

North American and Global Forest Products Markets

TIMBER MEASUREMENT SOCIETY

Central Meeting

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Ferndale, Washington

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Forest Products Markets

Overview

Forest Markets

- Pulp and Paper
- Biomass Energies
- Sawn Softwood
- Hardwoods

Forest Markets

- Europe
- North America
- Asia
- New Products
- CEO Outlook

Conclusions

Forest Products Markets and Developments

Global Trends

- A shift in economic balance to the far East?
- Growing middle-class in emerging markets
- Urbanization
- Shifting global wood flows – Asia is the driver
- Plantation forestry

Europe

- Severe downturn
- Mature market
- What will be the affect of bioenergy?

North America

- U.S. – A healing housing market?
- Canada – A housing bubble or one in the making?
- Industrial timbers are booming due to fracking and oil exploration
- China – still an significant market

Forest Products Markets and Developments

Wood Fibre Resources: Global Overview

Forest area

- Global: 3.9bn ha (30% of land area).
- Planted forests*: 271m ha (7% of forest area).

*Plantations plus the planted components of semi-natural forest.

Europe inc. Scandinavia

- Increasing forest resources.
- Removals below increment.
- Environmental/leisure issues a constraint.
- Wood fuel demand could improve economics for small forest owners.

Russia

- Holds 21% of world's growing stock inc. nearly 50% of world's softwood.
- Removals well below increment, but large areas are economically inaccessible.

Asia

- Highest rate of reforestation, led by China.
- Nearly 50% of world's planted forests. But huge and growing wood fibre deficit.
- Land and water constraints could limit future plantings.
- Scope to improve yield from existing plantations.

North America

- Stable forest resources.
- 18% of world's growing stock.
- Some scope to increase harvesting levels.
- Insect infestations in West will reduce future supply.

Southern Cone

- Highly productive plantations - nearly 10m ha.
- Highly competitive wood costs.
- Planted area could expand by up to 50% by 2020.

Amazon Basin & Congo Basin

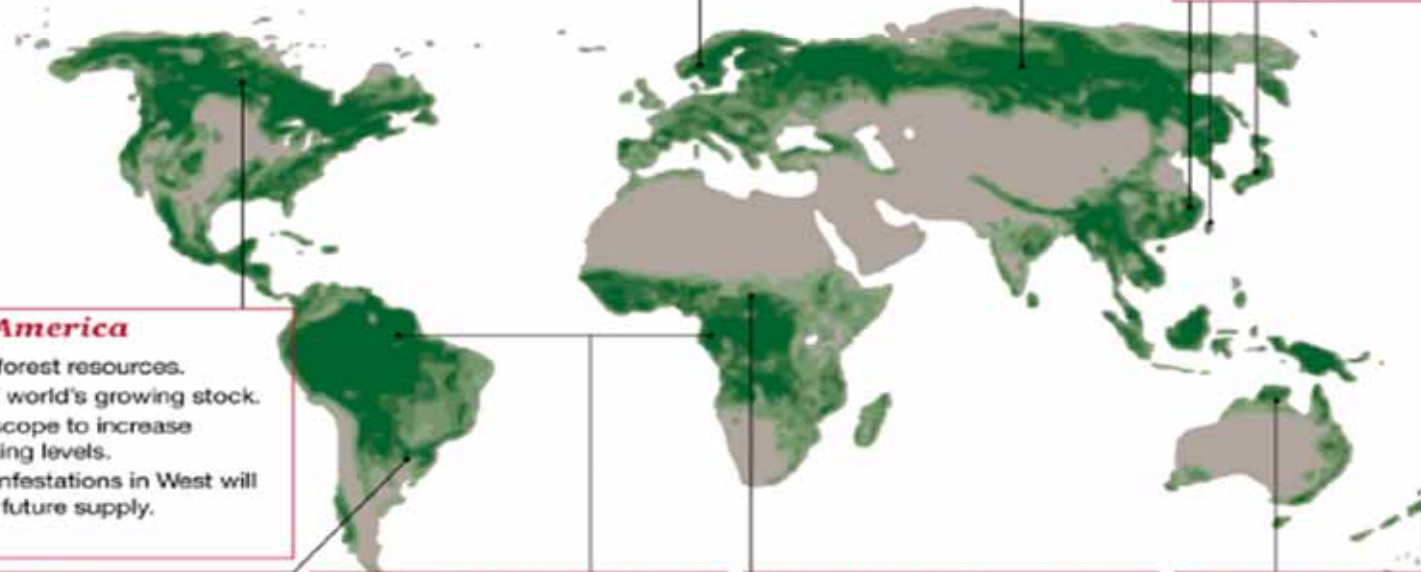
- Two largest areas of contiguous tropical forest.
- Over 30% of world's growing stock. Huge biodiversity.
- Sustainable removals are limited.

Africa (outside Congo Basin)

- Home to about 5% of world's growing stock.
- Deforestation continues.
- Outside South Africa, plantations are limited.
- Large land areas suitable for afforestation/reforestation but real potential is uncertain.

Australasia

- Some potential to expand supply from plantations - currently about 4m ha.



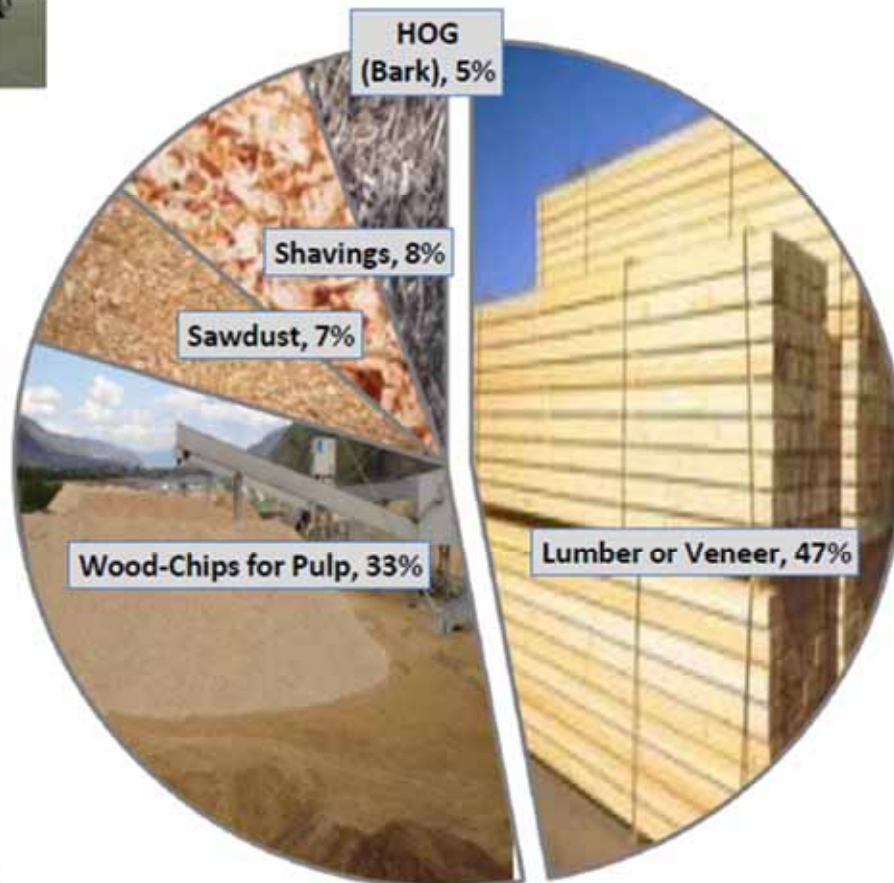
Source: UN FAO, PwC
PricewaterhouseCoopers LLP

Forest Products Markets – Biomass Energies

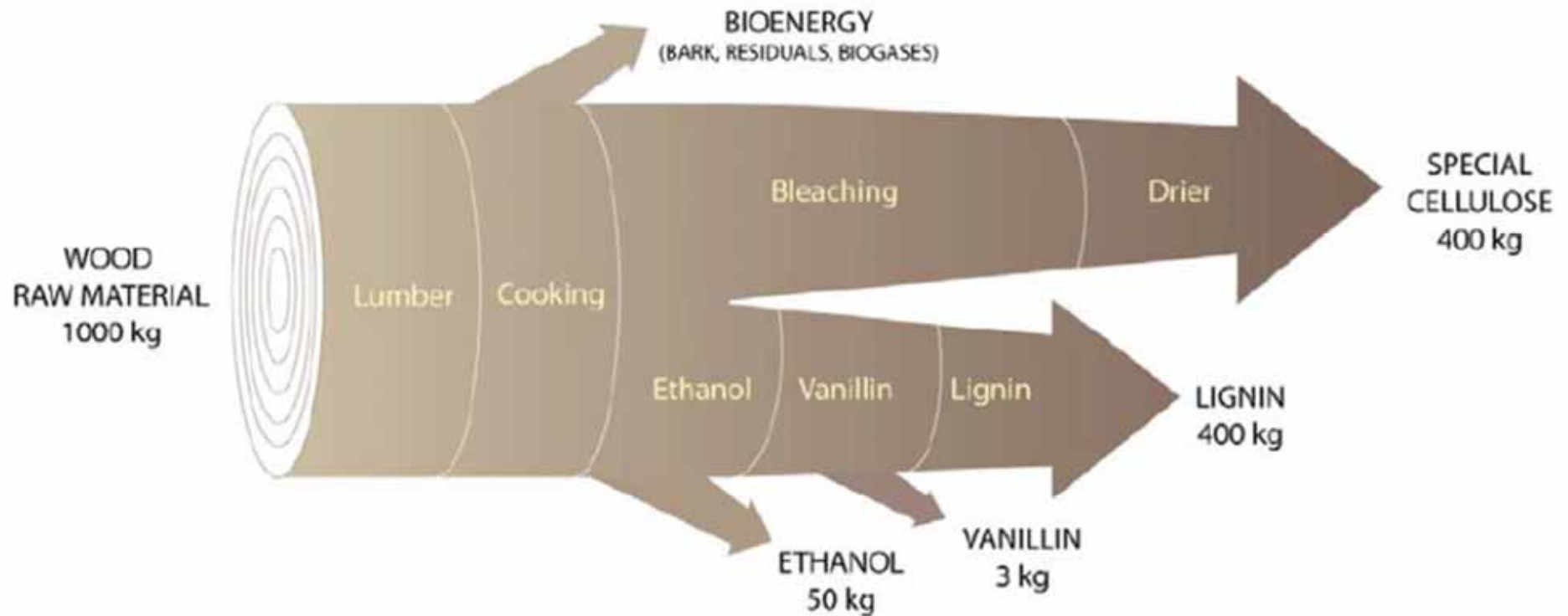
Parts of a Log



www.aflorforest.com - 1.800.565.0000



Forest Products Markets – Biomass Energies



CONSUMER PRODUCTS

LIGNIN

VANILLIN

ETHANOL

- Cosmetics
- Food
- Medicines
- Textiles
- Filters
- Building materials



- Animal food
- Colorants
- Batteries
- Briquettes
- Thickeners
- Compressed products



- Food
- Perfumes
- Medicines

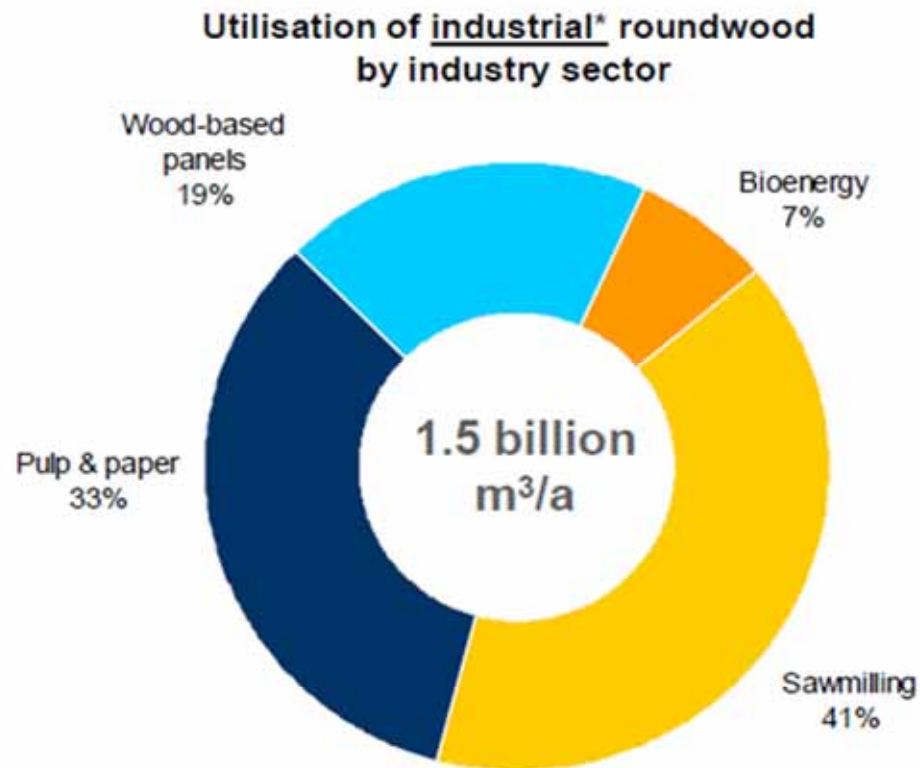


- Paint
- Laquer
- Medicines
- Biofuels
- Car service chemicals



Forest Products Markets and Developments

The global forest industry utilises around 1.5 billion m³/a of roundwood in wood products, pulp, paper and industrial bioenergy production. The demand for wood will continue to increase, but the importance of different geographic regions and product markets is changing.



* Total industrial roundwood by FAO for 2010-2011
Non-industrial fuel wood use is reported to be ~1.9 billion m³/a

Forest Markets – Pulp and Paper

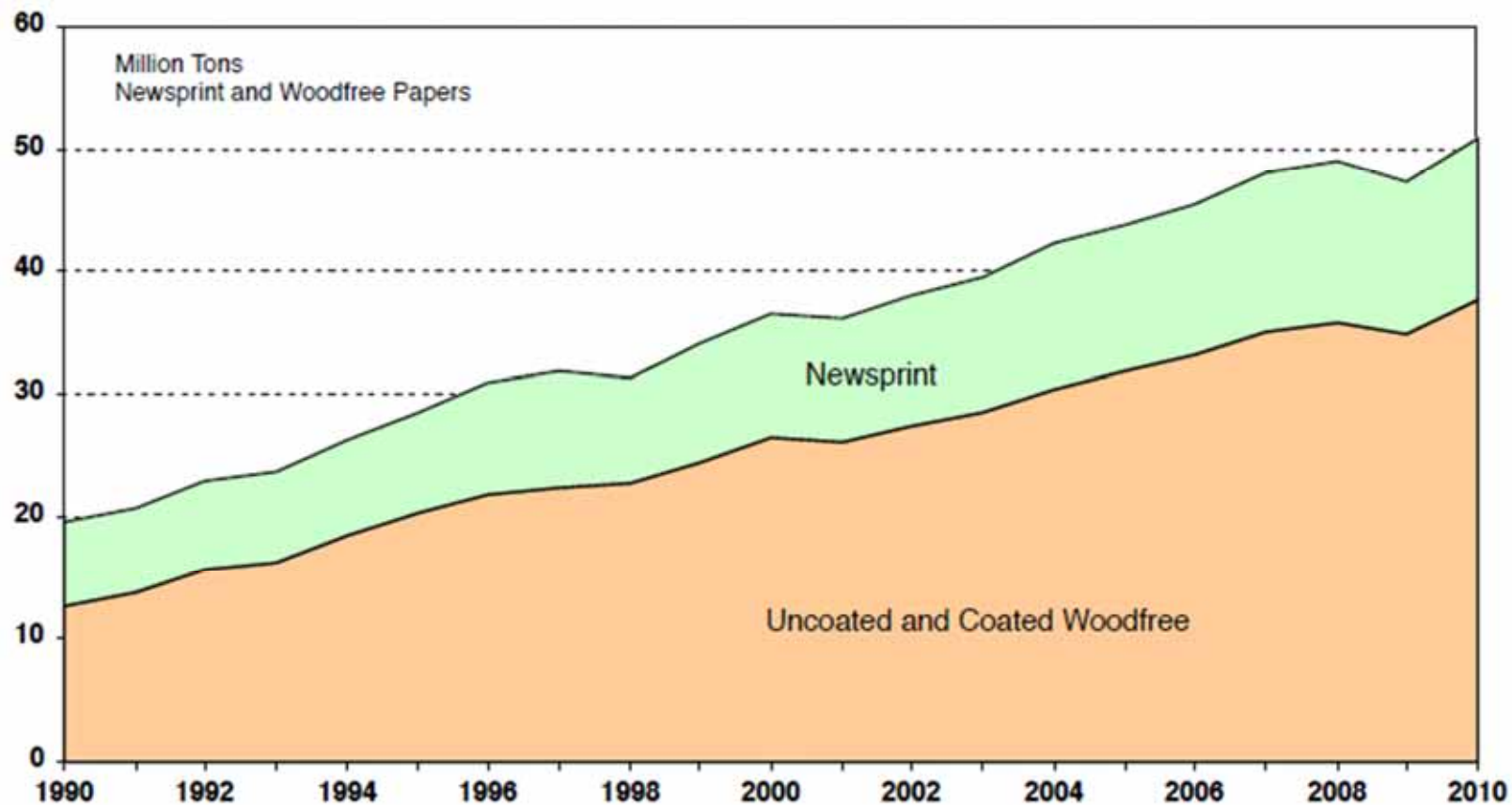
FOUR GLOBAL FLOWS IN PAPER INDUSTRY



Forest Markets – Pulp and Paper

Paper Demand Development

Woodfree demand has expanded rapidly while newsprint has lagged



Source: RISI



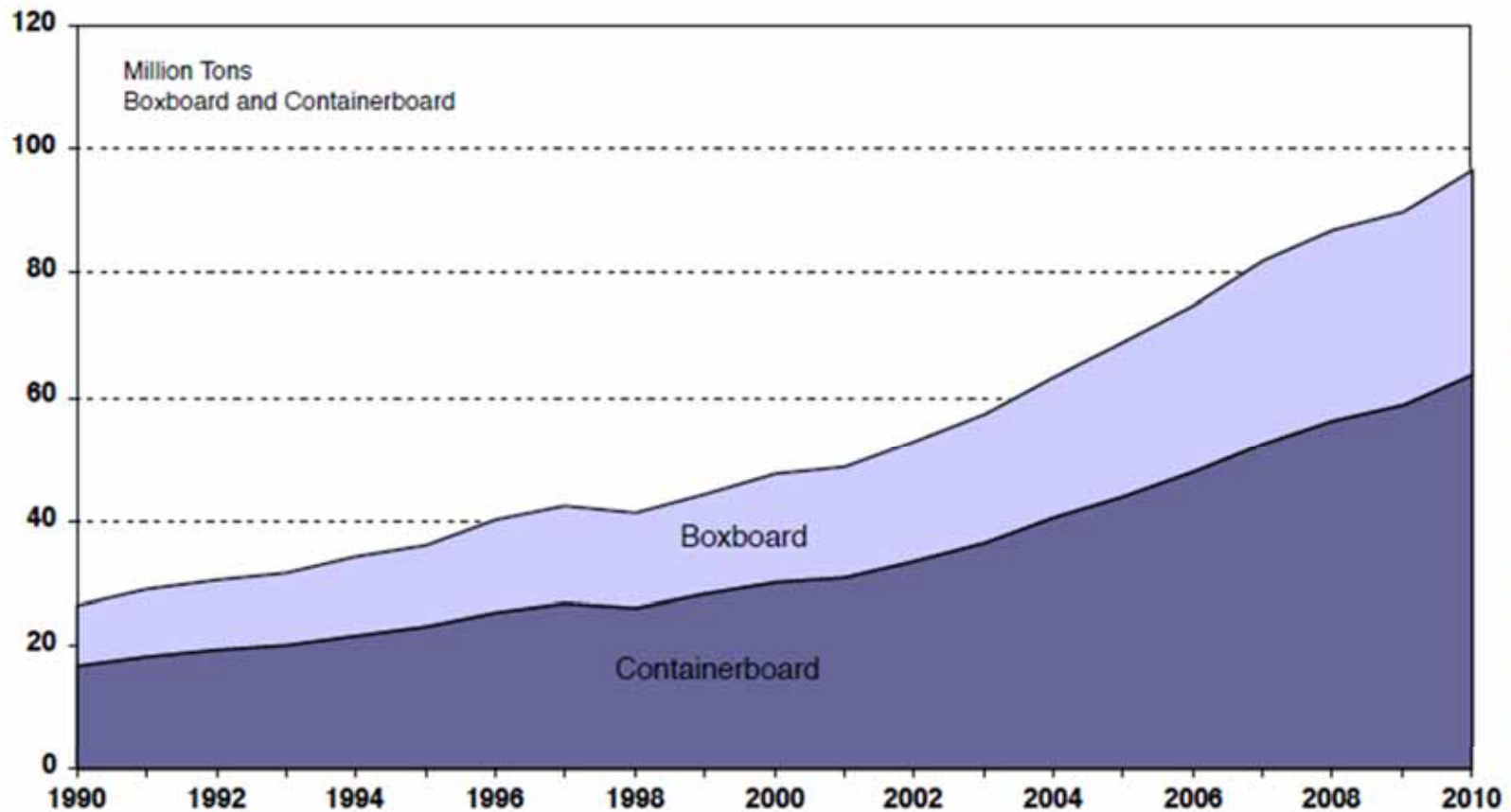
KAUURI CAPITAL

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Forest Markets – Pulp and Paper

Board Demand Development

Packaging consumption has been driven by export success



Source: RISI

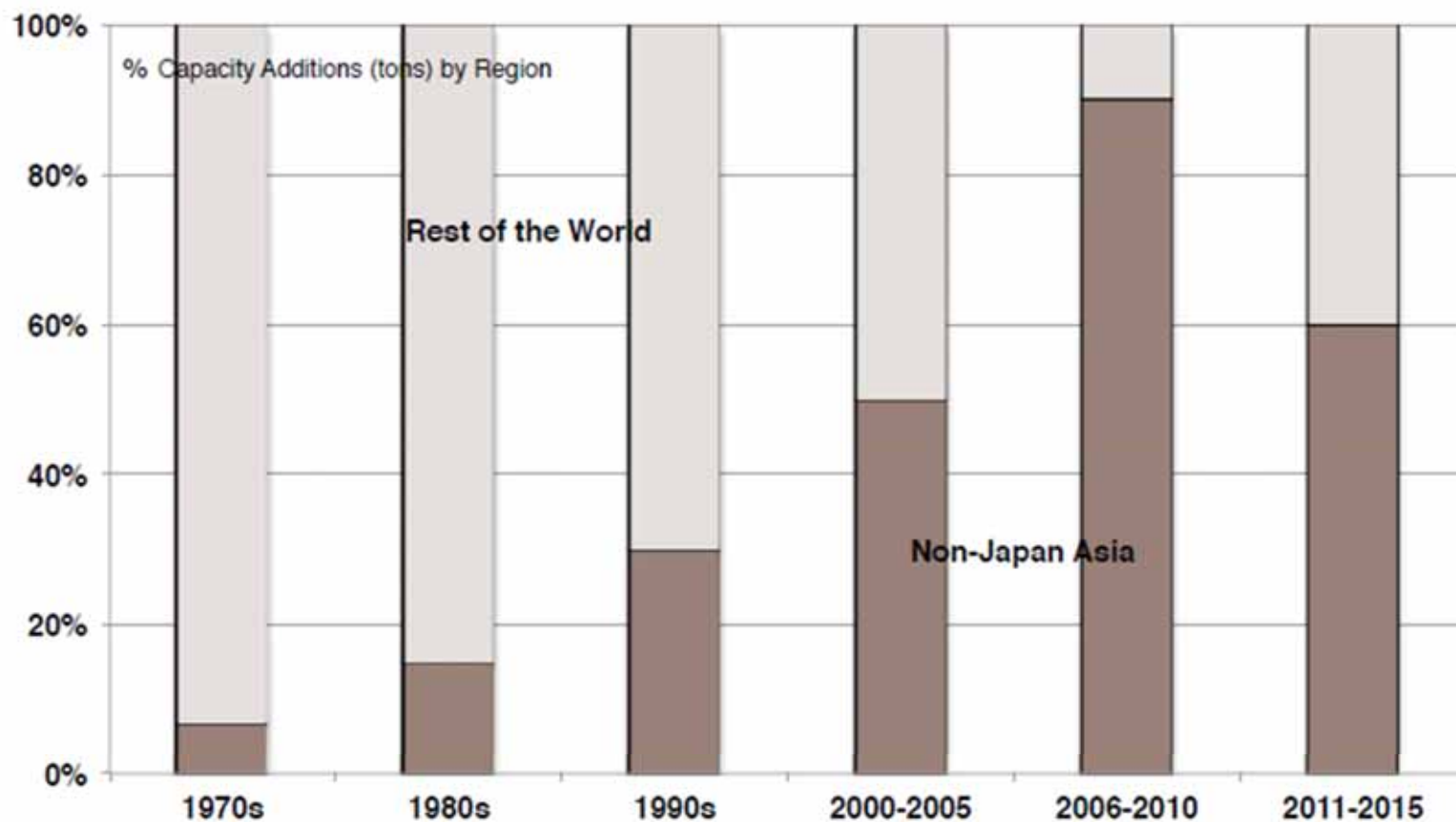


KAUURI CAPITAL

Forest Markets – Pulp and Paper

Global Paper and Board Capacity Growth

Asia's share of global capacity investments has grown rapidly since 1980s.



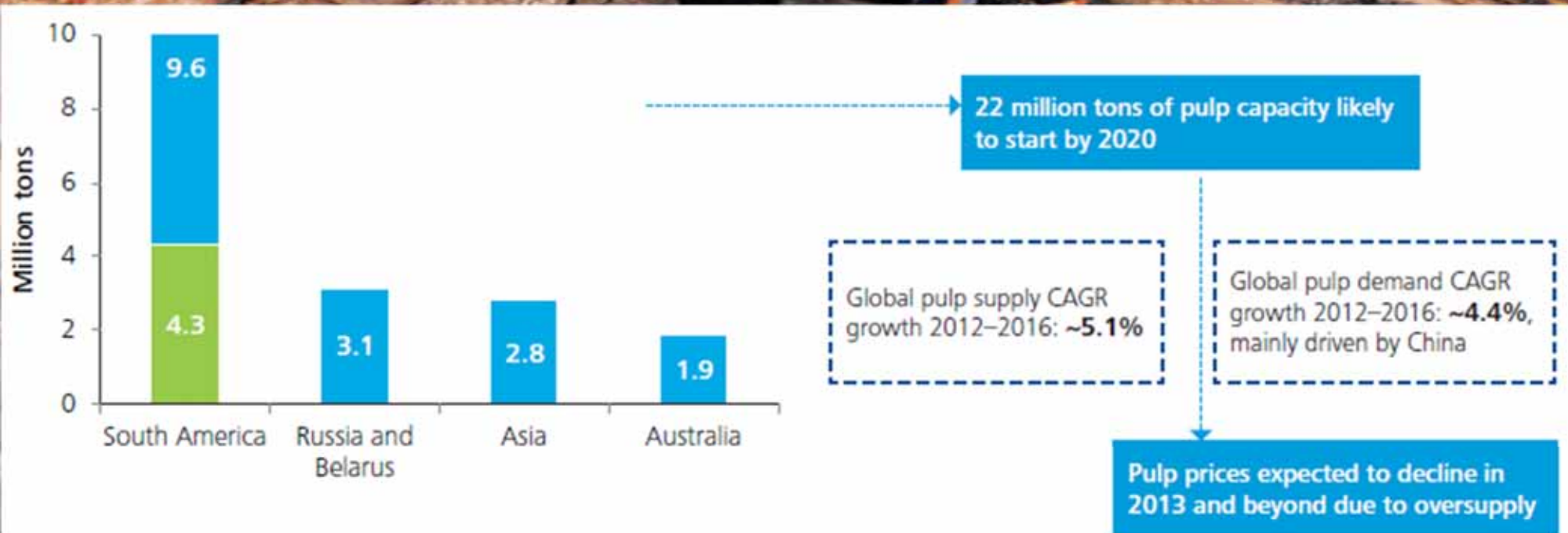
Source: Pöyry



KAUZI CAPITAL

Forest Markets – Pulp and Paper

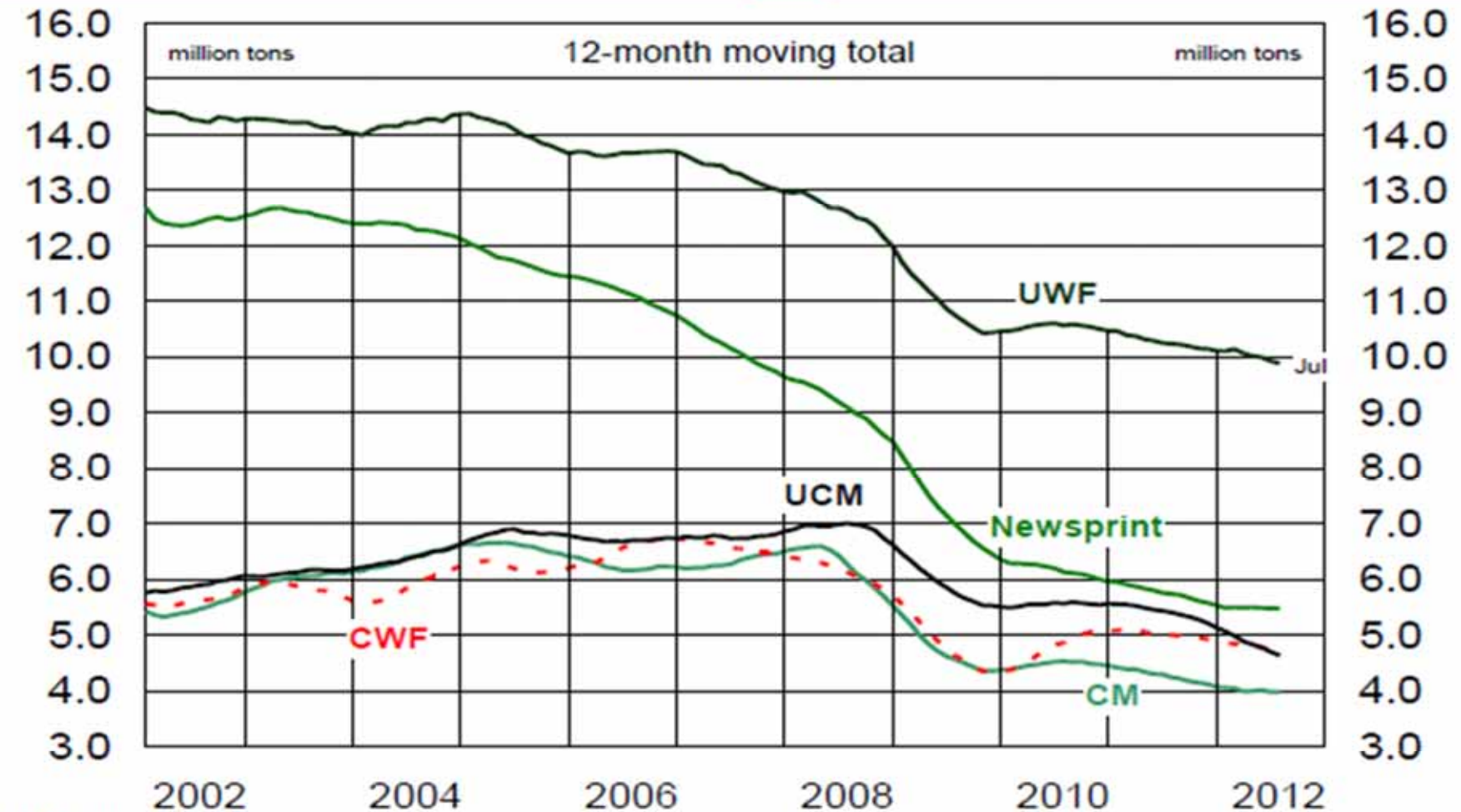
Estimated Global Pulp Capacity Additions by 2020



Source: DTL Global Manufacturing Industry group November 2012 analysis of data from Santander, *Chilean Pulp & Paper Sector: The Short-Term Illusion of Pulp Prices; Downgrading Copec and CMPC*, 28 March 2012

Forest Markets – Pulp and Paper

North American Paper Demand



Data Source: PPPC



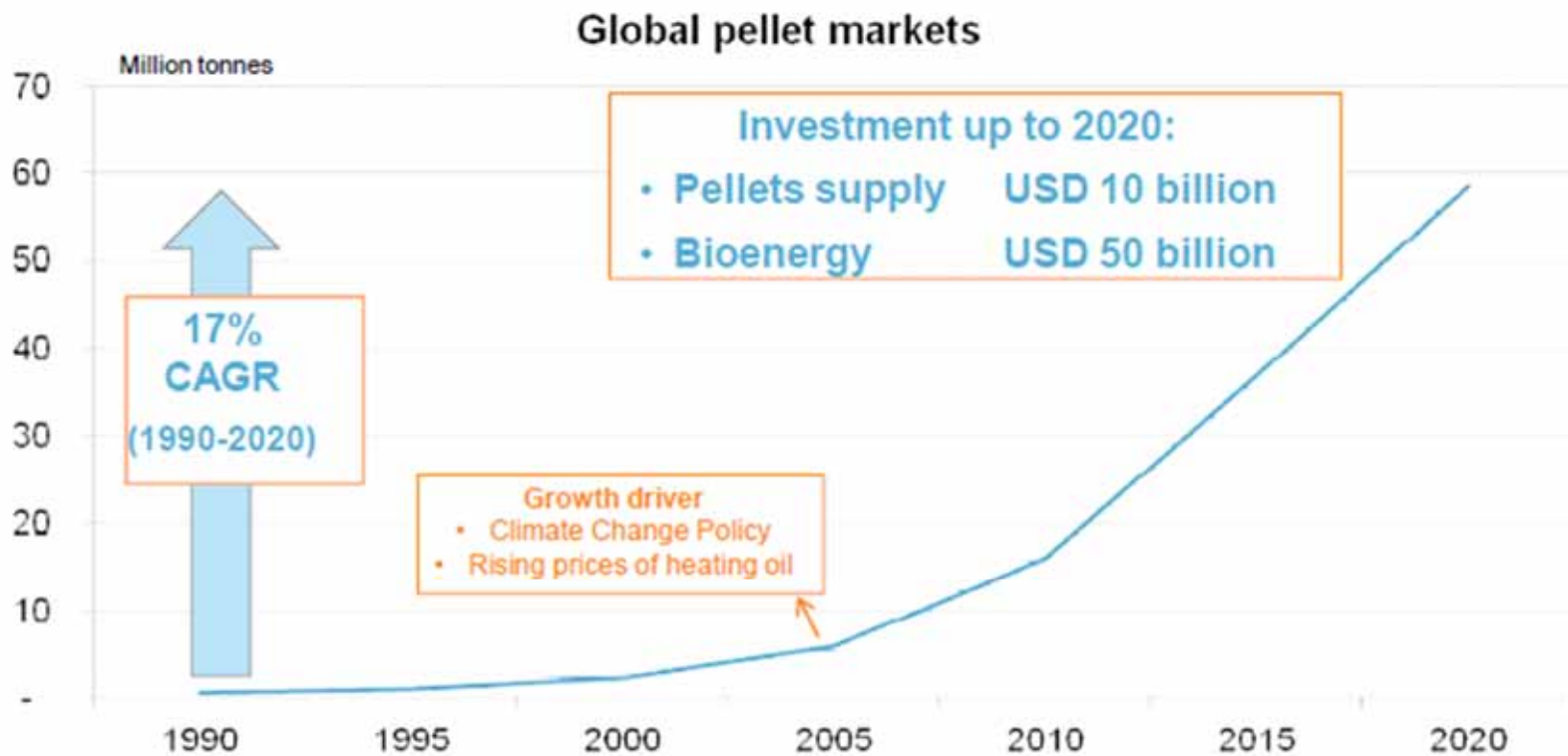
Just since 2005, N. American demand is down ~30% for Uncoated Woodfree and Mechanical Papers , ~40% for Coated Mechanical Paper, and 50%+ for Newsprint.....WE DO NEED TO TRANSFORM!

Source: ERA Forest Products Research

Forest Markets – Biomass Energies

BIRTH OF GLOBAL BIOMASS BUSINESS

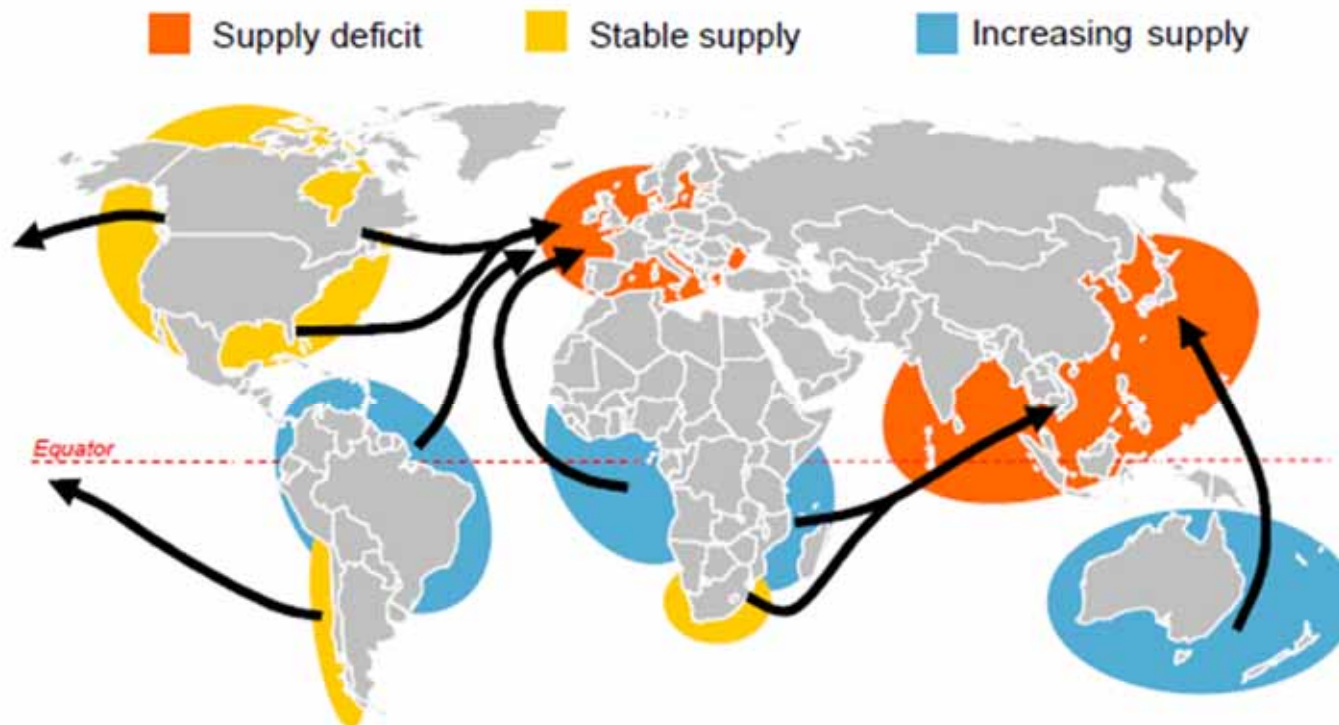
Growth of bioenergy markets and trade, driven by climate change policy and cost of fossil fuels.



Forest Markets – Biomass Energies

GLOBAL FOREST RESOURCES – REGIONAL BALANCES

Bioenergy sector in Europe, and growing economy and demand of traditional forest products in Asia will create significant regional wood deficits. Although only a small portion of forest area (4%) consists of fast growing plantations, they are a rapidly growing source, and trade flows from Southern Hemisphere will increase.



Forest Markets – Biomass Energies

From Don Roberts, CIBC

The Bio-economy has many segments:

- Bio-electricity
- Bio-transportation fuels
- Bio-chemicals
- Bio-materials

Renewable Energy Investment (2005-2012 Q3)

- Since 2005, roughly \$20 billion has been invested in Renewable Energy projects in Canada, and over \$830 billion at the global level.
- Despite its large forest products and agricultural sectors, investment in bio-energy projects has been relatively lower in Canada than at the global level (14% vs. ~ 20%)
- **Wind receives the bulk of the investments** in most places, and especially in Canada.”

Forest Markets – Biomass Energies

Forest Biomass

Business Opportunities and Market Challenges



Jay O’Laughlin, Ph.D.
Professor of Forestry & Policy Sciences
Director of the Policy Analysis Group
College of Natural Resources
University of Idaho
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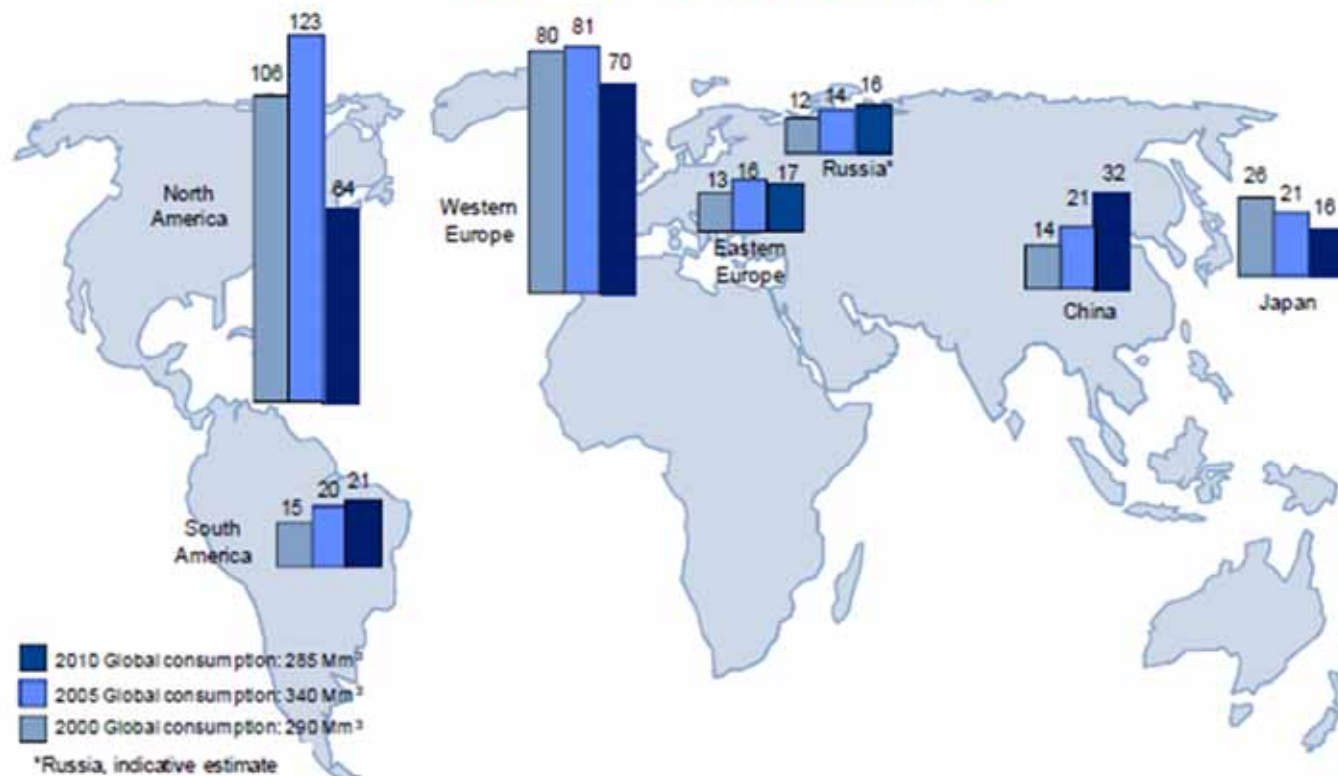
University of Idaho
A LEGACY OF LEADING

Forest Markets – Sawn Softwood

GLOBAL MARKETS OF WOOD PRODUCTS

Similarly to pulp and paper industries, there are regional markets where demand for sawnwood and other wood products continues to grow despite the economic downturn. The markets of wood-based panels continue to grow faster than the sawnwood market.

Global softwood sawnwood market



Forest Markets – Sawn Softwood

Lumber Markets Will Tighten and Prices Will Escalate as Housing Starts Approach 1.4 Million in the Coming Cycle

▲ Four reasons why 1.4 million U.S. housing starts is the new 2 million

- **Exports To Asia (China)** – 6 billion fbm in net exports in 2012 compared to 0.5 billion fbm in 2005
- **BC's Mountain Pine Beetle Epidemic** – 4 billion fbm decline in lumber production from 2005 (15 billion to 11 billion fbm)
- **Lower Allowable Cut In Ontario & Quebec** – lumber production in 2011 was 6 billion fbm from 12 billion fbm in 2004)
- **Permanently Shut Capacity** – estimate 10 billion fbm permanent sawmill closures in North America since 2005

▲ Bottom line?

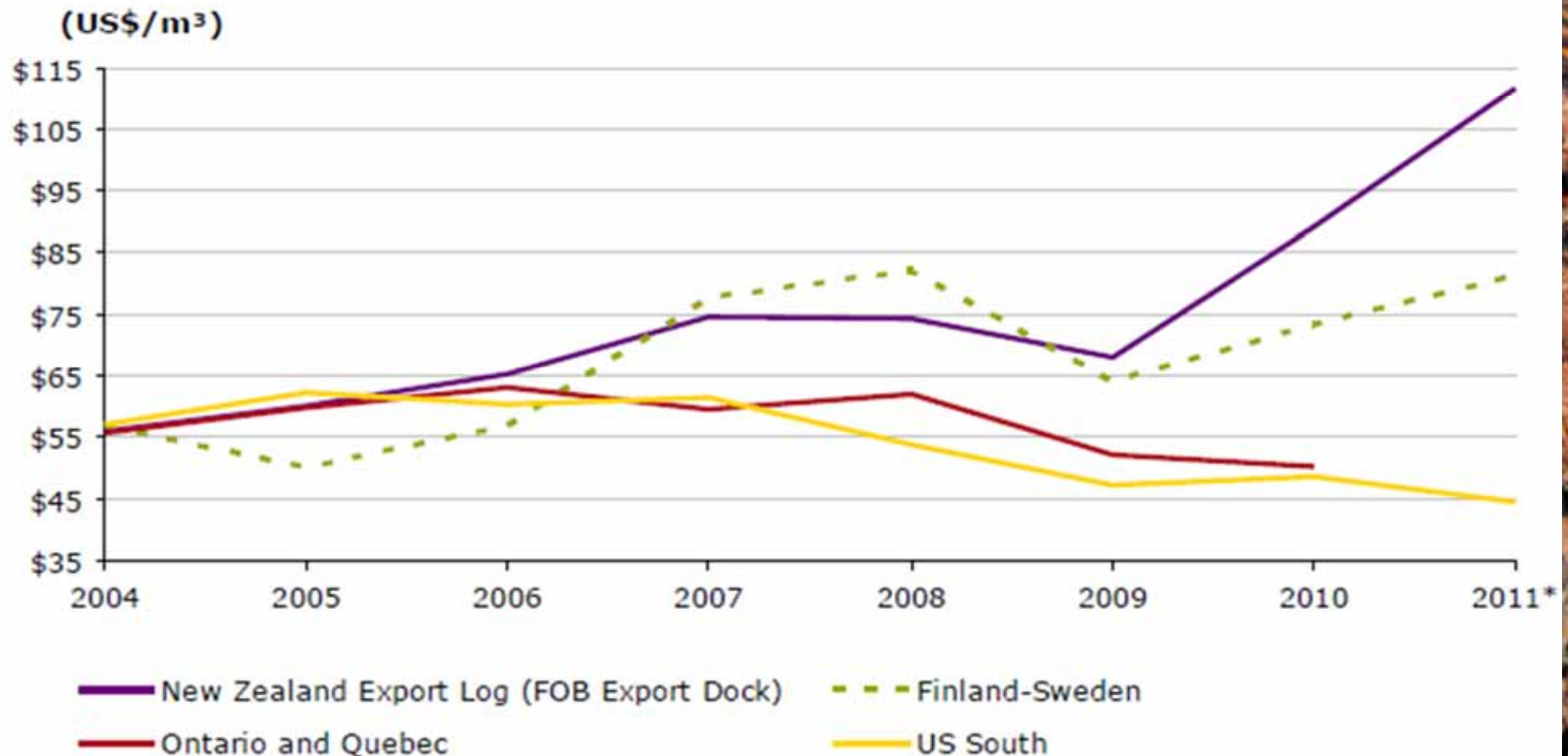
- We have a **new off-shore source of demand, and the supply response to the N. America market is lower** than it was during the last cycle
- **Both the secular (and cyclical) outlook for lumber looks promising** – despite experiencing the worst economic recession in over 70 years.
 - ⇒ Critical outcome, since **lumber is arguably the cornerstone of a competitive forest sector complex.**
 - ⇒ But
 - **Are you competitive within the lumber sector?**
 - **What are you going to do with the ~50% of the sawlog you don't make into lumber?**



Source: CIBC Equity Research.

Forest Markets – Sawn Softwood

- ▲ The delivered cost of sawlogs typically accounts for ~70% of the variable cost of producing lumber.
- ▲ Since the mid-2000's, sawlog prices have fallen in N. America and risen off-shore. As a result, the relative cost position of N. American sawmills has generally improved

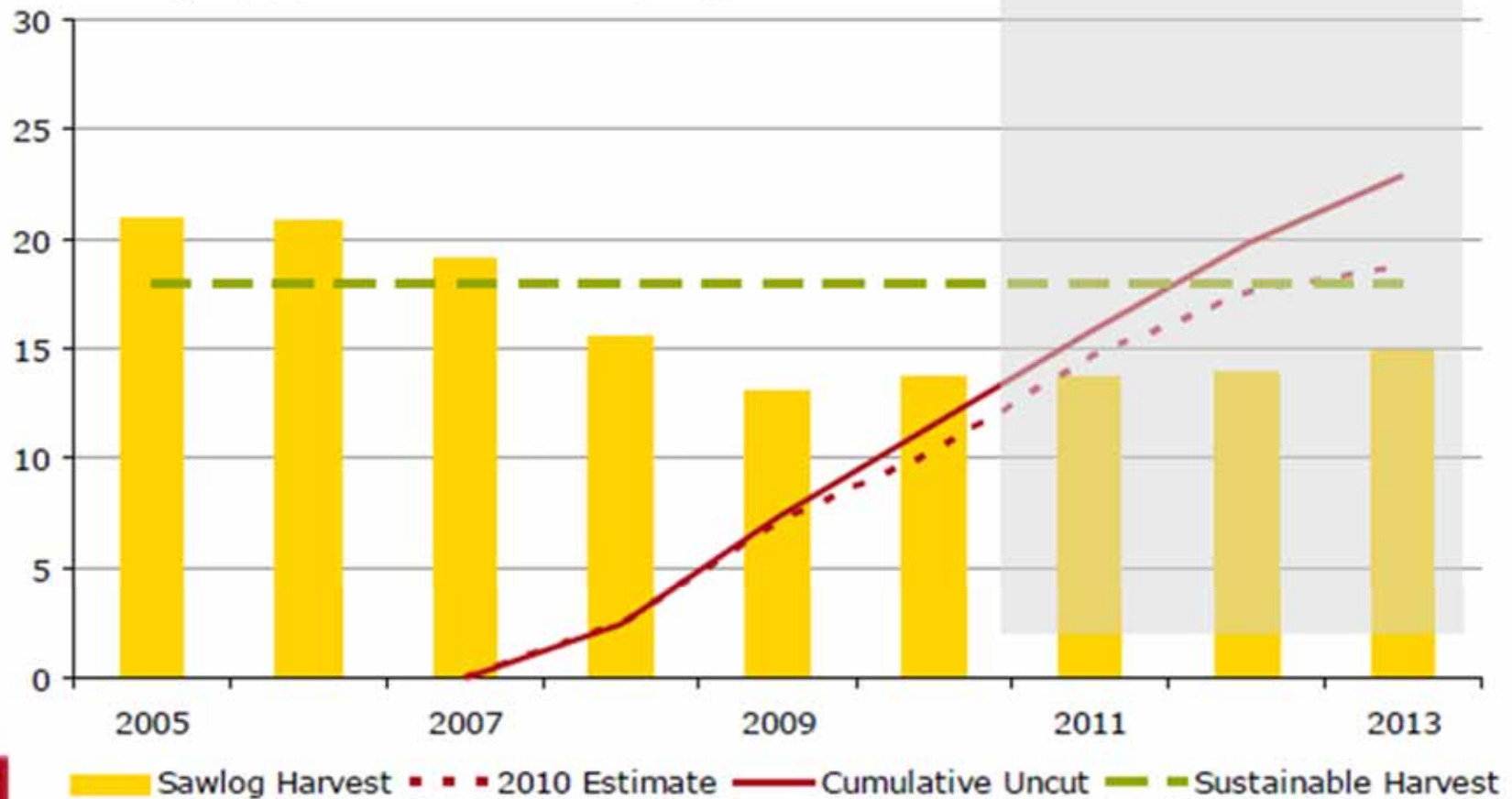


Source: RISI Inc., * Based on average of first two quarters.

Forest Markets – Sawn Softwood

- ▲ The inventory of sawlogs in the US South has been expanding, setting the stage for a good supply response to a recovery. It is the single largest lumber producing region in N. America.
- ▲ The increase in inventory reflects historical plantings & more recent undercutting due to the recession

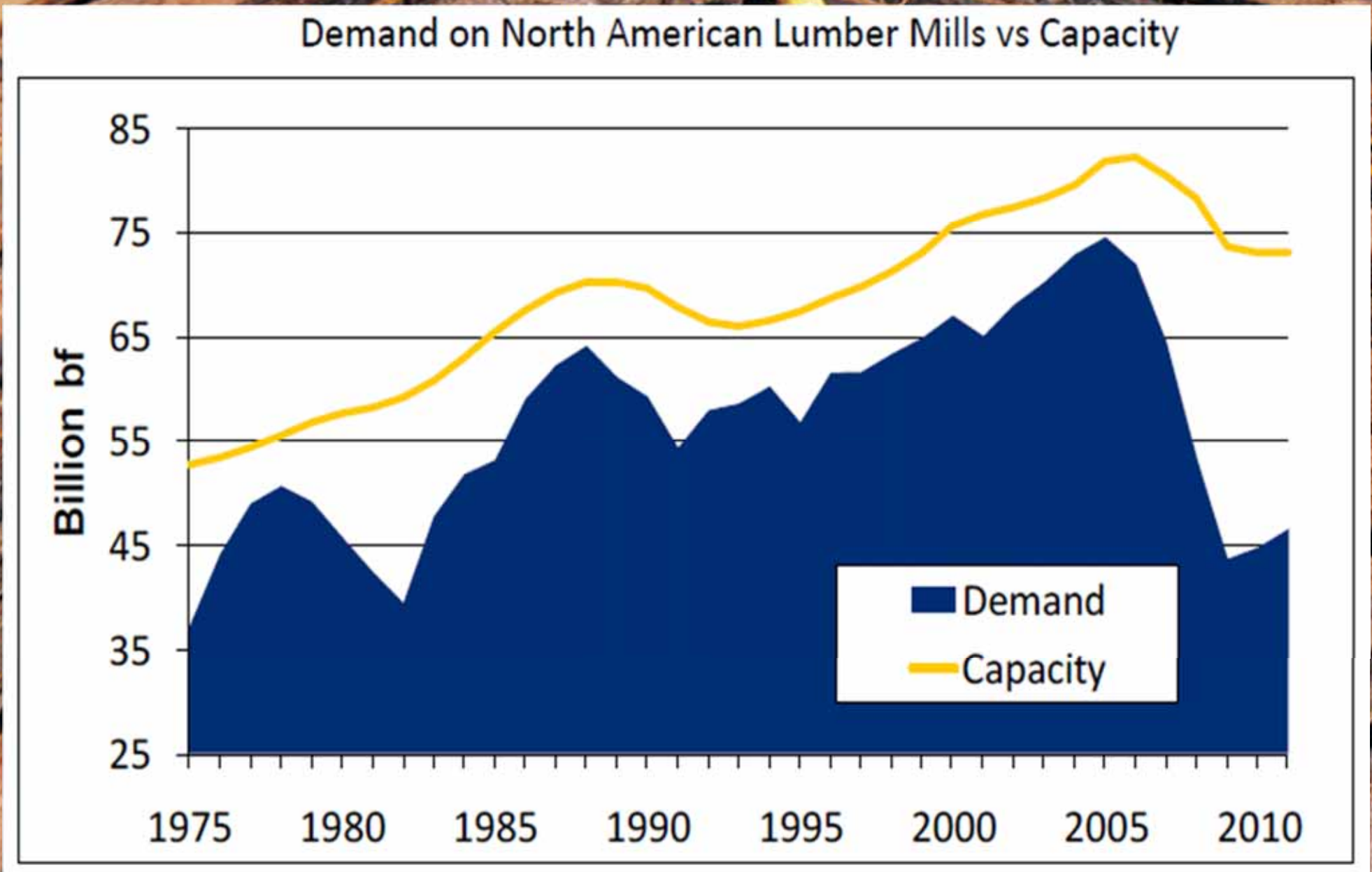
Sawlog Supply in the U.S. South (BBF)



■ Sawlog Harvest ■ 2010 Estimate — Cumulative Uncut — Sustainable Harvest

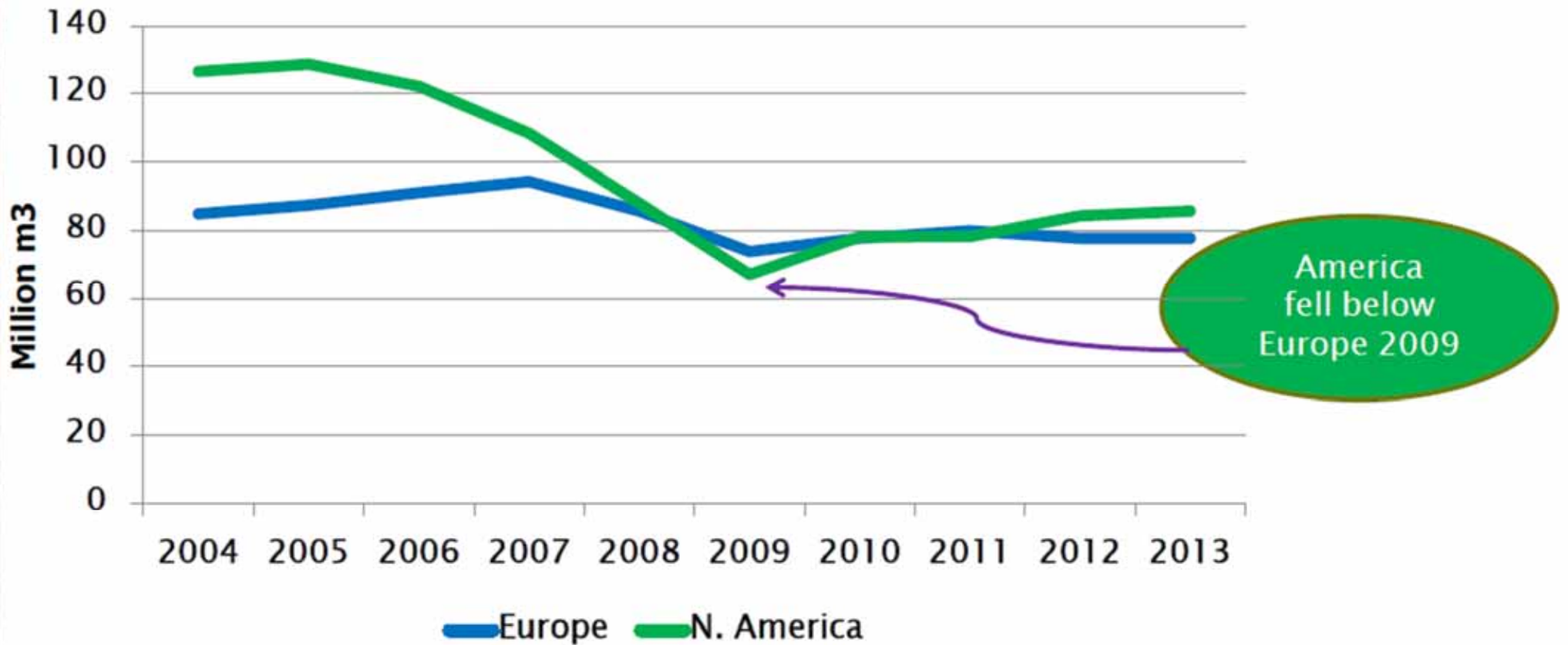
Source: RISI Inc.

North American Lumber Mills vs. Capacity



Forest Markets – Sawn Softwood

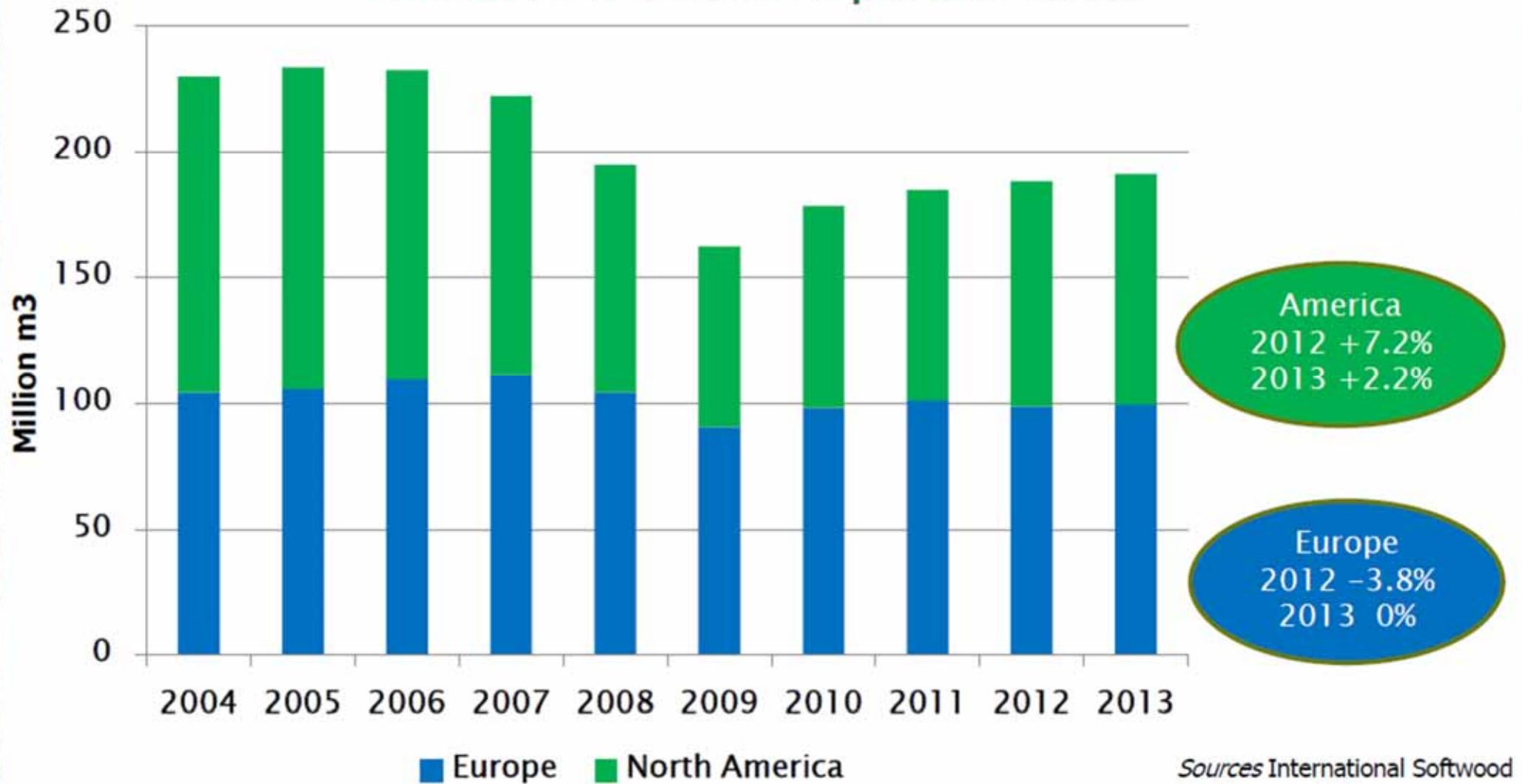
Softwood lumber consumption: Europe & North America



Sources International Softwood
Conference, FAO, 2012.

Forest Markets – Sawn Softwood

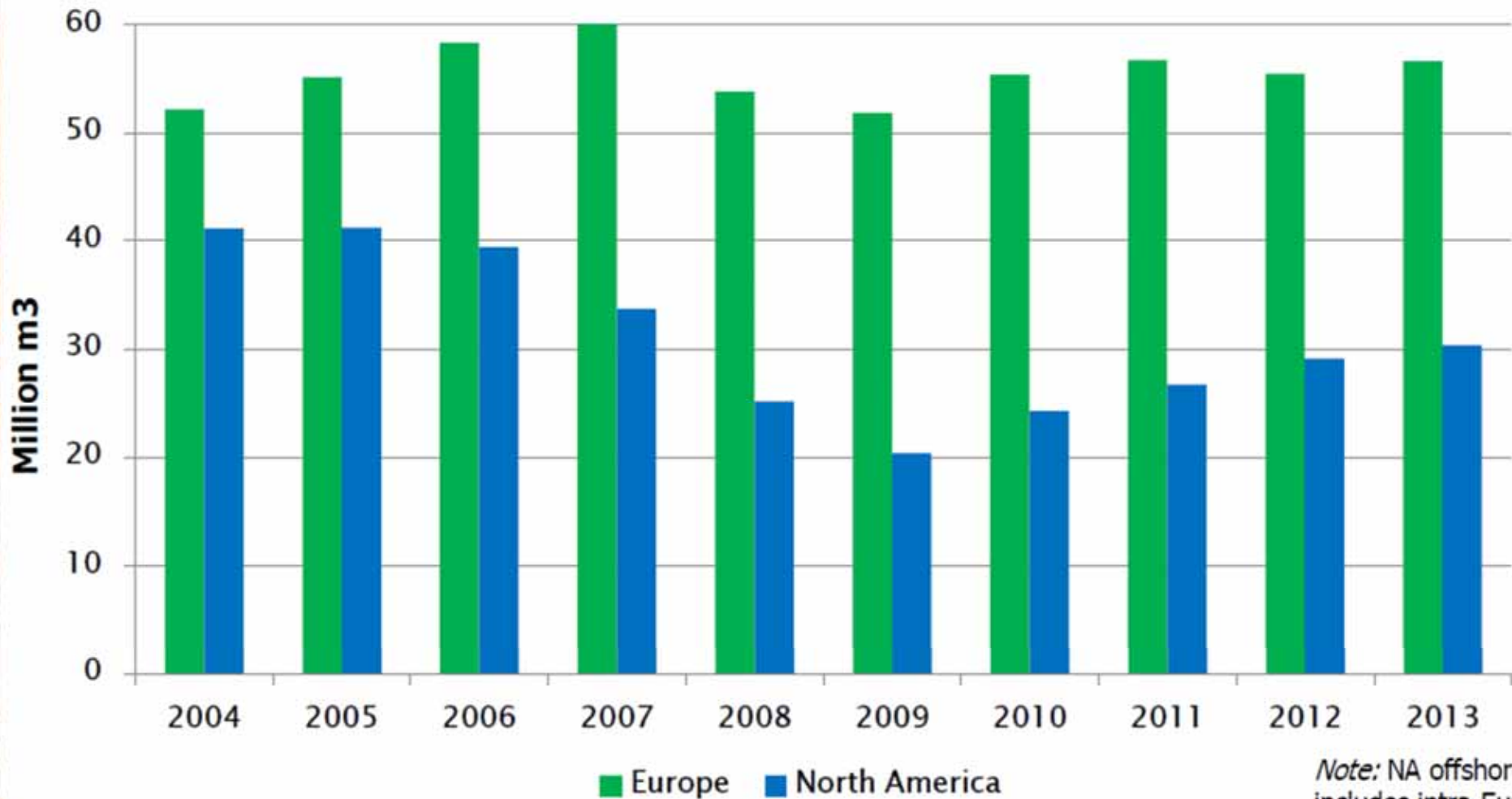
Softwood lumber production



Sources International Softwood Conference, 2012.

Forest Markets – Sawn Softwood

Softwood lumber exports



Note: NA offshore; Europe includes intra-Europe
Source: International Softwood Conference, 2012.

Forest Markets – European Housing

European economy

- **Recession in euro-zone (17 countries, not all in recession) + UK**
- **Construction decline 5% 2013**
 - -3.5% residential (not wood-based)
 - -4% non-residential
 - -8 civil engineering
- **Record unemployment**
 - EU 10.7%
 - Greece and Spain 27%



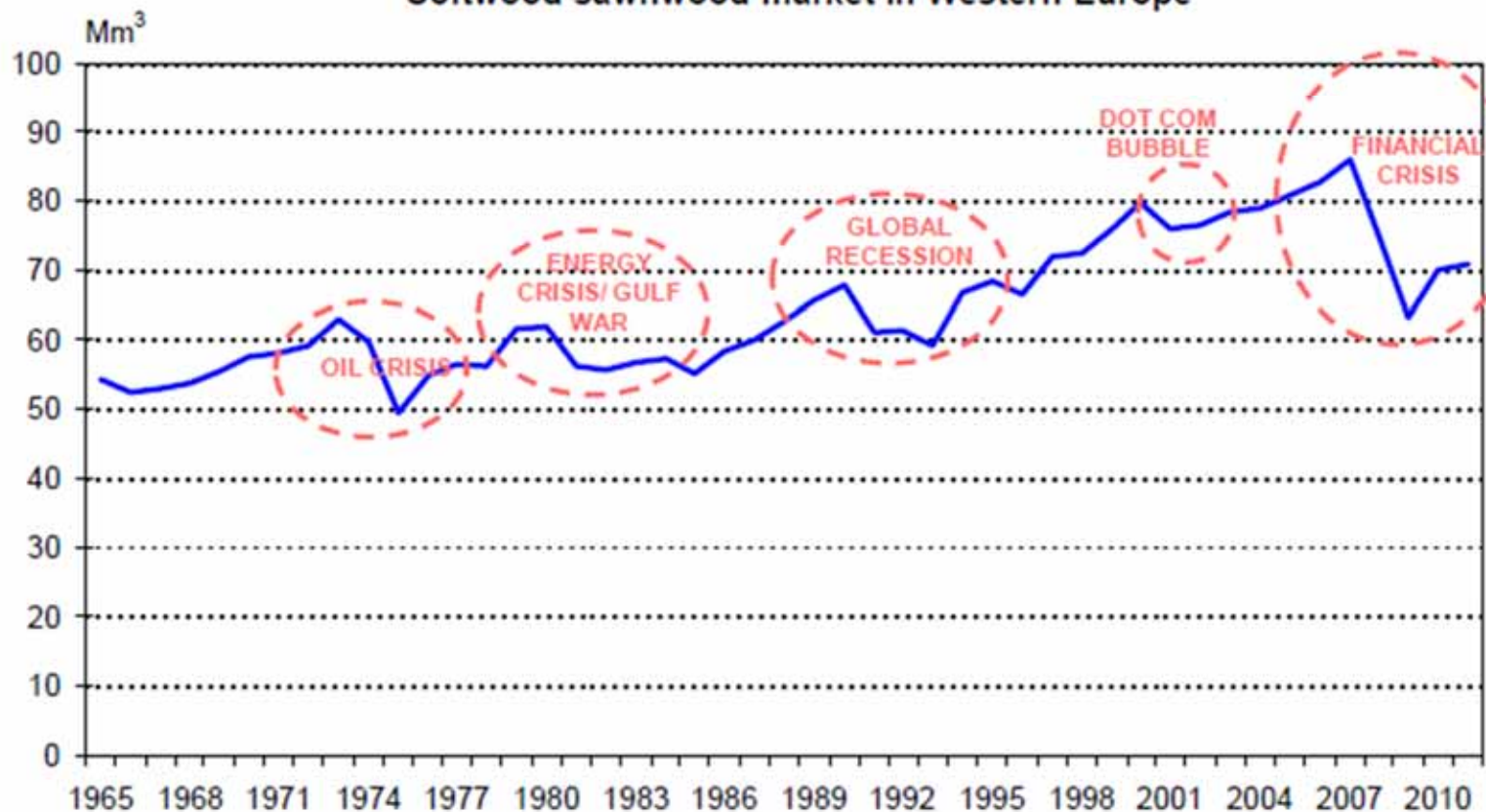
Sources: Euroconstruct,
Reuters, 2013

Forest Markets – Europe

SAWNWOOD MARKET CYCLES

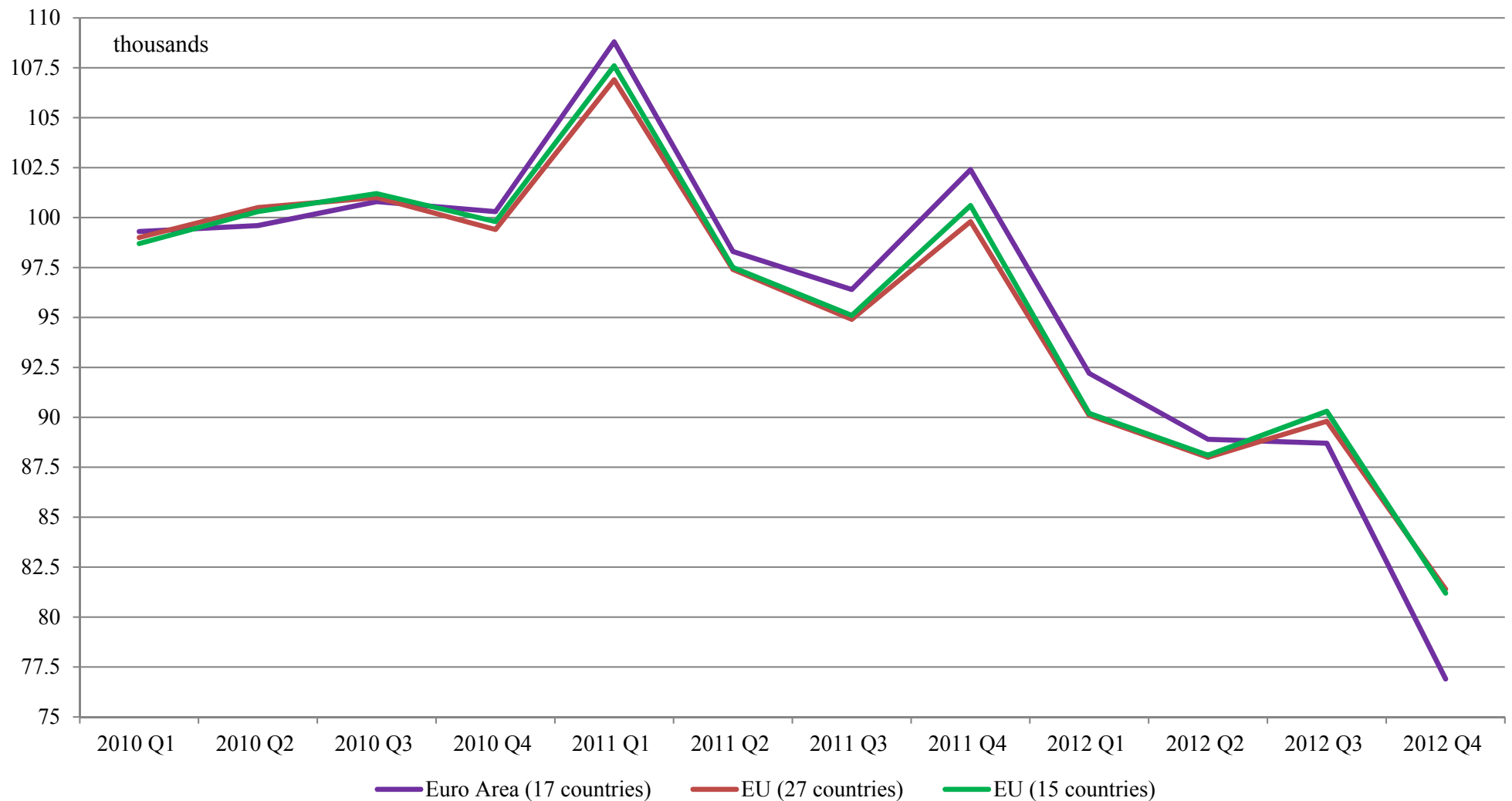
The Western European sawnwood market has not yet recovered from the 26% fall in demand from the peak in 2007 to 2009. The current 2011 and 2012 market volume is close to that of 15 years ago in 1996-1997.

Softwood sawnwood market in Western Europe



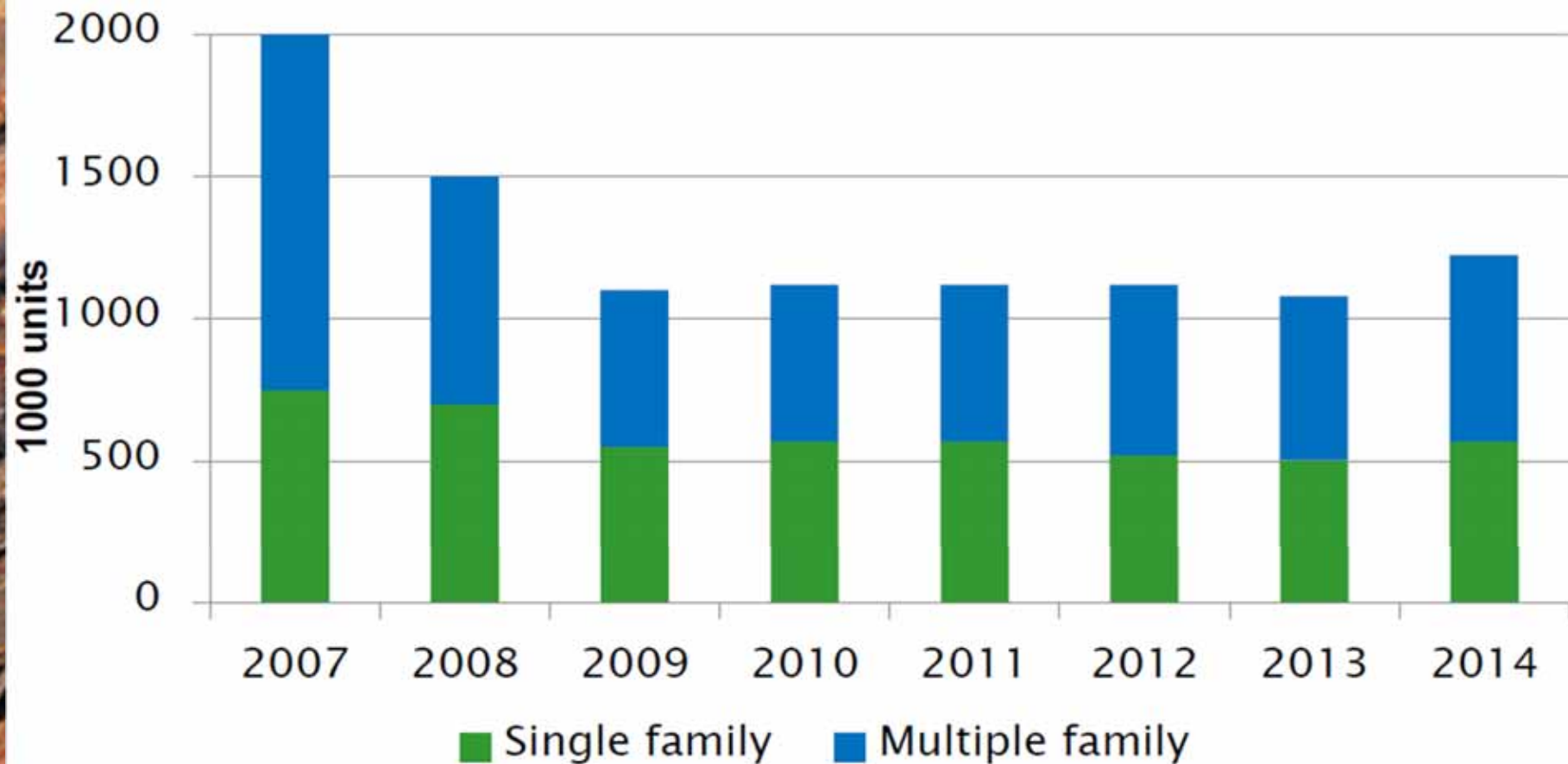
European Housing

Euro Area, EU 15 & 27: Dwelling Building Permits 2010 –2012



European Union Housing

European housing starts, 2007-2014



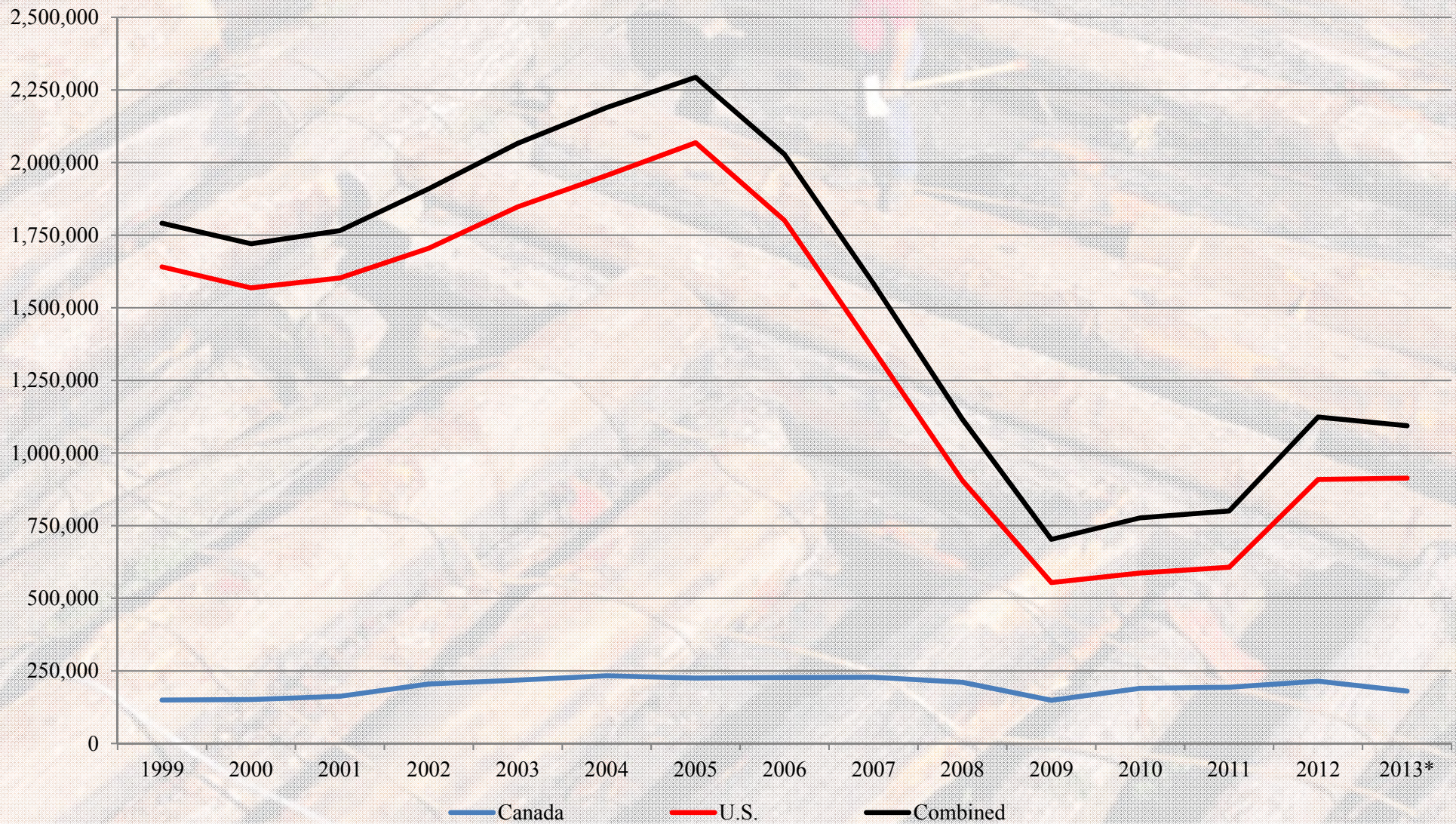
Note: 2013 and 2014 forecasts
Source: Euroconstruct, 2013.



Forest Markets – North America

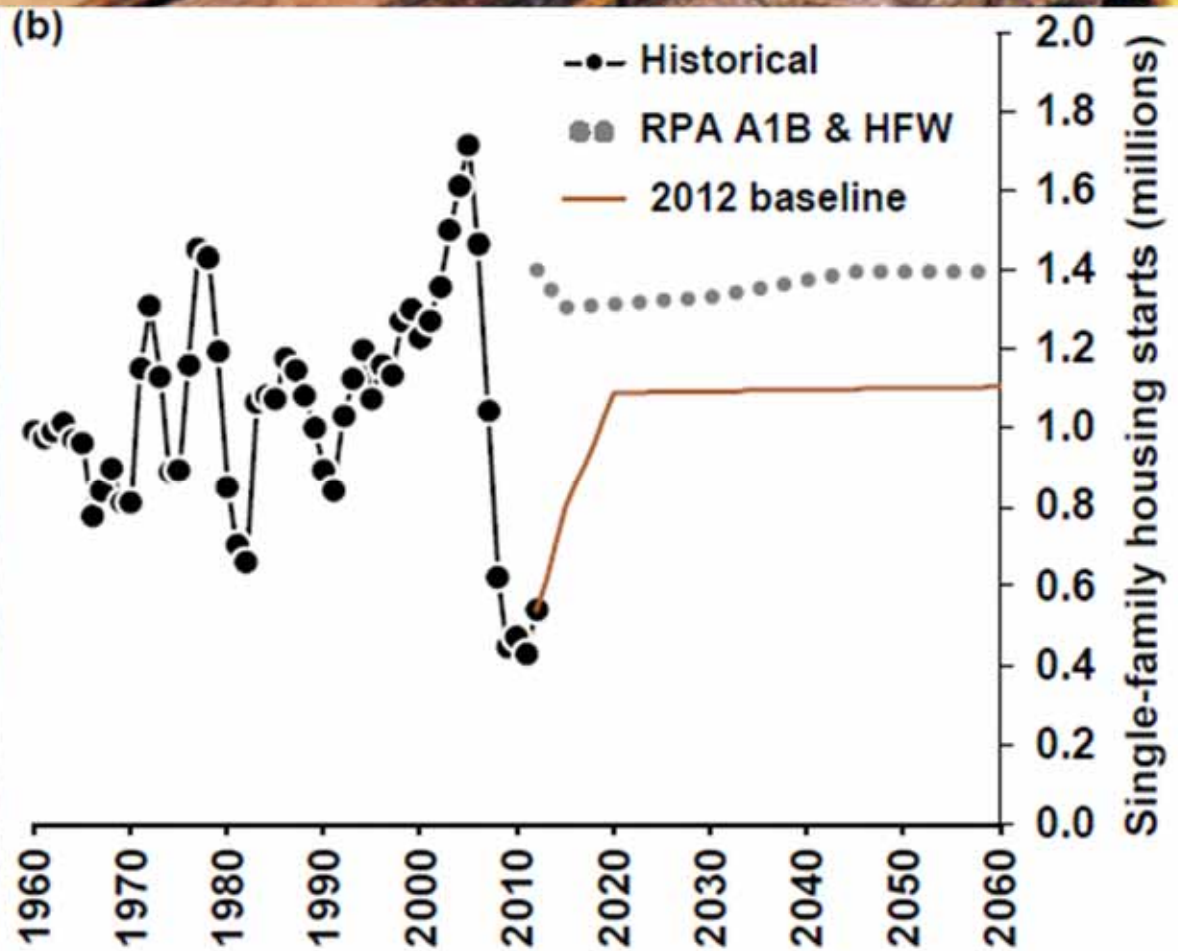
Canada and U.S. Housing

Canada and U.S. Housing Starts



Source: US DOC-Construction and CMHC

Projected U.S. Single-Family Starts



“... a gradual rebound in single-family housing starts, reaching the logarithmic trend line by 2020:

± 1.1 million

close to the long-run historical norm and within the range of current housing expectations

but much lower than recent RPA scenarios with similar or higher population growth.”

Structural change in the housing market include:

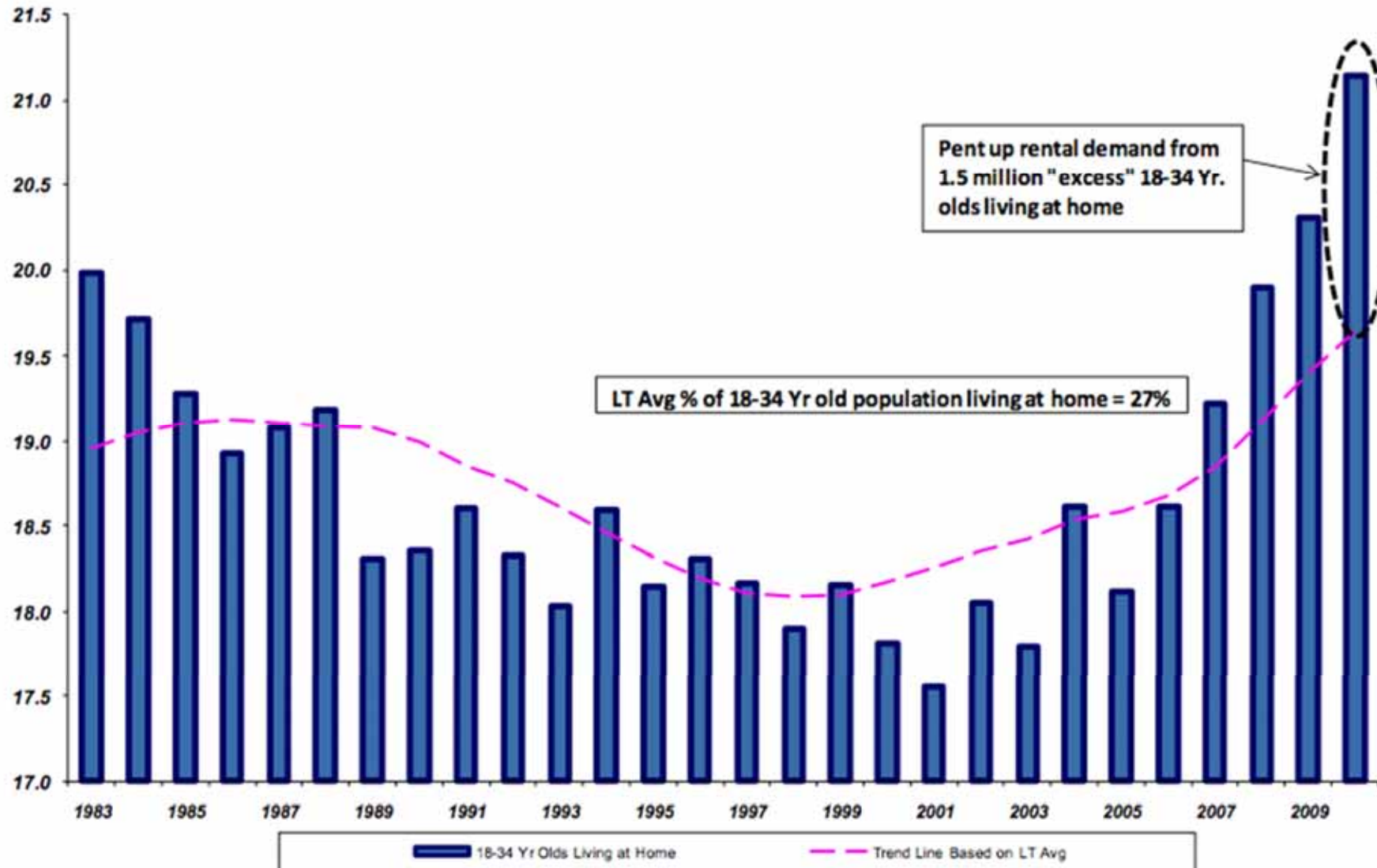
- a dramatic correction in median wealth of U.S. households as home values declined
- declining home ownership rates.

Future U.S. Housing Demand

Deferred Renters/Owners Will Drive Demand

HARVEST
CAPITAL STRATEGIES

18-34 Year Olds, in millions



Forest Markets – Hardwoods

Bill Luppold, Research Economist,
USDA Forest Service - Princeton

- Hardwood lumber production has declined by 40% between 1999 and 2010, and has only increased modestly since
- We have permanently lost as much as a third of our hardwood lumber production capacity in the past 5 years – Liquidated or abandoned
- Demand in the first half of 2010 looked promising but started to decline in late 2010 and has continued to be poor -- except for -- residues, crossties, pallet material, crane mats, and exports

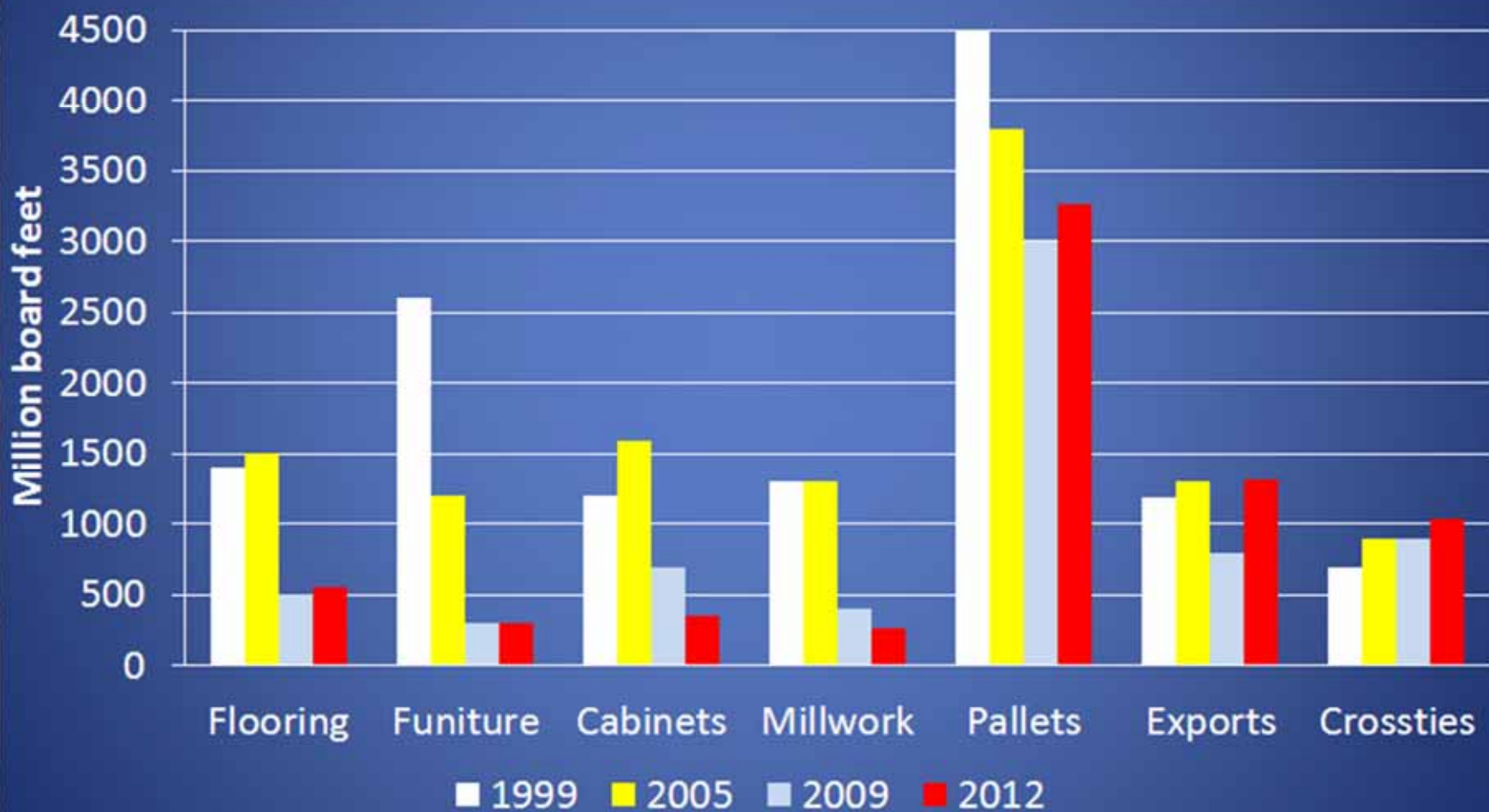
Forest Markets – Hardwoods

Eastern Hardwood Lumber Production



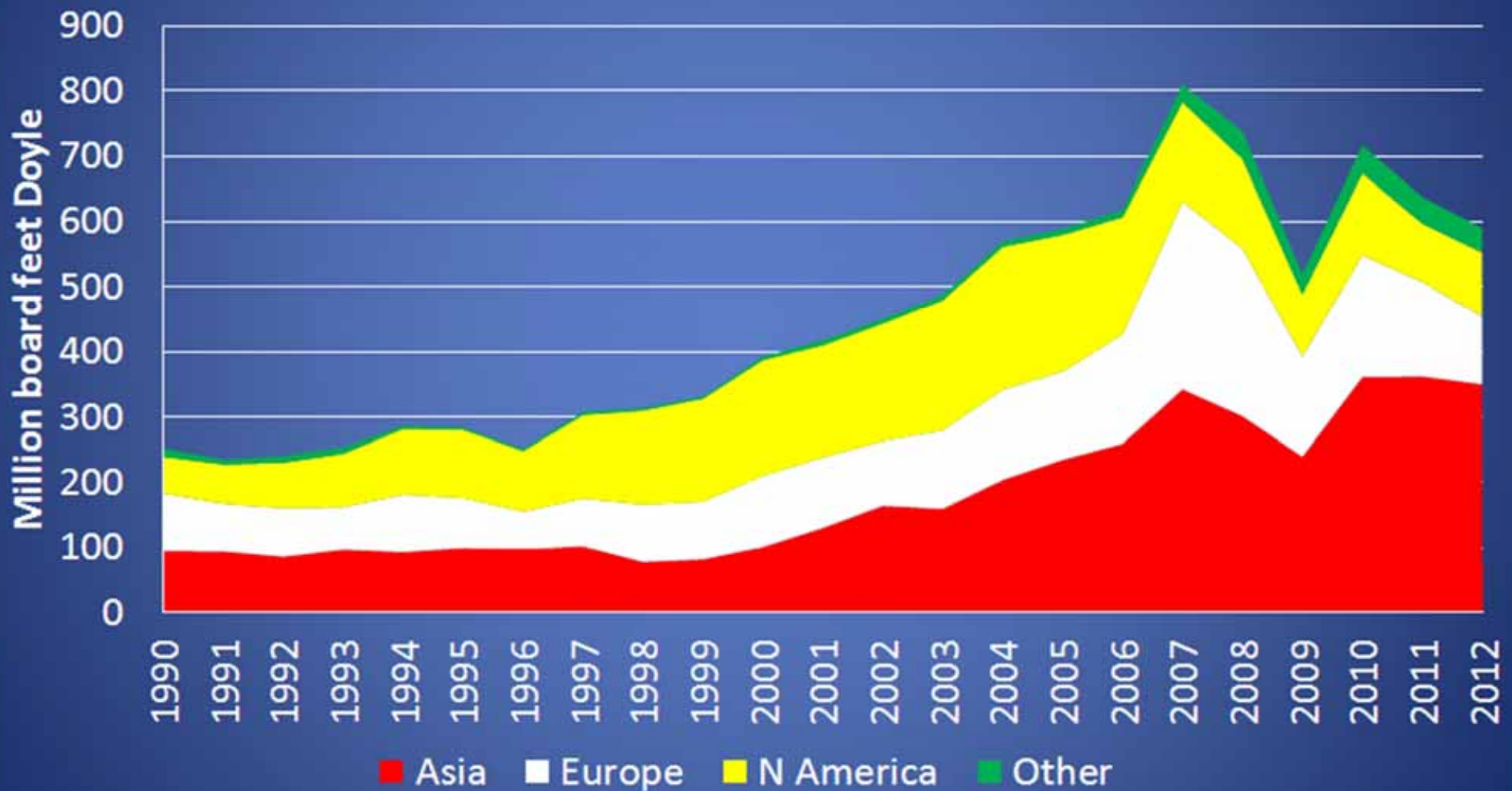
Forest Markets – Hardwoods

Hardwood Lumber Consumption 1999, 2005, 2009, 2012



Forest Markets – Hardwoods

Hardwood log exports



Forest Markets – China

2012 China – Largest Importer of Logs & Lumber

- Logs – 26.7 million m³, 15.4% down from 2011
- Lumber – 14 million m³, 4.7% down from 2011
- Since '03, exports of North American lumber have increased by 20 times
- Canadian and U.S. logs and lumber exports valued at \$US2.1 billion dollars, down 17% from 2011
- Canada's shipments valued at ±\$US1.1 billion dollars in both 2011 and 2012

Forest Markets – China

U.S. softwood lumber exports: WA, OR, No CA, and AK to China:
89.4 million board feet (2012)

271 mmbf, 60% of the West Coast's log exports, and $\pm 29\%$ of the total US lumber exports, were shipped to China in Q4 2012

Total value exported through the west coast increased about 17% to \$156 million in Q4 2012

Log exports from Western U.S. to China: Increased 10-fold the past 5-years

West coast log volume exports: $\pm 60\%$ of total US log exports

Forest Markets – China

In 2012

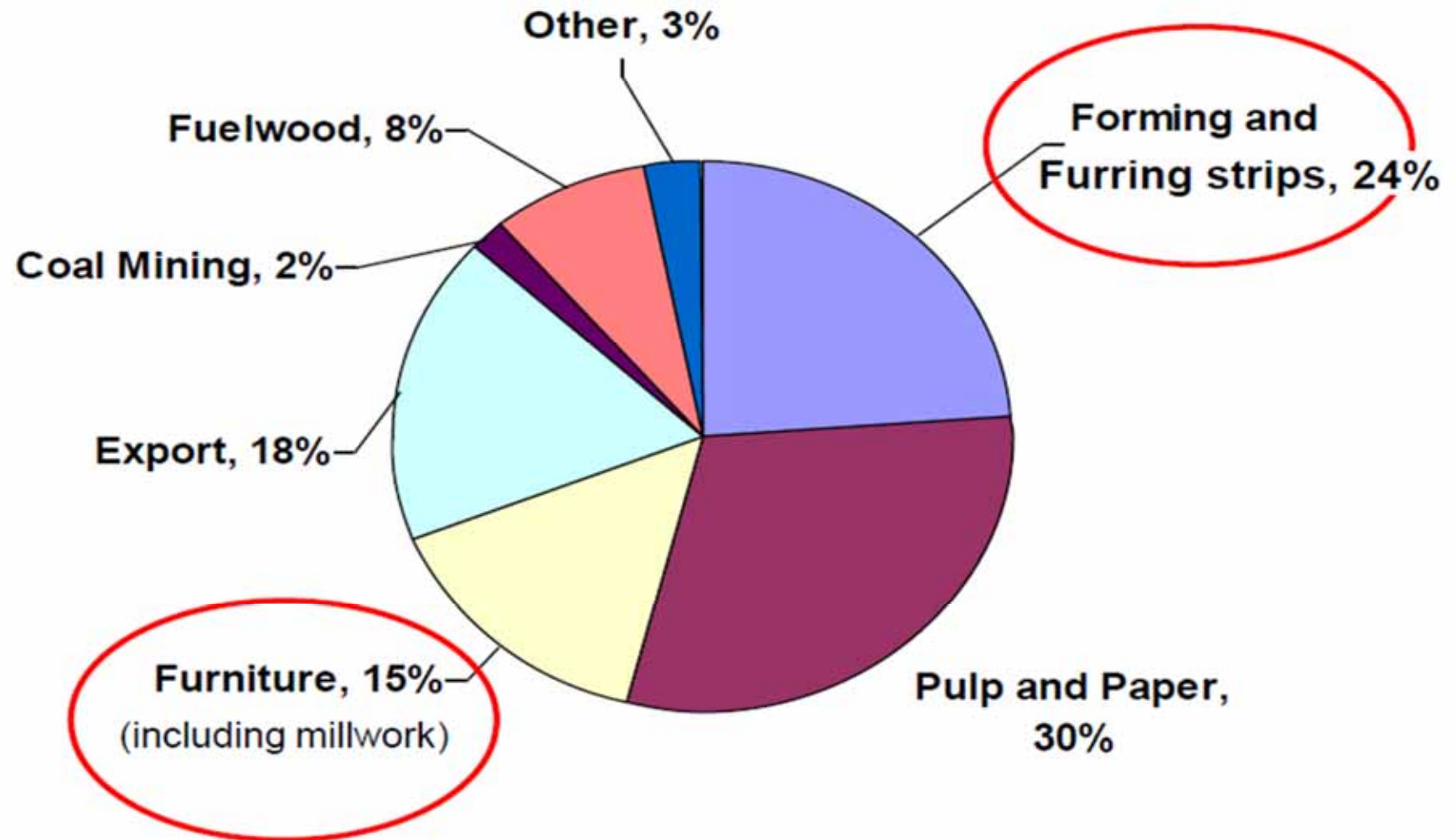
Canada the largest lumber supplier (both softwood and hardwood) -- 31% import market share

The major lumber suppliers to China:

- Canada: 6.4 million m³
- Russia: 6.2 million m³
- U.S.: 2.2: million m³
- Thailand: 1.5 million m³
- Indonesia: 744,000 m³
- Chile: 501,000 m³
- New Zealand: 486,000 m³

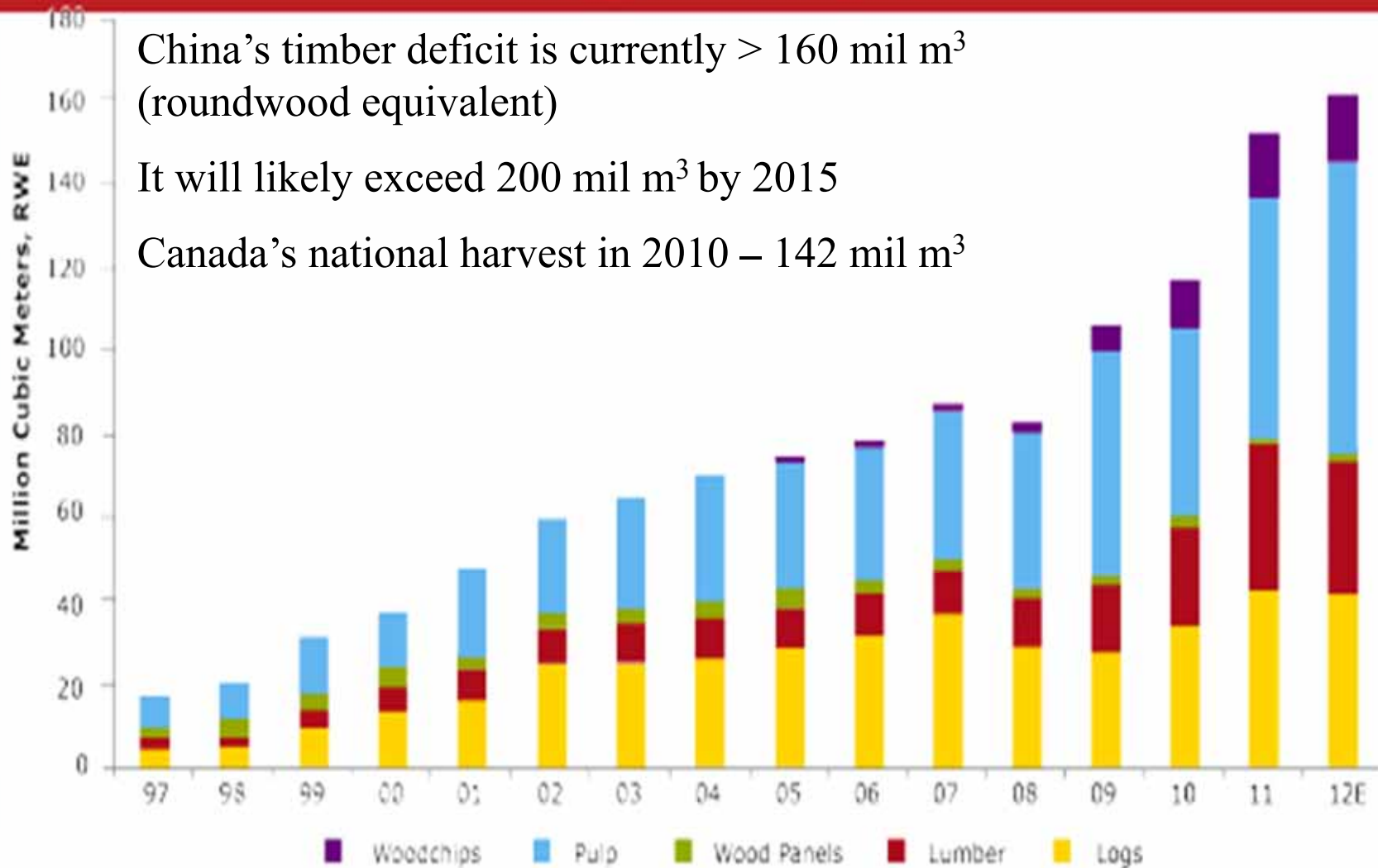
Forest Markets – China

China Timber Consumption in 2010: 432 million m3



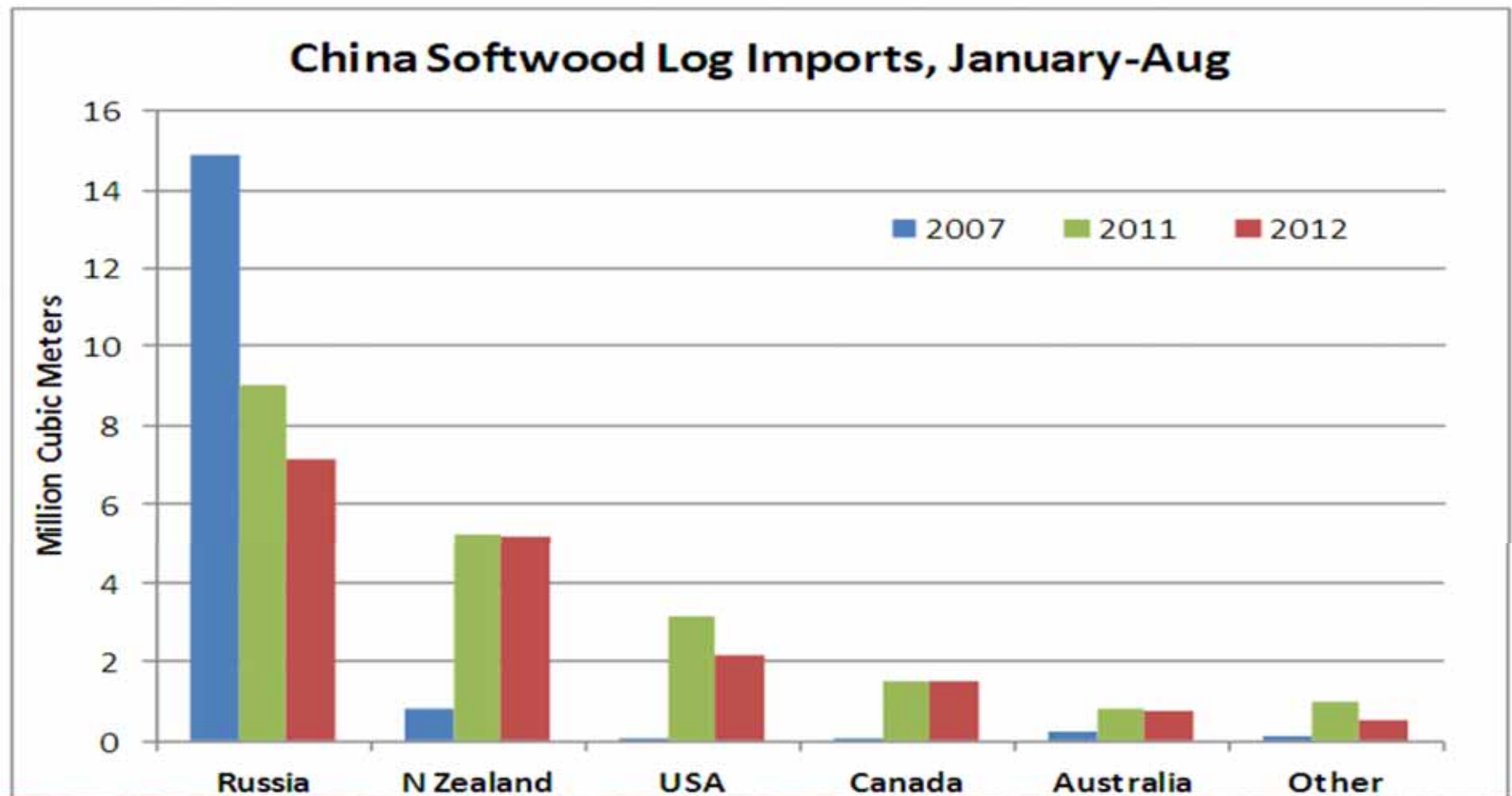
Chinese Demand for Forest Products

China's Growing Timber Deficit, 1997 - 2012E



Forest Markets – China

Russia's share of the Chinese log market fell from 91% in 2007 to 41% in 2012, while New Zealand is now supplying nearly 30%



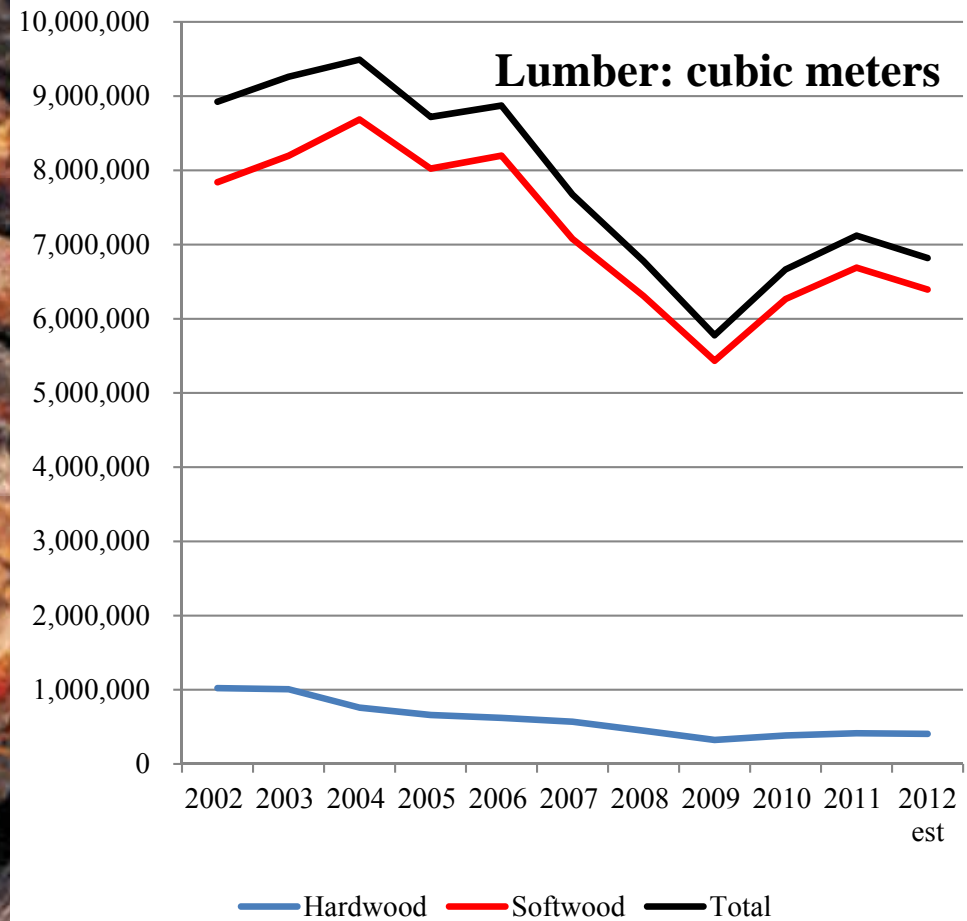
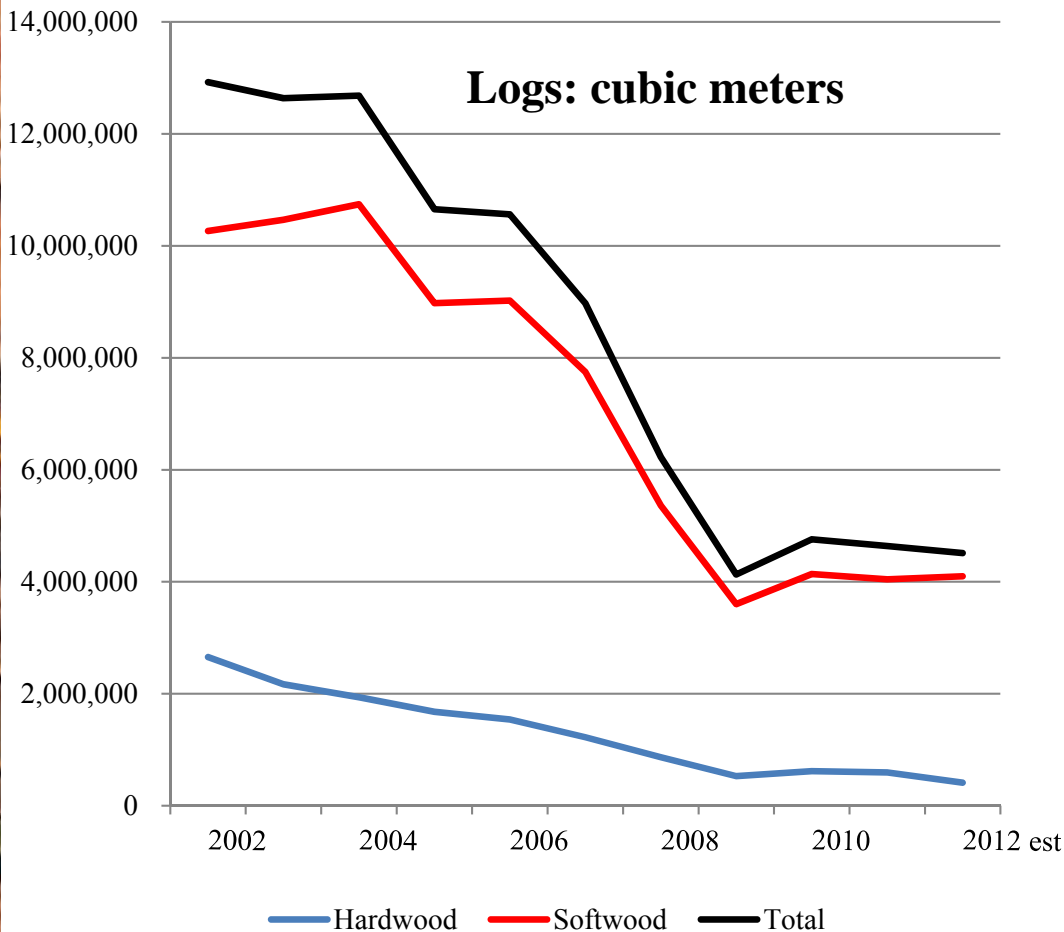
Forest Markets – China

China has begun the process of outward investment in forest resources, and this is expected to become a major trend

- **CIC and Russia Forest Products**
- **Greenheart in New Zealand and Suriname**
- **Several Chinese companies in New Zealand**
- **China Timber Resources Group in Guyana**
- **Sun Paper in Laos**
- **Several companies in Russia, e.g., China Yantai Northwest Forestry and Yangxin Eurasia Woodwork**
- **China Timber (COFCO) in Gabon**
- **Zaozhuang Mining in western Canada (Resurgence)**
- **Sustainable Forest Holdings Ltd. in Brazil**

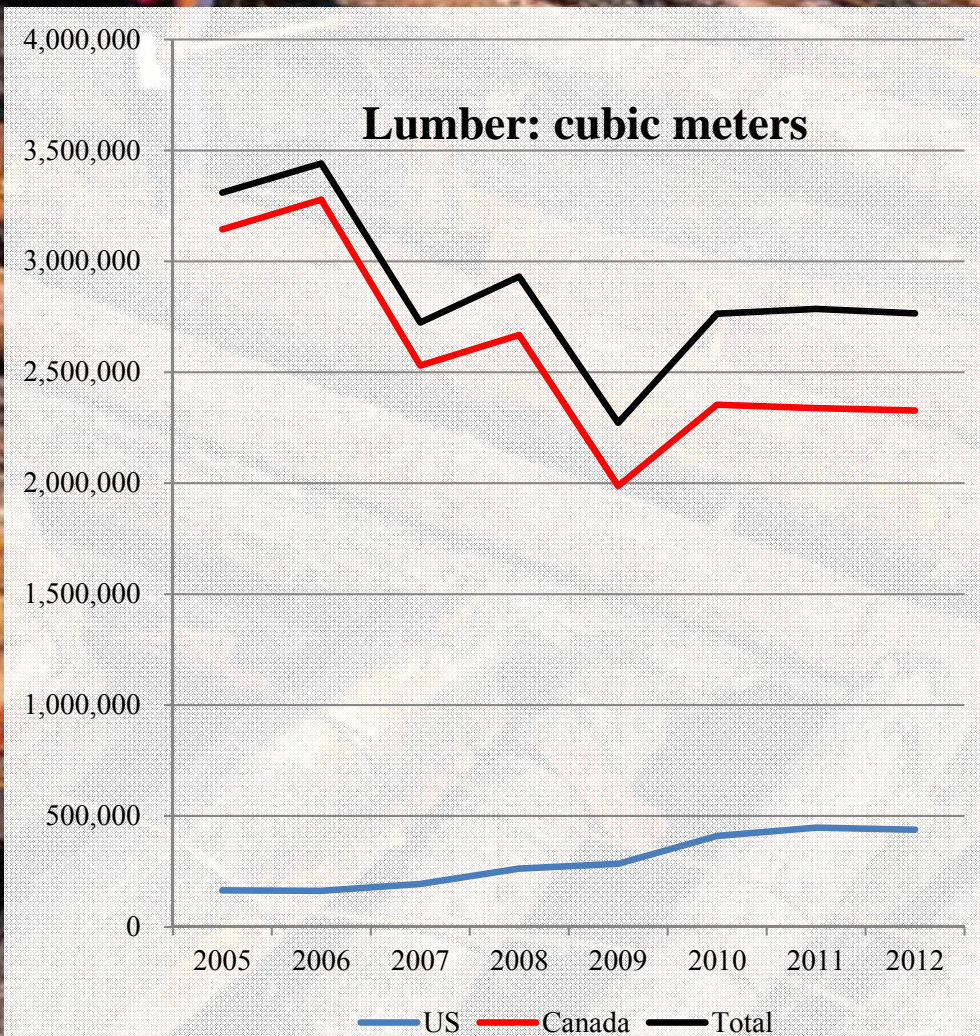
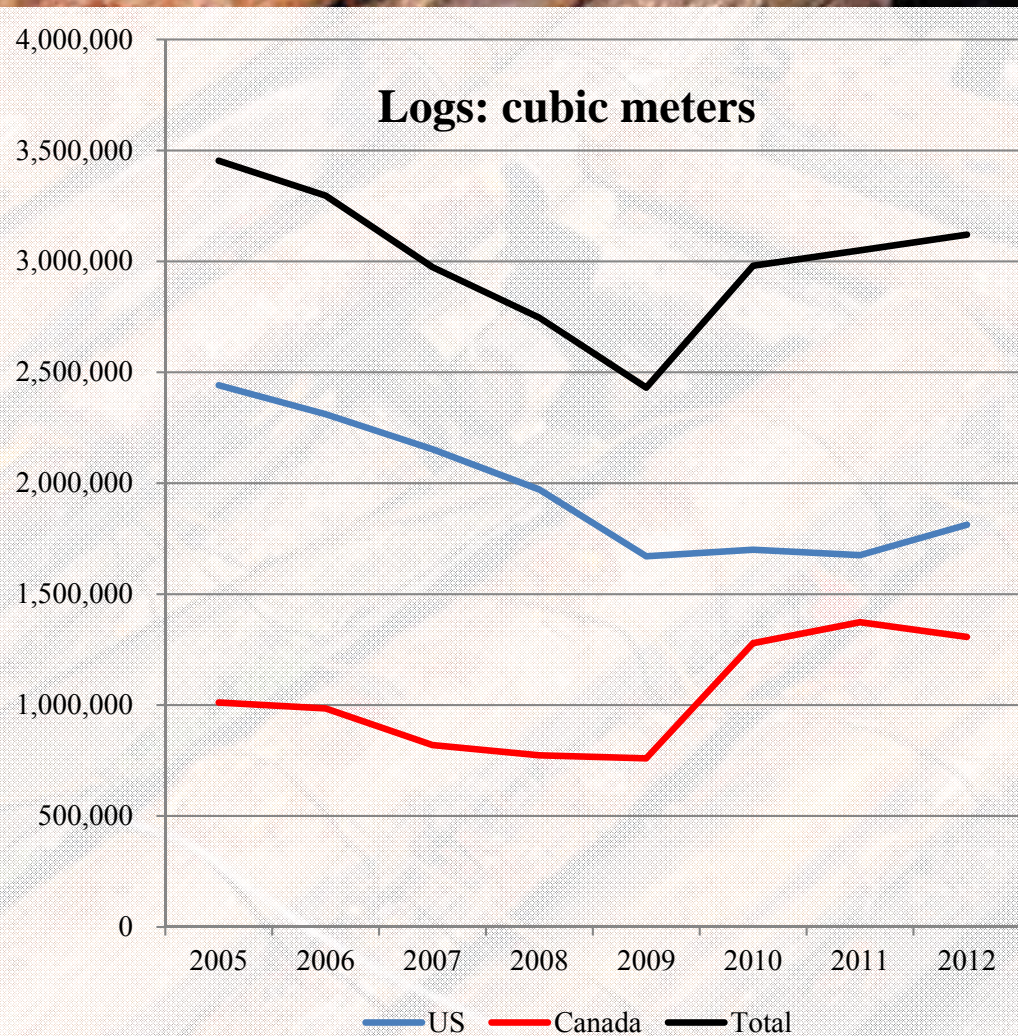
Forest Markets – Japan

Total Log and Lumber Imports

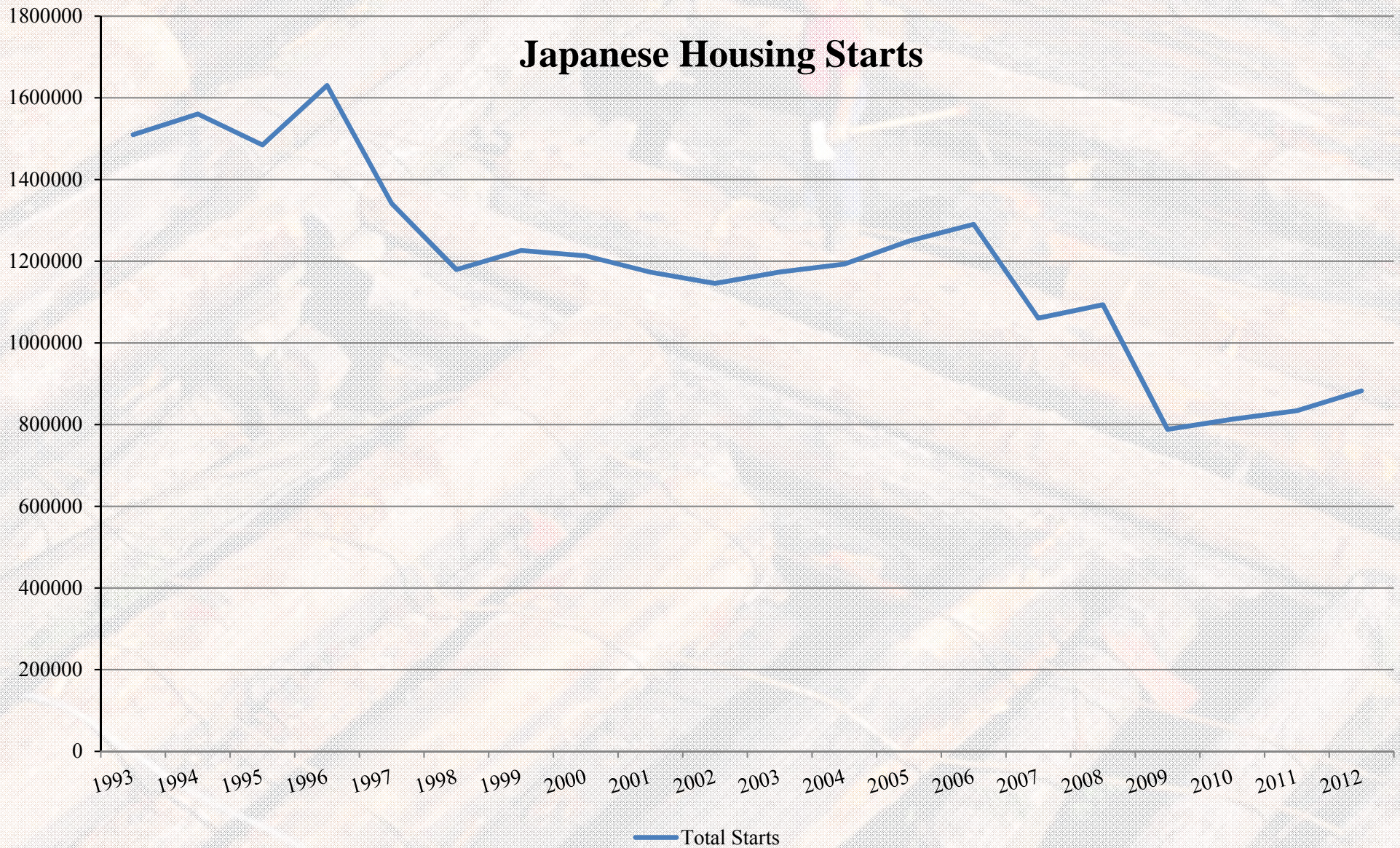


Forest Markets – Japan

Log and Lumber Imports: Canada & U.S.

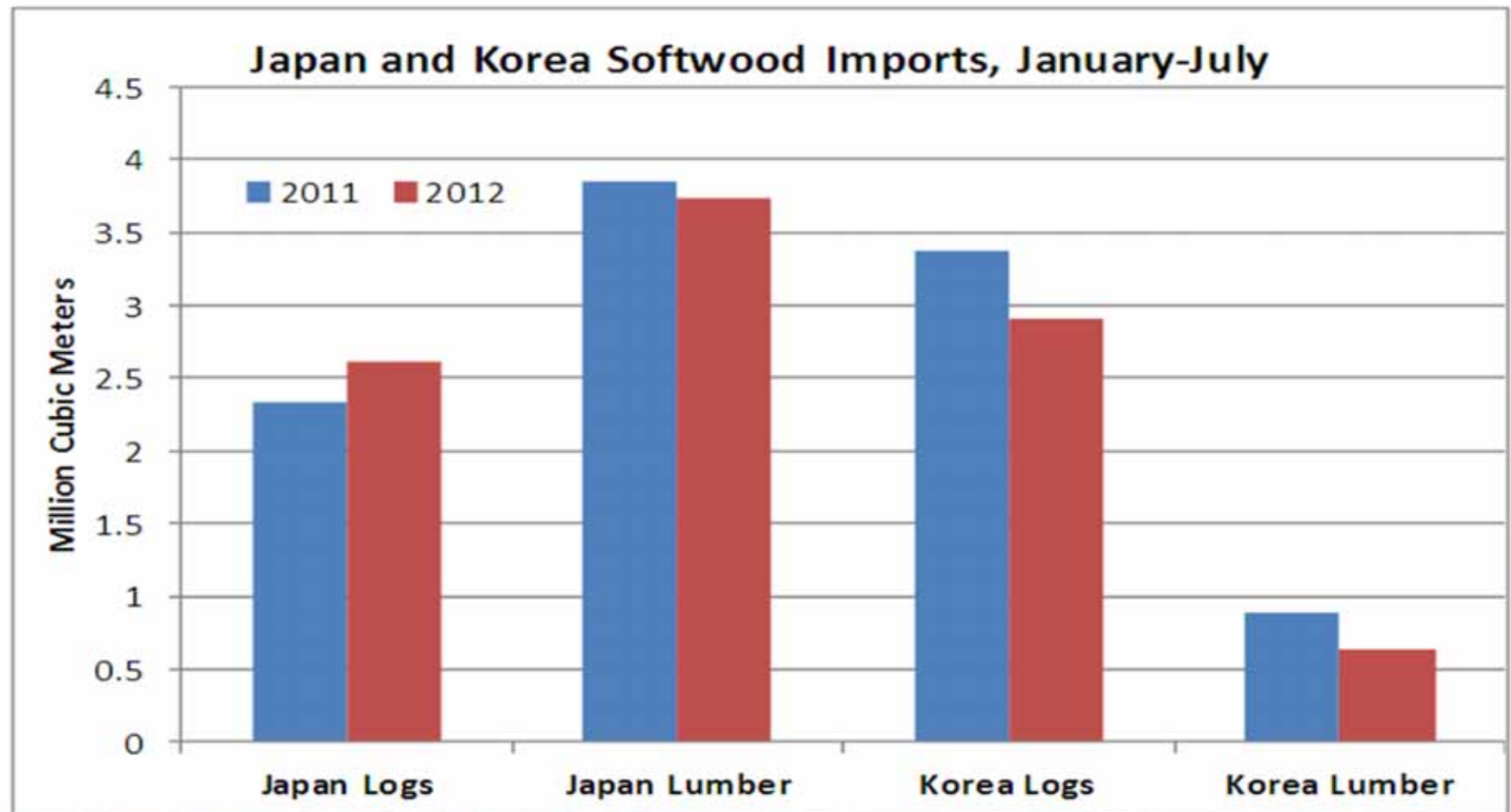


Forest Markets – Japan

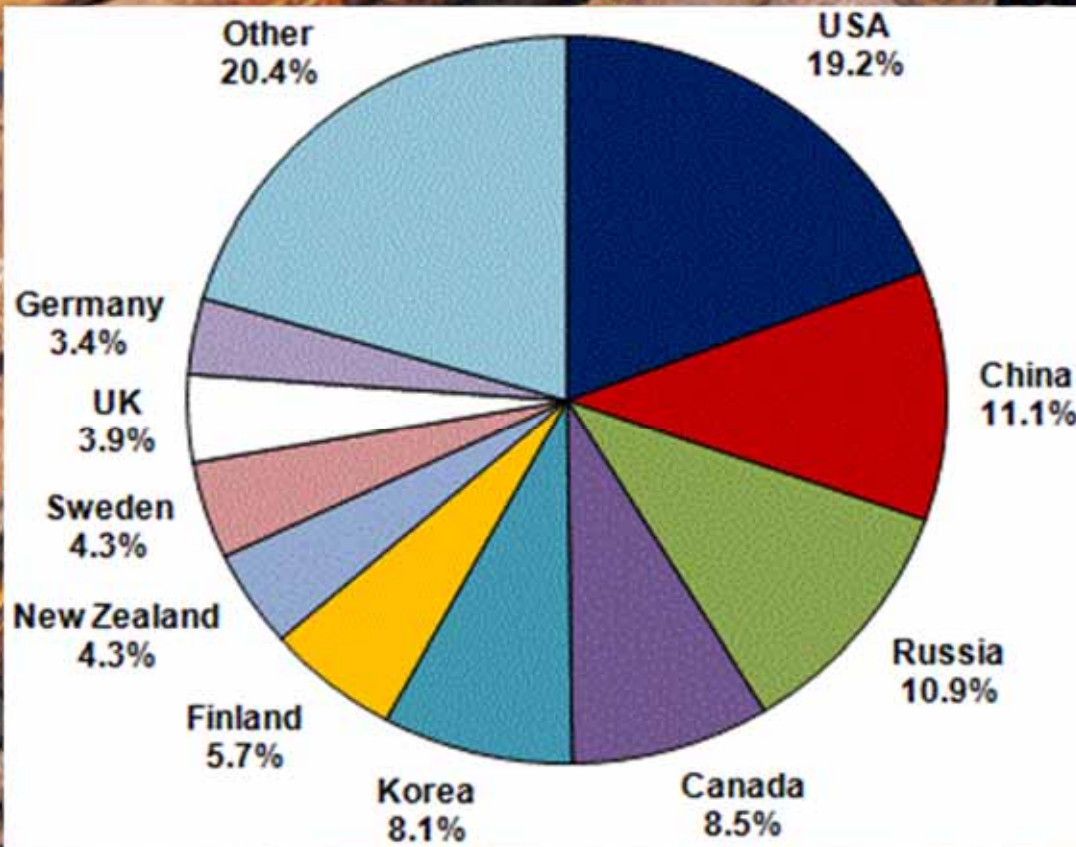


Forest Markets – Japan and Korea

Softwood log and lumber imports in Japan were unchanged in January-July 2012, but Korean imports declined 18%



Forest Markets – India



‘India's growth imports will not follow China

...will be one of the most important trends in global timber demand.

India's increasing need for imported wood fiber is expected to be sustained for several decades.”

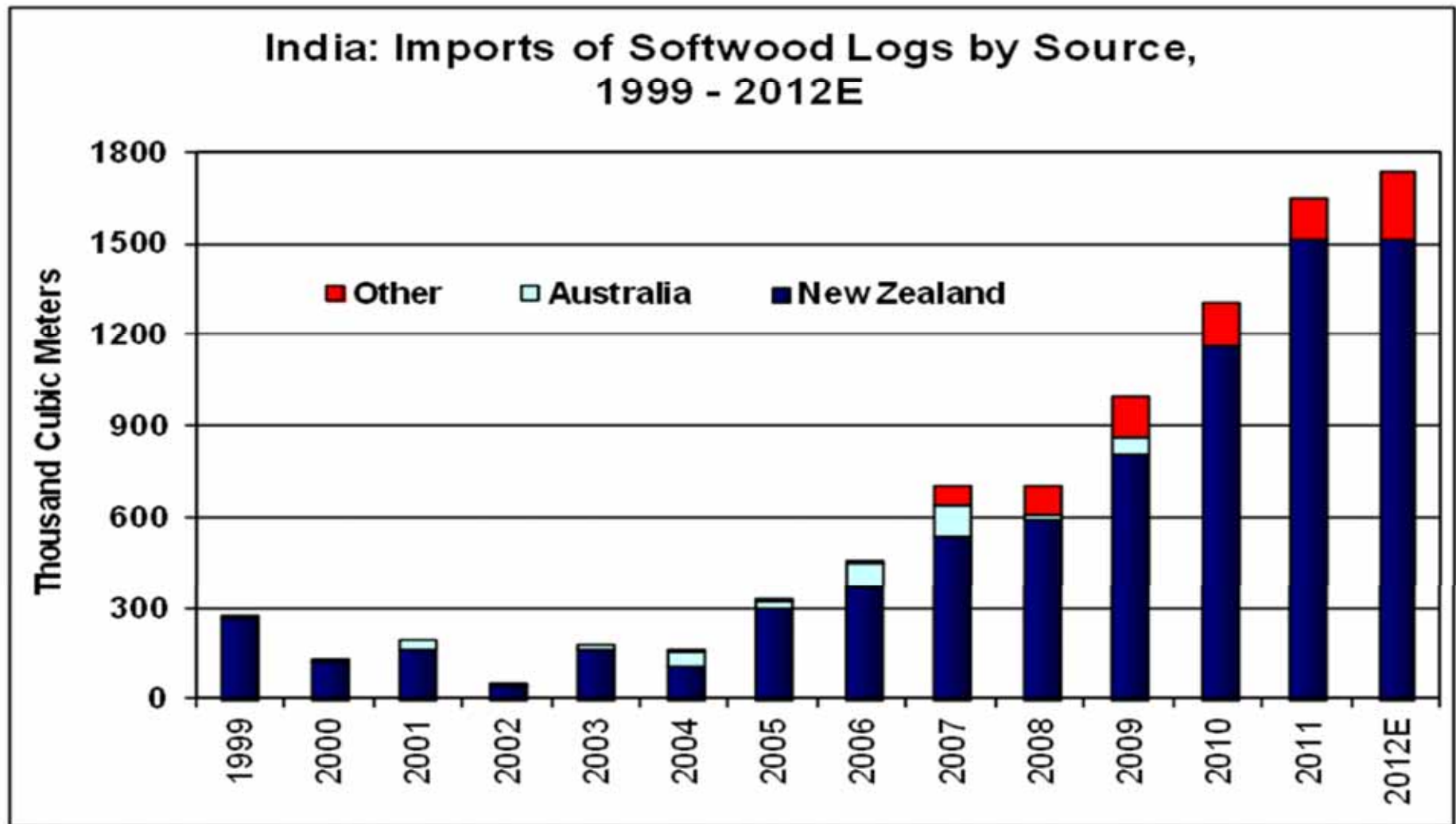
“In the past ten years India's forest products trade deficit has soared:

US\$1.0 billion (2001) to > US\$5 billion (2011)

Scarcity of domestic timber resources, rapidly growing demand, log imports have doubled since 2006 to meet the country's growing demand for wood products.” - - Robert Flynn, RISI

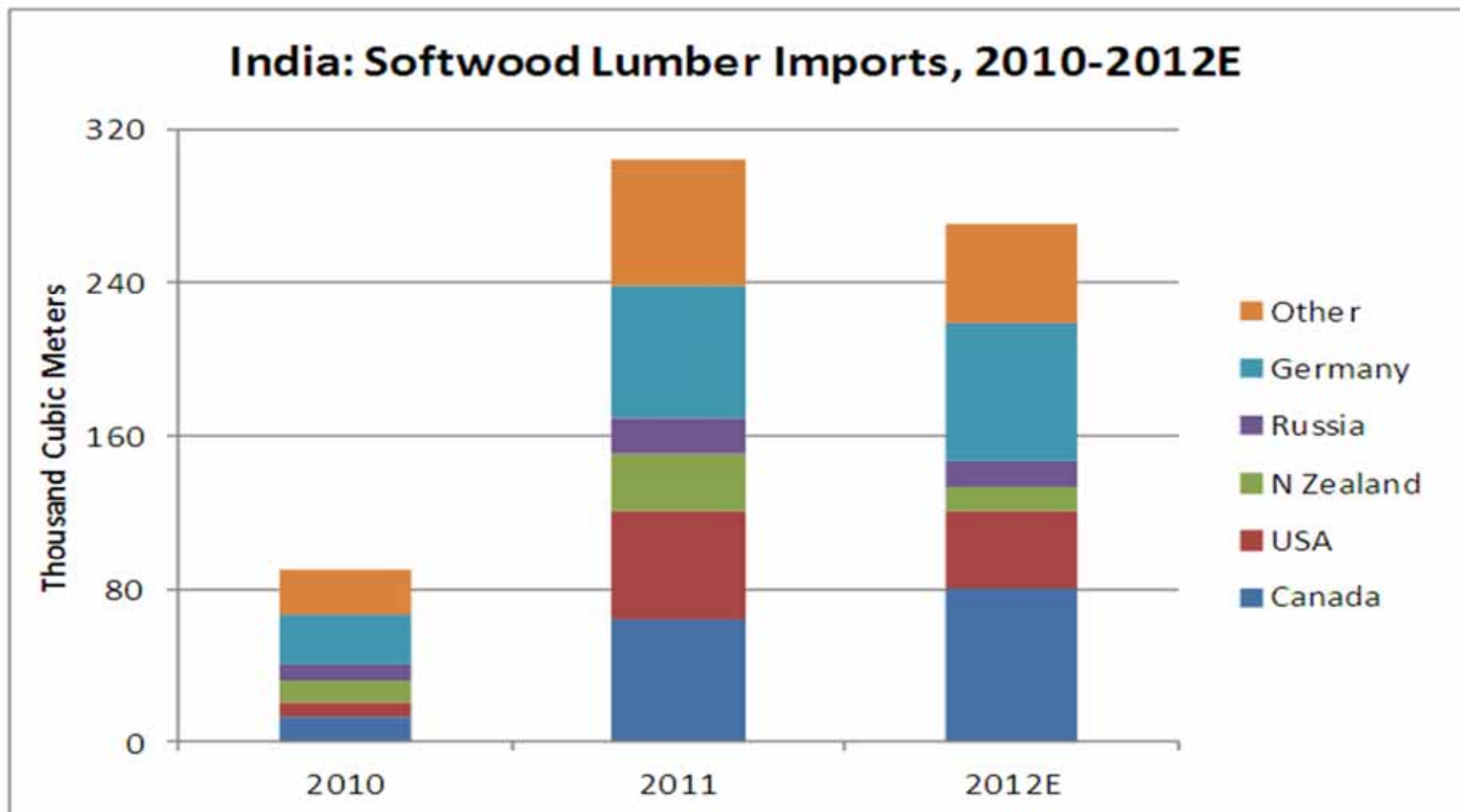
Forest Markets – India

Much slower economic growth in India has also slowed demand for logs in India in 2012

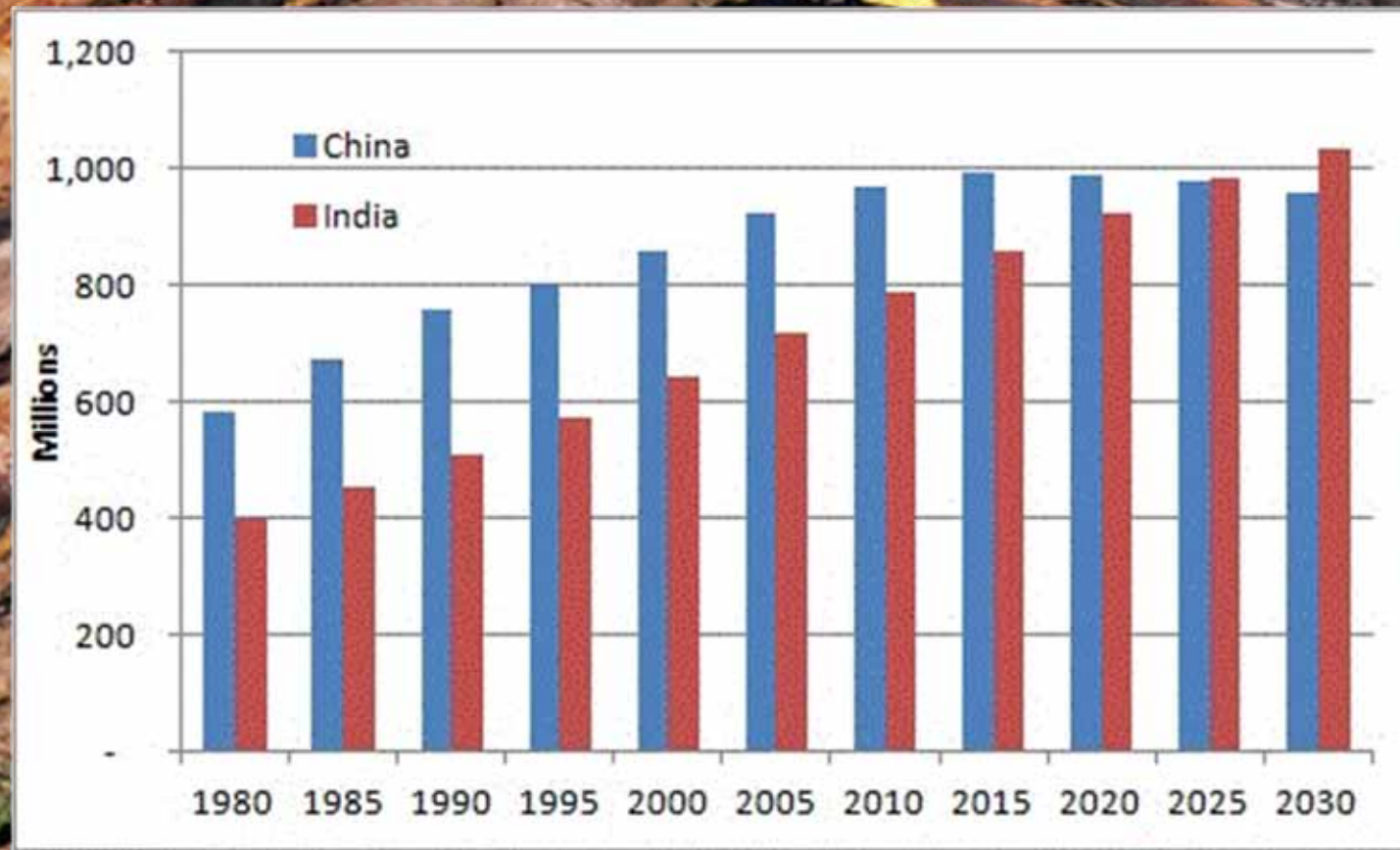


Forest Markets – India

India's imports of softwood lumber will also be about 10% lower in 2012, due to slower economic growth



Forest Markets – India



‘By 2030, India's working age population will be 8% larger than China's’

“India's per capita consumption of paper & paperboard is < 10 kg (China = 72kg/capita)”

...demand has been growing rapidly, and consumption of recovered paper, wood pulp and non-wood pulp have nearly doubled over the past decade.” - - Robert Flynn, RISI

Forest Markets – New Products

Cross-Laminated Timber



Forest Markets – New Products

High-Rise Timber Structures



Forest Markets – New Products

Thermally Modified Wood



Forest Markets – New Products

- Bulk fuel

Neste Oil:
NExBTL
biodiesel

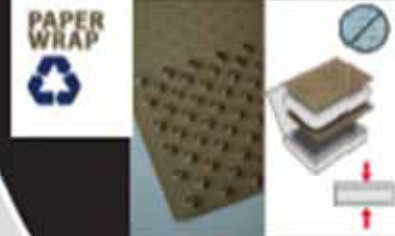


- Consumer materials



Coca-Cola and Heinz:
PlantBottle™ partly from
biomass

- Substituting
plastic
packaging



"Paper bubble
wrap" from
Yanko design

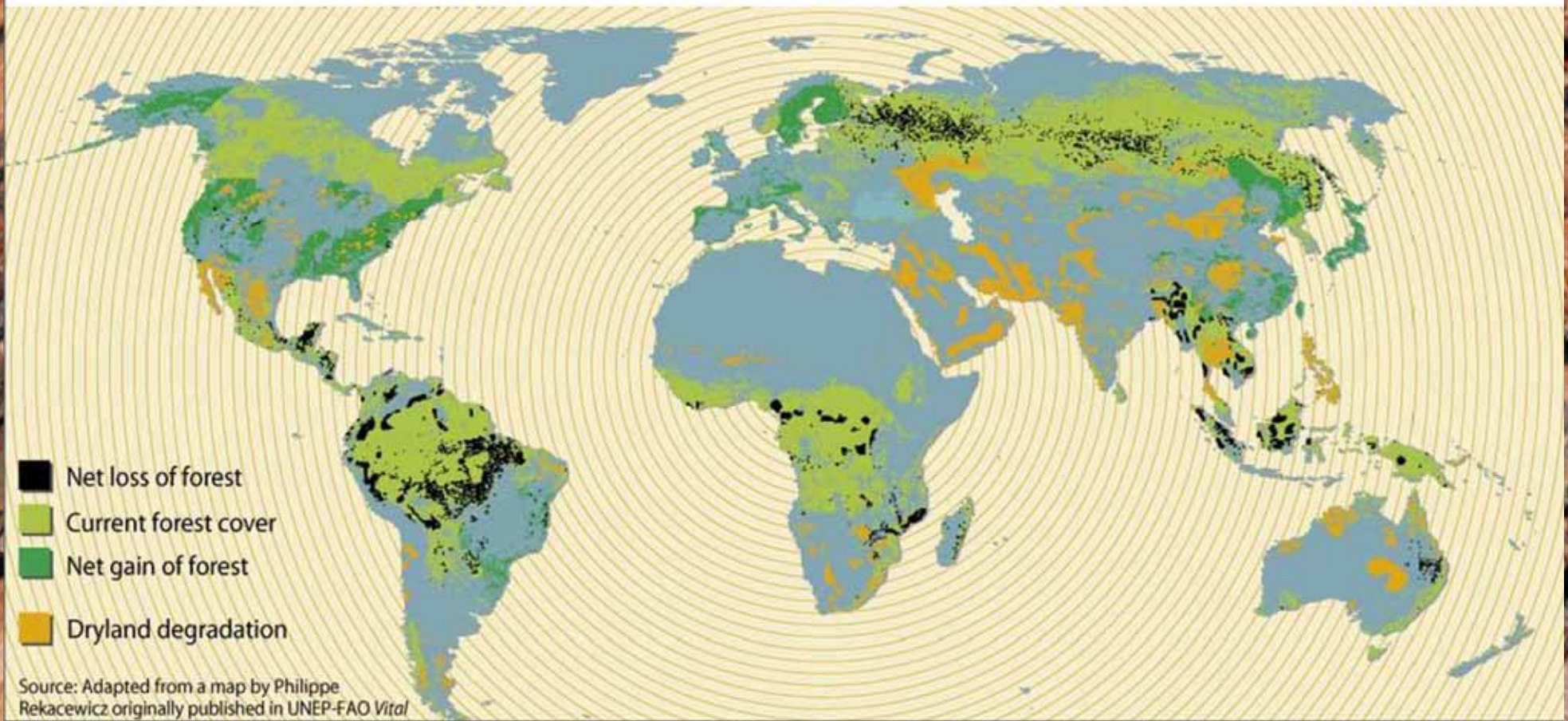
Zetix bombproof
fabric from
Auxetics
Inc



- Towards
superfibres

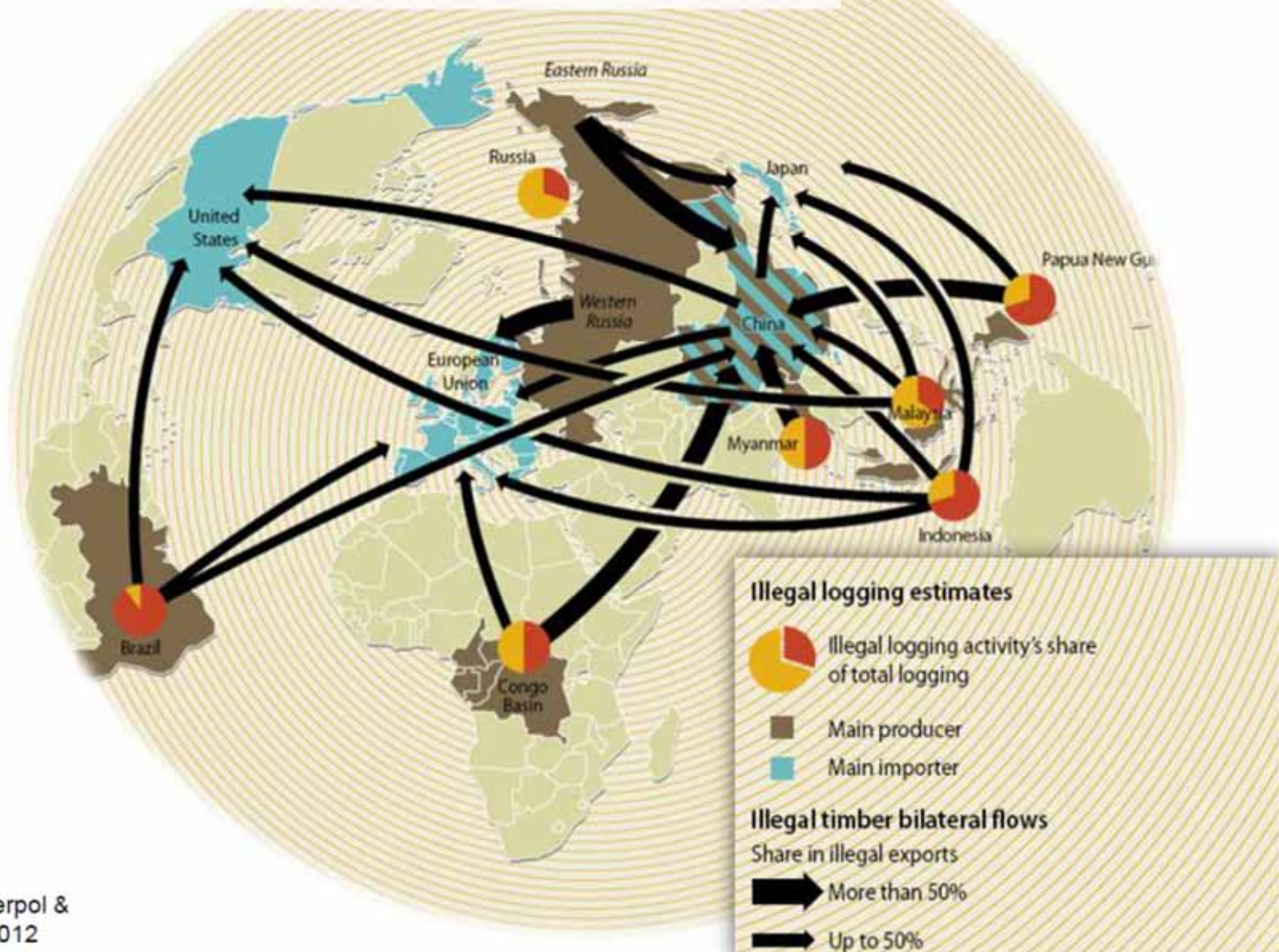
Forest Markets – Illegal Logging

- Most deforestation occurring in tropics (globally 5.3 million hectares per year ~ 25% of Idaho's forests)
- Illegal logging occurs in tropics (and temperate) forests
- Illegal trade stems from illegal logging
- *These issues negatively affect the global forest sector*



Forest Markets – Illegal Logging

Main bilateral flows of illegal timber



Source: Interpol & UNEP, 2012

Forest Markets – Illegal Logging

Costs of illegal logging and illegal trade of timber

- Valued at \$30-100 billion annually (Interpol & UNEP)
- Occurs in all countries to some extent
- 15-30% of global trade
- Depresses timber prices by 16%
- 1.2 billion people (20% world population)
 - Depend on forests for their livelihood
 - Deprives them of their full revenues





**World Debt or Leverage
nothing really has changed –
it just keeps piling up**

Cyprus: A “Game Changer”

Forest Markets – CEO Outlook

Threats to growth are looming for forest, paper & packaging CEOs

*Economic
uncertainty*

87% of sector CEOs say uncertain or volatile economic growth could threaten their prospects.

*Over-
regulation*

76% of forest, paper & packaging CEOs think over-regulation could hurt growth.

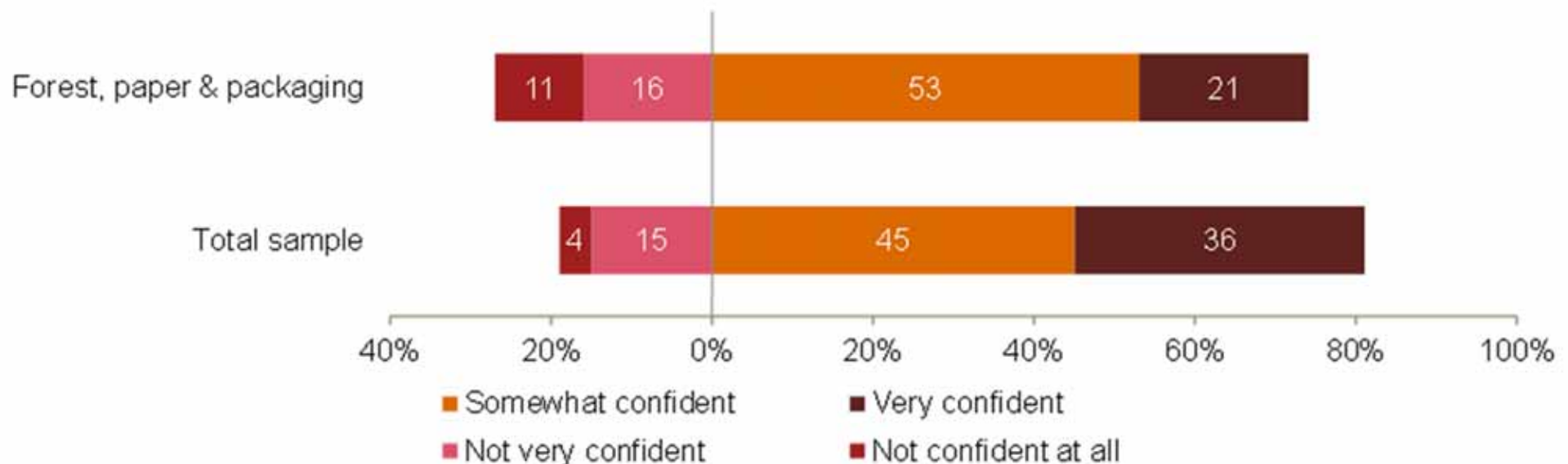
*Energy
and raw
material
costs*

76% see them as a concern, compared to just 52% of the overall sample.

Forest Markets – CEO Outlook

Forest, paper & packaging CEOs outlook for the next 12 months is subdued

The forest, paper & packaging sector is dealing not only with external shocks, like the earthquake which disrupted Chilean pulp production in 2010, but also with profound structural changes in demand. So it's not surprising that while the majority of forest, paper, & packaging CEOs expect to grow over the next 12 months, their outlook is more cautious than peers across the total sample.



Q: How confident are you about your company's prospects for revenue growth over the next 12 months?

Base: All respondents (Total sample, 1330; Forest, paper & packaging, 38)

Conclusions

Even in our current economics, there are growing markets:

- China – Paper, wood products, and logs
- Western Europe – Bioenergy and biomass markets
- European sawmill industry faces headwinds – housing and wooden packaging
- Asia has been, and will continue to be, the growth-driver of the forest products and paper industry.
- Expect Asian companies to remain focused on Asia: Why go elsewhere?

From CIBC: Demand for virgin wood fiber in the future,

1. Decline – in relative supply to recovered paper
2. Rise in Asia's wood fiber deficit
3. Growth of the bio-energy/chemical sector

Conclusions

Canada

- U.S housing market
- Asia
- Bio-energy/chemical sector – home and abroad
- Is housing in a bubble?

United States

- A never ending stream of new regulations
- Rising energy prices
- Economic Uncertainty
- Continued consumer pessimism
- Apparent continuing decline in “real” median incomes

The BIG question? → Will the U.S. housing market continue healing?

Questions?

Thank you

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