



Greenhouse Gas Reduction Strategy

Tembec Paper Group-Pine Falls Operations



**2001 Progress Report to
Canada's Climate Change
Voluntary Challenge &
Registry (VCR Inc.)**



Executive Summary

The Tembec-Pine Falls mill operations (formerly Pine Falls Paper Company) produces approximately 500 tonnes per day of newsprint using a combination of tree fibre and recycled material (old magazines and newspapers). The single largest source of greenhouse gas (GHG) emissions from the mill complex is the combustion of fossil fuel (coal) in our boilers. We are committed to significantly reducing our greenhouse gas emissions and thus contributing to the ability of Canada to meet its national GHG reduction targets, as committed to in the Kyoto Accord.

We have formalized our GHG reduction strategy in a number of ways, including being a part of the Voluntary Challenge and Registry (VCR), incorporating a GHG reduction target into our ISO 14001 Environmental Management System (registered in January, 2001), and under Tembec's Impact Zero Environmental Management Program. The Impact Zero program is designed to minimize the environmental impact of Tembec's manufacturing facilities by setting targets for various emission streams that are among the lowest in the world. Our goal is to be in the top 20% of environmental performers in the pulp and paper industry worldwide by 2005.

Under Impact Zero, our GHG reduction target is 6% below 1990 levels by 2005. A key strategy in our GHG reduction program is fuel substitution, whereby fossil fuels (coal) are substituted with biofuels and hydroelectric energy.

This action plan covers the GHG emissions from 1990 to 2001 from energy use in stationary sources (boilers), mobile sources

and process sources for the newsprint mill and woodlands operation in Pine Falls, Manitoba. It also provides GHG reduction projections to the year 2010.

Several initiatives at the newsprint mill complex have allowed us to reduce GHG emissions over the last four years. Since 1998, the use of solids (sludge) from our wastewater treatment system in our boilers as a source of biomass fuel has reduced our reliance on coal, and thus, the production of GHG emissions. In addition, 2001 was a hallmark year for our operation in terms of reducing GHG emissions. In March 2001, a new \$124 million thermomechanical pulp (TMP) mill was commissioned at the newsprint mill. A key component of this new TMP mill was the incorporation of a sophisticated heat recovery unit. Excess heat generated by the new mill is harnessed to produce steam, rather than the heat and steam being vented to the atmosphere. This has allowed us to reduce our reliance on coal as a primary means of generating steam for the whole paper mill complex. At the end of our fiscal year (September 30, 2001), we have reduced our GHG emissions by 17% below our 1990 level.

The startup of a proposed joint venture sawmill with 11 First Nation community business partners will provide additional biomass fuel (bark), allowing us to further reduce coal usage, and hence GHG emissions, at the newsprint mill. The historic joint venture sawmill, called Gaa-bimooka "ang (meaning New Dawn or New Beginnings in Ojibway) will be independent of the Tembec paper mill, and will be a 50/50 venture between Tembec and First Nation communities in Manitoba.

The above changes in process and energy source will result in ambitious reductions of

GHG emissions to 56% below 1990 levels by the end of 2002, 64% below 1990 levels by the end of 2003, and a decrease of 72% below 1990 levels by the end of 2004. Tembec-Pine Falls has previously achieved the Silver Medal reporting level under the VCR program. The format of this report follows that recommended by VCR.

Organization Profile

This Greenhouse Gas (GHG) Emissions Report is for the Tembec newsprint mill, located in Pine Falls, Manitoba. The Pine Falls operation is Manitoba's only producer of newsprint, with a production capacity of 170,000 tonnes/yr. Approximately 150 tonnes/day of recycled newspapers and old magazines are used to produce pulp for the production of newsprint, which has reduced use of the forest as a source of fibre by approximately 20%. The other source of fibre for pulp and paper production comes from trees. In 2001 there was a major process change in the mill. Two pulping departments (stone groundwood and sulfite), original processes from 1927, were decommissioned and a new thermomechanical pulp (TMP) mill was constructed and commissioned. The conversion of the mill to TMP had a remarkable, positive impact on air and effluent emissions.

Pine Falls employs 400 people in Mill operations, and hires 500 seasonal workers by contract in the Woodlands operation. The mill was constructed in 1927 and has run continuously since then. The emissions produced by the Company come from three main sources: the newsprint mill operations, woodlands operations, and a landfill previously used for disposing of wastewater treatment plant (WWTP) sludge. The sludge landfill was in operation from 1995 to 1998.

Mill Operations

The main GHG emissions source in the mill are the boilers that burn lignite coal. The boilers also burn wood waste resulting from the debarking process at the mill and the biosolids (sludge) generated from the WWTP. As stated in the IPCC's reporting guidelines, fuels such as wood waste and biosolids, that are not derived from materials that are part of the long-term geologic carbon store (e.g., hydrocarbons), do not contribute net CO₂ to the atmosphere. Other forms of fuel that are created over geologic time scales, such as hydrocarbons (gas, diesel, coal, oil) do contribute significant amounts of CO₂ to the atmosphere in Canada, and represent a key opportunity for GHG reduction and mitigating impacts related to climate change.

While the combustion of coal at the Pine Falls mill is our largest source of GHG emissions, other minor sources of GHG include gas and diesel used in transportation and propane for forklifts. Most other operations in the mill use electricity, and refuse that is not recyclable, are taken to a municipal landfill.

Woodlands Operations

The Woodlands operations main contributors to GHG emissions include fuel used for tree harvesters, haul trucks (for wood transportation), and vehicles to transport workers. Modern camps and harvesting equipment have replaced chainsaws, tree-farmers, and heating oil that the forest crews previously used in the harvesting operation.

Wastewater Treatment Plant Operations

The Wastewater Treatment Plant's main contributor to GHG emissions was the landfill utilized for the disposal of the sludge produced by the plant. The sludge is mainly comprised of organic solids produced by the

effluent discharged by the paper mill and de-inking plant. No municipal sewer waste is discharged into the effluent treated by the WWTP. The sludge landfill was in use from 1995 to 1998. A Geo-textile membrane to control odour emissions from the decomposing biosolids covers the landfill cells. In 1999, gases produced by the landfill site were burned off using a flare unit on site. However, since 2000 the amount of gas (methane) produced by the landfill cell was not detectable, and therefore not sufficient to allow the flare unit to work. In 2000, an activated carbon scrubber was commissioned at the landfill. All gases are adsorbed onto this filter and thus, are not released to the atmosphere.

Description of the Pine Falls Operations

Tembec currently produces newsprint through the use of a woodroom to debark spruce and pine logs in preparation for chipping. The groundwood and sulphite mills were replaced in 2001 by a thermomechanical pulp (TMP) mill. The TMP mill requires more purchased hydro electricity, but has resulted in a substantial reduction in coal use (approximately 50%) through use of a heat recovery unit. All wood wastes from the new mill are also burned. We are currently incinerating all of the biosolids produced at the WWTP in the existing boilers. This has reduced the amount of coal burned by approximately 10% since the biosolids system became fully operational in February 1999.

Through our Environmental Policy we strive to conserve energy and natural resources, to minimize the use of hazardous materials, and reduce wastes and emissions. The Company has invested time and money in a new De-inking Plant (DIP), Wastewater Treatment Plant, several new tree harvesters, pre- & post-harvest assessments in our woodlands division, a partnership with

Manitoba Model Forest to create innovative forestry practices based on ecological and social principles, energy efficiency, and the recycling of used oil, tires, paper, and water at the mill facility. We have recently joined a new program with the Canadian Forest Service to build carbon budget models at the forest management unit level. These carbon budget models will allow us to test various forest harvesting and disturbance scenarios in order to assess the impacts on forest carbon storage and release.

The new DIP was installed in 1995 at a cost of \$29.5 million. The plant recycles over 150 tonnes of old newspaper (ONP) and old magazines (OMG) daily, making Tembec the largest recycler of ONP and OMG in the province. This has significantly reduced the amount of pulp required from trees and therefore has decreased our reliance on the forest as a source of fibre.

The WWTP does not produce any GHG emissions on site because it uses an aerobic type of water treatment. The landfill, where the sludge produced after treatment was disposed of prior to February 1999 does not appear to be producing methane any longer. The WWTP receives all wastewater from the mill, including the DIP, but does not treat any sanitary sewer waste. The water used by the mill is taken from the Winnipeg River and is recycled through the mill processes as much as possible before being sent to the WWTP for treatment and released back into the Winnipeg River. From December 1995 to February, 1999, the sludge was disposed of at a landfill owned and operated by the Company. The leachate produced by the landfill continues to be hauled back to the WWTP for treatment. In 1998, the company began to burn its WWTP biosolids. In addition to burning, the Company is now investigating alternative uses for our biosolids, including land

application and composting of the sludge. This could provide a tremendous benefit to agricultural crop yield on the marginal agricultural soils of our region.

In our woodlands operation, we conduct pre-harvest assessments to determine the necessary harvesting considerations and silvicultural treatments, while taking into consideration the cultural, recreational, and commercial uses of the forest, as well as ecological considerations, including wildlife habitat. The post-harvest assessments allow the Company to determine the success of regeneration. The Company currently plants one-third of the harvested area and allows the remaining two-thirds to naturally regenerate. On planted sites, this represents planting 2.4 trees for every tree harvested. Audits and inspections are also conducted regularly under our ISO 14001 EMS to ensure that sustainable forest management practices are followed.

Tembec's Woodlands Operations, in conjunction with the Manitoba Model Forest developed the "Guidelines for Environmentally Responsible Forestry Operations in Manitoba". We are also currently developing guidelines for implementing forest planning and harvesting practices based on a natural disturbance model. The Company supports the Manitoba Model Forest both financially and philosophically. Tembec contributes over \$100,000 annually to the Manitoba Model Forest, and continues to actively participate on the non-profit organization's Board of Directors. The collaboration with the Manitoba Model Forest will allow for the development of a Sustainable Forest Management system that will benefit all users and inhabitants of the forest within our Forest Management License Area.

A copy of our statement of endorsement for VCR, originally signed in October of 1999, is included on the following page.

**Senior Management Statement of Endorsement for VCR
(Original version- October, 1999)**

Company Commitments

With the submission of our letter of intent and our first Action Plan and Greenhouse Gas Emissions profile in 1998, Pine Falls Paper Company made a commitment to reduce Greenhouse Gas Emissions to 1990 levels by the year 2000. The submission of this Progress Report reaffirms our support for the VCR program, and that Pine Falls Paper Company will help Canada surpass its goal, as committed in the Kyoto Accord. This will be accomplished through a number of mechanisms, including a change in pulping process from groundwood and sulphite to TMP, utilizing bark, wood waste and biosolids as bio-fuels to reduce our reliance on coal, by participating further with Manitoba Model Forest and other stakeholders to develop our Sustainable Forest Management program, and by finding new and improved ways to further minimize environmental effects. All of these mechanisms will be programs within our Environmental Management System (EMS) that we are developing. This EMS will be certified under ISO 14001 in the year 2000.

The Pine Falls Paper Company demonstrates our GHG reduction commitments as follows:

- 1) Senior management will ensure that PFPC meets, and goes beyond, the national target for GHG reduction.
- 2) A baseline for the year 1990 has been established as a benchmark against which to measure changes in emissions. This baseline is structured by GHG type.
- 3) Targets have been established for the years 1999 through 2002. These targets have been formally incorporated into our ISO 14001 Environmental Management System, and as such, will be reviewed annually by senior management to assess our progress. Future targets will be produced to further reduce GHG emissions beyond the year 2002.
- 4) The resources to achieve these targets will be allocated.
- 5) A formal annual report will be produced. This report will be available to all employees, local and First Nation communities, Environmental Non-Government Organizations (ENGO's) and other stakeholders.
- 6) Employee awareness of GHG initiatives and goals will be enhanced through newsletter updates and annual awareness training.
- 7) We will provide annual updates to VCR Inc.

Mr. Denis Beausejour
Vice President and General Manager, Pine Falls Paper Co.

On-going communication relating to Pine Falls Paper Company's Greenhouse Gas Emissions Report can be addressed to:

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Internal Practices and Management Systems Dealing With Climate Change

Tembec-Pine Falls supports a voluntary approach to greenhouse gas emissions management. Our management strategy is based on reducing GHG emissions and increasing greenhouse gas sinks. The components of our strategy are as follows:

- i) the development of a comprehensive GHG emissions profile (1990 and onward);
- ii) continuation of increasing greenhouse gas sinks through sustainable forest management practices;
- iii) review and implementation of effective and documented management measures which will reduce net GHG emissions;
- iv) commitment to setting and meeting ambitious objectives and targets through our ISO 14001 EMS; and
- v) evaluation and communication of progress.

We implemented an Environmental Management System (EMS) for international certification under ISO14001. Both the newsprint mill and the woodlands were audited in the fall of 2000, and both have been certified since January, 2001. Our GHG strategies become a formal Environmental Program under this EMS.

4.1

Base Year Quantification

Methodology

Tembec-Pine Falls has followed the Canadian Pulp and Paper Association (CPPA) GHG Action Plan Guidelines (1997 and 1999) to prepare our 1997 action plan subsequent Progress Reports. Following the Intergovernmental Panel on Climate Change (IPCC) reporting guidelines, Pine Falls has

not included CO₂ emissions from biomass sources in our Company's GHG emissions total.

This 2001 Progress Report includes an inventory of CO₂, CH₄, N₂O emissions from our Mill and Woodlands operations for the years 1990 to 2001, with projections to 2010. The Wastewater Treatment Plant's operation does not produce any Greenhouse Gas Emissions and therefore is not included. The GHG emissions from the WWTP's landfill are also not included in our progress report. All calculations are based on a physical unit basis (e.g. per litre of fuel) rather than on an energy (i.e., joule) basis because the latter factors are believed to have greater associated error. New Global Warming Potential values for CH₄, N₂O have been used as outlined in the 1999 Guidelines.

The focus of our Progress Report is on emissions from energy use in stationary (boilers) and mobile sources. We estimate that emissions from our stationary sources account for 92% of our total greenhouse gas emissions, while mobile sources account for the remaining 8%. This report identifies the measures the Company has taken, is taking and is planning to take to reduce GHG emissions relating to energy use and sources.

Quantification

A baseline has been created using 1990 as the reference year. This baseline of CO₂ e emissions is presented in two ways. The first provides the absolute quantity of emissions, as tonnes. The second method accounts for changes in newsprint production, and is expressed as tonnes CO₂ e per tonne of newsprint.

All values quantified or projected are based on calculating the amount of CO₂, CH₄ and N₂O released from various fuel (energy) sources. To do this, we have developed an accurate inventory of the amount of each energy source used in our mill and woodlands operations. Using emission factors supplied by VCR, absolute quantities of fuel are converted to CO₂, CH₄ and N₂O. The values for CH₄ and N₂O are converted to units of equivalent CO₂ to reflect the different global warming potentials that these have compared to CO₂. The sum of CO₂, CH₄ (in CO₂ equivalents) and N₂O (in CO₂ equivalents) represents our total GHG emissions, expressed as CO₂ e.

In the 1990 baseline year, our operations produced 138,908 tonnes CO₂ e of GHG. This is equivalent to 0.825 tonnes CO₂ e per tonne of newsprint produced.

Appendix A provides a detailed description of the calculations involved, using 1990 as an example. Conversion factors to relate quantity of fuel to GHG emissions are also presented in Appendix A. Appendices B & C provides a total inventory of the quantity of each fuel source used from 1990 to 2001. Appendix D provides a detailed accounting of all energy sources and GHG emissions from 1990 to 2001, as well as projections from 2002 to 2010.

Projection

Methodology

All methods used in Section 4.2 to calculate the baseline year were maintained when calculating subsequent annual greenhouse gas emissions. Projections of future energy usage focus largely on the startup of a sawmill which will provide bark to our paper mill. The bark will be used in our boilers as an energy source, which will displace coal usage further. The energy

projections are based on best available engineering estimates. Although several energy reduction projects are currently underway in the paper mill, these projects are not included in the projections for future energy use, as their impact on energy reduction is not currently known. These projects however, are described in Sections 7 & 8.

Quantification

Quantification of the projections are based on the same assumptions and criteria identified in Section 4.2.

Target Setting

GHG Targets

In our 1999 report, we committed to reduce GHG emissions by 26% below 1990 levels by 2001. We did not quite achieve our target due to the increase in electricity and coal use (for heating the TMP building) during the construction period. Actual GHG emissions in 2001 was 17% below 1990 levels (see Section 7 for a more detailed explanation). We have set a target of 56% reduction below 1990 levels by 2002 which accounts for a full year of TMP and a 72% reduction from 1990 levels by the end of 2004, which reflects the full impact of burning bark from our proposed sawmill project. Although GHG emissions are expected to remain stable for the remainder of the reporting period (until 2010), they will likely decrease due to several energy reduction projects that have been recently started. The impact of these energy reduction projects on GHG emissions however, is not known.

Process for Target Review and Update

The process for annual review has been incorporated into our ISO 14001 Environmental Management System. This review involves our Senior Management

Team who are responsible for setting direction and providing resources on our environmental objectives and targets. In addition, energy use and other important environmental performance indicators (water use, air emissions, effluent quality, fibre utilization, waste production) are tracked and reviewed monthly and quarterly by various EMS committees.

Measures to Achieve Targets

List of Key Activities / Projects

We attribute our decreasing trend in greenhouse gas emissions to several factors: (1) substitution of biomass energy from purchased energy (coal); (2) increasing greenhouse gas sinks (although we do not include sinks formally in our accounting yet); (3) conversion to TMP; (4) reduced consumption levels; and (5) closure of the Company's landfill site (although this is not included in our GHG emissions total).

Listed below are the measures, which have either been implemented, are underway or are being considered. If available, the associated reduction in GHG emissions has also been included.

Completed Projects: 1990-2001

- Installation of De-inking Plant, substituting recycled fiber for virgin fiber and reduced energy demand (completed 1996)
- Reviewed water consumption to reduce water use, increase water recycling and thus reduce energy requirements for water treatment. A 20% reduction in water use was achieved by December 2001 through better operational control of pulp and paper making processes, and by reusing hot water and white water in other locations in the mill.

- Purchased new harvesting equipment that reduced amount of fossil fuels being used (diesel only instead of diesel, gasoline, power saw gasoline and heating oil. Estimated reduction in greenhouse gas emissions: 2000 tonnes/yr)
- Reforestation practices that increase greenhouse gas sinks. This has resulted in more than 14,000 tonnes of CO₂ being sequestered since 1990.
- Sludge burning alternative, to displace fossil fuel consumption and eliminate landfill. Results indicate a 10-15% reduction in coal use.
- Collection and treatment of landfill gases produced using activate carbon filters.
- Commissioning of the TMP mill and use of heat recovery in 2001. Significant displacement of coal use equating to an additional 13.8% reduction in GHG compared to 2000.

Projects underway and to be implemented by 2004

- Use of small sized wood waste (from wood chipping operation at the mill), in the TMP pulping process which allows more wood fibre to go into paper production instead of ending up as a waste product (in progress).
- Energy reduction projects currently underway include use of low energy TMP refiner plates, lowering the amount of specific energy used to refine wood chips in the TMP, and minor adjustments to boiler overfire system to improve combustion efficiency.
- Water reduction projects designed to reduce water use by more than 50% (to be implemented in 2003). This will also save on chemical treatment and energy use.

- Construction and commissioning of Gaa-bi-mooka “ang sawmill in 2003. Bark from the sawmill will be burned at the Tembec newsprint mill, reducing coal use further and reducing GHG emissions (projected to reduce GHG by more than another 15% beyond what the TMP caused)
- Major alteration to boiler overfire system to improve boiler combustion efficiency
- Participation in the development and testing of carbon budget models with the Canadian Forest Service, as part of the Model Forest Program. These budgets will allow us to assess the implications of various forest harvesting and disturbance scenarios on carbon distribution and release from forests, peatlands and forest soils.

Current Reporting Year

Emissions data for 1990 to 2001 and projected emissions to 2010 are detailed in Appendix D. This section describes the achievements made from 1998 to 2001.

In 1998, we designed and commissioned a system to collect, dry and burn biosolids produced by the Wastewater Treatment Plant in our boiler. By 1999, this reduced both coal consumption and GHG production by 13% from 1997 levels. Emissions of GHG in 1999 was 126,589 CO₂ –e tonnes, 22,361 tonnes less than in 1997, and 19,300 tonnes less than in 1998 (Figure 1). The production of GHG per tonne of newsprint also decreased significantly from 0.888 tonnes CO₂ –e /tonne to 0.745 tonnes CO₂ –e/tonne, mainly due to the use of biosolids as a energy source (Table 1 – see section 8.2) .

Results Achieved

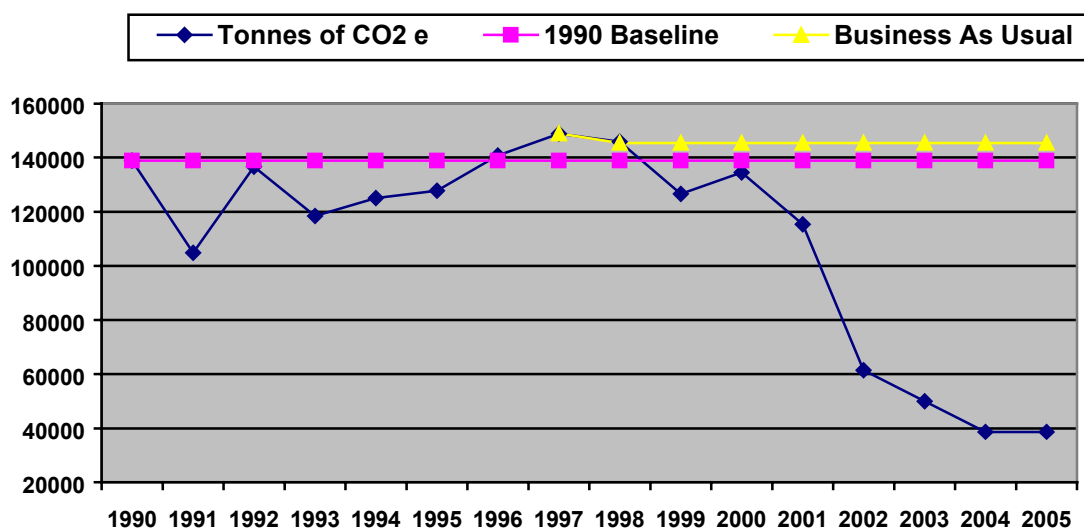


Figure 1. Tembec-Pine Falls GHG emissions 1990 to 2005. Values from 1990-2001 are based on actual data. Values for the year 2002 and beyond are projections. GHG emissions from 2006 to 2010 are projected to be stable at 2005 levels.

Throughout 2000, construction of our new \$124 million thermomechanical pulp mill (TMP) proceeded. During this time, energy use, particularly hydro electricity and coal use, increased. This reflected the energy requirements for construction and heating of the new building during the winter months. As a result, GHG emissions increased compared to 1999. GHG emissions increased to 134,494 tonnes CO₂-e, up from 126,589 tonnes in 1999 (Figure 1). When expressed on a newsprint production basis, GHG emissions increased from 0.745 to 0.760 tonnes CO₂-e/tonne of newsprint (Table 1, Section 8.2).

In March 2001, the new TMP was commissioned. The TMP proved to be a significant pollution prevention strategy, as many discharges were reduced at the source as a result of the change in pulping process. For example, large reductions in effluent loadings (e.g., chemical oxygen demand, biochemical oxygen demand, total suspended solids), in some cases up to a 90% reduction, resulted from the start up of the TMP and shut down of older pulping departments. Air emissions, including particulate, SO₂ and NO_x decreased substantially.

The switch to TMP in 2001 also had a significant effect on GHG production from the paper mill. A heat recovery unit built

into the TMP project, efficiently harnesses waste heat generated by the wood refining process and turns the waste heat it into usable steam, to be used in the TMP and other departments of the paper mill. The use of heat recovery in the TMP resulted in a 16% decrease in coal use in 2001. GHG emissions decreased from 134,494 in 2000 to 115,375 tonnes CO₂-e in 2001 (0.760 to 0.684 tonnes CO₂-e/tonne of newsprint). As the TMP was only in operation for 7 months of Tembec's fiscal year (Tembec fiscal year is October to September) in 2001, we anticipate a total reduction of 50% in coal use in 2002 after a full year of TMP. This will have a major impact on GHG emissions.

Please note that prior to 2001, all reporting years are based on data collected during the calendar year. In 2001, as a result of full integration of Pine Falls Paper Company into Tembec Industries Inc., we altered our reporting period to the Tembec fiscal year.

While the TMP has dramatically reduced reliance on coal for steam production, the TMP does use significantly more hydro electricity (Figure 2). Fortunately, this form of energy is one of the cleanest in terms of GHG emissions. Energy reduction projects currently underway in the paper mill are summarized in Sections 7 & 8.

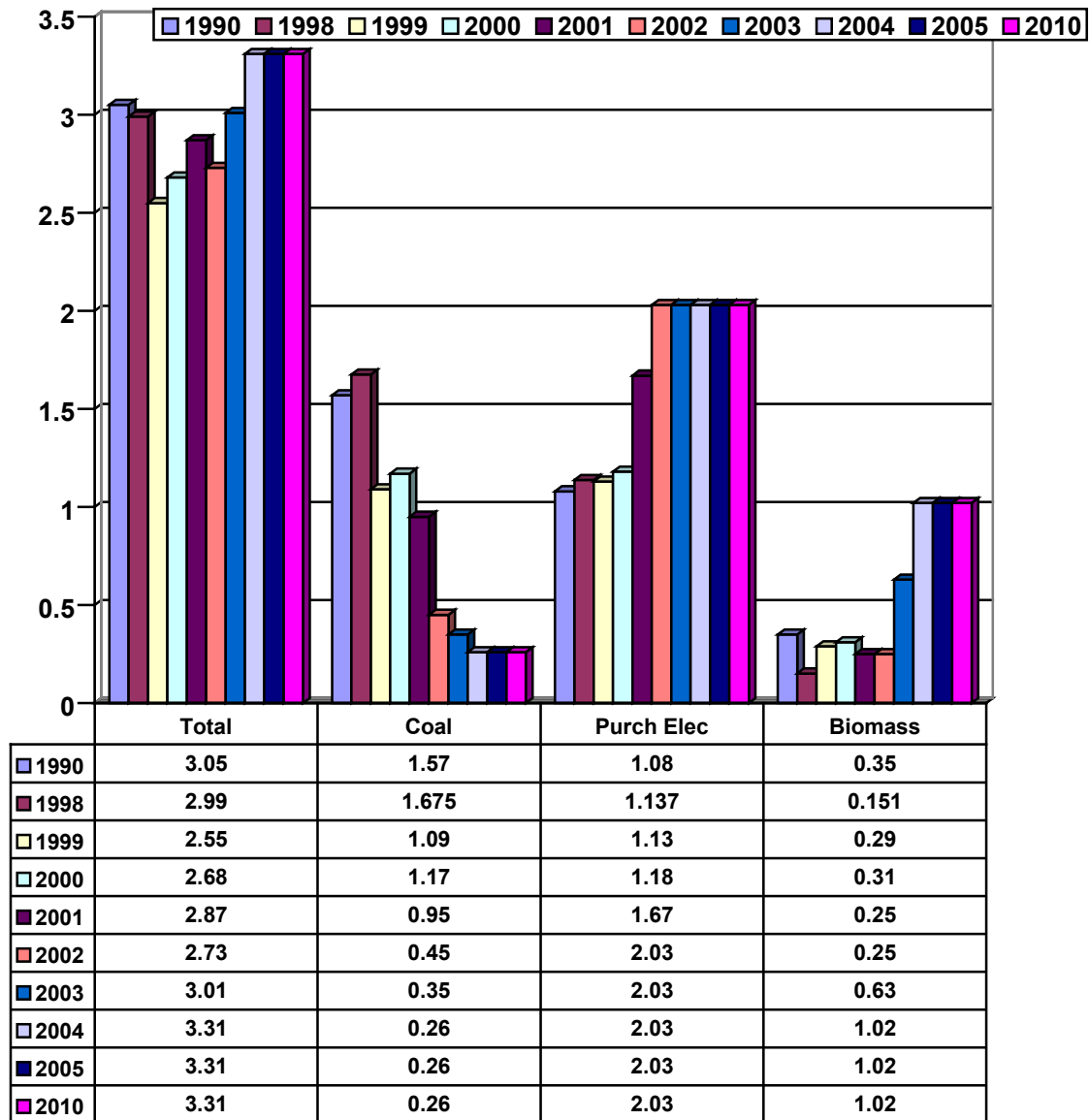


Figure 2. Tembec -Pine Falls energy use by type ($\times 10^6$ GJ/year). Values for 2002 and onward are projections

Interim Years

Table 1. Total Greenhouse Gas Emissions (1990-2005). Projections are in blue and GHG emissions from 2006 to 2010 are expected to be similar to 2005.

Year	CO ₂	CH ₄ (in CO ₂ e)	N ₂ O (in CO ₂ e)	Total CO ₂ -equivalent	Percent Change from 1990	CO ₂ e per tonne of newsprint
1990	135191	40	3676	138908		0.825
1991	102064	30	2762	104858	-24.5%	0.863
1992	132965	40	3552	136558	-1.6 %	0.875
1993	115395	29	3041	118465	-14.7%	0.815
1994	121956	30	3090	125078	-9.9%	0.746
1995	124609	30	3158	127797	-7.9%	0.755
1996	137219	33	3484	140737	+1.0%	0.864
1997	145229	35	3685	148950	+7.2%	0.888
1998	142178	35	3676	145889	+5.0%	0.860
1999	123382	31	3177	126589	-8.8%	0.745
2000	131155	32	3307	134494	-3.1%	0.760
2001	112562	27	2786	115375	-16.9%	0.684
2002	60020	14	1422	61456	-55.7%	0.361
2003	48898	11	1137	50049	-63.9%	0.294
2004	37776	9	855	38641	-72.1%	0.227
2005	37776	9	855	38641	-72.1%	0.227

Verification

Use of all energy sources (primary power, lignite coal, distillates, propane, bark waste and biosolids in GJ) are tracked daily. All data is entered into a database, which can be accessed, from a global network. Energy data is now being verified annually through a voluntary product life cycle program called the Environmental Profile Data Sheet (EPDS). The first of such EPDS audits for Tembec-Pine Falls took place in February 2002.

Offsets

Although carbon sequestration is not included in their GHG emission total, we consider it to be an important aspect of the Carbon Cycle. Forests act as carbon sinks by taking CO₂ from the atmosphere during photosynthesis.

This binds the carbon as organic matter for many years. When a tree is burned in a forest fire, some of the carbon is released. Similarly, carbon is also released through the processing of wood products. Depending on the forest product, carbon can effectively be sequestered in forest products for many more years than is possible in a natural forest. For example, carbon present in lumber may be sequestered for a longer period of time than in a tree subject to short fire cycles in the boreal forest. However, to properly assess this, the amount of carbon released during the processes of harvest planning, harvesting, manufacturing and delivery to the building site must be accounted for.

Full carbon accounting must be done to adequately assess the full impact on the carbon cycle.

Sustainable forest management is therefore an essential part of our operation. Through reforestation efforts, the Company has been able to sequester over 14000 tonnes of CO₂ e since 1990 (Table 2).

Table 2. Carbon Sequestration through reforestation.

Year	Area Planted (ha)	Carbon Sequestration (tonnes)
1990	996.6	1,494.9
1991	877.9	1,316.85
1992	820.9	1,231.4
1993	856.0	1,284.0
1994	970.5	1,455.8
1995	847.7	1,271.6
1996	634.5	951.8
1997	703.9	1,055.9
1998	637.8	956.7
1999	497.0	745.5
2000	823.1	1234.6
2001	712.8	1069.2

Education, Training and Awareness

Our Corporate Response to Climate Change Issues

Tembec-Pine Falls communicates progress on our environmental performance to our employees, First Nation communities, Environmental Non-Government Organizations (ENGO's) and other stakeholders and shareholders, through newsletters, articles in local newspapers and

environmental audit reports. This annual report is available to the public. Our communications strategy on environmental matters has been incorporated into our Environmental Management System under ISO 14001.

Climate Change and Our Employees

We are aware of the role that employees can make toward reducing GHG emissions. Energy usage and paper production is currently posted in all departments on a daily basis. Through the company's newsletters, we communicate GHG emission data to employees and their families. Our environmental commitments, including GHG reduction strategies, is part of every employees annual training and the training of new employees.

Climate Change and Our External Contacts

Through our commitment to annual reporting to the VCR program, the Company aims to make any GHG emission data available to our stakeholders. The Report is also available from the Environment Director.

Our Public Education on Climate Change

By submitting annual reports to VCR Inc., information on our efforts and results are available to any interested parties. These reports are available from VCR Inc.'s web-page at www.vcr-mvr.ca. and our office. We also include our successes in GHG reductions in our mill tours.

Tembec - Pine Falls Operations

Data Appendices

Appendix A. Detailed Calculations and Emission Factors for Baseline Year (1990)

Emission Factors For Converting to units of CO₂, CH₄ and N₂O

Emission Source	Emission Factor Units	CO ₂	CH ₄	N ₂ O
Coal (Lignite) Boiler	g/kg	1.34	0.015	0.11
Car (gas)	g/L	2360	0.25	0.21
Light Truck (gas)	g/L	2360	0.19	0.39
Chain saw (gas)	g/L	2360	4.2	1.65
Off-Road Vehicle (diesel)	g/L	2730	0.14	1.1
Propane Vehicle	g/L	1530	0.70	0.09
Kerosene	g/L	2550	0.21	0.23
Hydro Electricity	kg CO ₂ e/kWh	0.011		

Note: Above emission factors were subsequently scaled appropriately to report actual emissions (below) in tonnes

Global Warming Potential Conversion Factors

1 tonne of CH₄ produced the equivalent of 21 tonnes of CO₂

1 tonne of N₂O produces the equivalent of 310 tonnes of CO₂

Total GHG Emissions for 1990 Baseline

Fuel / Energy Source	Mass or Volume of Fuel Used	Direct CO ₂ produced (t)	CH ₄ produced (t)	CO ₂ e from CH ₄ (t)	N ₂ O produced (t)	CO ₂ e from N ₂ O (t)
Coal (Lignite) Boiler	95664.4 Mg	128190.30	1.43	30.03	10.52	3261.20
Car (gas)	43448 L	102.53	0.01	0.21	0.009	2.79
Light Truck (gas)	166445 L	392.81	0.03	0.66	0.06	18.60
Chain saw (gas)	64331 L	151.82	0.27	5.67	0.11	34.10
Off-Road Vehicle (diesel)	1076825 L	2939.73	0.15	3.15	1.18	365.80
Propane Vehicle	70789 L	108.31	0.05	1.05	0.01	3.10
Kerosene	3453 L	8.81	.0007	0.01	0.0007	0.25
Hydro Electricity	299793 MWh	3297.72				
	Sub Totals	135192.03	1.94	40.78	11.89	3685.84
Total = 138908.11 t CO₂ e						

Note: Total gasoline for vehicles for both mill and woodlands was 209894 L (62020 + 147874; Appendix B). This was further determined to comprise 43448 L for cars (20.7% of total gas use) and 166445 L for light trucks (79.3% of total gas use)

Sample Calculations using cars as an example:

CO₂ produced directly from cars (gas)

$$(43448 \text{ L} \times 2360 \text{ g/L}) \div (1 \times 10^6 \text{ g/tonne}) = 102.5 \text{ tonnes CO}_2$$

CH₄ and CO₂ e produced from cars (gas)

$$(43448 \text{ L} \times 0.25 \text{ g/L}) \div (1 \times 10^6 \text{ g/tonne}) = 0.01 \text{ tonnes}$$

$$0.01 \text{ tonnes CH}_4 \times 21 = 0.21 \text{ tonnes CO}_2 \text{ e}$$

N₂O and CO₂ e produced from cars (gas)

$$(43448 \text{ L} \times 0.21 \text{ g/L}) \div (1 \times 10^6 \text{ g/tonne}) = 0.009 \text{ tonnes N}_2\text{O}$$

$$0.009 \text{ tonnes N}_2\text{O} \times 310 = 2.79 \text{ tonnes CO}_2 \text{ e}$$

The sum of each emission source in the table above, in units of tonnes CO₂ e gives the total GHG emission for 1990. Please see Appendix D for a detailed breakdown of annual GHG emissions by gas type.

Appendix B. Total Annual Fuel Consumption

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Purchased Electricity GJ	1079255	819958	1069729	1005311	1123420	1140105	1143007	1152403	1137110.4	1134910.6	1187082	1676628
Coal Lignite GJ	1569757	1185591	1551335	1346368	1435635	1469189	1622198	1720193	1675013.6	1094940.3	1090500.3	955540.1
Hog Fuel GJ	350067	264063	267987	240824	277267	262636	184068	170149	151178.6	295629.6	316221.7	246900.3
Propane GJ	1805.2	1145.4	1778.1	1613.5	1609.1	1534.8	1870.1	2334.6	2257.4	2186.4	1946.4	2101.5
Distillates (Stat.) GJ	11859.1	7919.3	7726.8	2420.8	3518.4	3702.6	4086.5	3747.3	4622	4272.4	4159.7	3970.0
Gasoline (Mobile) GJ	7355.0	6422.4	7092.8	4837.9	3014.9	2657.4	2905.0	2618.3	2594.717	2401.7	2814.4	2590.5
Diesel (Mobile) GJ	32550	24105.7	26565.8	25787.7	9995.8	9452.4	10117.4	9985.1	18996.676	16108.6	3493.9	2830.6
Kerosene (Mobile) GJ	130.11	130.11	130.11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total TJ	3052.8	2309.2	2932.3	2627.2	2854.5	2889.3	2968.3	3061.4	2992.1	2550.4	2606.2	2890.5

Appendix C. Total Energy Use From 1990 to 2001 (Gj)

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Purchased Electricity MWH	299793	227766	297147	279253	312061	316696	317502	320112	315864	315249	329745	465730
Coal Lignite Mg	95664.4	72252.5	94541.7	82050.6	87490.7	89535.5	98860.2	104832	102078.9	88244.1	94526.2	79618.2
Hog Fuel BDMg	18115.3	13664.9	13867.8	12462.2	14348.1	13591.0	9525.3	8804.9	7823.2	27361	29450.6	24279
Propane litres	70789.0	44913.0	69724.0	63271.0	63100.0	60184.0	73334	91545.7	88526.1	85742	76333.6	82404.2
Gasoline (Mill) litres	62020.0	44166.0	41729.0	21416.0	47086.0	48423.0	56701	52258	71396	70540	70661	68568
Diesel (Mill) litres	235304	154031	147300	28915	30747	34253	36070	31806.2	35474	27132	24047	21150
Gasoline (Woods) litres	212205	185298	204638	139580	86985	76669	83094	75543	74862	62888	7733	3592
Diesel (Woods) litres	841521	623208	686810	666694	258424	244374	261567	258147	491124	420331	181482	145354
Kerosene (Woods) litres	3453	3453	3453	3453	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Appendix D. Detailed GHG Emission Data by Source and Gas Type.

Emissions								
Year		Source	Volume	Units	t of CO ₂	t of CH ₄	t of N ₂ O	t of CO ₂ e
1990	Pulp and Paper Mill	Hydro	299793	MWH	3297.72			
		Lignite	95664.4	Tonnes	128190.30	1.43	10.52	
		Diesel	235304	L	642.38	0.03	0.26	
		Gasoline	62020	L	146.37	0.01	0.02	
		Propane	70789	L	108.31	0.05	0.01	
	Forestry	Diesel	841521	L	2297.35	0.12	0.93	
		Gasoline	147874	L	348.98	0.03	0.01	
		Chainsaw	64331	L	151.82	0.27	0.11	
		Kerosene	3453	L	8.81	0.00	0.00	
	Total				135192.03	1.95	11.86	138908.11
		Biomass	18115.3	Tonnes	27172.95	2.72	2.90	28128.53
1991	Pulp and Paper Mill	Hydro	227766	MWH	2505.43			
		Lignite	72252.5	Mg	96818.35	1.08	7.95	
		Diesel	154031	L	420.50	0.02	0.17	
		Gasoline	44166	L	104.23	0.01	0.02	
		Propane	44913	L	68.72	0.03	0.00	
	Forestry	Diesel	623208	L	1701.36	0.09	0.69	
		Gasoline	136120	L	321.24	0.03	0.01	
		Chainsaw	49178	L	116.06	0.21	0.08	
		Kerosene	3453	L	8.81	0.00	0.00	
	Total				102064.70	1.47	8.91	104858.62
		Biomass	13664.9	Tonnes	20497.35	2.05	2.19	21218.17
1992	Pulp and Paper Mill	Hydro	297147	MWH	3268.62			
		Lignite	94541.7	Tonnes	126685.88	1.42	10.40	
		Diesel	147300	L	402.13	0.02	0.16	
		Gasoline	41729	L	98.48	0.01	0.01	
		Kerosene	14303	L	36.47	0.00	0.00	
	Forestry	Propane	69724	L	106.68	0.05	0.01	
		Diesel	686810	L	1874.99	0.10	0.76	
		Gasoline	136132	L	321.27	0.03	0.01	
		Chainsaw	68506	L	161.67	0.29	0.11	
		Kerosene	3453	L	8.81	0.00	0.00	
	Total				132965.00	1.91	11.46	136558.87
		Biomass	13867.8	Tonnes	20801.70	2.08	2.22	21533.23

						Emissions		
Year		Source	Volume	Units	t of CO2	t of CH4	t of N2O	t of CO2 e
1993	Pulp and Paper Mill	Hydro	279253	MWH	3071.78			
		Lignite	82050.6	Tonnes	109947.80	1.23	9.03	
		Diesel	28915	L	78.94	0.00	0.03	
		Gasoline	21416	L	50.54	0.00	0.01	
		Propane	63271	L	96.80	0.04	0.01	
	Forestry	Diesel	666694	L	1820.07	0.09	0.73	
		Gasoline	139580	L	329.41	0.03	0.00	
		Chainsaw	0	L	0.00	0.00	0.00	
		Kerosene	0	L	0.00	0.00	0.00	
	Total				115395.35	1.41	9.81	118465.44
		Biomass	12462.2	Tonnes	18693.30	1.87	1.99	19350.68
1994	Pulp and Paper Mill	Hydro	312061	MWH	3432.67			
		Lignite	87490.7	Tonnes	117237.54	1.31	9.62	
		Diesel	30747	L	83.94	0.00	0.03	
		Gasoline	47086	L	111.12	0.01	0.02	
		Propane	63100	L	96.54	0.04	0.01	
	Forestry	Diesel	258424	L	705.50	0.04	0.28	
		Gasoline	122570	L	289.27	0.02	0.01	
		Chainsaw	0	L	0.00	0.00	0.00	
		Kerosene	0	L	0.00	0.00	0.00	
					121956.58	1.43	9.97	125078.54
	Total	Biomass	14348.1	Tonnes	21522.15	2.15	2.30	22279.01
1995	Pulp and Paper Mill	Hydro	316696	MWH	3483.66			
		Lignite	89535.5	Tonnes	119977.57	1.34	9.85	
		Diesel	34253	L	93.51	0.00	0.04	
		Gasoline	48423	L	114.28	0.01	0.02	
		Propane	60184	L	92.08	0.04	0.01	
	Forestry	Diesel	244374	L	667.14	0.03	0.27	
		Gasoline	76669	L	180.94	0.02	0.01	
		Chainsaw	0	L	0.00	0.00	0.00	
		Kerosene	0	L	0.00	0.00	0.00	
	Total				124609.18	1.45	10.19	127797.80
		Biomass	13591	Tonnes	20386.50	2.04	2.17	21103.43

Emissions								
Year		Source	Volume	Units	t of CO2	t of CH4	t of N2O	t of CO2 e
1996	Pulp and Paper Mill	Hydro	317502	MWH	3492.52			
		Lignite	98860	Tonnes	132472.40	1.48	10.87	
		Diesel	36070	L	98.47	0.01	0.04	
		Gasoline	56701	L	133.81	0.01	0.02	
		Propane	73334	L	112.20	0.05	0.01	
		Forestry	Diesel	261567	L	714.08	0.04	0.29
			Gasoline	83094	L	196.10	0.02	0.01
			Chainsaw	0	L	0.00	0.00	0.00
			Kerosene	0	L	0.00	0.00	0.00
		Total			137219.59	1.60	11.24	140737.70
		Biomass	9525.3	Tonnes	14287.95	1.43	1.52	14790.41
1997	Pulp and Paper Mill	Hydro	320112	MWH	3521.23			
		Lignite	104832	Tonnes	140474.88	1.57	11.53	
		Diesel	31806.2	L	86.83	0.00	0.03	
		Gasoline	52258	L	123.33	0.01	0.02	
		Propane	91545.7	L	140.06	0.06	0.01	
		Forestry	Diesel	258147	L	704.74	0.04	0.28
			Gasoline	75543	L	178.28	0.02	0.01
			Chainsaw	0	L	0.00	0.00	0.00
			Kerosene	0	L	0.00	0.00	0.00
		Total			145229.36	1.70	11.89	148950.32
		Biomass	8804.9	Tonnes	13207.35	1.32	1.41	13671.81
1998	Pulp and Paper Mill	Hydro	315864	MWH	3474.50			
		Lignite	102078.9	Tonnes	136785.73	1.53	11.23	
		Diesel	35474	L	96.84	0.00	0.04	
		Gasoline	71396	L	168.49	0.01	0.03	
		Propane	88526.1	L	135.44	0.06	0.01	
		Forestry	Diesel	491124	L	1340.77	0.07	0.54
			Gasoline	74862	L	176.67	0.02	0.01
			Chainsaw	0	L	0.00	0.00	0.00
			Kerosene	0	L	0.00	0.00	0.00
		Total			142178.46	1.70	11.86	145889.30
		Biomass	7823.2	Tonnes	11734.80	1.17	1.25	12147.47

Emissions								
Year		Source	Volume	Units	t of CO2	t of CH4	t of N2O	t of CO2 e
1999	Pulp and Paper Mill Forestry	Hydro	315249	MWH	3467.74			
		Lignite	88244.1	Tonnes	118247.09	1.32	9.71	
		Diesel	27132	L	74.07	0.00	0.03	
		Gasoline	70540	L	166.47	0.01	0.02	
		Propane	85742	L	131.19	0.06	0.01	
		Diesel	420331	L	1147.50	0.06	0.46	
		Gasoline	62888	L	148.42	0.01	0.01	
		Chainsaw	0	L	0.00	0.00	0.00	
		Kerosene	0	L	0.00	0.00	0.00	
		Total			123382.48	1.47	10.25	126589.66
		Biomass	27361	Tonnes	41041.50	4.10	4.38	42484.79
2000	Pulp and Paper Mill Forestry	Hydro	329745	MWH	3627.20			
		Lignite	94526.2	Tonnes	126665.11	1.42	10.40	
		Diesel	24047	L	65.65	0.00	0.03	
		Gasoline	70661	L	166.76	0.01	0.02	
		Propane	76333.6	L	116.79	0.05	0.01	
		Diesel	181482	L	495.45	0.03	0.20	
		Gasoline	7733	L	18.25	0.00	0.01	
		Chainsaw	0	L	0.00	0.00	0.00	
		Kerosene	0	L	0.00	0.00	0.00	
		Total			131155.20	1.52	10.67	134494.75
		Biomass	29450.6	Tonnes	44175.90	4.42	4.71	45729.42
2001	Pulp and Paper Mill Forestry	Hydro	465730	MWH	5123.03			
		Lignite	79618	Tonnes	106688.12	1.19	8.76	
		Diesel	21150	L	57.74	0.00	0.02	
		Gasoline	68568	L	161.82	0.01	0.02	
		Propane	82404	L	126.08	0.06	0.01	
		Diesel	145354	L	396.82	0.02	0.16	
		Gasoline	3592	L	8.48	0.00	0.01	
		Chainsaw	0	L	0.00	0.00	0.00	
		Kerosene	0	L	0.00	0.00	0.00	
		Total			112562.08	1.29	8.99	115375.02
		Biomass	24278	Tonnes	36417.00	3.64	3.88	37697.66

Year 2002 and beyond is projected					Emissions			
Year		Source	Volume	Units	t of CO2	t of CH4	t of N2O	t of CO2 e
2002	Pulp and Paper Mill	Hydro	564000	MWH	6204.00			
		Lignite	39600	Tonnes	53064.00	0.59	4.36	
		Diesel	22000	L	60.06	0.00	0.02	
		Gasoline	70000	L	165.20	0.01	0.02	
		Propane	80000	L	122.40	0.06	0.01	
	Forestry	Diesel	145000	L	395.85	0.02	0.16	
		Gasoline	4000	L	9.44	0.00	0.01	
		Chainsaw	0	L	0.00	0.00	0.00	
		Kerosene	0	L	0.00	0.00	0.00	
	Total				60020.95	0.69	4.59	61456.99
		Biomass	25000	Tonnes	37500.00	3.75	4.00	38818.75
2003	Pulp and Paper Mill	Hydro	564000	MWH	6204.00			
		Lignite	31300	Tonnes	41942.00	0.47	3.44	
		Diesel	22000	L	60.06	0.00	0.02	
		Gasoline	70000	L	165.20	0.01	0.02	
		Propane	80000	L	122.40	0.06	0.01	
	Forestry	Diesel	145000	L	395.85	0.02	0.16	
		Gasoline	4000	L	9.44	0.00	0.01	
		Chainsaw	0	L	0.00	0.00	0.00	
		Kerosene	0	L	0.00	0.00	0.00	
	Total				48898.95	0.56	3.67	50049.35
		Biomass	40800	Tonnes	61200.00	6.12	6.53	63352.20
2004	Pulp and Paper Mill	Hydro	564000	MWH	6204.00			
		Lignite	23000	Tonnes	30820.00	0.35	2.53	
		Diesel	22000	L	60.06	0.00	0.02	
		Gasoline	70000	L	165.20	0.01	0.02	
		Propane	80000	L	122.40	0.06	0.01	
	Forestry	Diesel	145000	L	395.85	0.02	0.16	
		Gasoline	4000	L	9.44	0.00	0.01	
		Chainsaw	0	L	0.00	0.00	0.00	
		Kerosene	0	L	0.00	0.00	0.00	
	Total				37776.95	0.44	2.76	38641.70
		Biomass	59300	Tonnes	88950.00	8.90	9.49	92078.08

Emissions								
Year		Source	Volume	Units	t of CO2	t of CH4	t of N2O	t of CO2 e
2005	Pulp and Paper Mill	Hydro	564000	MWH	6204.00			
		Lignite	23000	Tonnes	30820.00	0.35	2.53	
		Diesel	22000	L	60.06	0.00	0.02	
		Gasoline	70000	L	165.20	0.01	0.02	
		Propane	80000	L	122.40	0.06	0.01	
	Forestry	Diesel	145000	L	395.85	0.02	0.16	
		Gasoline	4000	L	9.44	0.00	0.01	
		Chainsaw	0	L	0.00	0.00	0.00	
		Kerosene	0	L	0.00	0.00	0.00	
	Total				37776.95	0.44	2.76	38641.70
		Biomass	59300	Tonnes	88950.00	8.90	9.49	92078.08
2006	Pulp and Paper Mill	Hydro	564000	MWH	6204.00			
		Lignite	23000	Tonnes	30820.00	0.35	2.53	
		Diesel	22000	L	60.06	0.00	0.02	
		Gasoline	70000	L	165.20	0.01	0.02	
		Propane	80000	L	122.40	0.06	0.01	
	Forestry	Diesel	145000	L	395.85	0.02	0.16	
		Gasoline	4000	L	9.44	0.00	0.01	
		Chainsaw	0	L	0.00	0.00	0.00	
		Kerosene	0	L	0.00	0.00	0.00	
	Total				37776.95	0.44	2.76	38641.70
		Biomass	59300	Tonnes	88950.00	8.90	9.49	92078.08
2007	Pulp and Paper Mill	Hydro	564000	MWH	6204.00			
		Lignite	23000	Tonnes	30820.00	0.35	2.53	
		Diesel	22000	L	60.06	0.00	0.02	
		Gasoline	70000	L	165.20	0.01	0.02	
		Propane	80000	L	122.40	0.06	0.01	
	Forestry	Diesel	145000	L	395.85	0.02	0.16	
		Gasoline	4000	L	9.44	0.00	0.01	
		Chainsaw	0	L	0.00	0.00	0.00	
		Kerosene	0	L	0.00	0.00	0.00	
	Total				37776.95	0.44	2.76	38641.70
		Biomass	59300	Tonnes	88950.00	8.90	9.49	92078.08

Emissions								
Year		Source	Volume	Units	t of CO2	t of CH4	t of N2O	t of CO2 e
2008	Pulp and Paper Mill	Hydro	564000	MWH	6204.00			
		Lignite	23000	Tonnes	30820.00	0.35	2.53	
		Diesel	22000	L	60.06	0.00	0.02	
		Gasoline	70000	L	165.20	0.01	0.02	
		Propane	80000	L	122.40	0.06	0.01	
	Forestry	Diesel	145000	L	395.85	0.02	0.16	
		Gasoline	4000	L	9.44	0.00	0.01	
		Chainsaw	0	L	0.00	0.00	0.00	
		Kerosene	0	L	0.00	0.00	0.00	
	Total				37776.95	0.44	2.76	38641.70
		Biomass	59300	Tonnes	88950.00	8.90	9.49	92078.08
2009	Pulp and Paper Mill	Hydro	564000	MWH	6204.00			
		Lignite	23000	Tonnes	30820.00	0.35	2.53	
		Diesel	22000	L	60.06	0.00	0.02	
		Gasoline	70000	L	165.20	0.01	0.02	
		Propane	80000	L	122.40	0.06	0.01	
	Forestry	Diesel	145000	L	395.85	0.02	0.16	
		Gasoline	4000	L	9.44	0.00	0.01	
		Chainsaw	0	L	0.00	0.00	0.00	
		Kerosene	0	L	0.00	0.00	0.00	
	Total				37776.95	0.44	2.76	38641.70
		Biomass	59300	Tonnes	88950.00	8.90	9.49	92078.08
2010	Pulp and Paper Mill	Hydro	564000	MWH	6204.00			
		Lignite	23000	Tonnes	30820.00	0.35	2.53	
		Diesel	22000	L	60.06	0.00	0.02	
		Gasoline	70000	L	165.20	0.01	0.02	
		Propane	80000	L	122.40	0.06	0.01	
	Forestry	Diesel	145000	L	395.85	0.02	0.16	
		Gasoline	4000	L	9.44	0.00	0.01	
		Chainsaw	0	L	0.00	0.00	0.00	
		Kerosene	0	L	0.00	0.00	0.00	
	Total				37776.95	0.44	2.76	38641.70
		Biomass	59300	Tonnes	88950.00	8.90	9.49	92078.08

Appendix E. Total Annual Newsprint Production (Tonnes)

Year	Total Unwrapped Product (tonnes)
1990	168384.5
1991	121448.1
1992	155986.1
1993	145249.4
1994	167713.6
1995	169098.3
1996	162760.1
1997	167754.0
1998	169505.0
1999	169910.0
2000	176832.6
2001	168.621.5