

# Paper Industry Focus on Climate Change

Energy Efficiency Improvements, Fuel Choices,  
and Increased Use of Renewable Fuels

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Verso Paper



GAA Environmental Workshop – June 17-19, 2008

# Key Issues & Threats in our Industry

- **Wood/fiber from certified sources**.....efforts to increase amounts hindered by availability and cost..... pressures for FSC only while other certification programs also provide for sustainable forest management practices.....activists focus on Canadian pulp suppliers
- **Chain Of Custody Certification** (3<sup>rd</sup> party) for the mills.....desire to track fiber from the forest through the paper production process
- **Climate Change** / Energy Usage / Carbon Footprint of the mills and of the products.....**hottest emerging issue and here to stay**
- **Post Consumer Waste** (PCW) content.....activist pressures causing increased demand but coated paper may not be correct application
- **Transparency**.....expectation for public reporting, customer scorecards and accountability



# Verso's Sustainability Philosophy



“Verso Paper’s goal is to be the preferred supplier to the North American catalog and magazine segments and in doing so, to be financially, socially and environmentally sustainable. **In fact, sustainability is the core of our business philosophy.**”

**Our sustainability commitment reaches into virtually every area of our business, from fiber procurement to manufacturing to product stewardship.**

Mike Jackson  
Verso Paper CEO



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When we say sustainable .... we mean:

Meeting the needs of the present without compromising the ability of future generations to meet their own needs.



# Agenda

- Mill Based Energy Efficiency Improvements (Conservation and Efficiency)
- Fuel Choice and Impact on CO<sub>2</sub>
- Increased Use of Renewable Energy – Game Changers

Increasing Technology And Capex

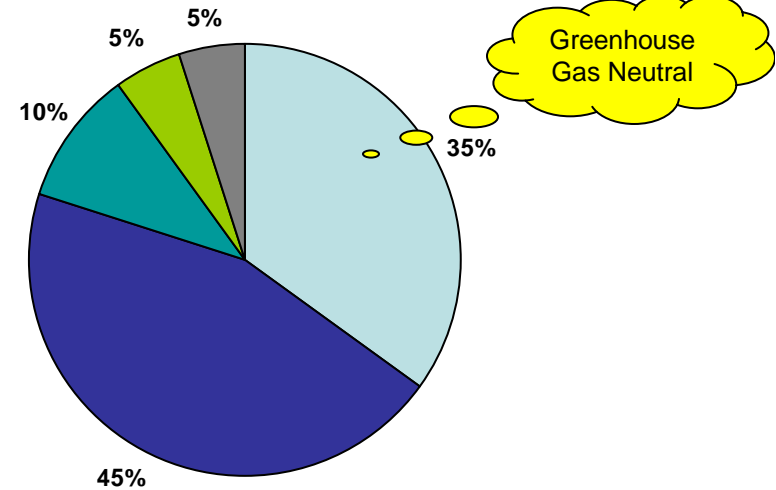
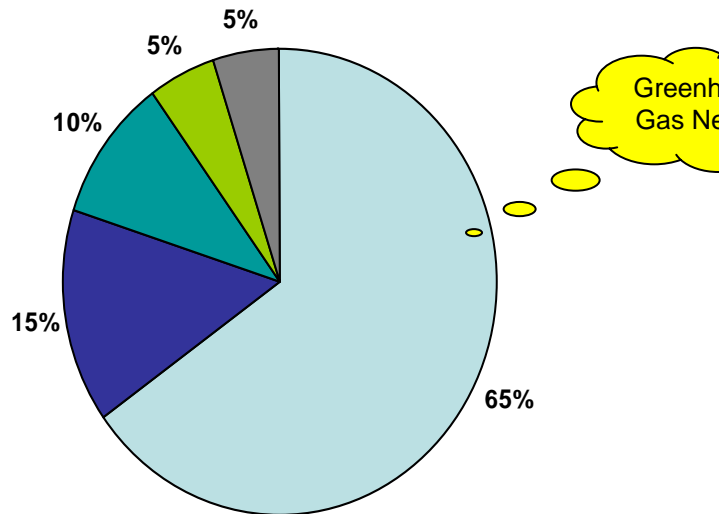


# How Much Energy are We Talking About ?

## Two Basic Footprints – Kraft Mills vs. Mechanical Pulp Mills Energy Self Sufficiency vs. Fiber Efficiency

Typical N.A Kraft Mill Uses 14,000,000 mmbtu /yr  
 Benchmark Mill Would Use 9,800,000 mmbtu / yr  
 Avg U.S. Household 34 mmbtu / yr

Typical N.A Mech Mill Uses 10,500,000 mmbtu /yr  
 Benchmark Mill Would Use 8,500,000 mmbtu / yr  
 Avg U.S. Household 34 mmbtu / yr



Own Made Purchased Power Coal Gas Fuel Oil

Own Made Purchased Power  
 Coal Gas  
 Fuel Oil

Typical Mill footprint – 750,000 tons of CO2 Equivalent



# Mill Based Energy Efficiency Improvements

We increase production every year ... since 2002 we have effectively added the capacity of two medium size paper machines to our system ... How do we combat / mitigate ?



# Mill Based Energy Efficiency Improvements

Historical approach to mill energy efficiency improvements have been based on limited data – capital driven solutions – short term energy cost considerations





# Mill Based Energy Efficiency Improvements

Verso recognized the need for this approach to change.....

Verso's approach has been data based improvements focused on 3 main principles

- o Energy Measured and controlled at the point of use - non technical conservation and control of energy required to produce each product
- o Energy analyzed and reported at the enterprise level
- o Technical / Capital solutions identified, prioritized, and executed based on energy balance and thermal "pinch" analysis

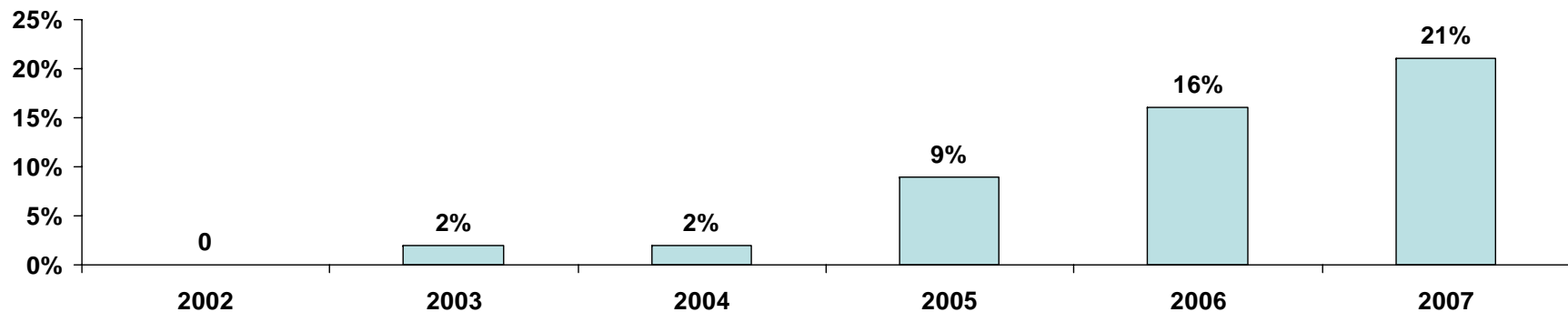


# What are the results of this approach ?

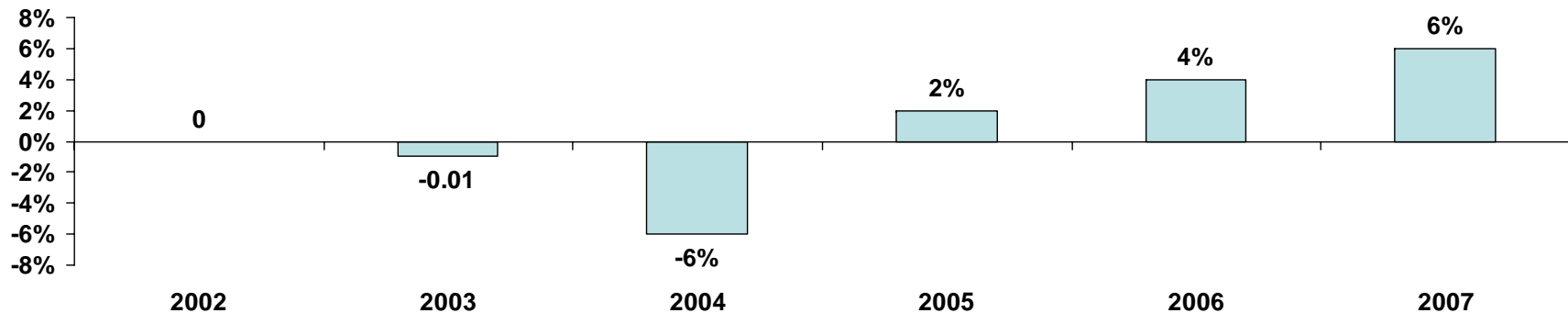
With excellent execution mill's can negate and even improve on the production creep issue

Verso Results

% Reduction in Thermal Energy Used to Make a Ton of Paper



% Reduction in Electrical Energy Used to Make a Ton of Paper



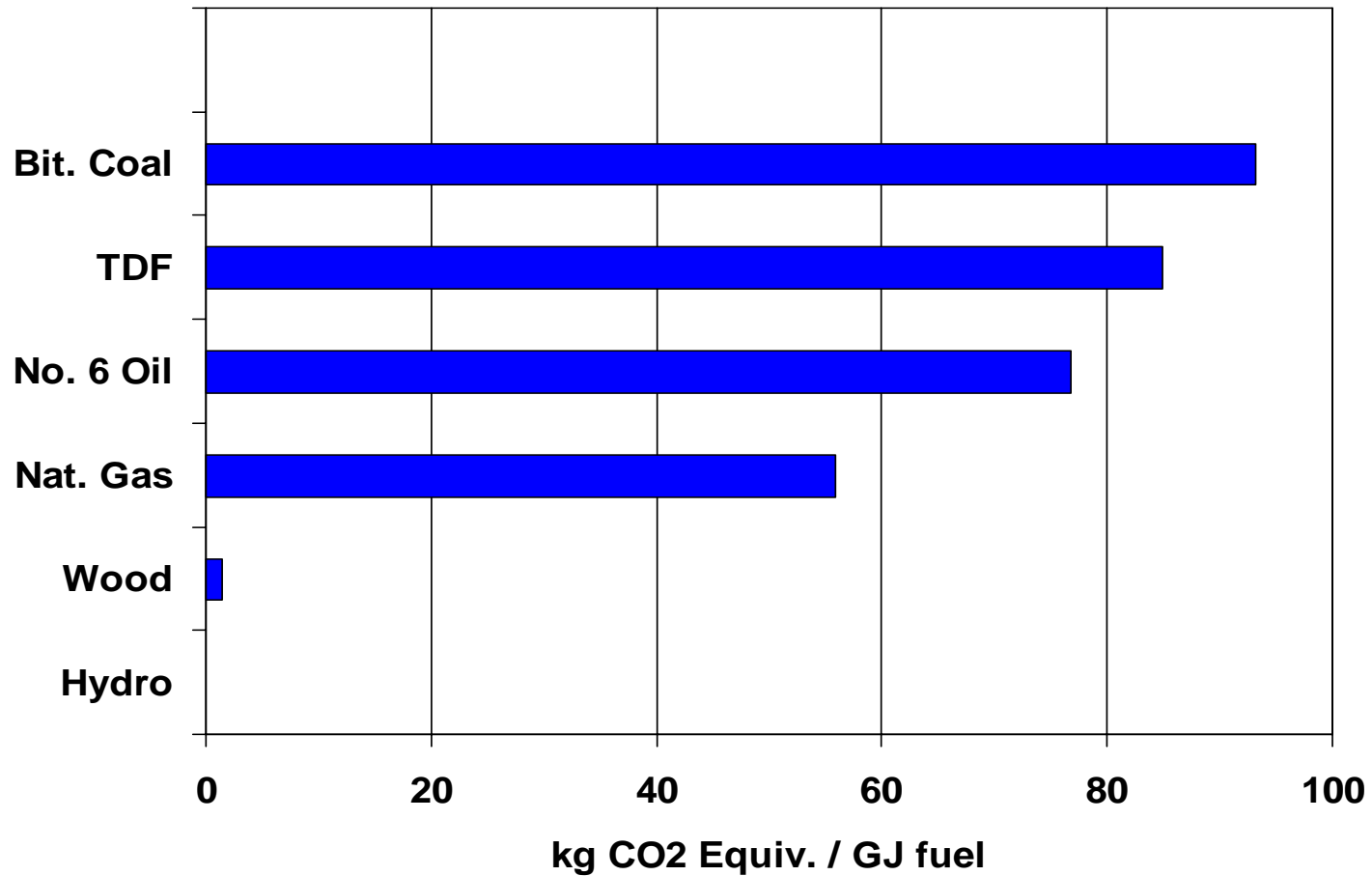
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# Fuel Choice

- What impact does fuel choice have on CO<sub>2</sub> emissions ??
- What can be done to change fuel types ??



# Greenhouse Gas Emission Factors

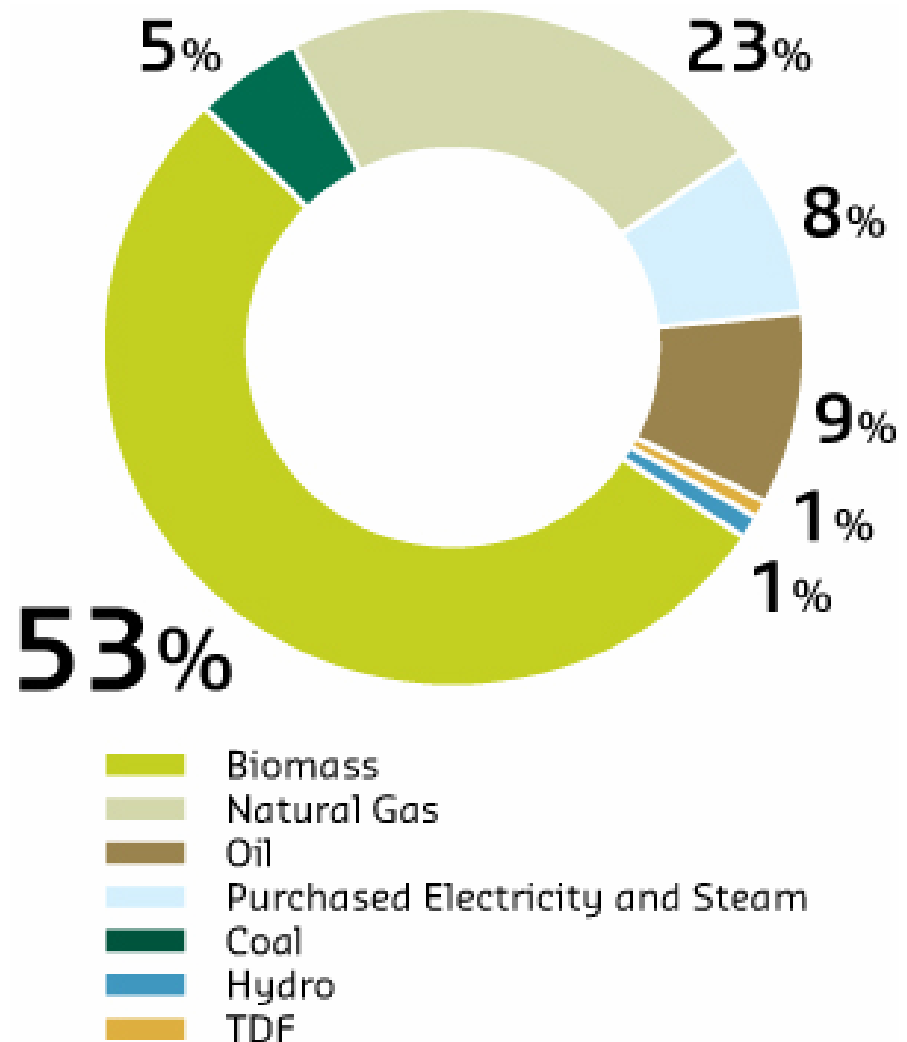


Greenhouse gases from our processes include carbon dioxide, methane & nitrous oxide.  
1 ton of CH<sub>4</sub> is equivalent to 24 tons of CO<sub>2</sub>; 1 ton of N<sub>2</sub>O is equivalent to 310 tons of CO<sub>2</sub>.



# Focus on Energy Type & Efficiency

Verso is working continuously to improve energy efficiency and reduce GHG emissions. More than half of the energy used to manufacture our products - about 53% - comes from renewable, GHG-neutral biofuels. These include bark and other wood residuals, solids that result from effluent treatment and wood lignin recovered from the chemical pulping process.



# Impact of Fuel Choice ?

Unfortunately.....

- Paper Mill energy reconfiguration projects are almost never NPV positive investments
- This fact has certainly limited these reconfigurations outside of Natural Gas Co-Generation plants
- The rapid growth in Natural Gas Co-Generation plants in the late 1990's and early 2000's – coupled with the fact that natural gas in the U.S. is more expensive than just about anywhere else in the world makes continued natural gas conversions on a large scale unlikely
- Large PET Coke and Biomass investments can make economic sense

But.... \$130 / bbl oil is a strong economic incentive that will drive a lot of investment – will these prices persist



## Renewable Energy – Does it Offer Solutions

The pulp and paper industry is probably the best suited N.A. industry to advance 2<sup>nd</sup> Generation bio-energy and bio-fuel investments

.....And Investments look attractive !!



## What do Biorefineries offer the Pulp and Paper Industry ?

- Integrated feedstock and procurement harvesting chain (residues from current operations)
- Optimal utilization of Biomass (the value chain can be preserved)
- Chance to become Carbon Neutral
- The Pulp and Paper Industry has decades of experience in Sustainable harvesting
- Additional revenue and profit





# Why move from 1<sup>st</sup> to 2<sup>nd</sup> Generation biofuels ?

## Feedstock

- From food to non-food renewable feedstocks
- Energy crops, agrowaste, and forest residuals

## GHG Reductions

- Can achieve substantially larger GHG reductions
- Integration with existing operations – waste heat displaces other fossil fuel uses

## Better Fuel Quality

- Compatible with conventional engine technology
- Compatible with conventional distribution systems



# Co-Production alternatives at Pulp and Paper Mills

- Full utilization of the incoming biomass and other raw materials for simultaneous production of fiber based products, chemicals, and energy
- Product Examples:
  - Tall oil, turpentine, ethanol (sulfite mills), lignosulfinate
- New Product Examples:
  - Diesel, methanol, electricity, gas, waxes, acetic acids, PVA's

