

# Development of Sector-Specific Greenhouse Gas Calculation Tools for the Pulp and Paper Industry

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# Background

- Early 2001 - International Council of Forest and Paper Associations (ICFPA) identified need for guidance:
  - Assist companies in performing inventories
  - Enhance comparability
  - Address issues especially important to pulp and paper mills
  - Inform national and international accounting and trading schemes
  - Address stakeholder concerns

# The Process

- Summer 2001 - NCASI selected to assist ICFPA in developing calculation tools
- ICFPA and NCASI assemble working group of industry experts
- 2001 - Draft tools developed and reviewed by the industry internationally
- 2002 -Peer reviewed by World Resources Institute and World Business Council for Sustainable Development for consistency with the GHG Protocol
- Final tools issued by ICFPA and WRI/WBCSD in November 2002
- Available at [www.ghgprotocol.org](http://www.ghgprotocol.org) and [www.ncasi.org](http://www.ncasi.org)

# General Principles

- Consistency with established protocols
  - WRI/WBCSD GHG Protocol
  - IPCC methods
  - National schemes (to the degree possible)
- Applying the tools requires that they be tailored to local and national circumstances
- Transparency

# Overview of Tools

- For corporate or facility GHG *emissions* inventories
- The tools do not address sequestration
- In essence, the tools are a compilation of calculation methods & emission factors
- Use in conjunction with other guidance:
  - WRI/WBCSD GHG Protocol
  - National guidance (e.g. DOE Voluntary Reporting)
- Tools err on side of comprehensiveness
  - Companies may be interested in only a subset of the emissions covered by the tools

# Scope

- Fossil-CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O
  - On-site direct emissions (company-owned/controlled)
  - Off-site direct emissions (company-owned/controlled)
  - Indirect emissions from steam and power imports
  - Indirect emissions from other outsourced, on-site core operations (e.g. waste treatment)
- Supporting information
  - Climate neutral CO<sub>2</sub> from biomass combustion
  - Emissions from sale of own-generated power

# Issues to Consider

- Ownership/control of emission sources (organizational boundaries, WRI/WBCSD guidance)
- Operations to include (operational boundaries)
- Materiality
- Emissions to include
  - CO<sub>2</sub> only
  - three main GHGs (CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O)

# Calculation tools: Guidance Document and Excel<sup>®</sup> workbook

## Calculation Tools for Estimating Greenhouse Gas Emissions from Pulp and Paper Mills

Version 1.0

A Project of

The Climate Change Working Group

of

The International Council of Forest and Paper Associations (ICFPA)

(with special contributions from)

Paper Manufacturers Association of South Africa

Japan Paper Association

Forest Products Association of Canada

Confederation of European Paper Industries

CNLean Forest and Industry Association

The screenshot shows a Microsoft Internet Explorer browser window with the address bar displaying <http://www.ncasi.org/pulpandpaperworkbook.xls>. The browser window displays the content of an Excel workbook. The spreadsheet has a blue header with the title "Spreadsheets for Calculating GHG emissions from pulp and paper manufacturing" and "Workbook Version 1.0 (see below for USER AGREEMENT)". The main content area contains the following text:

**An aid to developing estimates using the methods in "Calculation tools for estimating greenhouse gas emissions from pulp and paper mills," Report Version 1.0**

This tool intends to facilitate the calculation of direct CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O emissions from pulp and paper mills and ancillary operations. It also addresses emissions attributable to the purchase and export of electricity and/or steam. This document is to be used in conjunction with two additional documents:

- 1) 'Calculation tools for estimating Greenhouse Gas Emissions from pulp and paper mills,' and
- 2) 'Corporate GHG Accounting and Reporting: Corporate Inventory Module', available at [www.ghgprotocol.org](http://www.ghgprotocol.org)

*These spreadsheets include significant amounts of material copied from other WRI and WBCSD calculation tools. Intellectual property rights of the WRI and WBCSD calculation tools belong to WRI and WBCSD, unless stated otherwise.*

The browser window also shows a taskbar at the bottom with the Start button, several application icons, and the system tray showing the time as 4:04 PM.

Download from [www.ncasi.org](http://www.ncasi.org)

# Stationary Fossil Fuel Combustion

- Usually much larger than any other source
- Estimate CO<sub>2</sub> based on carbon content of fuels or emission factors
- Estimate CH<sub>4</sub> and N<sub>2</sub>O from emission factors
  - Usually very small compared to CO<sub>2</sub>
- *Use best information available* - Hierarchy
  1. Mill-specific information
  2. Factors from local or national authorities
  3. Most appropriate factors from other sources
  4. IPCC factors as defaults

# Kraft Mill Lime Kilns and Calciners

- Count only CO<sub>2</sub> from fossil fuel combustion
  - CO<sub>2</sub> from CaCO<sub>3</sub> (lime mud) is almost entirely biomass-derived
- Methane emissions - very few data
  - Tools suggest an emission factor
- Nitrous Oxide emissions - very few data
  - Tools suggest an approach for estimating
- *Exports* of fossil-CO<sub>2</sub> to PCC Plants

# Biomass Combustion

- Do not include CO<sub>2</sub> from biomass combustion in the GHG inventory totals
  - Neutrality of biomass carbon accepted by national and international authorities
  - If reporting under the WRI/WBCSD GHG Protocol, climate-neutral biomass combustion CO<sub>2</sub> must be reported but kept separate from other emissions
- Methane and Nitrous Oxide
  - Few data - emission factors suggested
  - Use other factors where appropriate

# Indirect Emissions Associated with Power and Steam Imports

- Facilitates tracking of performance of end user of power and steam
- Report separately from direct emissions
- National schemes will specify reporting
- Tools use GHG Protocol approach
- Power and steam imports
  - Use most appropriate grid emission factor
  - Can use factor from power generator
  - Do not include transmission and distribution losses
  - Comparable approach for steam imports

# Emissions Associated with Power and Steam Exports

- Report all direct emissions associated with the generation of power or steam
  - Emissions associated with generation of exported power or steam are reported separately as a subset of direct emissions (not netted)
- Allocation of emissions from CHP systems
  - Default method is based on WRI/WBCSD “efficiency method”

# Emissions from Transportation and Other Mobile Sources

- Fuel-Based Transportation Sources
  - Emission factors based on quantity of fuel consumed
- Distance-Based Transportation Sources
  - Emission factors based on distance traveled
  - Less accurate than fuel-based factors
- Other Mobile Sources
  - Harvesting equipment, etc.
  - Emission factors based on quantity of fuel consumed

# Methane from Mill Landfills

- Do not count  $\text{CO}_2$  - it is from biomass
- $\text{N}_2\text{O}$  assumed to be negligible
- For landfills with efficient gas collection and gas collection measurements
  - use mill-specific or assumed (75%) collection efficiency to estimate total generation
  - assume burning completely destroys methane
  - correct release estimate to reflect oxidation in cover
- For other landfills
  - use first-order approach suggested by IPCC to estimate generation
  - correct release estimate for gas collected and burned and for oxidation in cover

# Methane from Anaerobic Waste Treatment Operations

- Do not count CO<sub>2</sub> - it is from biomass
- N<sub>2</sub>O is negligible or released after discharge
- Methane from anaerobic waste treatment systems
  - At present, IPCC has parameter values only for anaerobic systems
  - If have gas measurements, use them
  - Otherwise use IPCC approach
    - Based on BOD/COD sent to treatment plant

# Pulp Mill Make-up Carbonates

- Calcium-carbonate and sodium-carbonate are sometimes used in the pulp mill
  - usually contain fossil carbon
  - may be reasonable to assume these are emitted
  - however, may be balanced by losses that are also in the form of carbonates
- Very small source in almost all situations

# Reporting Inventory Results

- List emission sources included in the inventory
- Include information that is needed to help understand the scope, methods, and results
- Report direct emissions
- Report indirect emissions
- Report emission factors used in inventory
- Importance of transparency
- Suggested reporting format

Thank You!

Questions?