



Estimating Greenhouse Gas Emissions from Pulp & Paper Mills

PULP AND PAPER MANUFACTURERS HAVE DEVELOPED AN INTERNATIONAL CALCULATION TOOL, WHICH CREATES A UNIFIED PROCESS FOR MILL MANAGERS TO COLLECT CONSISTENT DATA ON GREENHOUSE GAS EMISSIONS. THESE DATA ARE COMPARABLE WORLDWIDE AND ESTABLISH A METHOD, WHICH ADDRESSES THE INDUSTRY'S UNIQUE ATTRIBUTES.

The forest products industry has taken a first critical step in developing an inventory system to account for greenhouse gas emissions. In early 2001, the pulp and paper industry working through the International Council of Forest and Paper Associations (ICFPA) began a project to develop an international methodology for estimating greenhouse gas emissions. The resulting industry-specific calculation tools were based on protocols developed by the World Resources Institute/World Business Council for Sustainable Development (WRI/WBCSD) and the Intergovernmental Panel on Climate Change (IPCC).

The project was undertaken to create a unified process to collect credible data that is comparable world-wide and to establish a method that addresses the industry's specific attributes. The process assures that the assumptions and calculations used to estimate the industry's emissions are transparent – or that they are consistent, accurate, and easily understood.

Inventory Method Selected

The industry elected to use an inventory method to account for emissions on a mill basis. The calculation tools include a discussion on establishing inventory boundaries and, to help interpreting the results, the tools recommend that mill inventories include a list of operations contained within the boundaries and a list of factors used to estimate emissions. The calculation tools also contain extensive documentation on emission factors generated through international research.

The inventory addresses

- core pulp and paper making operations (regardless of the ownership of the emission source) and
- other mill-owned sources (such as a mill-owned fleet of lorries).



Indirect emissions (such as those related to the import of electricity or steam) are included in the results. Mills sometimes produce electricity for export, so the method also provides tools for estimating emissions associated with exported electricity and steam and highlights the benefits of biomass-based power exported to the grid.

A SUSTAINABLE INDUSTRY

The forest products industry plays an important and complex role in the global carbon cycle. Forests, which supply the industry's primary raw material, also store significant amounts of carbon and provide much needed products for society.

Forests provide multiple environmental, social, and economic benefits, and the industry's emissions should be viewed in the context of the overall forest products' carbon cycle.



Emissions Included in Inventory

The calculation tools address the following:

- Carbon dioxide emissions from fossil fuel combustion are estimated using widely accepted emission factors, which are based on the carbon content of the fuel. CO₂ emissions include those from production processes as well as the use of company-owned vehicles and other equipment.
- Methane and nitrous oxide emissions from combustion processes are estimated using emission factors. Emissions of CH₄ and N₂O are usually very small compared to those of CO₂, and some inventory protocols (such as that of the WRI/WBCSD) do not address such emissions.
- Greenhouse gas emissions from mill landfills and waste water treatment plants are estimated using mill-generated data and are consistent with methods suggested by the IPCC.

In all cases, mills are urged to use site-specific information if such data yield more accurate estimates of emissions than the calculation tools.

Value of Biomass Recognised

Many pulp and paper mills generate more than half of their energy needs from climate-neutral biomass fuels recovered from the industry's waste and process streams. Energy-rich biomass – derived from wood chips, bark, sawdust and pulping liquors recovered from the harvesting and manufacturing processes – is the result of atmospheric carbon dioxide being sequestered by trees during growth and transformed into organic carbon substances. When these biomass fuels are burned, the CO₂ emitted during the manufacturing and combustion processes is the atmospheric carbon dioxide that was sequestered during the growth of a tree. There is no net contribution to the atmospheric CO₂ level. This carbon cycle is a closed-loop. New tree growth keeps absorbing atmospheric carbon dioxide and maintains the cycle. Therefore, carbon dioxide emissions from biomass combustion are not counted in the inventory – a convention adopted by most protocols – including that of the IPCC.

SUSTAINABLE BIOFUELS

Biomass consumption is assumed to equal its re-growth...In other words, biomass is equal to net zero because all carbon accounting is conducted within the forestry module.

*Intergovernmental Panel on
Climate Change*

Recommendation for Use of the Calculation Tools

The International Council of Forest and Paper Associations recommends that the calculation tools be recognised by governments as well as by domestic and international organisations establishing protocols and developing calculation techniques as the appropriate tools for calculating greenhouse gas emissions for pulp and paper mills.