

# TIMBER TRENDS

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## Highlights

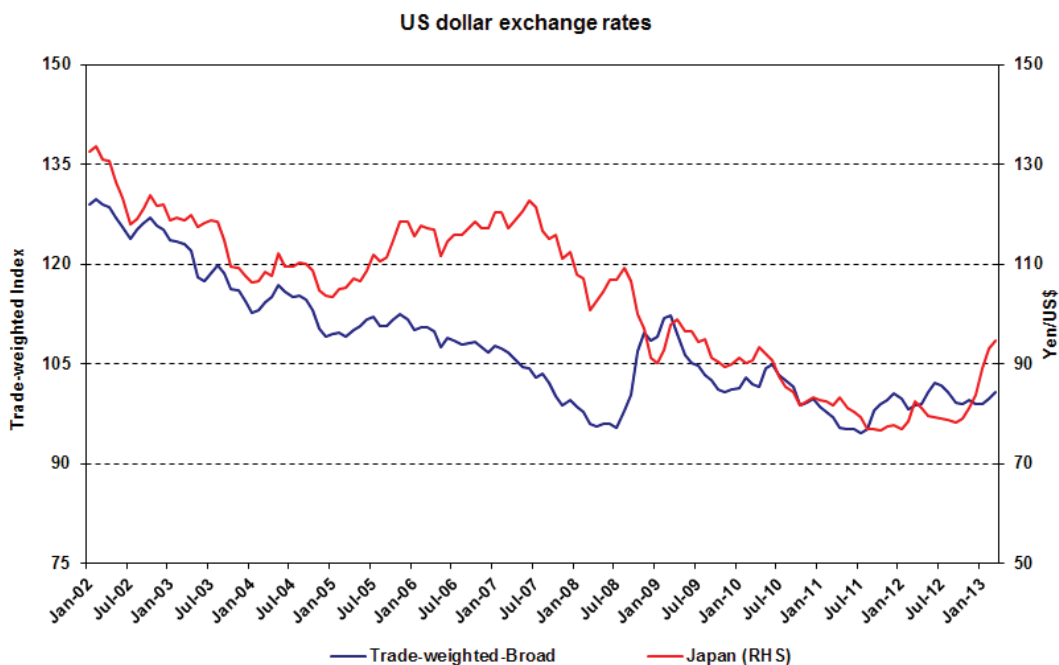
- US housing continues its recovery, contributing to a strengthening economy.
- Multi-family housing starts in the US are riding high at present, but they appear to be cresting.
- US West Coast log prices continue to rise, driven by export demand and increasing commodity lumber prices.
- Sawlog prices in the US South remain flat in the face of limited sawmill demand resulting from capacity closures in the downturn and a current abundance of supply from deferred harvest.
- The mountain pine beetle epidemic will continue to crimp timber supply for at least another decade, as it moves eastward into Canada and deeper into the intermountain states in the US.

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## International Trade

**The US Dollar Is Holding Its Own Against Its Major Trading Partners--Except For Japan**

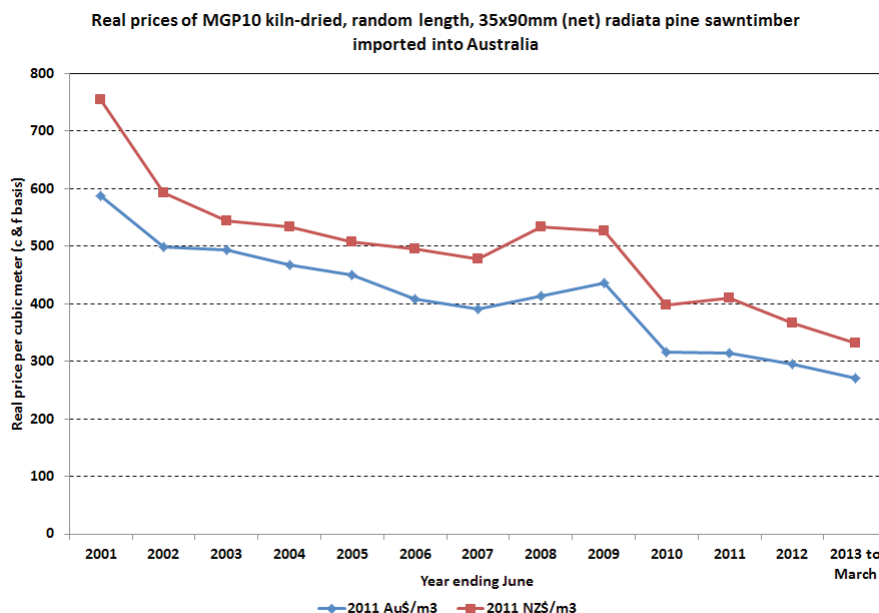


Source: Federal Reserve Bank

## Trade in Wood Products

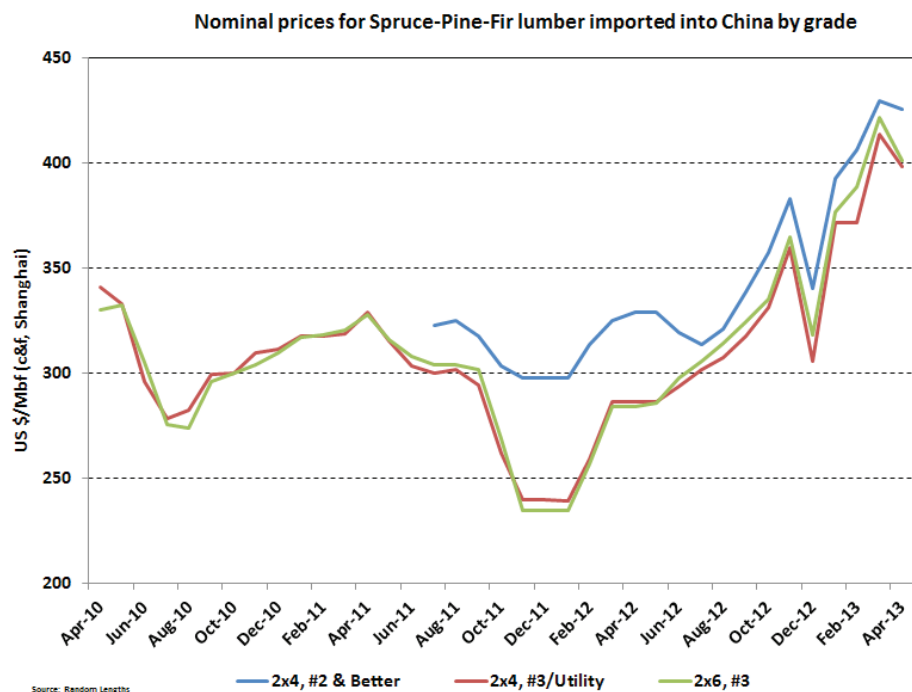
### Australia

#### Prices Of Framing-Grade Radiata Pine Lumber Entering Australia Are On A Long-Term Decline



### China

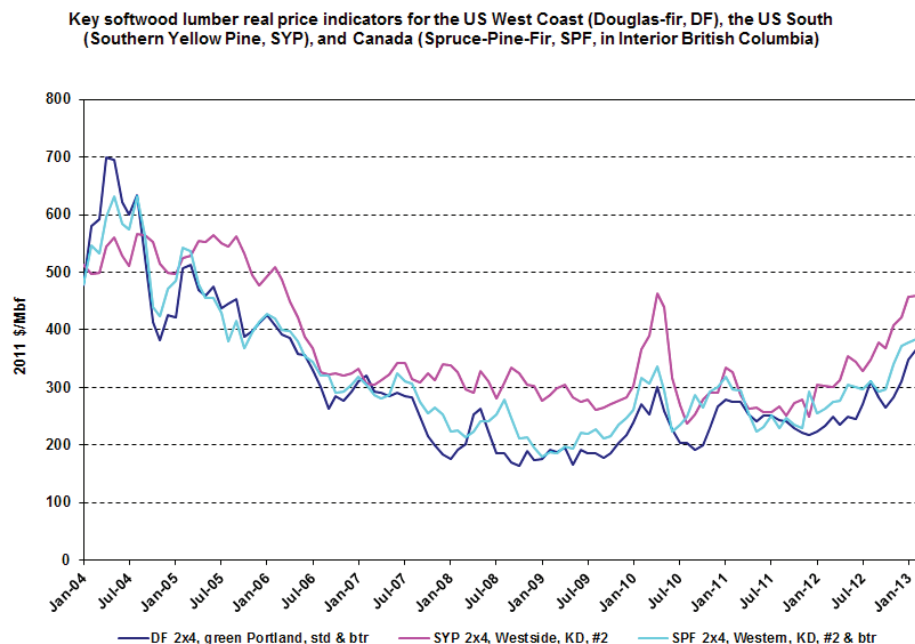
#### Prices For North American SPF Lumber Entering China Have Softened In Recent Months



## Prices

### North American Lumber

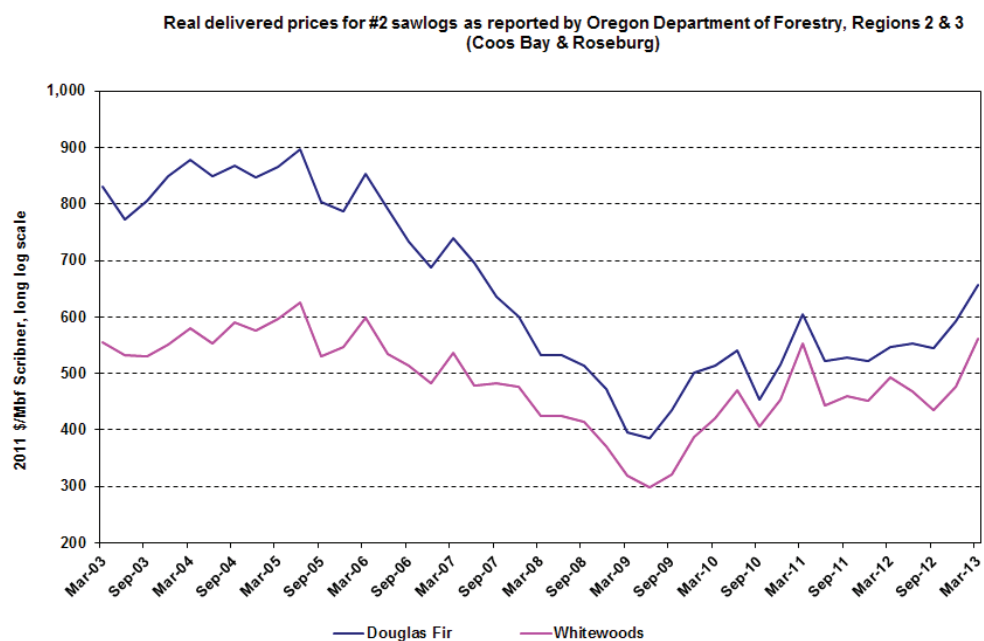
#### In Real Terms, North American Lumber Prices Are Fast Approaching Levels Of 2005



Source: Random Lengths, BLS

### Pacific Northwest Coastal Region

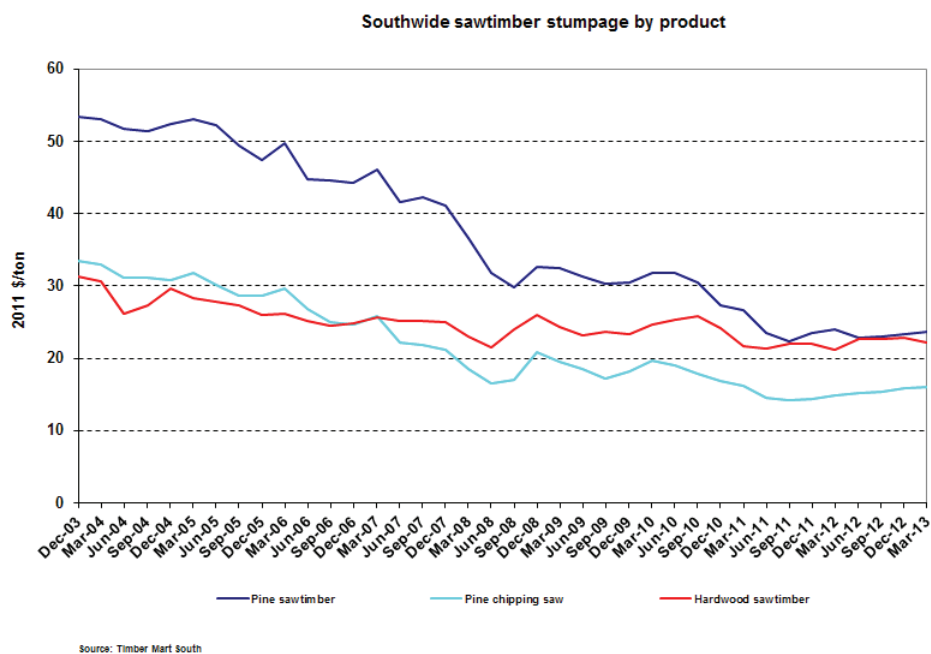
#### Log Prices Have Turned Up Sharply In The Last Six Months



Source: ODF

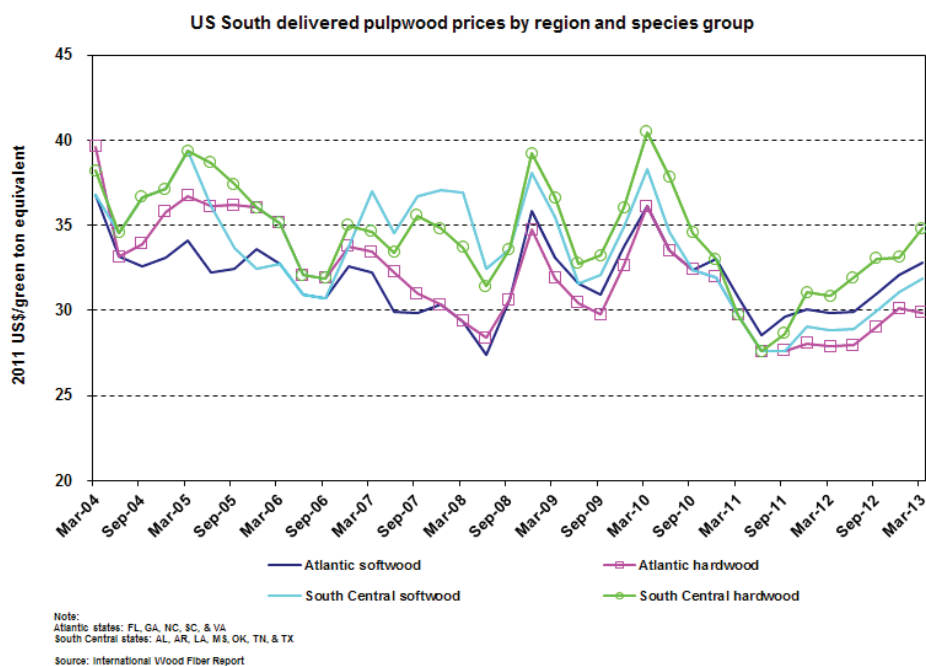
## US South

### Low Log Demand And Abundant Log Supply Underlie Flat Sawlog Prices In The US South



## Pulpwood and Chips

### Delivered Pulpwood Prices In The US South Are Rising From The Lows Of 2011-12



## Economics

### Canada

#### Slowdown Predicted For Canadian Economy<sup>1</sup>

Canadians can anticipate two years of economic difficulties, with higher unemployment and a protracted correction in the housing market, according to Capital Economics, an international forecasting firm. The firm projected a growth rate of 1% in the Canadian economy this year, improving only slightly to 1.3% in 2014.

## Global Wood Prices

#### Sawlog Prices In North And Central Europe Have Trended Downward The Past Two Years<sup>2</sup>

Sawlog prices have trended downward, in US dollar terms, in most major markets in Western Europe during the past two years, but this trend was broken in 2012Q4 when prices increased slightly mainly as a result of a weakening US dollar. In the local currencies, log prices were practically unchanged in 2012Q4.

The biggest price declines have been seen in Sweden where pine sawlog prices fell over 15% from 2011Q4 to 2012Q4 in both local currency and US dollar terms. Spruce log prices have declined over 25% during the same time period. In Finland, Germany and Norway, prices have dropped a more modest 5-10% over the past two years. Sawlog prices fell during 2012 because sawmills were cutting back production in response to the weaker demand for lumber throughout Europe.

While log prices have fallen in both US dollar terms and local currencies the past two years in Northern and Central Europe, prices for sawlogs in 2012Q4 in Eastern European countries, including Estonia, Latvia and the Czech Republic, were generally higher than in 2011. This development has mainly come as a result of the relatively strong lumber export market which kept the log markets healthy.

The only major market in Eastern Europe where log prices have fallen has been Poland. From 2011Q2 to 2012Q4, average prices have fallen over 20% and the country has now some of the lowest conifer sawlog prices in Europe.

As a consequence of slowing lumber production, log trade declined in Europe during 2012, which also had a dampening impact on log prices on the continent. Net log imports to Western Europe fell from over 14 million m<sup>3</sup> in 2011 to an estimated 10.8 million m<sup>3</sup> in 2012. Much of the decline in imports was those from Russia and the Baltic States.

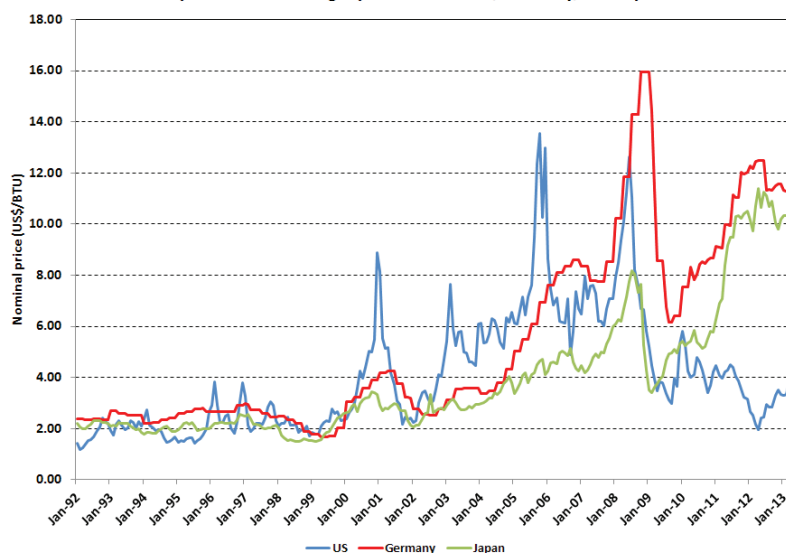
Sawlog prices might be close to the bottom in 2013Q1, and they are likely to remain at these levels as long as European demand for lumber continues to be weak. Despite the recent price declines, current price levels are higher than the ten-year average in all major markets throughout Europe.

## Costs

### Energy

#### It Is Small Wonder That Wood Pellet Demand In Europe Is So Strong: Will Japan Follow Suit?

Comparison of natural gas prices in the USA, Germany, and Japan



## Substitute Materials versus Wood

### US Paper Recovery Rate In 2012 Reaches 65.1%, Nearly Doubling Since 1990<sup>3</sup>

The American Forest & Paper Association announced that 65.1% of paper consumed in the US in 2012 was sourced from recycled fiber. The annual paper recovery rate has nearly doubled since 1990 and remains above the trend line for the industry to achieve its goal of recovering more than 70% per year by 2020.

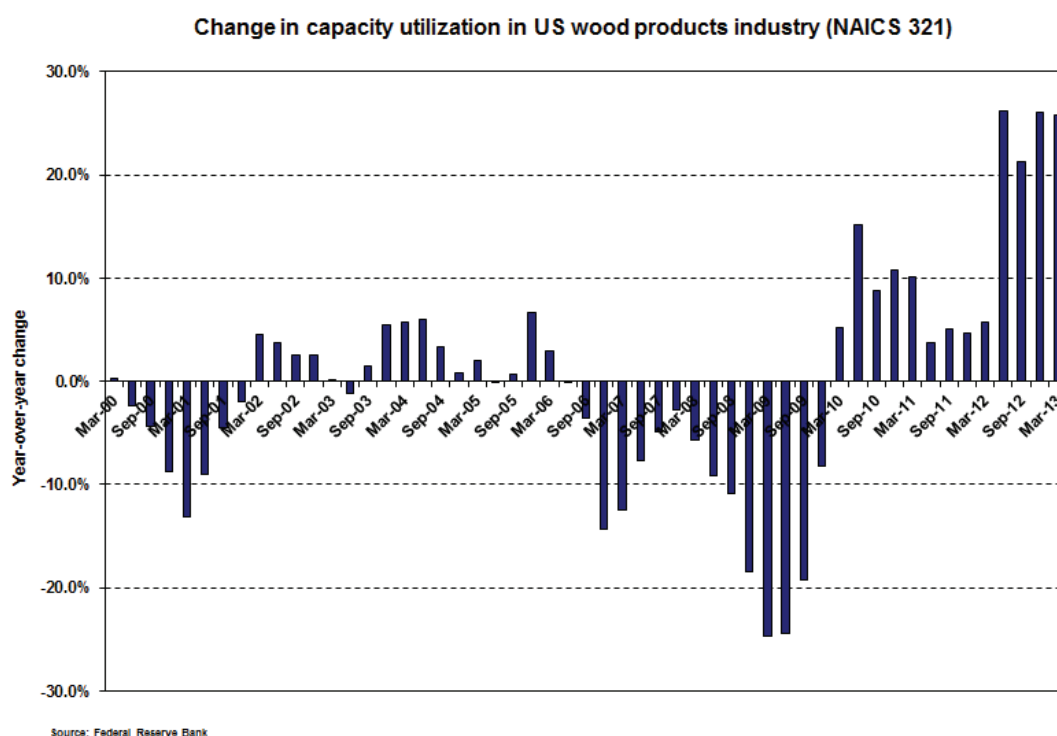
## Supply

### US Lumber Production

#### US Lumber Output In January Up 12.5% Versus Year Ago<sup>4</sup>

US lumber production in January totaled 2.596 bbf, up 12.5% compared with the January 2012 total and 22.1% higher than the December 2012 figure, according to the Western Wood Products Association. Western production rose 15.6% in January versus a year ago; output in the South was up 9.9%.

#### Increasing US Lumber Production Is Reflected In Increasing Capacity Utilization



#### Western Lumber Output Jumps Versus Year Ago<sup>5</sup>

Western lumber production through February totaled 2.267 bbf, up 11.6% from the January-February 2012 total according to the Western Wood Products Association. Coast production was up 11.7% through the first two months this year compared with the same period last year. Inland production was up 9.0%, and production in the California Redwood region was up 38.4%. Across the West, February production totaled 1.108 bbf, down 4.4% from January but up 7.7% from the February 2012 total.

### Canadian Lumber

#### Canadian Lumber Output Rebounds In January<sup>6</sup>

After falling 20% from November to December, Canadian lumber production rebounded with a 26% gain in January, according to Statistics Canada. At 2.0 bbf, production also was 10% above the January 2012 level. Quebec led year-over-year gains with an 18% increase to 416 MMbf, a 15% increase from December. British Columbia increased 30% from December to 1.1 bbf, 54% of total Canadian output.

## Interior Mills Outside Beetle Zone Draw Investment<sup>7</sup>

Companies hunting for wood are finding it in the north and southeast of the province. Areas of the Interior that were largely spared from the pine beetle blight are now attracting investment from large forestry companies. Canfor plans to invest \$80 million in its Mackenzie and Elko sawmills this year, and reopened its shuttered Radium mill last fall. Interfor has invested \$26 million to rebuild its Grand Forks sawmill and has sunk another \$5 million into its Castlegar mill.

## Logs

### Canada

## Mountain Pine Beetle Poised To Ravage Eastern Canada<sup>8</sup>

Billions of mountain pine beetles from BC are expected to devastate forests in Ontario, Quebec and the Maritime provinces as they munch their way east over the next two decades, scientists predict in a new documentary. "Most every scientist studying the beetle feels that it's inevitable," said David York, the filmmaker behind "The Beetles Are Coming." "It's going to happen and we're going to have to adapt."

The rice grain-sized mountain pine beetle has already wiped out an area of BC's lodgepole pine forest as large as Nova Scotia and New Brunswick combined. It has since crossed the Rocky Mountains into Alberta and is heading for Saskatchewan. The mountain pine beetle is native to northern BC where it has long played an important role in the renewal of lodgepole pine forests, York said. "The beetle's job is to take out 80- to 100-year-old over-mature pine trees, thin out the canopy and allow room and nutrients for younger trees to grow." Lodgepole pines have evolved defences against the beetles, which have also traditionally been kept in check by harsh, cold winters, limiting their damage to small outbreaks every 25 years or so.

### Russia

## Putin Pledges 400 Billion Rubles For Russia's Forest Industry<sup>9</sup>

Russia will earmark 400 billion rubles (US\$13 billion) to finance priority projects in the country's forestry industry to make the sector attractive for investment and address its long-term problems, President Vladimir Putin said. "We must also make forestry attractive for investment. We plan to invest over 400 billion rubles in 118 projects in the sector which have received priority status," Putin told a State Council meeting which discussed measures to increase the efficiency of the forest industry.

Russia's forestry business has been in the doldrums for the past two decades, marred by poor governance, low investment potential and the growth of illegal felling and illegal timber sales. Up to 20% of timber logging or about 35 million m<sup>3</sup> of timber is illegal, with economic damage from illegal timber sales estimated at 13-30 billion rubles (\$420-\$970 million) annually, according to WWF Russia and World Bank data. Putin said Russia needed to stiffen punishment for illegal loggers. "First of all, we need to streamline a system of accurate monitoring and define tougher measures for those who barbarically destroy the forest," Putin said. Over 7,000 people were fined in 2012 for illegal felling, with damage amounting to around 10 billion rubles, the president said, adding only 2% of these funds were recovered. "The forest also needs to be rescued from illegal felling, which has increased by 66% in the past five years and the amount of this felling remains colossal," Putin said.

The existing system for forestry project selection, which favors large production facilities for timber processing, should also cater for small and medium businesses, Putin said, adding Russia also needed universal methods of support for all businesses which could bring economic and social benefits.

### Asia/Oceania

## Surge In Log Exports Gives Forestry Investors Hope<sup>10</sup>

Forestry investors are touching wood over forecast growth in forestry production, worth more than \$3 billion a year in exports alone. Latest gross domestic product figures showed forestry production was up 9% in the December quarter, to its highest level since The Statistics New Zealand's series began in 1987. In the next few years, New Zealand forests are predicted to increase log production by 5 million m<sup>3</sup>, on top of the 26 million m<sup>3</sup> of logs already produced a year.

The present surge had resulted from rising housing starts in the United States, which had slowed the flow of wood to China. According to Agrifax, New Zealand prices for A-grade logs were up by about 1% from February to March, for a weighted average price of \$101/tonne.

Statistics NZ said total exports, worth more than \$3b per year, made forestry the country's third largest export goods sector, behind dairy and meat. The monetary value of New Zealand's exports of logs, lumber and other wood products was \$847 million in the December 2012 quarter.

## Demand

### January Furniture Factory Orders Rise<sup>11</sup>

January furniture factory orders increased 7% and shipments jumped 10% from the same month in 2012, Smith Leonard reported. The accounting and consulting firm's monthly survey of residential furniture manufacturers and distributors showed that 65% of participants reported higher orders, some by double digits.

### February Construction Spending Advances<sup>12</sup>

US construction spending during February was estimated at a seasonally adjusted annual rate of \$885.1 billion, 1.2% higher than the revised January estimate and 7.9% higher than the February 2012 figure, according to the Census Bureau. Residential construction was at a SAAR of \$303.4 billion in February, 2.2% above the revised January estimate.

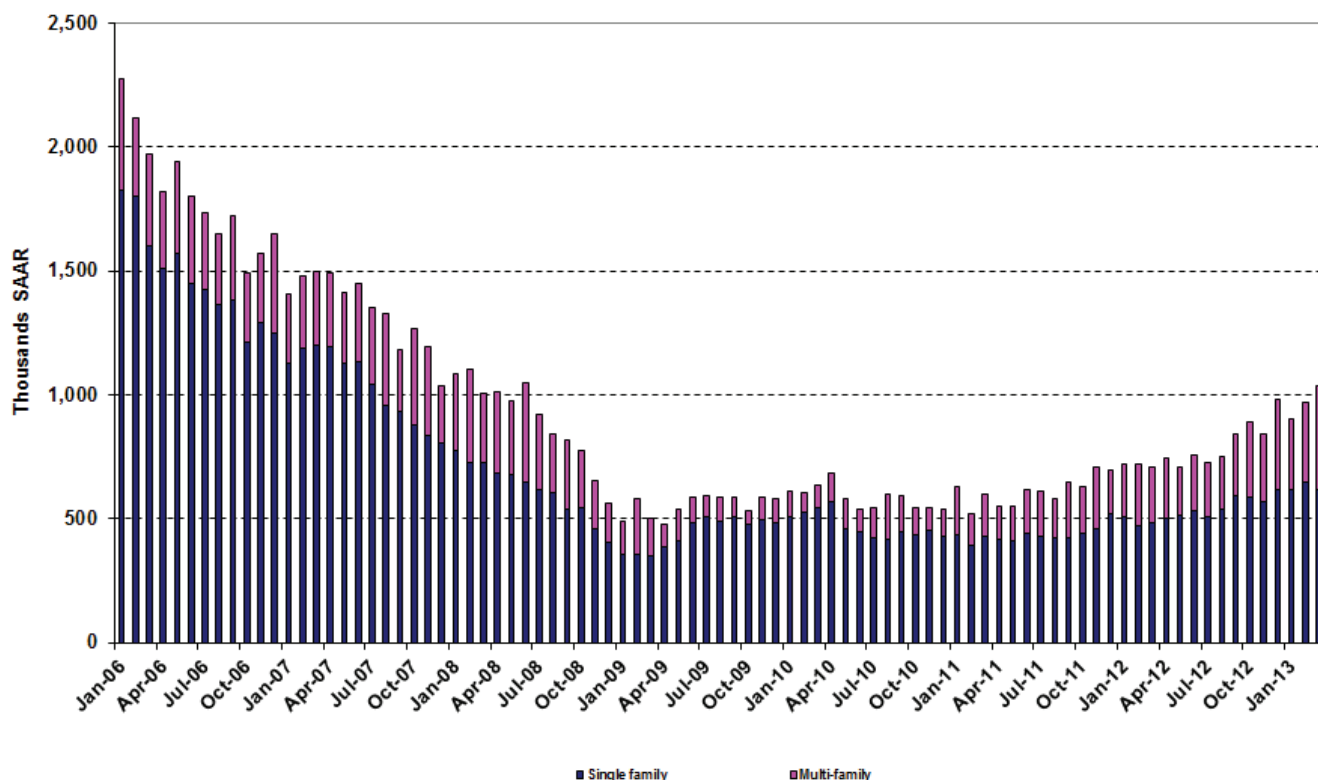
## Housing

### US Housing Starts Surge In March<sup>13</sup>

US housing starts were at a seasonally adjusted annual rate of 1.036 million units in March, 7.0% higher than the revised February estimate and 46.7% above the March 2012 rate, according to the Census Bureau. The March rate of starts was the highest since June 2008. The increase was driven by a big jump in multifamily starts. Single-family housing starts were at a SAAR of 619,000 units in March, 4.8% below the revised February figure.

### Housing Starts Breached The 1 Million Mark In March, On Surging Multi-Family Starts

US housing starts



Source: US Census Bureau



## Pent-Up Demand For Homes Among US Millennials Beginning To Surface<sup>14</sup>

Housing industry, brace yourself: The Millennials are moving in. A generation that's about 90 million strong, Millennials (or Generation Y) forms the largest demographic wave in the nation's history—even larger than the Baby Boomers. And now that the oldest are in their early 30s (the youngest are 12), they're coming of age for home ownership.

They're not that different from their parents, except they're not as wowed by luxury and are more likely to demand technology and flexible space. "This generation is coming at the right time," says Fred Ehle, vice president for PulteGroup. "It's the largest potential number of buyers coming in to the market."

They would've come sooner had the recession and high unemployment not deferred many Millennials' dreams. "We forget how tough it is right now for these young GenYs to have a down payment," says Greg Tsujimoto, manager at John Burns Real Estate Consulting in Irvine, CA. "They have student debt. Another obstacle is finding and establishing their careers."

Slowing GenY's entry into the housing market: delaying moving out of Mom-and-Dad's house, delaying marriage and delaying kids. "Right now, it's either GenXers or Boomers buying," Tsujimoto says. "It's no secret Millennials want to own a home. That hasn't changed. But there's at least a four-year delay."

The pent-up demand is starting to surface, and "that will more than offset a year or two we missed in the market," Ehle says. "As soon as we get these folks out of their parents' basement and into a job ... " Unemployment for Millennials (born from 1982 through 2001) is just under 10%, more than two points higher than the US rate of 7.7%, he says.

They will buy when they're ready, says Tommy Stephenson, broker/owner of Better Homes and Gardens Real Estate Executive Partners in Augusta, GA. "Millennials are more well-versed and educated in regard to today's real estate industry and are prepared to buy when the time is right for them," he says.

## US Property Owners Recapture US\$1.6T In Real Estate Equity In 2012<sup>15</sup>

More American homeowners will be able to use their properties as cash machines again after real estate equity jumped last year by the most in 65 years. Property owners recaptured \$1.6 trillion as home values climbed to the highest levels since 2007. The amount by which the value of the houses exceeds their underlying mortgages rose to \$8.2 trillion last year, a gain of 25%, according to Federal Reserve data.

An expanding group of homeowners is able to get cash from their properties as banks show more willingness to make home equity loans with the market's recovery. Originations for so-called junior, or second, mortgages should rise 10% to almost \$83 billion this year, from about \$75 billion in 2012, said Shaun Richardson, a vice president at Icon Advisory Group, a mortgage analytics firm in Greensboro, NC. About 6% of lenders eased equity-mortgage standards at the end of 2012, the most in 18 months, according to the Fed.

"Lenders are starting to come back into the marketplace," said Greg McBride, a senior financial analyst at Bankrate Inc. "We're not going back to the Wild, Wild West we saw during the real estate boom, but we are going to see more people spending their equity."

## Has Multifamily Sector Already Hit Its Peak?<sup>16</sup>

Multifamily housing in 2012 accounted for 31.5% of all housing starts, a greater proportion than in any year since 1986. Inclusive of those years and all in between, multifamily starts were 22% of all starts. "That was an outgrowth of a policy America has to get people to own homes," noted one forest products analyst, who indicated the multifamily proportion has simply reverted to the norm.

However, there are now signs, as well as anecdotal evidence, that the multifamily sector may be topping. The sector was boosted by a shift from ownership to renting as the housing collapse generated a foreclosure wave, which is now ebbing. Meanwhile, a bottom in housing prices is enticing qualified buyers into the single-family market.

Also, the rental vacancy rate in the second and third quarters of 2012 was 8.6%, lowest for any quarter since 2002. That rate, which comprises both single-family and multifamily housing, increased to 8.7% in the fourth quarter. The rate for single-family housing rose from 8.7% to 8.9%, but the rate for housing of five units or more fell from 9.1% to 8.8%, lowest since the fourth quarter of 1999. Lower vacancy has driven up rents.

Still, it could take time for the multifamily sector to crest. The latest housing starts report showed the sector remains relatively strong. Although a drop in the sector accounted for a sizable decline in the South last month, permit data nationally remained robust.

## US Home Prices Up 8.1% In January From Year Ago<sup>17</sup>

Average home prices increased 8.1% in the S&P/Case-Shiller 20-city home price index for the 12 months ending in January 2013. All 20 cities posted year-over-year gains, led by Phoenix with a gain of 23.2%. Nineteen of the cities showed acceleration in their year-over-year returns.

## New Home Sales Dip In February<sup>18</sup>

US sales of new, single-family homes were at a seasonally adjusted annual rate of 411,000 units in February, 4.6% below the revised January rate but 12.3% higher than the February 2012 estimate, according to the Census Bureau. The median sales price of new houses sold in February was \$246,800. The seasonally adjusted estimate of new houses for sale at the end of February was 152,000, representing a supply of 4.4 months at the current sales rate.

## Pulp and Paper

### The Sixth International Woodfibre Resources And Trade Conference, Istanbul<sup>19</sup>

At the Sixth International Woodfibre Resources and Trade Conference in Istanbul, key market players and experts gave their outlook for the international pulp, woodchip, and biomass markets. Pulp producers are increasingly diversifying their market exposure to the textile industry and the growing paper markets in Asia, where tissue consumption in particular is forecast to drive pulp demand. Also, paper for food packaging and less recovered paper availability from developed countries will support wood pulp demand going forward. Similarly, the outlook for the biomass market in Europe is positive. Private consumers, as well as large and small-scale energy producers, are increasingly looking for alternative energy sources to high oil and electricity prices. The market is growing, and US pellet production has developed more rapidly than expected to support a growing demand from Europe.

## Announcements

### German Pellets To Build Second US Pellet Plant<sup>20</sup>

German Pellets is further expanding its production capacities in North America. In Urania, a town in northern Louisiana, German Pellets will soon begin construction work on a new pellet production facility. The output will be about 1 million tonnes of wood pellets per year. Urania will be the German Pellets Group's second North American site. In April a plant will open for production in Woodville, TX.

"Once again, we have chosen a site with well-established wood supplies and logistics," said Peter Leibold, manager of the German Pellets Group. Until a few years ago Urania had been an important location for the wood-based panel industry. The US company Georgia Pacific had produced particleboard and other products at this site. Supply and other infrastructure, including a railway siding, are already in place. Construction on the new plant will begin soon. The decisive factor for the choice of location was the availability of raw materials in this densely forested region, where the annual timber increment is significantly higher than in Germany owing to the subtropical climate.

Demand from the European power plant market for the production of heat and electricity from wood pellets has risen sharply. There is also an increasing demand for wood pellets among private consumers and large-scale users, for example for supplying heat to hospitals, schools, commercial buildings and industrial facilities.

For the transport of wood pellets from the Urania and Woodville sites to Europe, German Pellets will be using the harbor of Port Arthur, TX, on the Gulf of Mexico. At the deep-water port, German Pellets operates storage and loading systems.

### World First For Swedish Environmental Technology<sup>21</sup>

On 12 March, the North American pulp and paper company, Domtar, announced that it had started the operation of a facility for separating lignin from the process at its pulp mill in Plymouth, NC. The facility is the first of its kind in the world on a commercial scale, based on the LignoBoost technology developed by Swedish research company Innventia and researchers at Chalmers University of Technology.

The successful installation of the LignoBoost facility represents the culmination of a research and technology project that Domtar began in 2010. BioChoice lignin is Domtar's name for the product, and production in Plymouth--capacity around 75 tonnes per day--began in February this year. The lignin is intended to be used for a wide range of industrial applications, for example as a bio-based alternative to oil and other fossil fuels, or as raw material for other materials.

LignoBoost is a unique and effective process for extracting high-quality lignin from kraft pulp mills, and has generated a great deal of interest--both in Sweden and internationally. The technology has been developed since the late 1990s by Innventia in Stockholm, in association with Chalmers University of Technology, within the framework of three research programs. In 2008, Innventia sold the LignoBoost concept to the technology company Metso, which is now delivering the first facility to Domtar.

The technology is being continuously improved. Metso and Innventia have been working together since 2008 to refine the technology and to develop new lignin applications in partnership with potential customers. Lignin is one of the main focus areas for Innventia's research and development, and the work is being carried out in association with customers within the industry. "It would be fantastic if this were to represent a reversal of the trend," said Innventia's Per Tomani, one of the people behind LignoBoost. "It creates opportunities for developing kraft pulp mills into modern biorefineries that can supply large volumes of products in addition to the traditional fiber products and by-products--primarily tall oil and electricity.

## New Zealand Forest Grower Referendum Support Levy<sup>22</sup>

A referendum of New Zealand forest growers has shown strong support for a levy on harvested forest products. "We have been given the thumbs-up to introduce a funding system that will provide greater certainty, equity and commitment for activities that benefit all growers, such as research, promotion and forest health," says Forest Growers Levy Trust chair Geoff Thompson. "At this stage, we expect the levy to be introduced on 1 January 2014."

The audited referendum results reveal that 502 growers (86.3%) voted yes and 80 (13.7%) voted no. There was the same percentage support when the votes were weighted by area, with 947,762.71 hectares (86.3%) in favor and 149,926.91 ha (13.7%) opposed. Mr. Thompson said having identical percentages for voters and area was "simply a fluke". Under the Commodity Levies Act, for the levy to proceed it must have the support by number and by area of more than 50% of those forest owners who voted.

The Trust believes the turnout was about 15% of an estimated 4,000 eligible voters. Their votes represent more than two-thirds of the eligible forest area. "This was quite a good turnout, compared with other recent primary sector referenda," says Mr. Thompson.

## Georgia-Pacific To Open Massive Clarendon, SC, OSB Mill<sup>23</sup>

South Carolina government officials joined Georgia-Pacific leaders to celebrate the start-up of production at the company's oriented strand board (OSB) plant at Clarendon County, SC. The mill was part of a \$400 million acquisition of Grant Forest Products in 2010 that also included a plant in Allendale County, SC, and another plant in Englehart, ON. Georgia-Pacific spent an additional \$30 million to complete construction on the Clarendon facility in 2011, and in 2012 announced plans to start-up operations this year.

## Transparent Paper Made From Cellulose Nanofiber<sup>24</sup>

Oji Holdings Corp. and Mitsubishi Chemical Corp. have announced that they have succeeded in making sheeted transparent paper by thoroughly thinning down plant-fiber material to enable the world's first mass production of such product. The two companies will work to put the transparent paper, which can be folded like origami and is expected to be applicable for pocket-size electric newspapers and other devices, into practical use around 2016 or 2017.

The firms succeeded in producing the paper from "cellulose nanofiber" which was developed by thinning down the plant-fiber pulp for making regular paper to about one-20,000th of a strand of hair. The transparent fiber had been too thin to make sheeted paper, but Oji Holdings and Mitsubishi Chemical have developed a new method of doing so by adding a chemical treatment during the processing.

Although the new material is as thin as one-50th of a millimeter, it is as strong as firefighting clothing and is resistant to heat, making it possible for it to be used for lighting and as displays for tablet devices. Mitsubishi Chemical will study technology to show various colors on the new material, and the two companies plan to set up a joint venture for the project's full-fledged operations for the new product once preparations are set for mass production.

## Openings, Closings, Curtailments

### Oregon Sawmill Shuts Down<sup>25</sup>

Rough & Ready Lumber Co. of Cave Junction, OR, has announced its closure due to the mill's inability to secure a sufficient supply of logs from the surrounding federal forests.

### Colville Plywood Mill In Omak, WA, To Reopen<sup>26</sup>

Wood Resources has signed a 25-year lease with the Colville Tribal Federal Corp. to reopen the Colville plywood mill in Omak, WA. The mill has been shut down since 2009, and will require significant restorative maintenance and upgrades to become operational. Wood Resources expects to begin manufacturing veneer as soon as this summer. The mill will produce softwood veneer for Northwest markets, as well as Douglas-fir plywood for specialty and commodity applications. Wood Resources operates the Olympic Panel Products plywood mill in Shelton, WA, as well as plants in North and South Carolina.

## Certification/Environmental

### Pine Bark Beetles Poised For New Attacks On Canada's Boreal Forests<sup>27</sup>

After more than a decade, the mountain pine beetle epidemic that surged through British Columbia appears finally to be in remission. Having devastated the province's lodgepole pine forests, the insect is running out of food.

But forest managers now see new beetle infestations appearing at the edge of the Boreal Forest, in Alberta, and in the Yukon and Northwest Territories--areas well outside the insect's historical range. As a warming climate lifts the temperature limitations that once kept the beetle in check, scientists fear it may continue its push across the continent, perhaps as far as the Atlantic Coast.

British Columbia is home to the largest contiguous pine forests in North America, and the pine beetle is no stranger to the territory. In measured doses, the beetle can actually play a useful role in lodgepole forest ecology, attacking *en masse* every century or so and killing off mature stands so that fire and decomposition can clear the way for new growth. These outbreaks have historically been limited by the cold northern climate in which lodgepole pine typically grows. The beetle's life cycle is regulated by temperature,



and cold snaps are one of the only sure ways of killing the insects off in large numbers. Since the late 1990s, however, temperatures in North America have held at levels well above the historical average, allowing MPB to explode through the province.

"In 2004, we had pine all over the place," said Staffan Lindgren, a professor at the Natural Resources and Environmental Studies Institute at the University of Northern British Columbia. "Now, if I drive around [the city of] Prince George and I see a mature pine tree, it's remarkable. We saw 90 to 99% die-off among mature pines in some areas."

By 2006, clouds of beetles were swarming over the Rocky Mountains and coming down as much as 400 miles distant. Farmers reported hearing sounds like hail on their roofs in the middle of summer, only to find that beetles were raining down out of the sky. "The rate of expansion surprised virtually all of us," said Allan Carroll, an insect ecologist with the University of British Columbia's School of Forestry.

Since 2006 those dire projections have been revised downward. Roughly half of the province's lodgepole pine has been killed, but that number is projected to increase only slightly through the next decade, according to data from the BC Ministry of Forests, Lands and Natural Resource Operations. While a sizable population remains in British Columbia, suppression efforts, such as removal of vulnerable stands, are keeping their spread in check, said Carroll. More importantly, though, the insect has largely exhausted its food supply in the province. "We know that the rate of expansion from this point forward can be nowhere near what it was in British Columbia, because nowhere else are you going to find that kind of contiguous pine forest," he said. The beetle's ability to disperse is directly related to its population size during any given year, and with less pine trees to inhabit that population should be curbed in coming years, he added.

### **Victory For Oregon Loggers In US Supreme Court<sup>28</sup>**

In a major victory for Oregon forest management practices, the US Supreme Court reversed a lower court ruling when it determined water runoff in the Tillamook State Forest does not constitute industrial activity. The court held that logging roads and their associated ditches, culverts and channels were not point sources of pollution and did not require special permits.

## **Bioenergy**

### **US Power Generation From Wood Biomass Expected To Rise From 105 GWh/Day In 2013 To 111 GWh/Day In 2014<sup>29</sup>**

US power generation from wood biomass is expected to amount to 105 gigawatt hours (GWh) per day of electricity in 2013. Total power generation from wood biomass in the first quarter was estimated at 104 GWh/day of power, according to the April issue of the US Energy Information Administration's Short-Term Energy and Summer Fuels Outlook. The report forecast that wood biomass would be used to produce 98 GWh/day, 109 GWh/day and 111 GWh/day, respectively, during the remaining three quarters in 2013. The EIA's report projects these sectors will use the following amounts of wood biomass in 2013 and 2014:

- Electric power sector: 191 trillion British thermal units (Btu), 218 trillion Btu
- Industrial sector: 1.25 quadrillion Btu, 1.253 quadrillion Btu
- Commercial sector: 69 trillion Btu, 70 trillion Btu
- Residential sector: 417 trillion Btu, 425 trillion Btu.

## **Conferences, Overview Studies, And Reports**

### **The Bark Beetle Blues: As The Infestation Catches Its Breath, Research Picks Up<sup>30</sup>**

Forests across western North America have been ravaged for more than a decade by mountain pine beetles and other bark beetles in the continent's most extensive such attacks on record. Scientists at NCAR and their colleagues at universities and federal labs are now getting a better handle on what comes next for the forests and what it means for Earth's carbon cycle. The answers aren't as straightforward as they expected.

Aided by intense drought and warm winter temperatures, bark beetles have affected some 46 million acres of forest in the western United States, and millions more across Canada, over the last 13 years. Within those zones, beetle-killed trees have spanned as many as 10 million acres. However, data from the US Forest Service show that infestation rates for the mountain pine beetle have slowed over the last several years. The affected US acreage dropped by more than 70% from 2009, the peak year, to 2012. "I think the mountain pine beetles are running out of trees, for the most part," says Jeffrey Hicke (University of Idaho). Hicke notes that once an infestation rages through a suitable stand of trees, it may not be able to leap to the next vulnerable region, which could be hundreds of miles away.

While the mountain pine beetles now seem to be spreading at a less frantic pace, some areas are still vulnerable, and other bark beetle species, including the spruce beetle, are on the move. Meanwhile, beetle-affected forests are going through a transformation whose impacts will continue to play out over centuries.

The drought of 2002 across much of the US West killed many trees directly. It also laid the groundwork for many more to die from subsequent beetle attacks, since drought-stressed trees are less able to mount an effective biological defense. By the time more rain and snow returned to the region, beetles had become so numerous that many trees were already a lost cause. “The beetle populations have been extremely high in recent years,” notes Hicke. “When there are a jillion beetles attacking a tree, they’re going to overwhelm the tree even if it’s healthy and well watered.”

Consistently mild weather is another key element at work. Temperatures of  $-40^{\circ}\text{F}$  ( $-4^{\circ}\text{C}$ ) will reliably kill mountain pine beetles, and even readings of  $-4^{\circ}\text{F}$  ( $-20^{\circ}\text{C}$ ) can cause some mortality if they occur when beetles are not fully acclimated. Beetles generate their own cold-weather protection each year, a sort of internal antifreeze that’s most effective in midwinter. Although this past January was one of the coldest on record in the Great Basin, the frigid inversions were strongest at lower, less-forested elevations.

Although trees pull large amounts of carbon dioxide from the air as they photosynthesize in daylight, the trees and the microbes in soil beneath them also respire, or “breathe out,” carbon dioxide. Just as when humans breathe, this adds carbon dioxide to the atmosphere. The team found that while photosynthesis slowed by an average of 10–15% in the decade after a pine beetle attack, respiration also slowed by roughly the same amount, so there was little net effect on the carbon cycle.

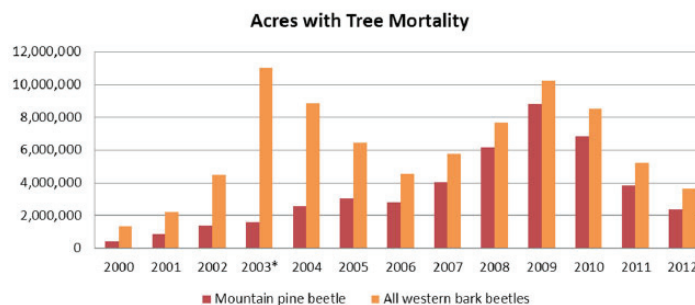
When a tree dies, microbes feasting on the wood pump additional carbon dioxide into the air. However, it can take decades for trees to fall down and decompose in high-altitude lodgepole forests, and over the first decade it appears that microbial activity decreases. The upshot is that any infusions of carbon into the atmosphere from beetle-killed trees may happen more gradually than previously thought.

### Mountain Pine Beetle’s Genome Decoded<sup>31</sup>

The days of the mountain pine beetle gnawing, unchecked, through the forests of BC and north-central Alberta could be numbered, thanks to a microscopic breakthrough. Scientists at the University of British Columbia and the Michael Smith Genome Sciences Centre have decoded the genome of the voracious pest, permitting the first crystal clear look at how the little beetle wreaks such tremendous havoc.

“We know a lot about what the beetles do,” says Christopher Keeling, a research associate at the Michael Smith Laboratories. “But without the genome, we don’t know exactly how they do it. Sequencing the mountain pine beetle genome provides new information that can be used to help manage the epidemic in the future.”

A study published in the journal *Genome Biology* shows the genome, the genetic coding that makes the beetle unique, reveals extreme variations among individuals of the species, more than four times as many differences as those found among humans. Researchers from the University of Northern BC and the University of Alberta say the bug also has genes that allow it to defeat a tree’s defence compounds and others that degrade plant cell walls, allowing it to suck up nutrients from the tree. “It might be used to digest woody tissue and/or the microorganisms that grow in the beetle’s tunnels underneath the bark of the tree,” Keeling said. “Gene transfers sometimes make organisms more successful in their environments.”



Mountain pine beetles (red) are just one of a number of bark beetle species chewing their way through western U.S. forests since 2000. This chart shows the number of acres with at least some loss of pine trees due to beetle attacks. The spike in 2003 (asterisk) is related to intensified surveying of piñon pine in New Mexico, which were heavily affected by the 2002 drought and related beetle damage. (Image from "Areas with Tree Mortality from Bark Beetles," 2013, courtesy U.S. Forest Service.)

## Background Reading

### The Biorefining Dilemma<sup>32</sup>

New products, manufactured largely by chemical pulping processes, are emerging and growing market share. They may provide a future for elements of the existing industry, especially operating in conjunction with traditional paper manufacturing. In particular, dissolving pulps can be used to produce cloth (rayon), acetate (filters), nitro-cellulose (explosives) and ethers (pharmaceutical and food additives). Synthetic cloth has grown rapidly in recent years.

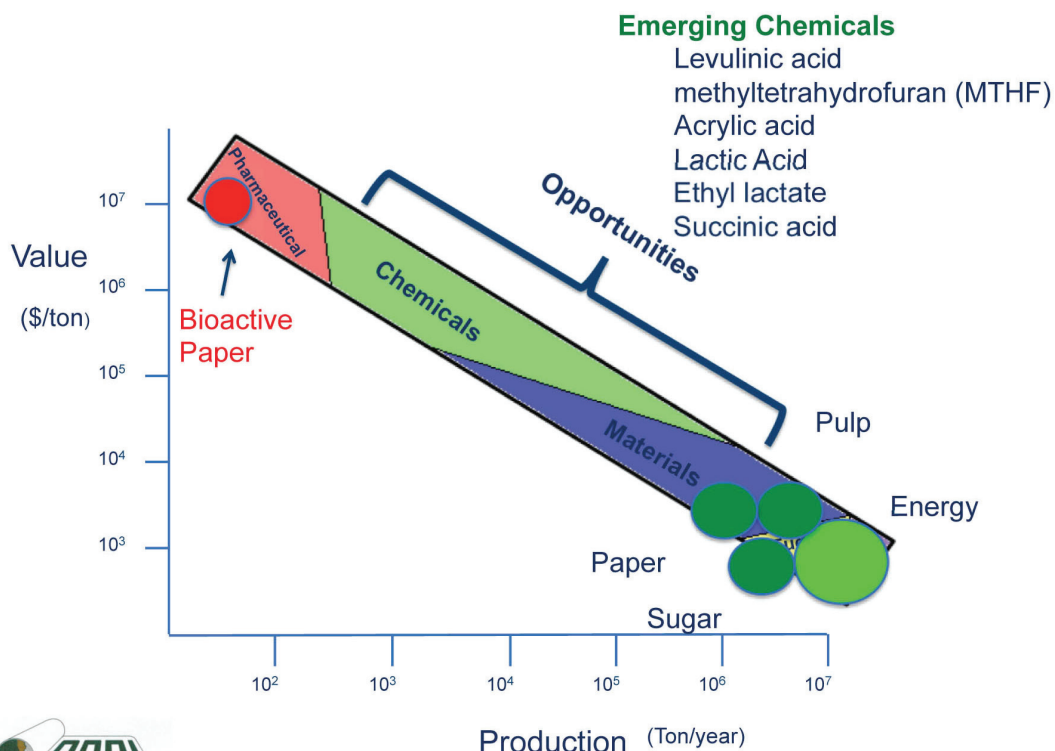
RISI reports that after almost three decades of decline, use of dissolving pulp turned upwards around 2000, reaching an estimated 4.5 million tonnes of production in 2010. At least one million tonnes/annum of additional capacity was installed in 2011 and 2012. Symptomatic of global demand factors, there has been an increase in transformations of pulp mills to the production of dissolving pulps. Declining demand for paper and increasing populations and demand for clothing have coincided neatly to accommodate the conversions.

Perhaps the most significant new opportunities will arise from new chemicals, with many of the facility requirements for extracting a wide range of chemicals from cellulosic fiber being consistent with existing chemical pulp mills. There are higher value products available, in the medium to long term, than paper products and dissolving pulps.

In particular, pharmaceutical and chemical outcomes are possible. The work of the Australian Pulp & Paper Institute (APPI) has demonstrated this previously, with its novel bioactive paper products. Speaking to IndustryEdge, Professor Gil Garnier, the Director of APPI says, "The forest and paper industries need to be protected from the cyclical variation of the commodity market; the only sustainable solution is to rely on a portfolio of products that include materials, chemicals and energy product. This is phase one of the migration process. Phase 2 is to develop novel and high value products that starts a new technology-value curve and can grow a market for a few decades. Both phases are technology driven."

At the heart of these new manufacturing opportunities is bio-refining. Bio-refining refers to any process or facility that integrates biomass conversion processes and equipment to produce fuels, power, heat, and value-added chemicals from biomass. The opportunities are described in the diagram.

A biorefinery could, for example, produce one or several low-volume, but high-value, chemical or pharmaceutical products and a low-value, but high-volume liquid transportation fuel or fuels such as bio-diesel. At the same time, the bio-refinery can generate electricity and process heat, through combined heat and power technology, for its own use and perhaps enough for sale of electricity.



## The Upward Slope Of Real House Prices<sup>33</sup>

A year ago, Dave Altig asked 'Just how out of line are house prices?' Dr. Altig's post featured both a price-to-rent graph and a real house price graph based on Professor Robert Shiller's work. The price-to-rent ratio graph Dr. Altig presented seemed to show that house prices were getting back to normal, but the graph based on Professor Shiller's work seemed to suggest that house prices could fall much further.

The Shiller graph has suggested to many observers that house prices track inflation (i.e. that house prices adjusted for inflation are stable--except for bubbles). Last year I pointed out the slope depends on the data series used, and that if Professor Shiller had used either CoreLogic or the Freddie Mac house prices series, before Case-Shiller was available, there would a greater upward slope to his graph.

An upward slope to real prices makes sense to me as I've argued before: "In many areas--if the population is increasing--house prices increase slightly faster than inflation over time, so there is an upward slope for real prices." It is important to realize that Professor Shiller used the quarterly Case-Shiller National index starting in 1987. From 1975 through 1986 he used what is now called the FHFA index. He used other price indexes in earlier periods.

The FHFA index used by Shiller was based on a small percentage of transactions back in the 1970s. If we look at the CoreLogic index instead, there is a clear upward slope to real house prices. If Professor Shiller had used the Freddie Mac quarterly index back to 1970 (instead of the PHCPI), there would be more of an upward slope to his graph too. So it is important to understand that for earlier periods the data is probably less accurate.

The second graph shows the upward slope for both real price indexes. Even the Shiller "Irrational Exuberance" real price index has an upward slope (about 0.5% per year)--and the CoreLogic upward slope is steeper (about 1.5% per year). Right now the real CoreLogic HPI is only slightly above the trend line (it could overshoot), and the Case-Shiller national index will probably be just above the trend line when the Q1 data is released.

This would suggest nominal prices are at the bottom (and real prices are close too). This is one reason I think the Case-Shiller and CoreLogic house prices indexes probably stopped falling, NSA, in March 2012 (the March data will be released next month).

## Rethink Trees: Opportunities With Nanotechnology<sup>34</sup>

This video outlines the versatility of wood but delves into the real opportunities open to using wood fibers--nanocellulose--a key component for a range of new high tech materials. [http://www.youtube.com/watch?feature=player\\_embedded&v=0BxkNj7L2mM](http://www.youtube.com/watch?feature=player_embedded&v=0BxkNj7L2mM)

## Resources

### US Endowment For Forestry And Communities Improves Wood-To-Energy Facility Database<sup>35</sup>

In 2010, the US Endowment for Forestry and Communities (Endowment) announced creation of a one-of-a-kind database of industrial and selected community-scale users of wood-to-energy facilities across North America. Today the Endowment is unveiling major improvements in the database. The site--[www.wood2energy.org](http://www.wood2energy.org)--is a searchable database open to anyone with interest in the state of wood-to-energy conversion at a national, state/provincial or local operating level. Through the Woody Biomass Joint Venture--a partnership between the USDA Forest Service and the Endowment--recent updates to the Wood2Energy database ensure that it serves as the most comprehensive and up-to-date source of users and processors of wood for energy, e.g., electric facilities, thermal installations, pellet mills, etc. Partners throughout the biomass industry as well as state and federal agencies have worked to improve the usability and accuracy of the database and recently began including thermal installations, such as schools and government offices.

### Latest Australian Timber Market Survey Results Out<sup>36</sup>

URS has released the December quarter 2012 edition of the Australian Timber Market Survey (TMS) report. The TMS reports timber price movements collected through a quarterly survey of the buying prices of timber products by timber wholesalers and merchants in eastern Australia.

Prices for major structural softwood timber products MGP10 and MGP12 changed only marginally in the December quarter 2012, with movements ranging from -0.3% to 0.7%. Over the 2012 calendar year, prices for MGP10 products fell by around 5.4% to 5.9% and prices for MGP12 products fell by around 3.9% to 7.0%. Meanwhile, prices for outdoor softwood timber products, panel products and engineered wood products remained relatively stable.

TMS results showed mixed price movements for hardwood flooring and joinery appearance grade products over the six months to December 2012, which may reflect relatively subdued spending on home renovations. Price movements for structural hardwood products varied over the second half of 2012. Structural F17 prices ranged from 0.4% to 2.3% across the dimensions surveyed, reflecting mixed results within each of the eastern states. Meanwhile, structural F27 prices recorded an increase of 0.5%.

For more information, a copy of the Timber Market Survey report is available for download from the URS Asia-Pacific website.



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