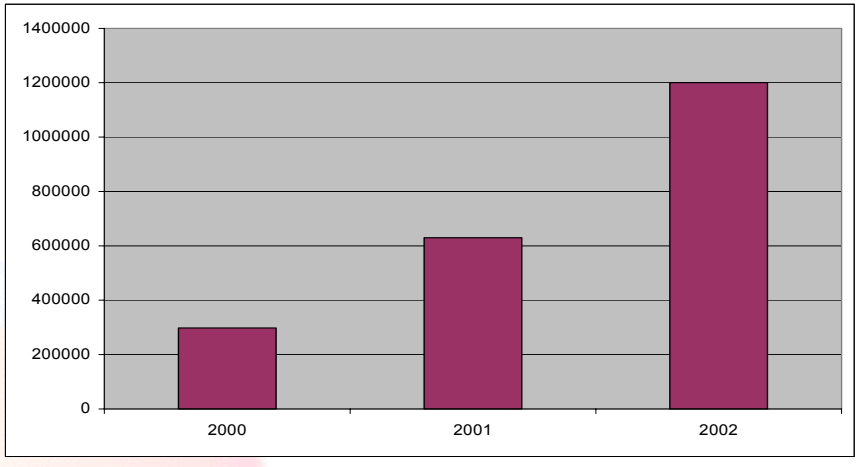
Inconsistencies related to reporting are communicated to the Parties with the request to make appropriate changes and to resubmit relevant files

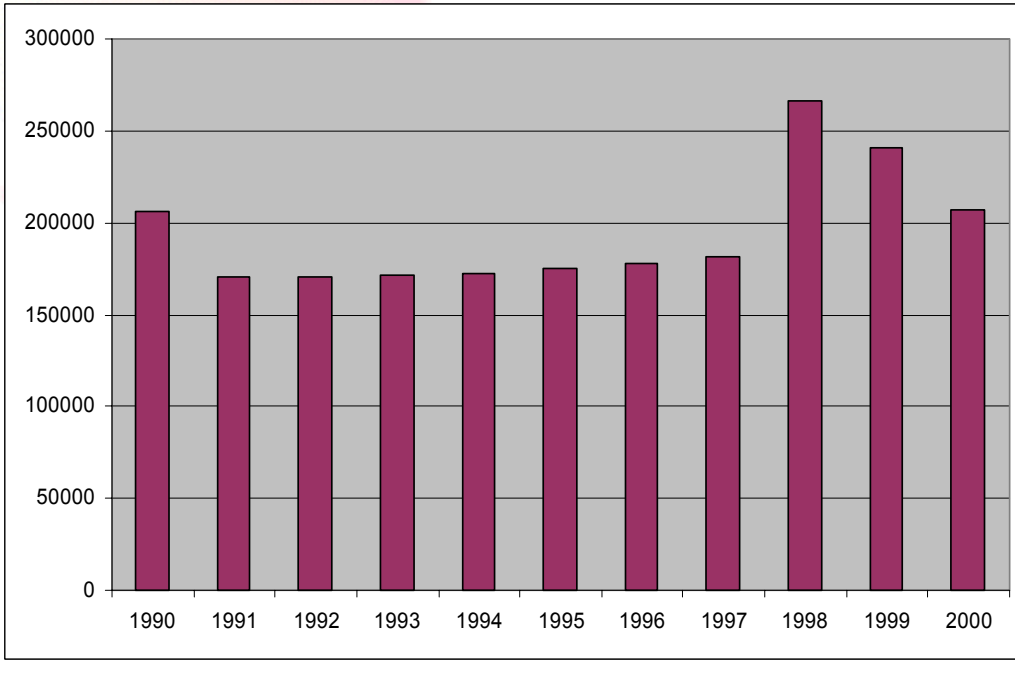
General Statistics

Current database size – 135 MB

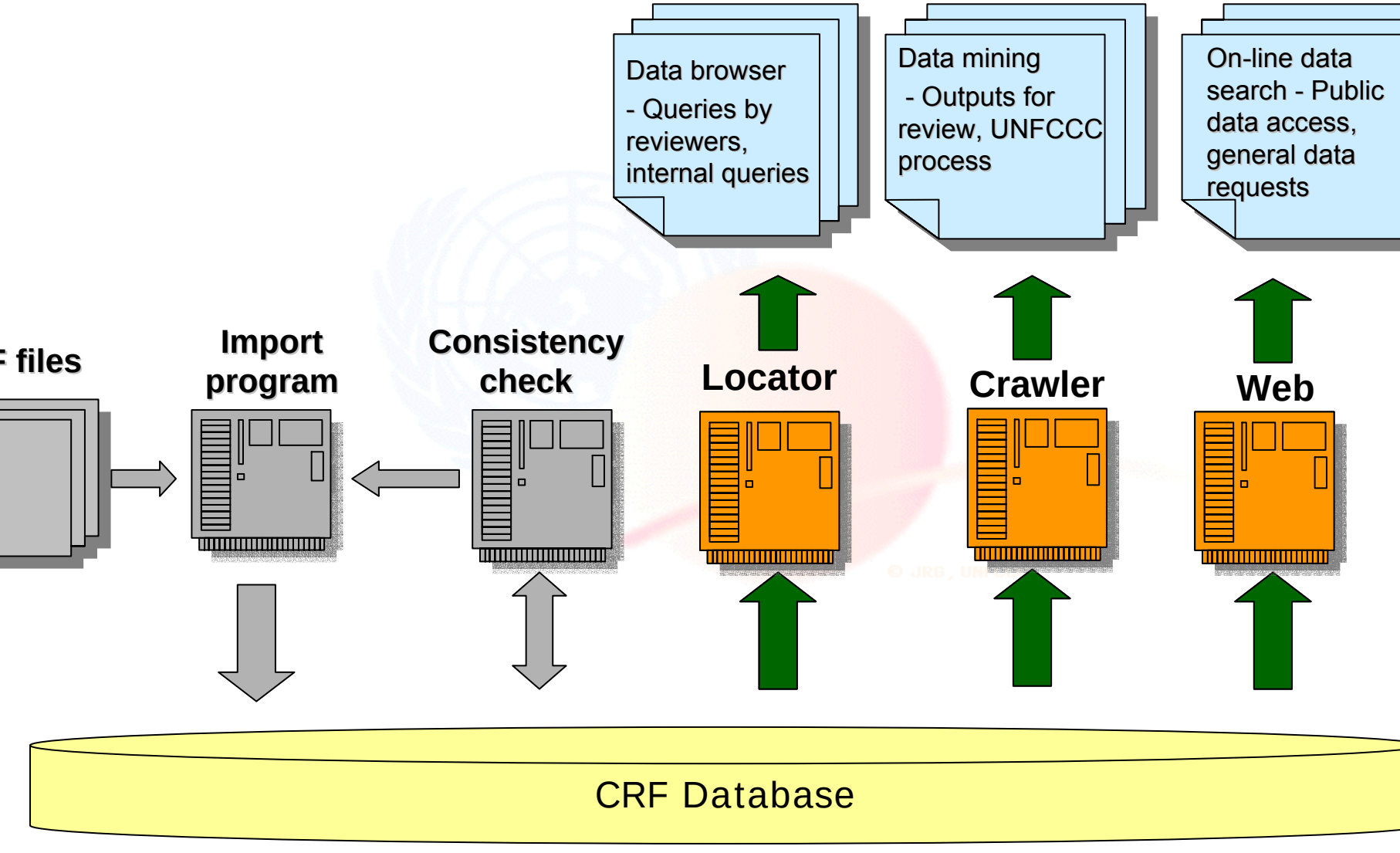
Total number of values – 2,140,000 (34 Parties)

- by submissions:
  - 2000 – 300,000 (23 Parties)
  - 2001 – 630,000 (31 Parties)
  - 2002– 1,200,000 (32 Parties)
- by inventories
  - 1990 – 206120 (30 Parties)
  - 1991 – 170276 (25 Parties)
  - 1992 – 170743 (25 Parties)
  - 1993 – 171515 (25 Parties)
  - 1994 – 172724 (26 Parties)
  - 1995 – 175436 (26 Parties)
  - 1996 – 178222 (24 Parties)
  - 1997 – 181719 (23 Parties)
  - 1998 – 266503 (30 Parties)
  - 1999 – 240472 (33 Parties)
  - 2000 – 207025 (31 Parties)



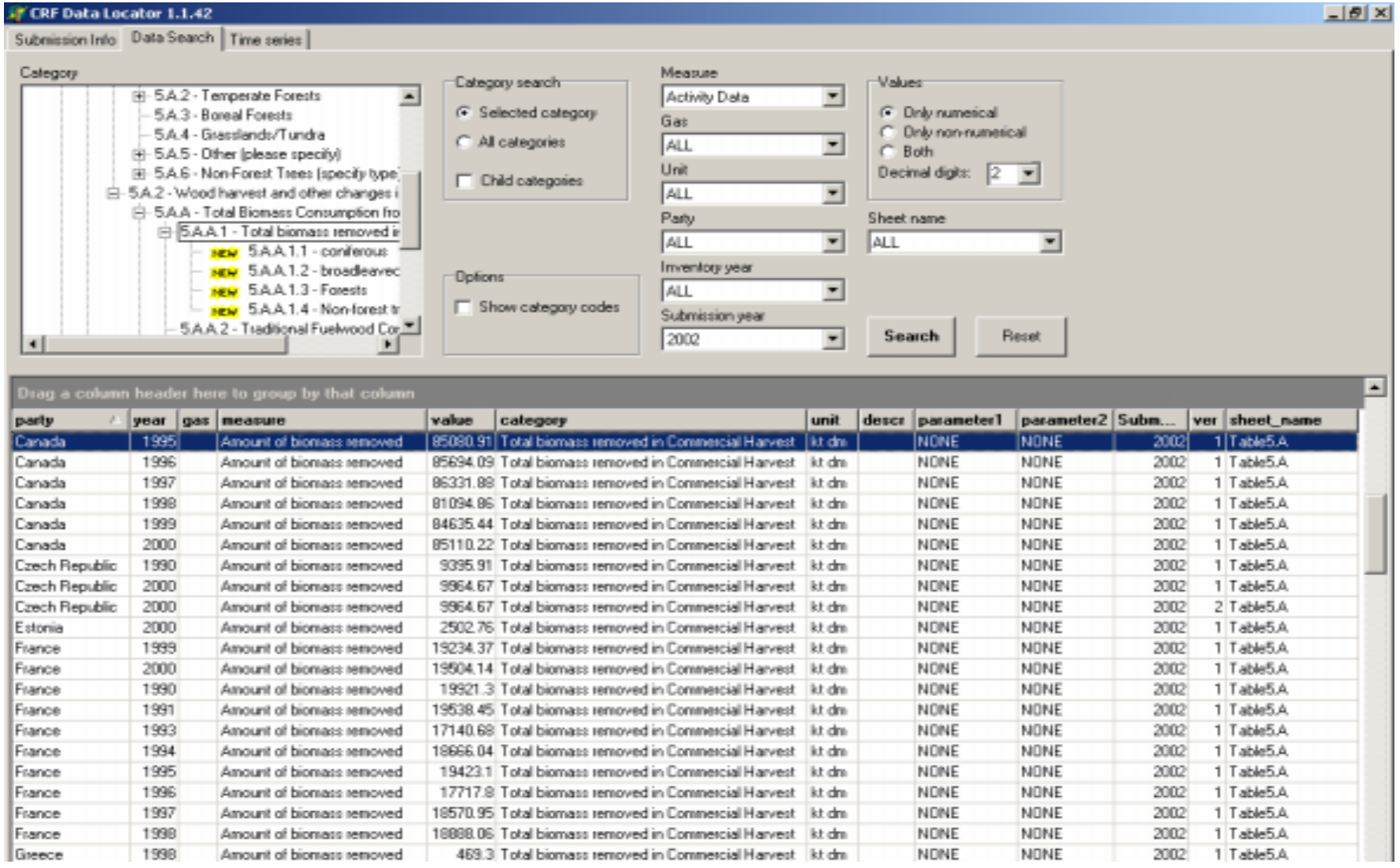


Dataflow: Outputs and tools



The Locator

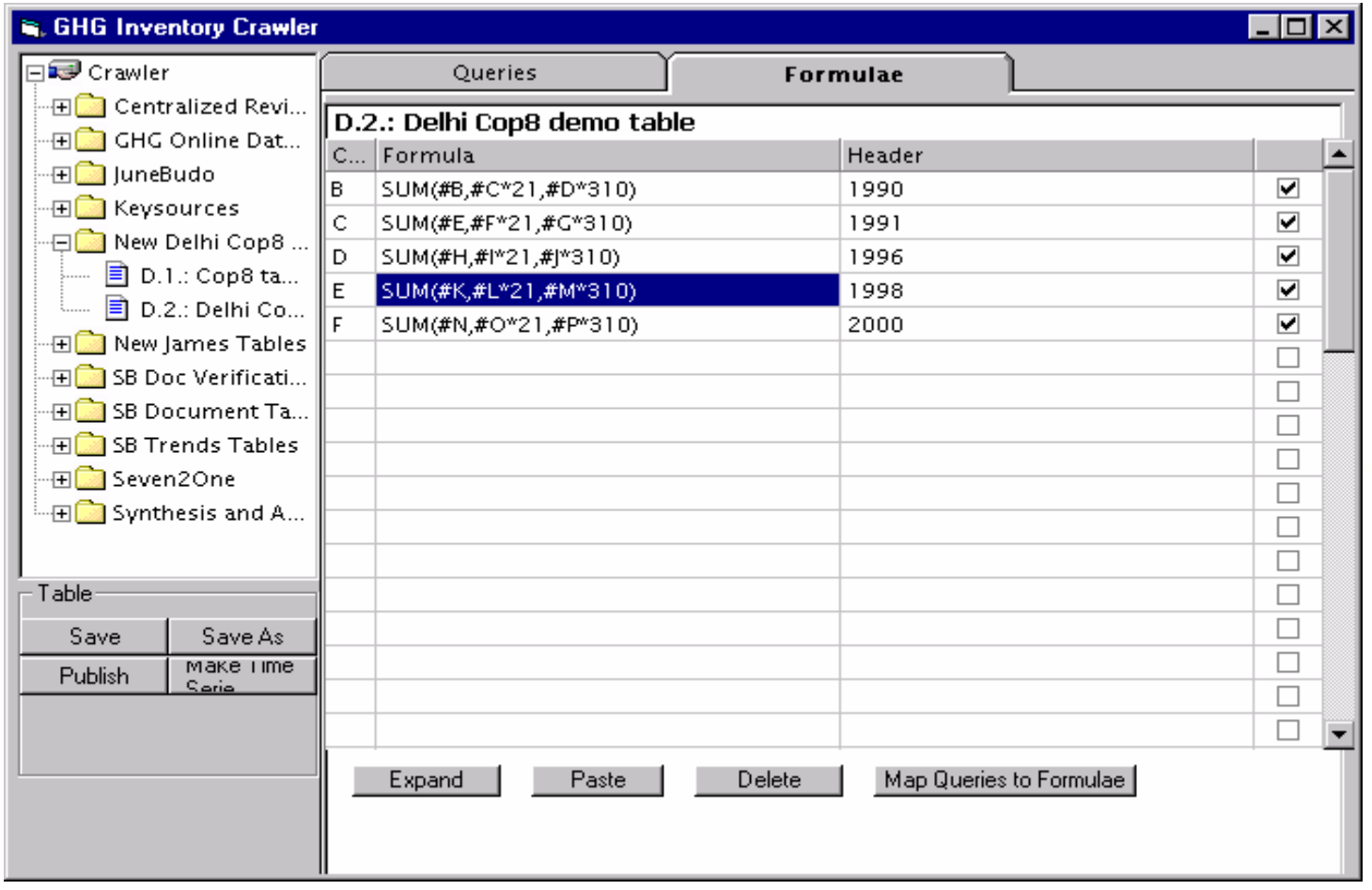
A very practical search engine on top of the CRF Database, intensively used by experts at all stages of the review process .



party	year	gas	measure	value	category	unit	descr	parameter1	parameter2	Subm...	ver	sheet_name
Canada	1995		Amount of biomass removed	85080.91	Total biomass removed in Commercial Harvest	kt dm		NONE	NONE	2002	1	Table5.A
Canada	1996		Amount of biomass removed	85694.09	Total biomass removed in Commercial Harvest	kt dm		NONE	NONE	2002	1	Table5.A
Canada	1997		Amount of biomass removed	86331.88	Total biomass removed in Commercial Harvest	kt dm		NONE	NONE	2002	1	Table5.A
Canada	1998		Amount of biomass removed	81094.86	Total biomass removed in Commercial Harvest	kt dm		NONE	NONE	2002	1	Table5.A
Canada	1999		Amount of biomass removed	84635.44	Total biomass removed in Commercial Harvest	kt dm		NONE	NONE	2002	1	Table5.A
Canada	2000		Amount of biomass removed	85110.22	Total biomass removed in Commercial Harvest	kt dm		NONE	NONE	2002	1	Table5.A
Czech Republic	1990		Amount of biomass removed	9395.91	Total biomass removed in Commercial Harvest	kt dm		NONE	NONE	2002	1	Table5.A
Czech Republic	2000		Amount of biomass removed	9964.67	Total biomass removed in Commercial Harvest	kt dm		NONE	NONE	2002	1	Table5.A
Czech Republic	2000		Amount of biomass removed	9964.67	Total biomass removed in Commercial Harvest	kt dm		NONE	NONE	2002	2	Table5.A
Estonia	2000		Amount of biomass removed	2502.76	Total biomass removed in Commercial Harvest	kt dm		NONE	NONE	2002	1	Table5.A
France	1989		Amount of biomass removed	19234.37	Total biomass removed in Commercial Harvest	kt dm		NONE	NONE	2002	1	Table5.A
France	2000		Amount of biomass removed	19504.14	Total biomass removed in Commercial Harvest	kt dm		NONE	NONE	2002	1	Table5.A
France	1990		Amount of biomass removed	19921.3	Total biomass removed in Commercial Harvest	kt dm		NONE	NONE	2002	1	Table5.A
France	1991		Amount of biomass removed	19538.45	Total biomass removed in Commercial Harvest	kt dm		NONE	NONE	2002	1	Table5.A
France	1993		Amount of biomass removed	17140.68	Total biomass removed in Commercial Harvest	kt dm		NONE	NONE	2002	1	Table5.A
France	1994		Amount of biomass removed	18666.04	Total biomass removed in Commercial Harvest	kt dm		NONE	NONE	2002	1	Table5.A
France	1995		Amount of biomass removed	19423.1	Total biomass removed in Commercial Harvest	kt dm		NONE	NONE	2002	1	Table5.A
France	1996		Amount of biomass removed	17717.8	Total biomass removed in Commercial Harvest	kt dm		NONE	NONE	2002	1	Table5.A
France	1997		Amount of biomass removed	18570.95	Total biomass removed in Commercial Harvest	kt dm		NONE	NONE	2002	1	Table5.A
France	1998		Amount of biomass removed	18888.06	Total biomass removed in Commercial Harvest	kt dm		NONE	NONE	2002	1	Table5.A
Greece	1998		Amount of biomass removed	469.3	Total biomass removed in Commercial Harvest	kt dm		NONE	NONE	2002	1	Table5.A

The Crawler(I)

Data mining tool which allows for the design and production of complex tables with user-defined queries and formulae



The Crawler(II): Output table

Formulae

Queries

dustrial Processes CO2 +CH4 + N2O (Gg CO2 equ)

	1990	1991	1996	1998	2000
ulgaria	10,841	6,548	7,645	4,790	0
zech Republic	4,708	5,459	3,614	3,942	3,447
ew Zealand	2,389	2,513	2,744	2,758	2,824

	1990 CO2	1990 CH4	1990 N20	1991 CO2	1991 CH4	1991 N2O	1996 CO2	1996 CH4	1996 N2O	1998 CO2	1998 CH4	1998 N2O	2000 CO2	2000 CH4	2000 N20
ulgaria	*8,361*	*2.8*	*7.8*	*4,873*	*2.4*	*5.2*	*5,610*	*3.5*	*6.3*	*3,762*	*2.8*	*3.1*			
zech Republic	3,380	5.6	3.9	*4,335*	*12*	*2.8*	2,479	4.9	3.3	2,661	4.0	3.9	2,251	3.4	3
ew Zealand	2,386	0.12	*NO*	2,511	0.12	*NO*	2,742	0.10		2,755	0.11		2,822	0.11	

Color Codes:	Background data (2002)	*Former Submission*	Gg <-> Gg CO2 Equ	Trend data	Alternative Datasource	SUM(CO2+CH4+N2O)	Base Year

ta source profile

y	1990	1991	1996	1998	1999	2000
ch Republic	2002	Pre - CRF	T:2002	T:2002 A:2000	T:2002 A:2001	2002
comments	2002 Submission year 1990	Non CRF submission 1999	Submission 2002 Year 2000 Trends Tables	Submission 2002 Year 2000 Trends Tables + Submission 2000 Year 1998	Submission 2002 Year 2000 Trends Tables + Submission 2000 Year 1999	2002 Submission year 2000

Outputs from Crawler (I): Key Source Analysis

ey Source analysis aims to identify and prioritize the most important emission sources in a given Party *PCC Good Practice).*

very Key Source is evaluated on the basis of its "Level Assessment" :

Level of Assessment = Source Category Emission / Total Emission(without LUCF)

Keysources - Czech Republic - Year 2000	Level Assessment	Cumulative Total	Trend Assessment (since 1990)	
CO2 Stationary combustion-coal	57.3%	57%	35.5%	
CO2 Stationary combustion-gas	11.9%	69%	25.4%	
CO2 Stationary combustion-oil	7.6%	77%	3.4%	
CO2 Mobile combustion-Road vehicles	7.0%	84%	18.3%	
CH4 Fugitive emissions: coal mining&handling	3.4%	87%	2.6%	
Direct N2O emissions from Agricultural soils	1.7%	89%		
CO2 from Cement production	1.4%	90%	1.4%	
Indirect N2O from Nitrogen used in Agriculture	1.3%	92%	1.5%	
CH4 from Enteric Fermentation in Domestic Livestock	1.2%	93%	2.6%	
CH4 from Solid Waste Disposal Sites	1.1%	94%		
N2O from Nitric Acid production	0.7%	94%		
Non-CO2 Stationary combustion-coal	0.6%	95%		
N2O Mobile combustion-Road vehicles		97%	1.5%	
Non-CO2 Stationary combustion-coal		98%	1.8%	

he trends assessment is a measure of how the variation of a source category over years impacts on tot missions.

Outputs from Crawler (II): Synthesis & Assessment

&A Part I consists of 100 tables aimed to facilitate the consideration of inventory data and ther information across Parties and the identification of issues for further consideration uring the review of individual inventories.

pecific checks: **IEF and other inventory data across Parties; emission and removal stimates; AD, IEF , and comparison of AD with international statistics.**

emperate ecosystems

	Original natural ecosystem: Temperate - coniferous							Original natural ecosystem: Temperate - broadleaf						
	On- & off-site burning			Decay			Difference in annual net loss of biomass	On- & off-site burning			Decay			Differe in an net los biom
	Area converted annually	Average annual net loss of biomass	Annual net loss of biomass	Average area converted	Average annual net loss of biomass	Annual net loss of biomass		Area converted annually	Average annual net loss of biomass	Annual net loss of biomass	Average area converted	Average annual net loss of biomass	Annual net loss of biomass	
	kha/yr	t dm/ha/yr	kt dm/yr	kha/yr	t dm/ha/yr	kt dm/yr	t dm/ha/yr	kha/yr	t dm/ha/yr	kt dm/yr	kha/yr	t dm/ha/yr	kt dm/yr	t dm/h
1		*(220-295)*			*(220-295)*				*(175-250)*			*(175-250)*		
											6,488.10	0.25	1,611.90	
	3.20	33.9	108.34	0.00	na			1.20	19.7	23.66				
	135.70	1.0	135.70	114.20	114.20	13041.64	-113.2	673.60	1.0	673.60				
	4.83	9.4	45.51					3.28	9.4	30.71		11.00		
	NA		853.29	NA	NA					1,179.60				
m	3.20	1.00	45.51	0.00	114.20	13,041.64	-113.20	1.20	1.00	23.66	6,488.10	0.25	1,611.90	
m	135.70	33.86	853.29	114.20	114.20	13,041.64	-113.20	673.60	19.72	1,179.60	6,488.10	11.00	1,611.90	
	47.91	14.76	285.71	57.10	114.20	13,041.64	-113.20	226.03	10.03	476.89	6,488.10	5.62	1,611.90	

Online GHG Database

eb database for public access and general external requests:

http://ghg.unfccc.int

Selection by Party (Annex I and non-Annex I), Gas, Emission Source (IPCC),Years

Tabular output in HTML (exportable to Excel)

Years by parties for CO_2 for Changes in Forest and Other Woody Biomass Stocks (in Gigagrams)

	1990	1994	1995	1996	1997	1998	1999	2000
Canada	68,194	38,236	30,792	28,195	25,372	40,565	29,920	28,288
European Community	-235,706	-243,275	-233,391	-242,555	-243,855	-237,380	-241,706	-220,739
Finland	-23,798	-17,259	-14,687	-21,032	-12,637	-9,713	-10,821	-11,953
France	-68,086	-76,775	-74,400	77,228	-80,560	80,518	-81,962	-76,140
Japan	-84,482	-94,473	-97,648					
Russian Federation	-392,000	-568,000						
United States of America	-828,667	-830,133	-825,000	-825,000	-762,667	-755,333	-766,333	-773,667
Total	-1,564,545	-1,791,680	-1,214,334	-983,164	-1,074,347	-881,342	-1,070,902	-1,054,210

Select Annex I Party (Country) | Select non-Annex I Party (Country) | Select gas | Select source | Select year | Show current selections | Reset selection | Show Data

Web site is also used to disseminate material to the review experts and to
lish of results of the review process.
assword protected download area is available for review experts.

Future developments

- Improved reporting software for Parties
  - ☞Take into account new guidelines
  - ☞Ensure flexibility for future changes (i.e. LULUCF)
  - ☞Allow consistency check at the client-side
  - ☞Streamline data processing routines
- Further enhancement of system
  - ☞Move to an analysis-oriented structure
  - ☞Develop additional/improve review software
  - ☞Integrate existing tools, software, datasets