

# Clean Energy

Reducing Energy Usages, Understanding  
Fuel Choices, and Recognizing the  
Increased Demand for Renewable Fuels

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Verso Paper Corporation



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# 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
- **Pressure on Wood Baskets** as the result of the Renewable Energy Demand / legislative concerns
- **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



**“At Verso, we are committed** – in principle and in action – to building a company that is financially successful, environmentally excellent and socially responsible.

Certainly, we factor issues like the strained U.S. economy, increased input costs and an ever-evolving coated paper marketplace into how we operate our business. But external forces have not deterred us from fully integrating our Sustainability Principles into our business decisions, and doing so remains a key strategy.”

Mike Jackson  
Verso Paper CEO

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

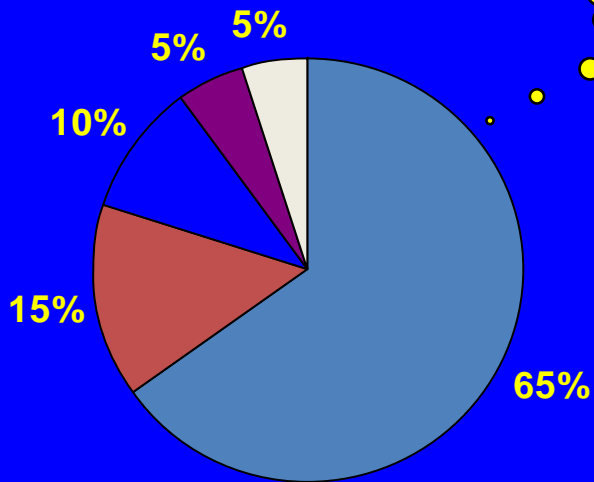
- Mill Based Energy Efficiency Improvements (Conservation and Efficiency)
- Fuel Choice and Impact on CO<sub>2</sub>
- Reality of Renewable Energy
- Renewable Energy as a Strategy

# How Much Energy are We Talking About ?

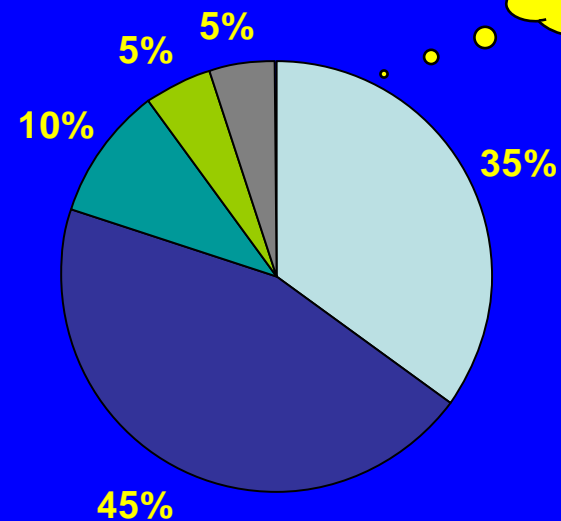
Two Basic Footprints – Kraft Mills vs. Mechanical Pulp Mills  
 Energy Self Sufficiency vs. Fiber Efficiency

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



Greenhouse Gas Neutral



Greenhouse Gas Neutral

■ Own Made ■ Purchased Power ■ Coal ■ Gas ■ Fuel Oil      ■ Own Made ■ Purchased Power ■ Coal ■ Gas ■ Fuel Oil

Typical Mill Footprint – 750,000 tons of CO<sub>2</sub> 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 4 main principles:

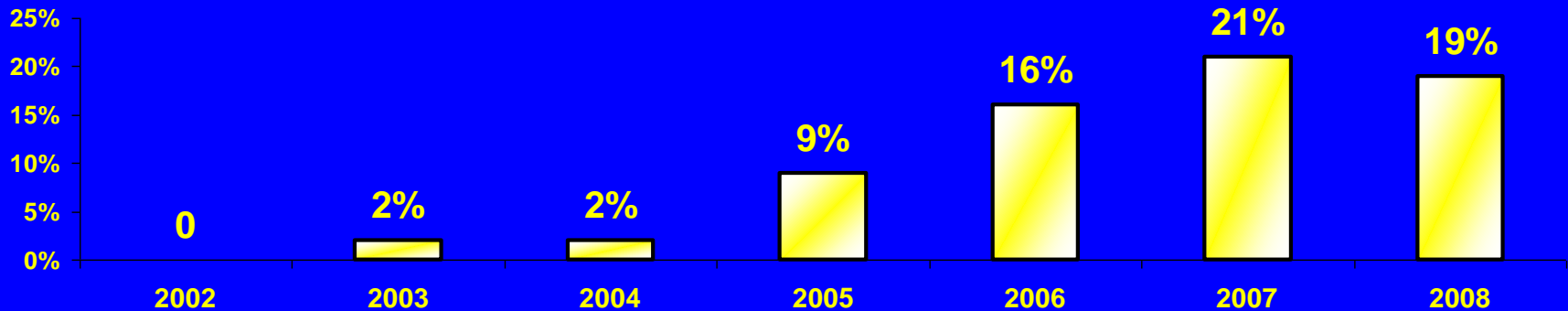
- Energy Measured and Controlled at the point of use
- Audits and Best Practices identified
- Energy Analyzed and Reported at the enterprise level
- Technical / Capital Solutions identified, prioritized, and executed based on energy balance and thermal "pinch" analysis

# What are the results of this approach ?

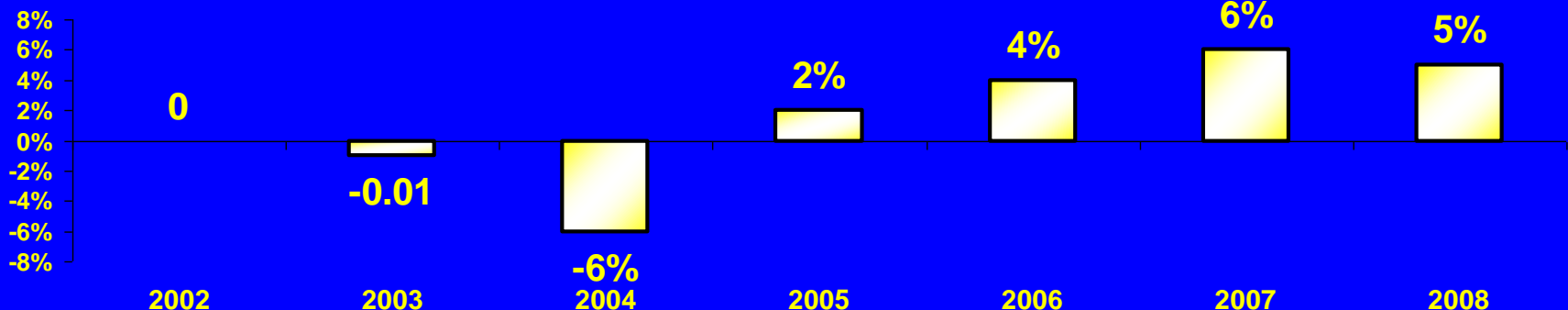
With excellent execution mills can negate and even improve on the production creep issue

## Verso Results

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



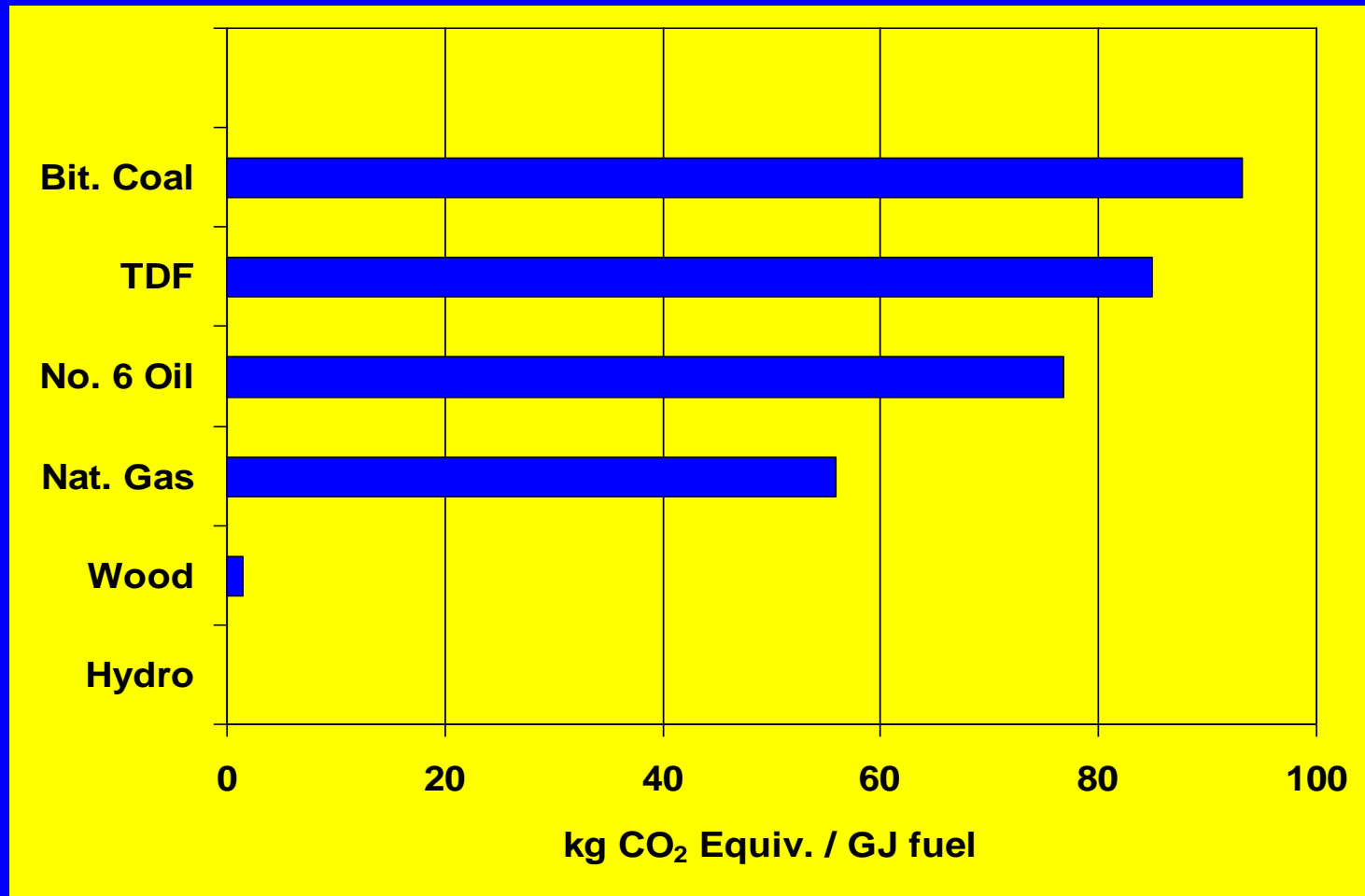
% Reduction in Electrical Energy Used to Make a Ton of Paper



# Fuel Choice

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

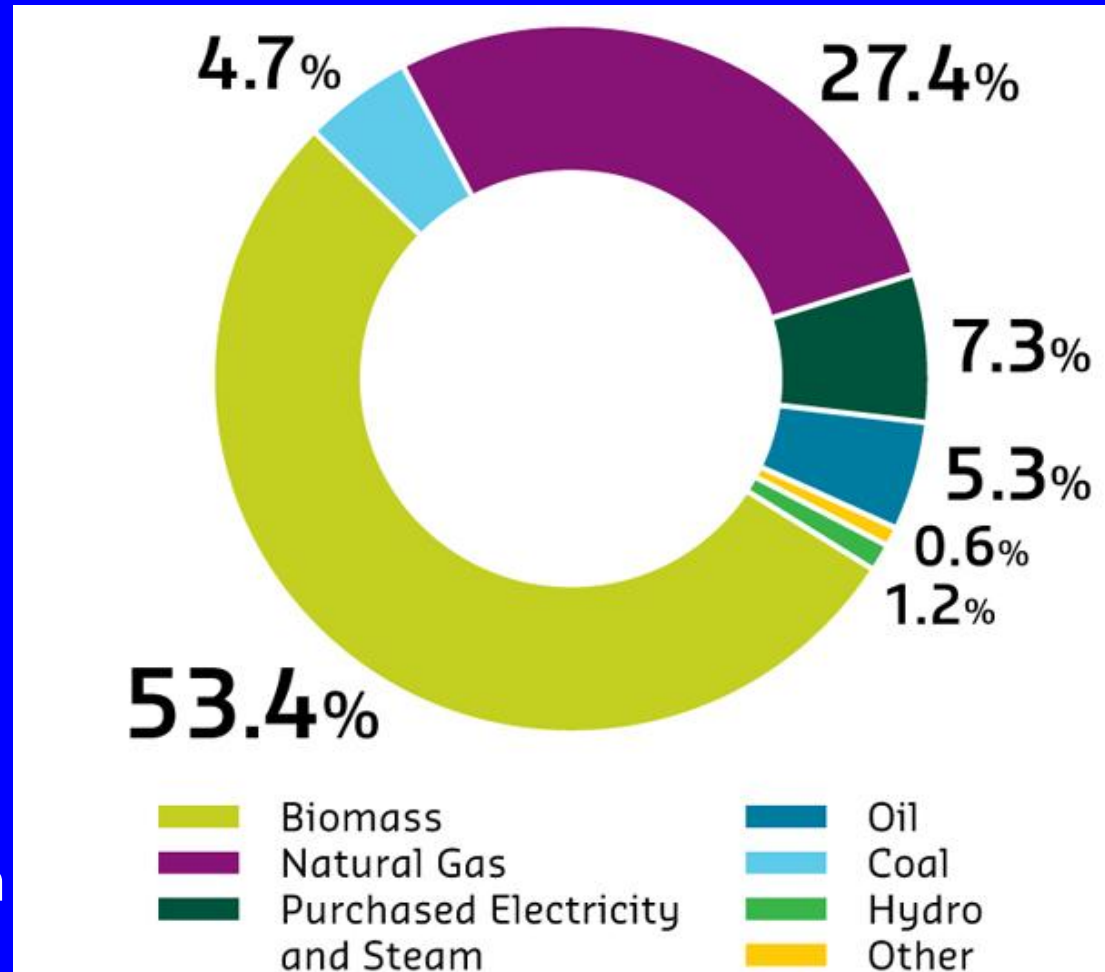
# Greenhouse Gas Emission Factors



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 53.4% - comes from renewable, GHG-neutral bio-fuels. 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

These Economic uncertainties will delay the progression of large renewable improvement projects.

# Legislative and Regulatory Concerns

- Cost for Discovery and Influence
- Cap and Trade (threats / benefits)
- Capital Requirements
- Incentives that Facilitate Bad Behaviors

# Renewable Energy

The Pulp and Paper Industry is probably the best sector to play in the production of clean/renewable power and even the advancement of 2<sup>nd</sup> generation bio-energy and bio-fuel.



# Reality of Renewable Energy

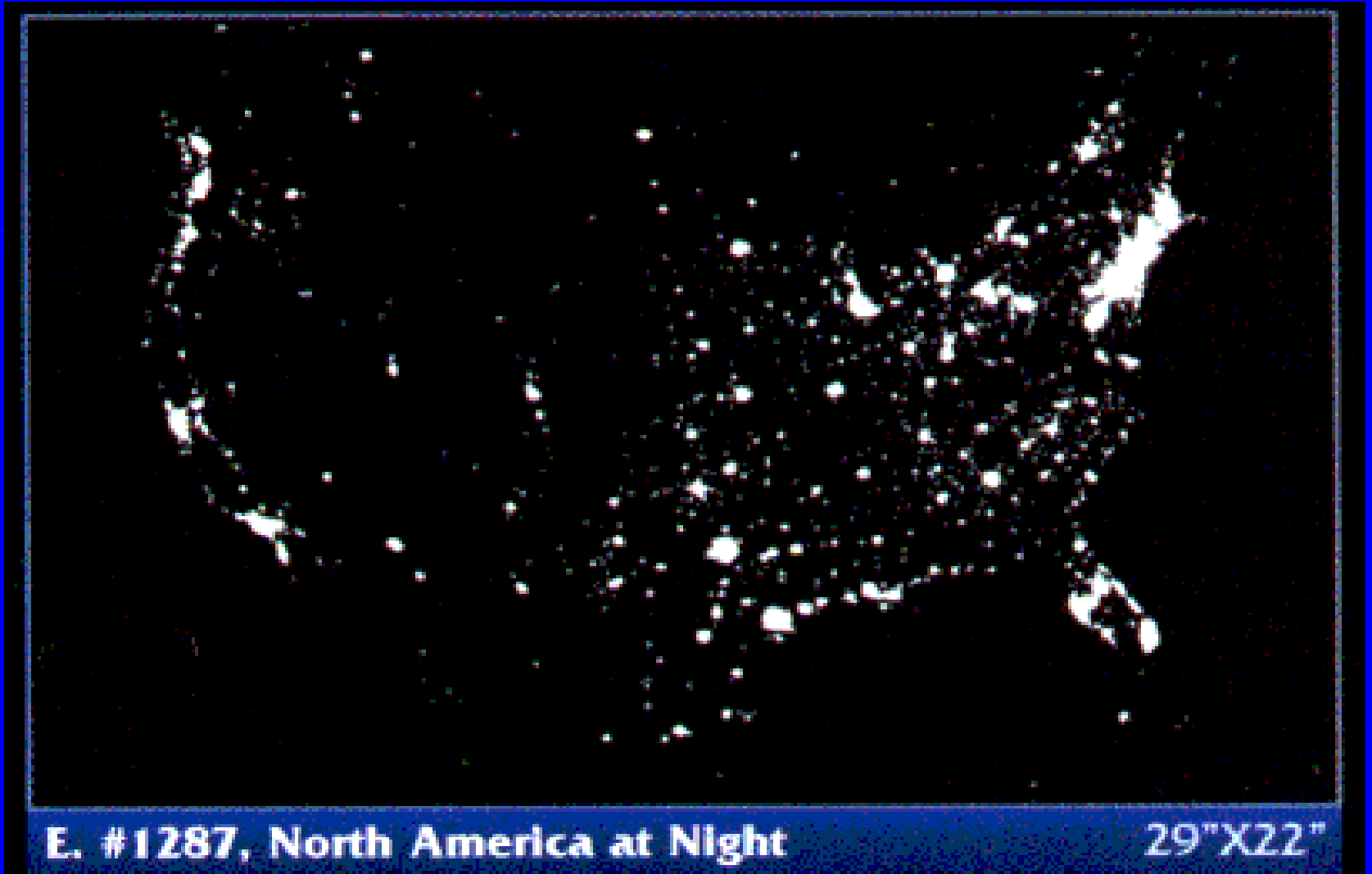
Renewable energy requires enormous land commitments that, given present technologies, make the widespread replacement of fossil fuels by renewable energy problematic.

# Land Density Matters

To meet the entire U.S. energy demand using:

- Biomass (wood) would require a land area approximately twice the size of the U.S., assuming sustainable harvesting of 1 cord per acre.
- Switchgrass – entire country east of the Mississippi
- Wind – an area bigger than TX and CA combined
- Solar - a land area equal to the State of Montana

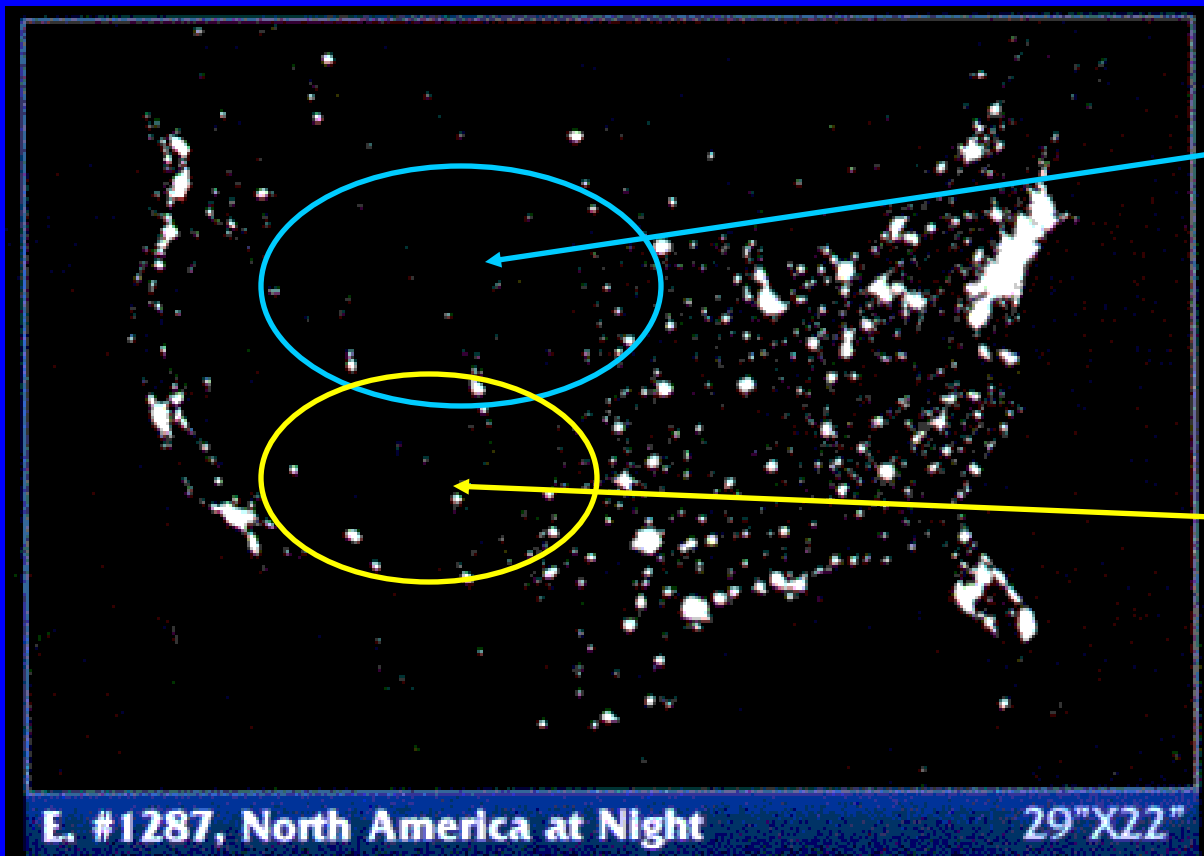
# So Where is All The Land ...



E. #1287, North America at Night

29"X22"

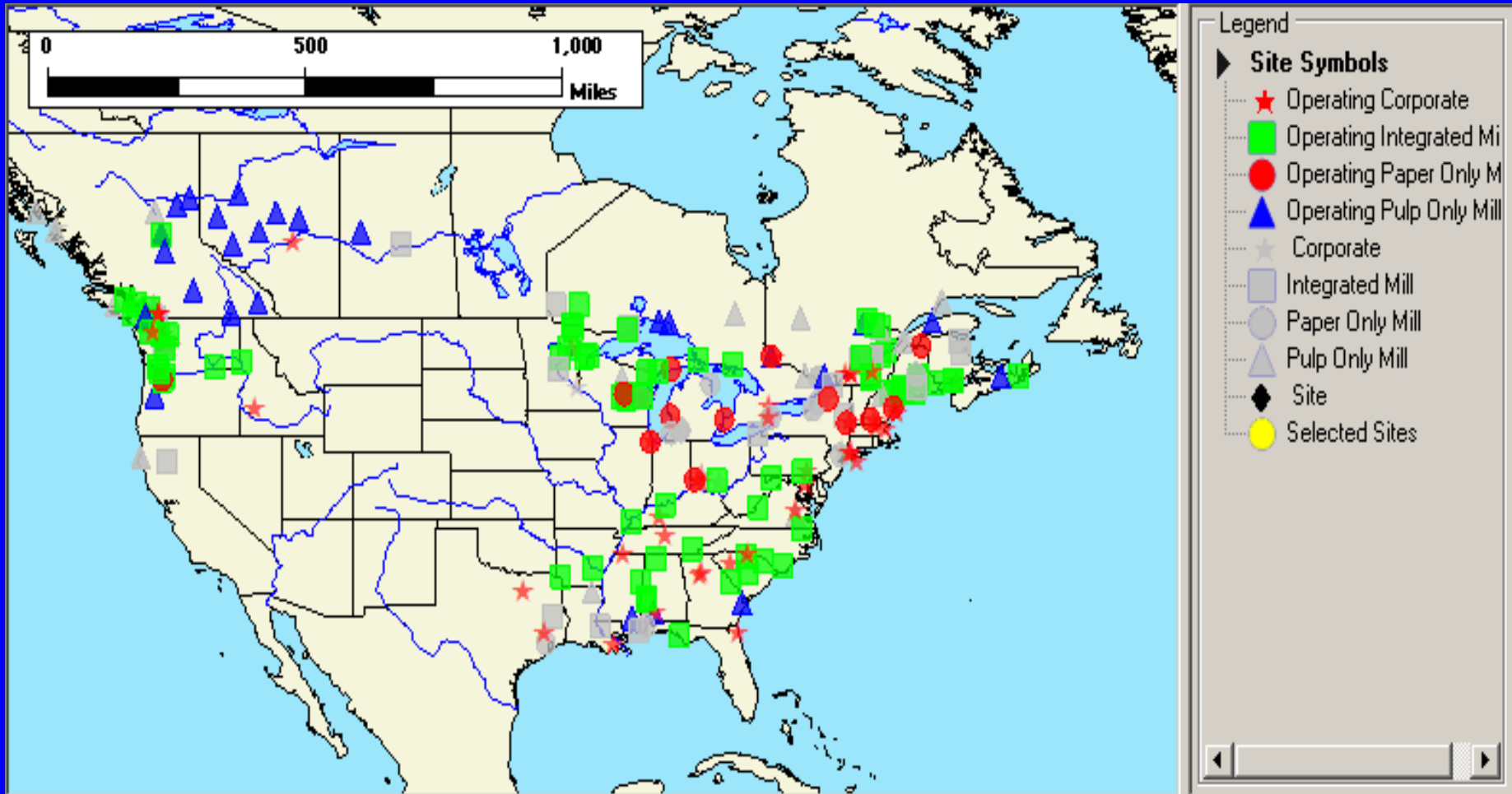
# So Where is All The Land ...



**Open-space for  
wind power  
development**

**Open-space for  
solar power  
development**

# Advantage of Pulp & Paper



# 1<sup>st</sup> Generation Bio-energy

- Conventional / Proven technologies
- Maximize energy produced by bio-fuels like wood waste or black liquor
- Improve existing equipment technologies
- Improve the harvesting of wood waste
- Focus on maximizing the production of Green Power

# 2<sup>nd</sup> Generation Bio-fuels

## 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



# Advantages of 2<sup>nd</sup> Generation Bio-fuels ?

## 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