



# Energy Costs In A Global Context

Ville Henttonen  
Product Manager, Cost Benchmarking

PPI Awards

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# Energy Costs In A Global Context

## I - Cost Benchmarking Methodology

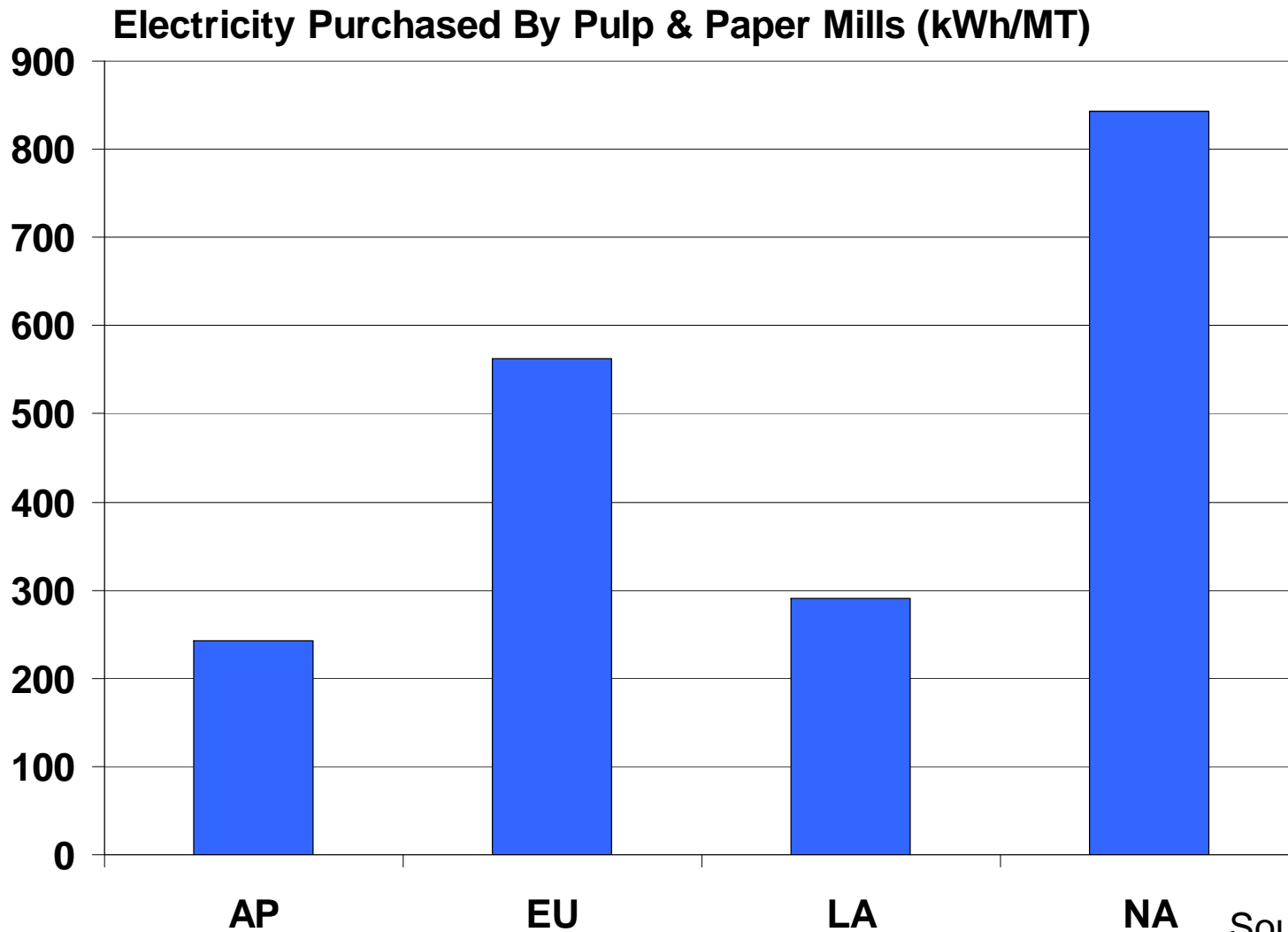
# RISI Mill Intelligence uses proven methodology to analyze cost competitiveness of pulp & paper mills

- ▶ Mill level cash manufacturing costs are estimated for non-converted, ready-to-deliver customer rolls / bales at the mill gate
  - No indirect costs (taxes, insurance, depreciation, etc.)
- ▶ A mass and energy balance is calculated for existing mills to determine the raw material consumption of each mill process
- ▶ **Consumptions** are multiplied by **regional average market prices**
  - $\text{Cost} = \text{Consumption} * \text{Price}$
  - Typically one price per region, but mill specific adjustments are possible
- ▶ All analysis 2Q09
- ▶ Data from a variety of publicly available sources
  - Company reports and websites
  - Pulp and paper directories
  - Magazine articles
  - Technical literature
  - Consultants
  - Mill visits
  - Surveys and interviews
  - Personal experience



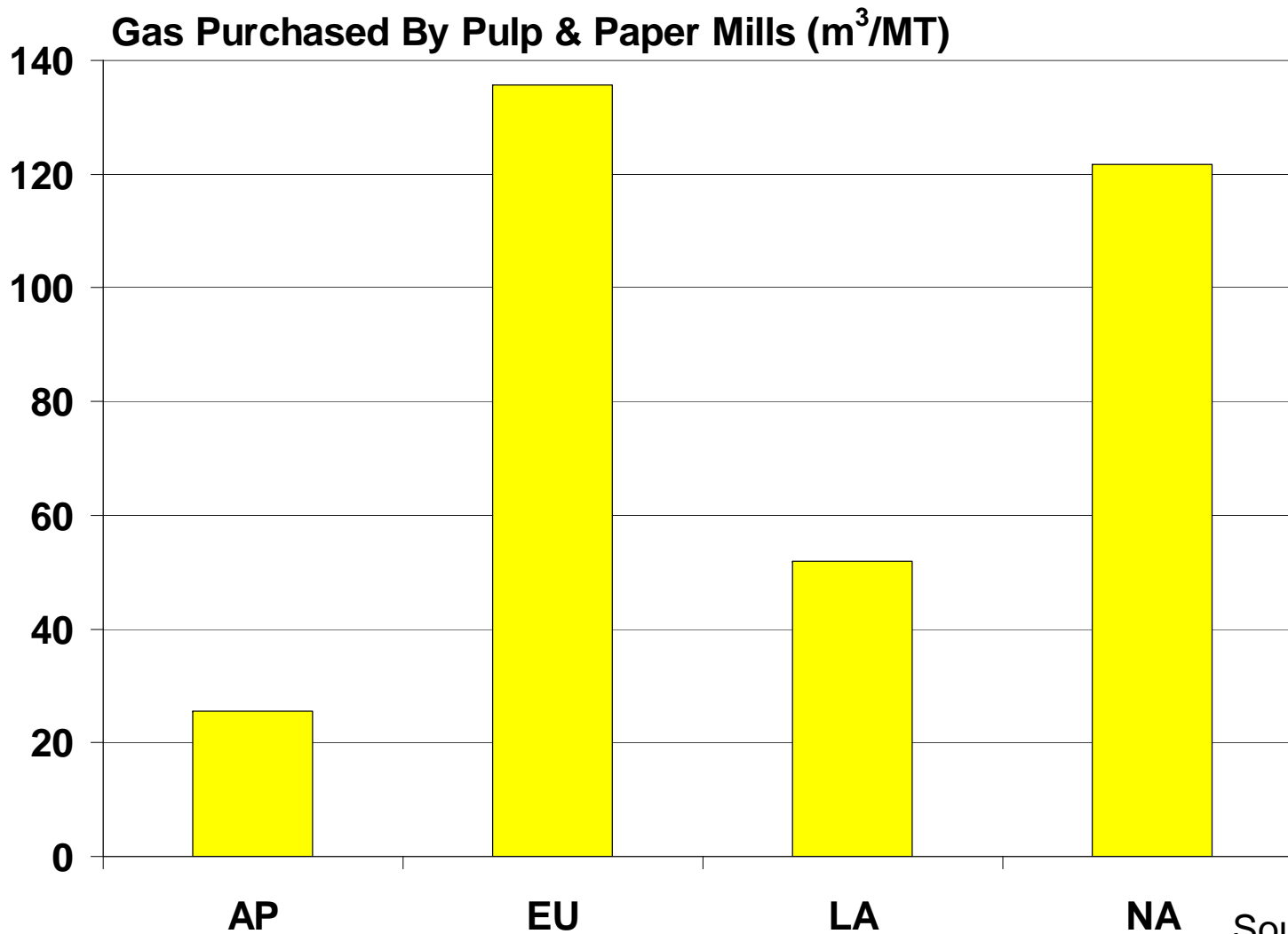
# Energy Costs In A Global Context II – Regional Energy Usage Estimates

# Asian mills have high electricity independence, Europe & NA are more dependent on purchases



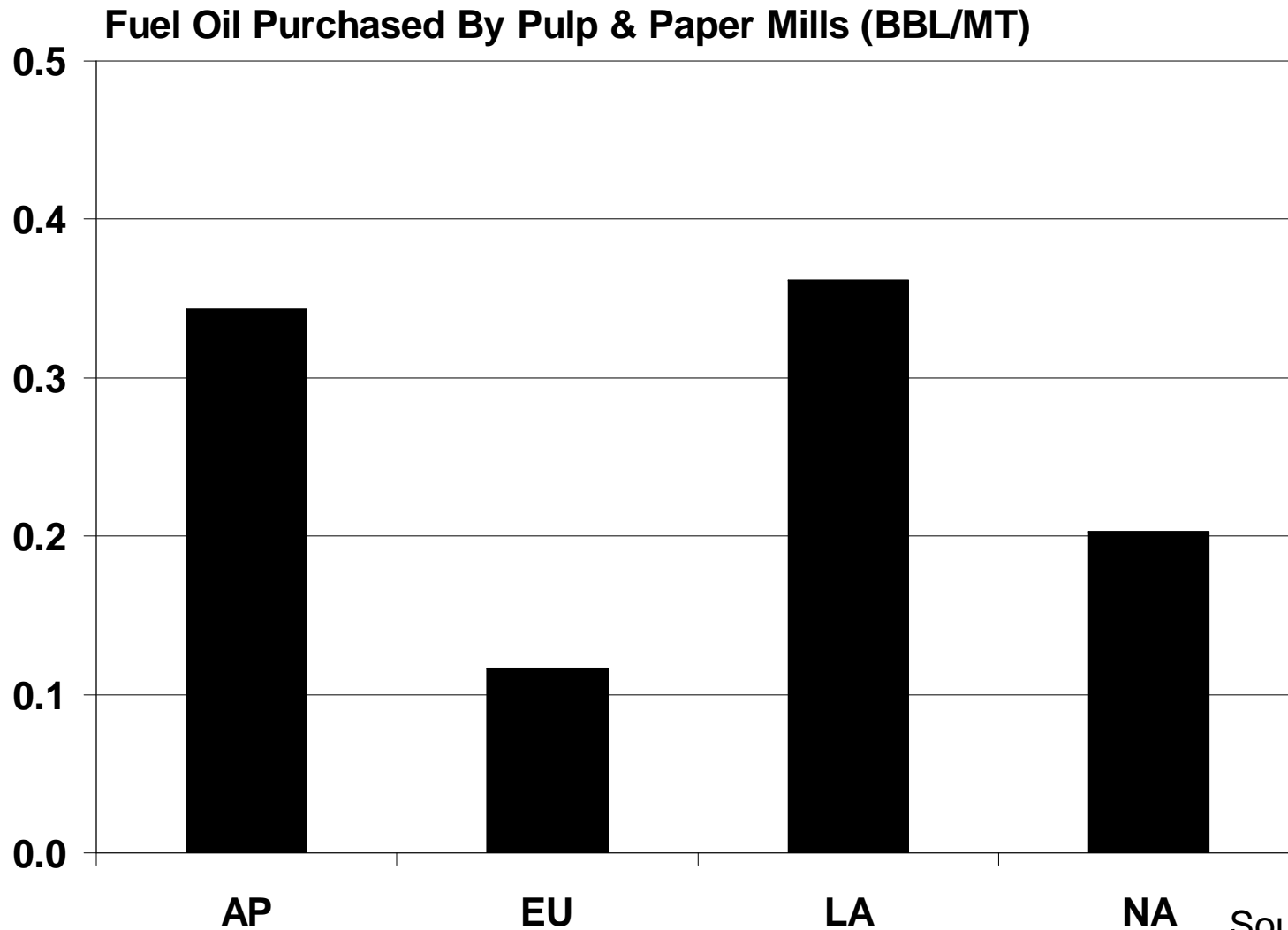
Source: RISI

# NA & European mills have access to gas pipe lines, while LA & Asian mills have more supply issues



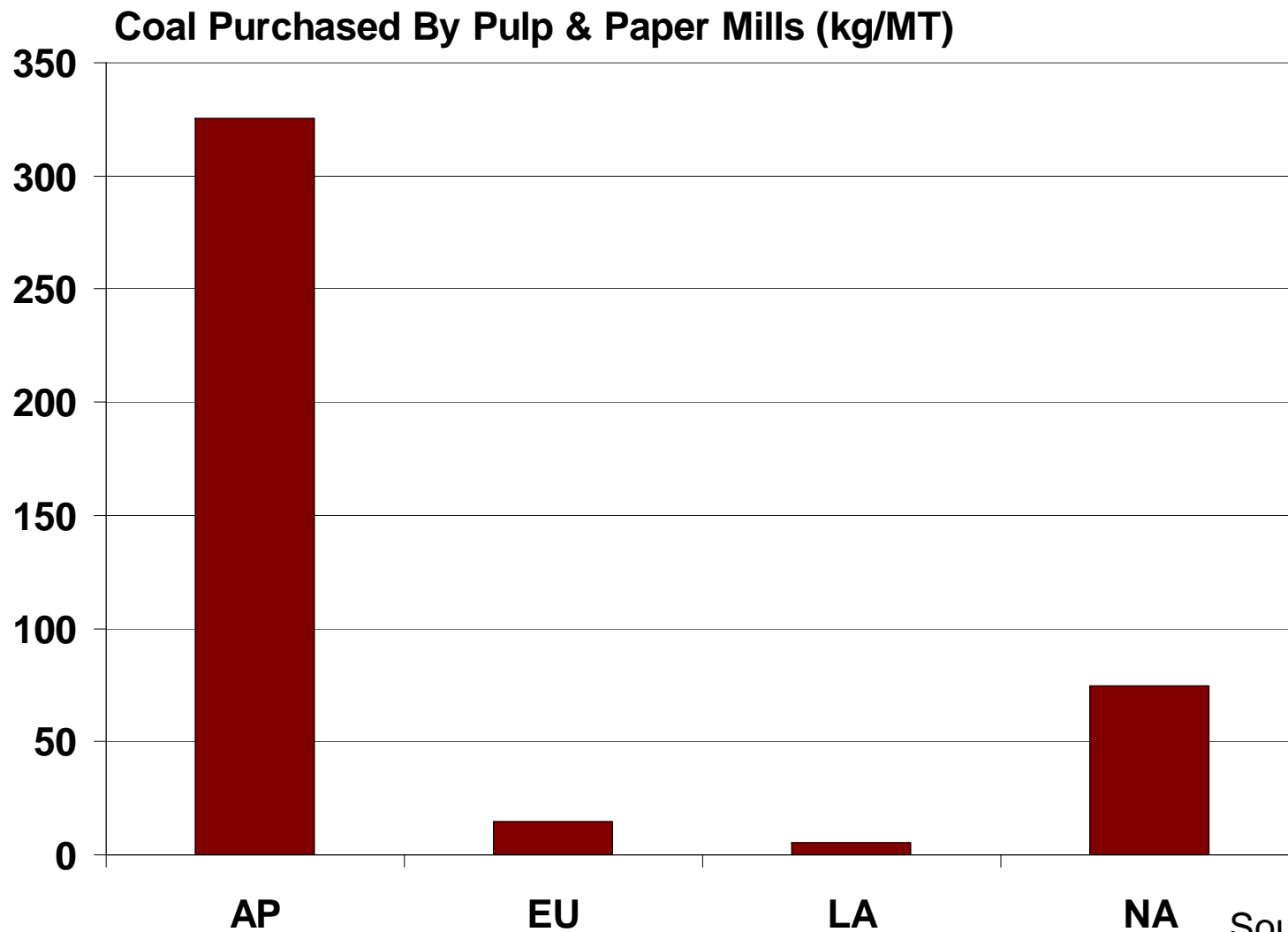
Source: RISI

# LA and Asian pulp & paper are oil-thrifty, Europeans have switched to other fuels



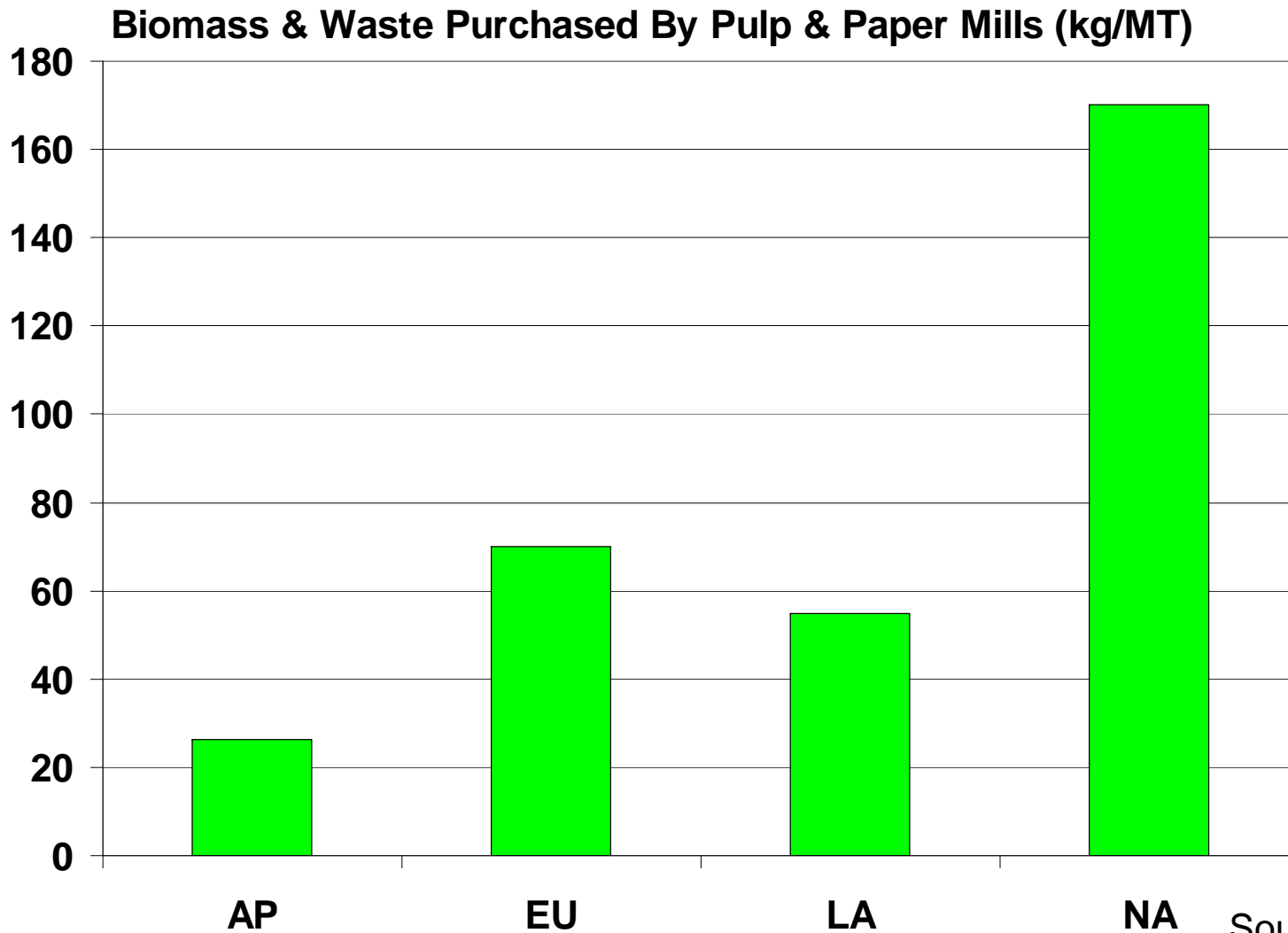
Source: RISI

# Coal is the major fuel in many Asian mills, and is especially important in China



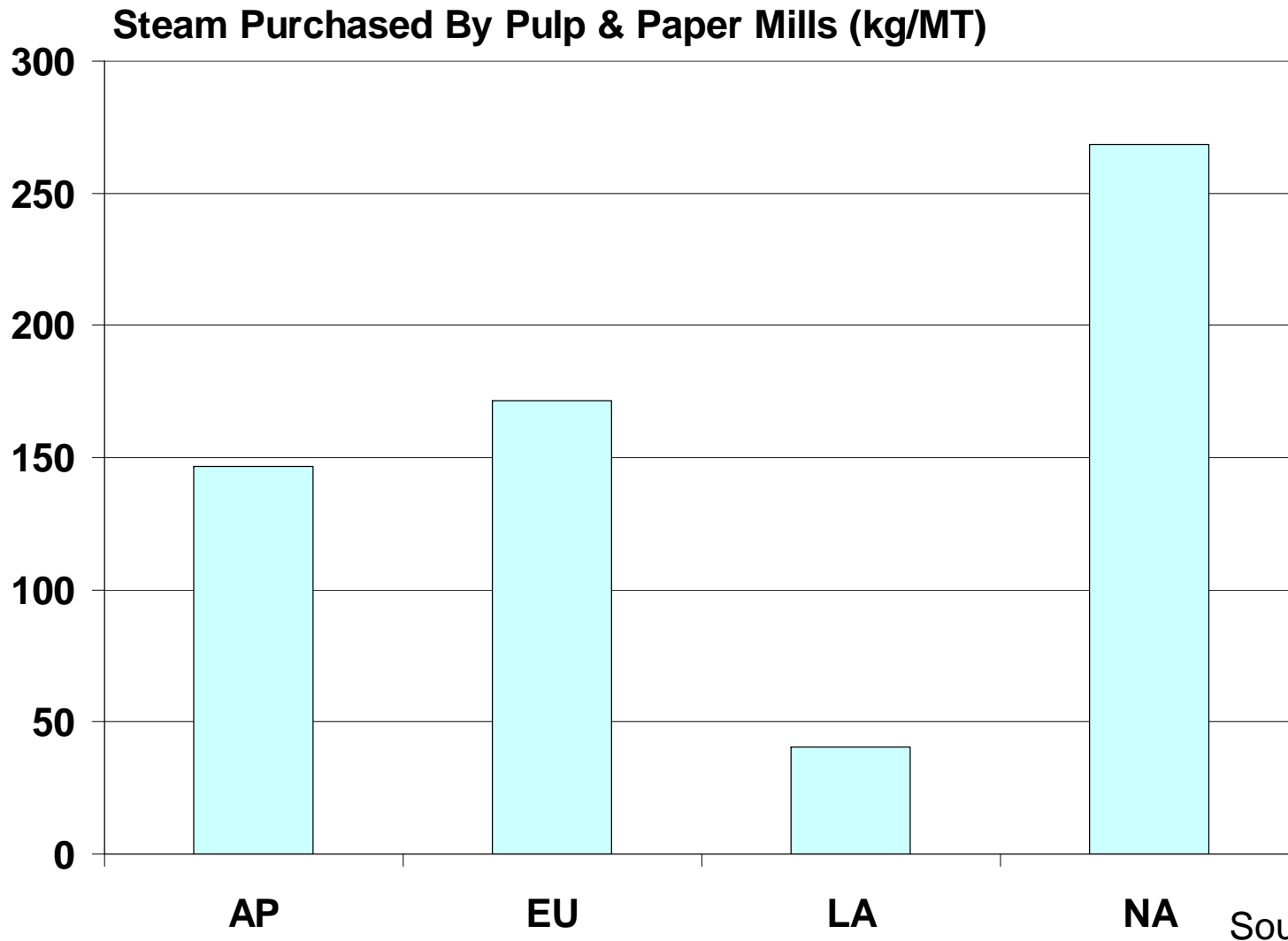
Source: RISI

# Burning biomass requires special boilers, which are more common in integrated mills

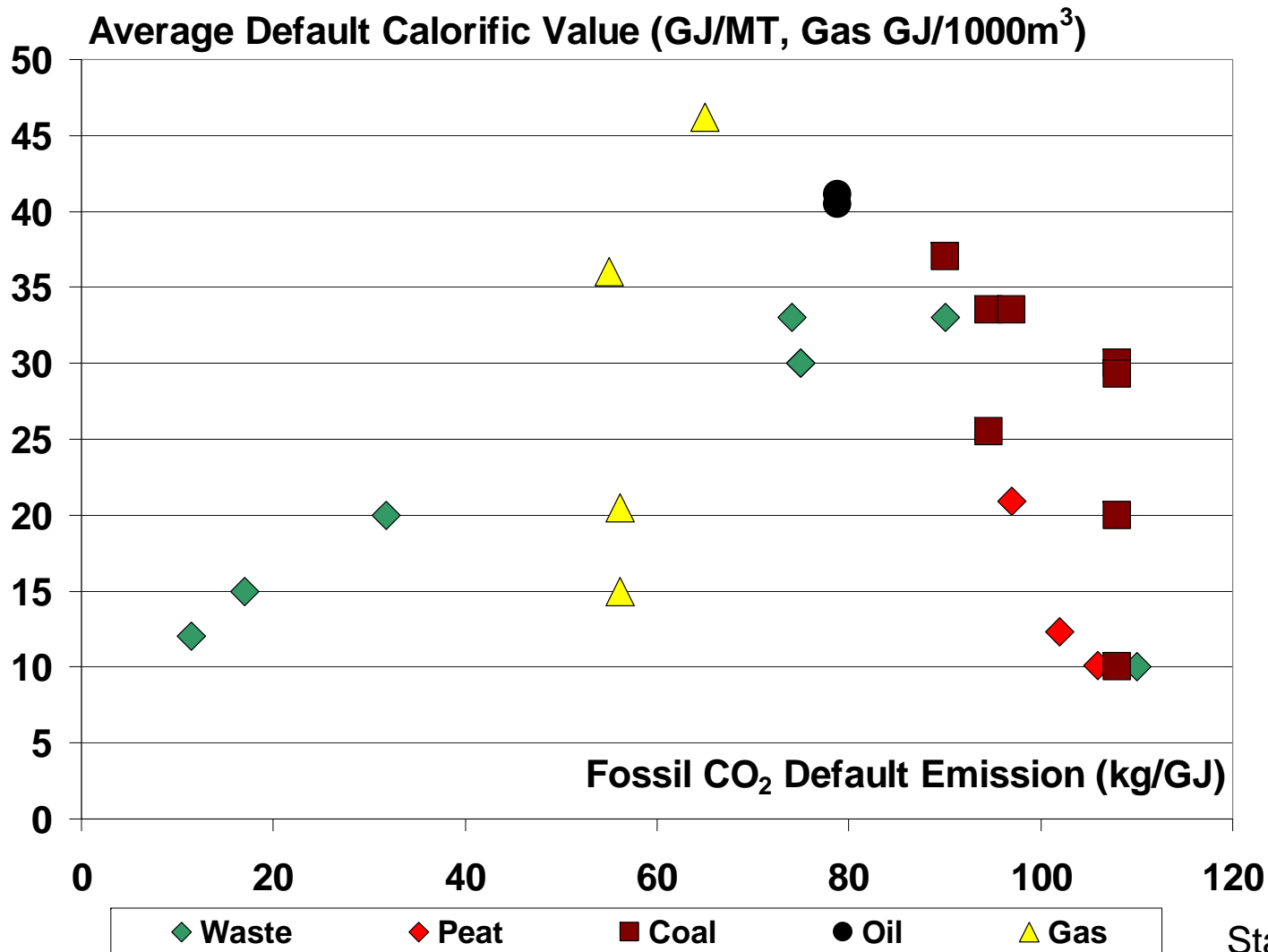


Source: RISI

# Many NA and European mills have chosen to purchase steam instead of producing it

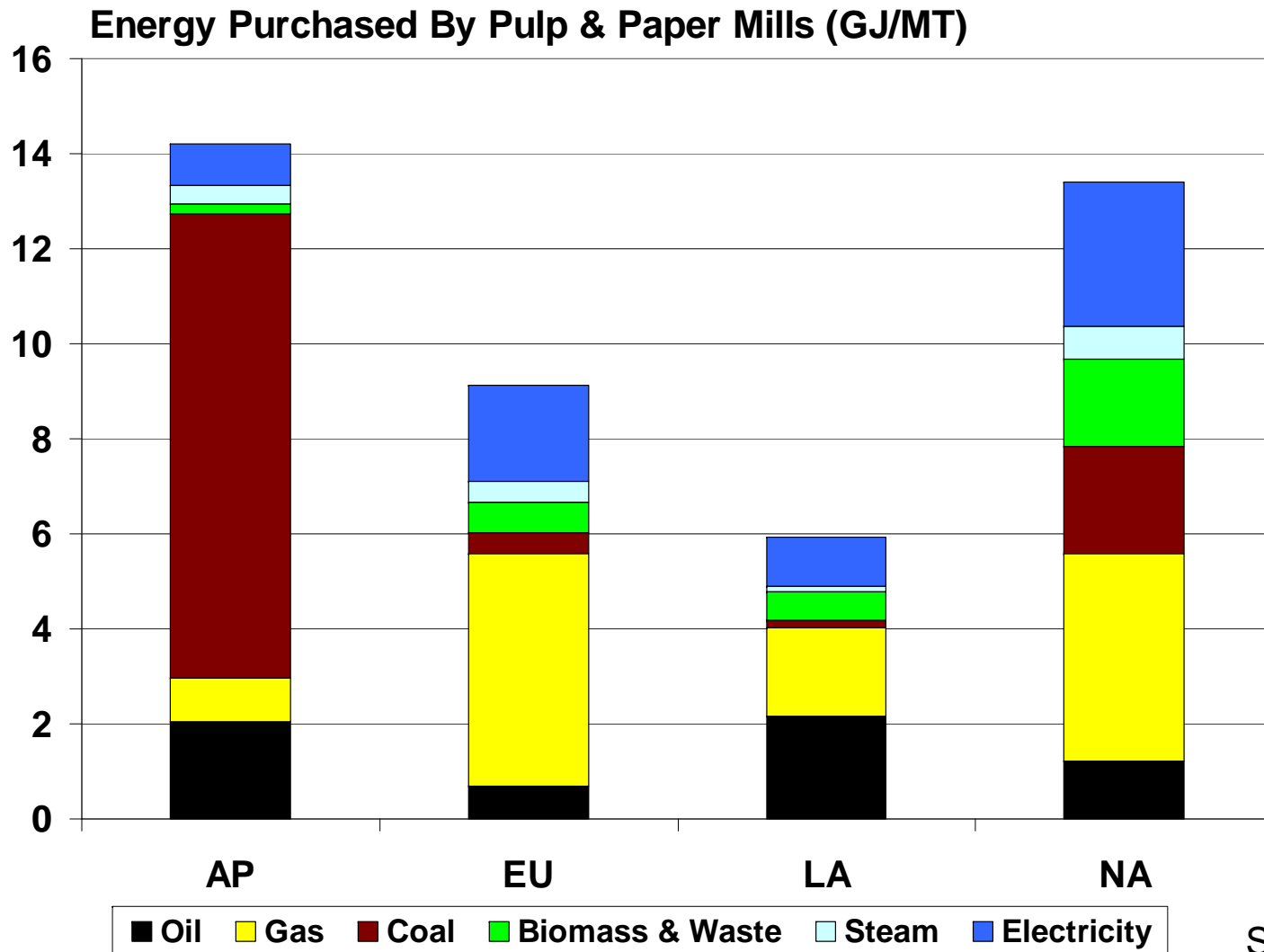


# Coal is a very CO<sub>2</sub> intensive fuel compared to gas, but also peat and waste have fossil CO<sub>2</sub> emissions



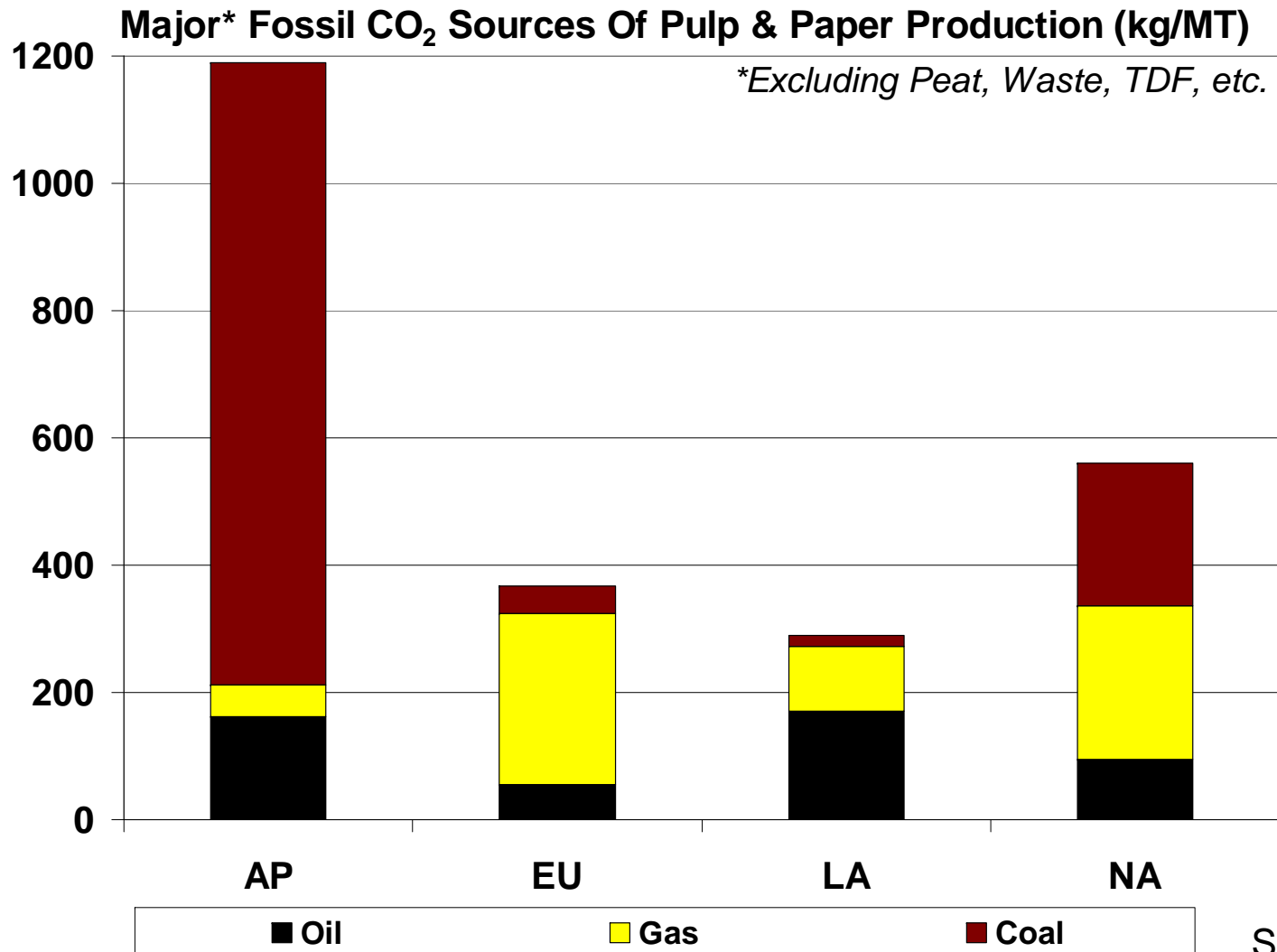
Source: RISI / Statistics Finland

# Typical purchased fuel mix and its energy content is very different in each world region



Source: RISI

# Asian P&P products have highest carbon footprints, CO<sub>2</sub> emissions are part of emission trading



Source: RISI

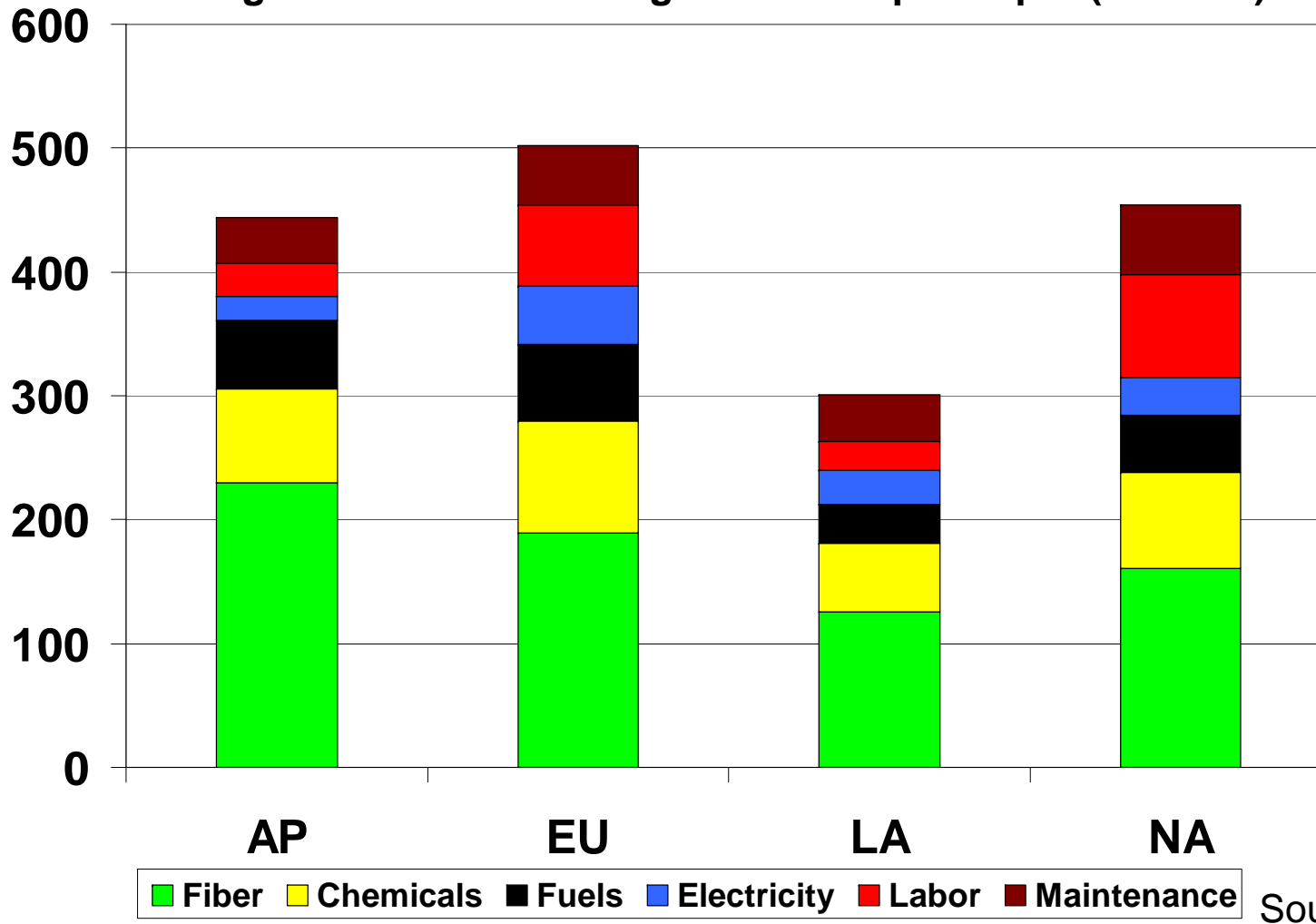


# Energy Costs In A Global Context

## III - Cash Manufacturing Cost Analysis

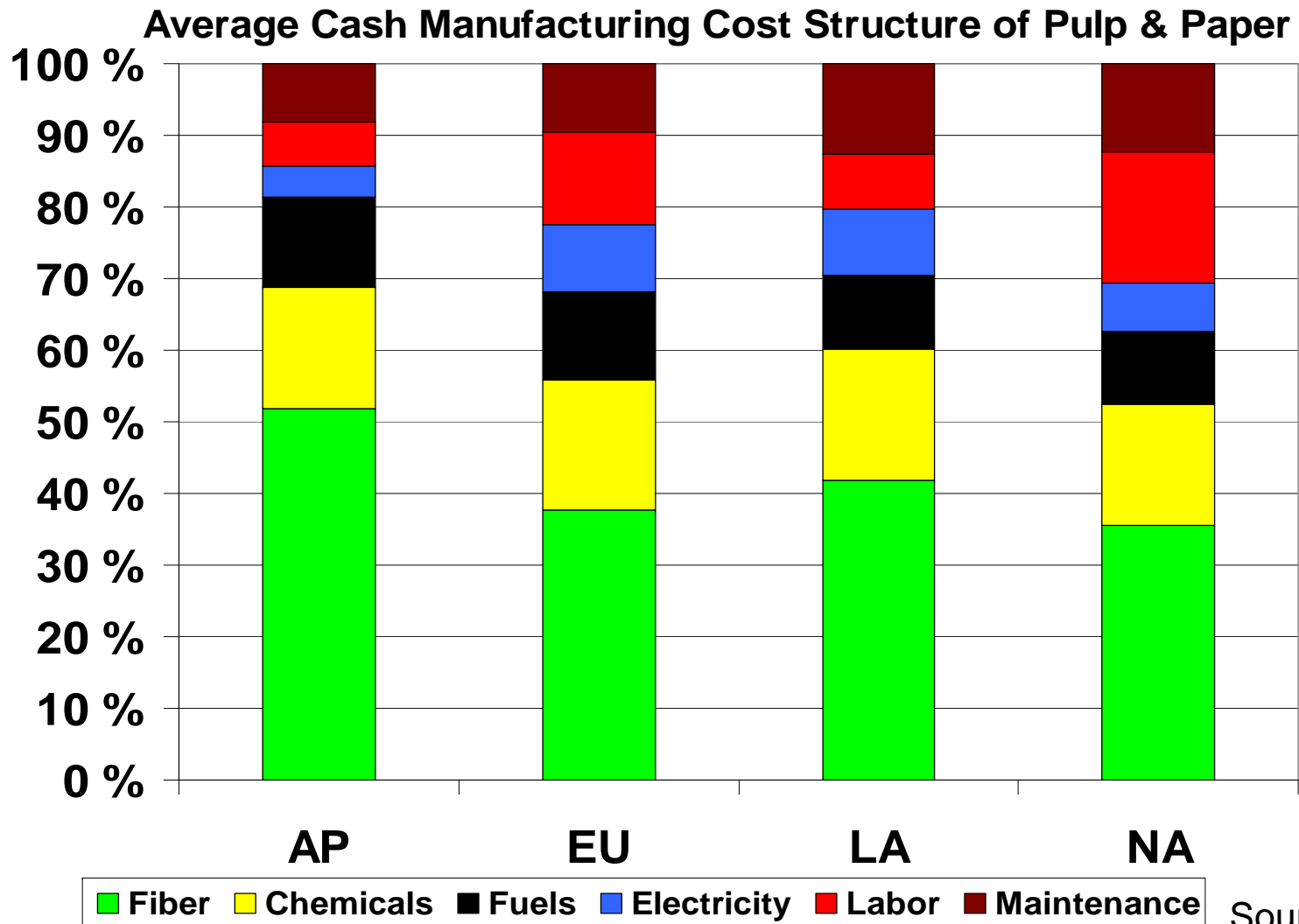
# Fiber is still the major pulp & paper cost driver, but energy costs can make winners and losers


Average Cash Manufacturing Cost of Pulp & Paper (USD/MT)



Source: RISI

# Average energy cost is around 18% of the total cash manufacturing cost of pulp and paper





# Energy Costs In A Global Context

## IV - Summary

# Energy Costs – Regional Summary

## ▶ Europe

- Natural gas and electricity are the most important energy cost drivers
- Traditionally high focus on energy efficiency
- Electricity supply is often outsourced to big (national) companies
- Challenging issues: EU & regional legislation, energy taxes, biofuel demand...

## ▶ North America

- Integrated and productive mills, but often high energy usage
- Fuel price volatility challenge to improve energy efficiency
- Wide range of energy sources, also local alternatives

## ▶ Latin America

- Both state-of-the-art and very old technology, especially in pulp mills
- Pulp mills often leave biomass to plantations and use oil or gas instead

## ▶ Asia

- Both state-of-the-art and very old technology, especially in China
- Coal and oil are the most important energy cost drivers