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Correction

The article, ‘A Tale of Two Perspectives’ (CPBIS Newsletter, May 23, 2013) incorrectly suggested that DOE was not funding a demonstration-sized integrated biorefinery project in Old Town, Maine, due to a finding of ‘no significant impact’. In a letter to the Editor, Mr. James St. Pierre, Biofinery Project Manager, Old Town Fuel & Fiber corrected this, noting that “This project, which utilizes assets of a pulp mill to convert wood to cellulosic sugars, then converted to fuel grade ethanol, is not only continuing under the cooperative agreement with DOE, but also with their full support. A ‘Finding of No Significant Impact’, or FONSI, is a determination resulting from a NEPA environmental review of the project’s impact, and, in fact, a FONSI is favorable to funding a project because no significant environmental impacts have been identified that might delay or effectively cancel a project.”

DOE lists on-going integrated biorefinery projects, including the Old Town, Maine demonstration project at

<http://www1.eere.energy.gov/biomass/factsheets.html#integrated>.

We regret the error and thank Mr. St. Pierre for promptly bringing this to our attention. We strive to be completely accurate and welcome all comments, clarifications, and corrections to our newsletter content.

Carbon Taxes and the Paper Industry

By Pat McCarthy, Director

A hallmark of market-based or market-oriented economies is that an economy’s resources – capital, labor, materials, energy, and land – can freely move among the virtually infinite competing uses available for those resources. Input and output prices are key in determining how resources move from one use to

another. The pervasive use of electronic media, for example, has led to a significant decrease in the demand for newsprint. Facing this structural shift, the only way that newsprint producers could hope to maintain price was to reduce newsprint production and, ultimately, capacity. The expected fall in newsprint prices if production stayed at existing levels signaled the industry and the economy to shift resources -- labor, capital, materials, and energy -- out of newsprint and into other pulp and paper product categories or, in some cases, to products completely outside the sector. Not surprisingly, between 2000 and 2005, US newsprint consumption fell 26.7% from 6.67 to 4.89 million tonnes.

Whether producing kraft pulp, cigarette paper, containerboard, tagboard or any of the vast number of other paper-related goods, CEOs continually assess whether prices are sufficient to cover costs and generate needed ROIs and profits. In general, what’s good for the company is good for the economy. A company’s profit maximizing strategies are consistent with maximizing company shareholder value as well as a nation’s overall well-being.

But there are many reasons why a market may ‘fail’, why profit-maximizing strategies based upon market prices may not be consistent with maximizing a nation’s well-being. Carbon emissions (mainly CO₂) and other greenhouse gases (GHGs) are relevant examples.

Is there something special or peculiar about GHG emissions that cause the market for pulp and paper products (and that of many other industries) to fail? No, but there is something special about the production process in industries that release GHGs. In the words of Milton Friedman, ‘there is no such thing as a free lunch’ and industries that emit GHGs have enjoyed a free lunch for many years.

In producing their respective products, cement, transportation, food processing, pulp and paper, and

many other industries have been using a limited resource for which they have not been fully paying, the atmosphere. In a real sense, the atmosphere has been a free input, industry's free lunch in production as it burns fossil fuels to produce energy. According to the EPA (<http://www.epa.gov/climatechange/basics/>), the cumulative effects of GHGs can 'change Earth's climate and result in dangerous effects to human health and welfare and ecosystems'.

There are serious concerns and ongoing debates about the causes, effects, and magnitudes of climate change (<http://theweek.com/article/index/244345/scientists-climate-change-is-real>). However, what is undeniable is that as a society we have used the atmosphere as an underpriced resource in production – which brings us back to prices, market failures, and carbon taxes. When the atmosphere is a free resource, i.e. incorrectly priced at zero, then producers rationally use more of the atmosphere than is socially efficient. If, on the other hand, there was a market for the atmosphere's use and producers had to pay a price for each unit of atmosphere used, as they do for labor, energy, capital, and land, then producers would rationally and efficiently use the atmosphere. In other words, emitting fewer GHGs into the atmosphere would be efficient, profit-maximizing for the firm, and welfare-maximizing for the economy. No longer would the atmosphere be a free lunch and companies would use all of their resources, including the atmosphere, efficiently and productively.*

The economic rationale for carbon taxes and other market-oriented policies aimed at reducing CO₂ and other GHG emissions is that these are ways of trying to price the atmosphere's use. And in so doing, pulp and paper, transportation, cement, food processing, and other industries will then face correct input price signals – including the price of using the atmosphere – that enable companies to not only use all of their resources but to use them efficiently and productively. Carbon taxes are not intended to eliminate GHGs but they are intended to induce companies to make optimal production and input decisions based on correct price signals. And by using the atmosphere efficiently, firms produce an optimal amount of GHGs.

In this light, what would carbon taxes mean for prices in the pulp and paper industry? Gemechu and his colleagues [Gemechu, E.D. et al. (2012). "Environmental tax on products and services based on their carbon footprint: A case study of the pulp and paper sector", *Energy Policy* 50, 338-344] address this

question for Spain's industries, including the pulp and paper industry. The study uses environmentally extended input-output (EIO) and life cycle analysis (LCA) methodologies for calculating carbon footprints. EIO approaches are appealing because they link all industries in a given economy and because they include direct and indirect emissions. LCA is a commonly used for specific products and provides a comprehensive analysis of systems at the unit processes level. Essentially, EIO is a top-down approach and LCA a bottom-up approach; each has advantages and disadvantages.

The Spanish Institute of Statistics (<http://www.ine.es>) provided emissions and economic data for the EIO analysis and theecoinvent Centre (<http://www.ecoinvent.org>) was the source of real industry-based life cycle inventory data for the LCA. In the EIO analysis, Gemechu et al.'s study reported CO₂ tax rates for the country's top 25 polluting product groups, which included two pulp and paper categories. The highest carbon tax rates are associated with 'Cement, lime, and plaster' (20.9%), 'Production and distribution of electricity' (8.9%), 'Other non-metallic products' (4.1%), 'Water transport' (3.5%), and 'Production and distribution of gas' (3.3%). 'Articles of paper and paperboard' ranked 14th with a tax rate of 1.2% and 'Pulp, paper, and paperboard' ranked 23rd with a 0.8% carbon tax rate.

The study also calculated the carbon tax rate for the top 26 polluting industries. In this calculation, 'Manufacture of pulp and paper products' ranked 16th with a carbon tax rate of 1.2%, well behind 'Manufacturer of Cement' whose carbon tax rate was 23.6%.

Including non-carbon greenhouse gases in the calculation had an insignificant effect on carbon tax rates for the pulp and paper industry. The primary non-CO₂ GHGs are methane and nitrous oxide, important sources of emissions in agriculture, mining, and food manufacturing sectors but not in the pulp and paper sector.

Last, in an LCA case study, the authors calculate the carbon tax rate for the production of one ton of air dried (10% moisture content) kraft pulp with a chlorine-free bleaching process. Relative to the EIO methodology, the energy intensity for kraft pulp production in the LCA is greater and warrants a carbon tax rate of 1.8%, higher than the EIO-based estimates. This is not surprising since the EIO methodology is top-down and reflects an average across different

product categories. The LCA methodology, on the other hand, uses on-site data at a real plant for a highly energy intensive production process. Yet both approaches yield similar estimates and provide pulp and paper CEOs some idea of what a carbon tax would mean for their companies. .

Carbon taxes and related market-oriented policies that target carbon emissions are beneficial from many perspectives. In pricing the use of our atmosphere, these policies use the market system to provide producers with an incentive to use this resource efficiently and, in so doing, to reduce the undesirable effects associated with climate change. As an energy intensive industry, pulp and paper has long focused on developing innovative processes to reduce the industry's energy footprint. Had the industry not done so, its carbon footprint today would be much larger as would a carbon tax. With estimated carbon tax rates in the 0.8% - 1.8% range, the results of Gemechu et al.'s study suggests that the industry has been successful implementing processes that reduce energy intensity and carbon footprints.

* There is another market failure because the effects of GHGs go well beyond pulp and paper suppliers and buyers. Pulp and paper, and other industry GHGs can also affect human health and ecosystems. These effects, called third party effects, may alter the size of the tax but do not alter the basic argument.

AF&PA Statistics

Since our last reporting of American Forest and Paper Association statistics releases, the Association has issued reports on paperboard, containerboard and kraft paper. Below are the key findings:

Paperboard

June: Total boxboard production increased by 0.7 percent compared to June 2012 but decreased 0.3 percent from May. Unbleached kraft boxboard production increased over the same month last year but decreased compared to May. Total solid bleached boxboard & liner production increased compared to June 2012 and increased compared to May. The production of recycled boxboard increased compared to June 2012 but decreased when compared to May.

May: Total boxboard production decreased by 0.6 percent compared to May 2012 but increased 0.6 percent from April. Unbleached kraft boxboard production increased over the same month last year and increased compared to April. Total solid bleached boxboard & liner production decreased compared to May 2012 and decreased compared to April. The

production of recycled boxboard increased compared to May 2012 and increased when compared to April.

Containerboard

May: Containerboard production increased 7.3 percent over April and 4.5 percent over the May 2012. The containerboard operating rate gained 3.6 points from April, from 94.3 percent to 97.9 percent.

Kraft Paper

June: Total kraft paper shipments were 131.4 thousand tons, an increase of 2.3 percent over May. Bleached kraft paper shipments increased year-over-year 5.7 percent, and the 2.8 percent year-over-year decline in unbleached shipments were enough to bring overall kraft paper shipments down 1.5 percent year-over-year. Total month-end inventory increased 0.7 percent to 71.2 thousand tons compared to May month-end inventories.

May: Total shipments were 128.5 thousand tons, a decrease of 3.3 percent compared to the prior month. Bleached kraft paper shipments increased year-over-year 24.5 percent, but the 11.5 percent year-over-year decline in the larger unbleached category was enough to bring overall kraft paper shipments down 7 percent year-over-year. Total month-end inventory increased 6.3 percent to 70.7 thousand tons this month compared to April month-end inventories.

Trend Indicators from Industry Intelligence Inc.

[Industry Intelligence Inc.](http://www.industryintel.com) has provided market intelligence to more than 600 companies worldwide since it began as Forestweb in 1999. Industry Intelligence delivers a daily report featuring news of the paper and forest products industries. For your subscription visit: <http://www.industryintel.com>

Below is a selection of recent headlines chosen to mirror significant trends in and around the paper and forest products industries.

Stora Enso's plan to build €32M biorefinery at Sunila kraft pulp mill in Kotka, Finland, aimed at accelerating European forest products company's transformation into renewable materials company

The biorefinery will initially service the needs of the mill, substituting up to 90% of its natural gas usage with lignin extracted from black liquor. Later it will be part of a new business selling lignin to external customers.

Finland's pulp and paper industry cuts its CO2 emissions by 12% in 2012 from 2011 due to increased bioenergy use; since early 1990s, oil and coal consumption fell by more than 75%, while wood-based energy use rose to 82% from 60% of total energy used

The forest-based sector produces two-thirds of Finland's renewable energy.

UK consumers worried about environmental impact of excessive packaging for home deliveries, with nearly one-third of respondents less likely to shop at retailers with too much packaging; smart packaging set to become larger trend, says industry player

According to the company that commissioned the study, poorly packaged parcels can affect trailer volumes by as much as 300 per cent, so any improvement can reduce an organization's carbon footprint and shipping costs.

i2live: UPS senior manager on the role of packaging in logistics, warns that excessive packaging not only affects the environment, but also carries social risk, highlights efforts by Cisco, Staples

In an Industry Intelligence i2Live presentation, Arnold Barlow, senior manager of sustainability solutions at UPS, stressed the importance of optimizing package sizes. A larger-than-needed package results in increased shipping cost; using too little packaging may result in product damage, with its associated economic and environmental costs. As examples of packaging optimization, he cited Staples Inc.'s use of Packsizer's on-demand packaging machine, which measures and cuts boxes to match the content for each order, and savings realized by Cisco when it reduced one product line's packaging.

US-based Corrugated Packaging Alliance says assumptions in IFCO's recent LCA study comparing corrugated packaging with returnable plastic containers has discrepancies favoring plastic, plans to release its own LCA study with more data later this year

In a recently issued statement, Corrugated Packaging Alliance Executive Director Dennis Colley asserts that a Life Cycle Analysis (LCA) recently released by IFCO uses assumptions that influence the study in favor of returnable plastic containers (RPCs). CPA has also been working on a comparative LCA to be released later this year. According to Colley, "the CPA study will contain accurate corrugated container and containerboard mill data, along with RPC data as reported by IFCO. The CPA study examines industry-

wide corrugated data rather than data from one individual company and will include all ten commonly-used ISO certified environmental indicators instead of picking and choosing indicators that bias one system over another."

Editor's note: It would be interesting to see a similar effort by paper towel producers in response to an LCA by the manufacturers of electric hand dryers.

Tech vs. Trees: Paper science graduates enter promising job market

A 100% employment rate for graduates is a boon for any university major—and for Miami University of Ohio, the program claiming that glorified title is paper science, USA Today reported June 26. Miami is one of eight U.S. schools that offer such a concentration, and graduates are in high demand. While print-to-digital may be a looming threat to publication paper makers, tissue products and paperboard are stable or growing.

European pulp and paper production in 2012 down 1.6% year-over-year, to 92.1 million tonnes, due to effects of economic recession but in line with most other major paper-producing regions; only China and Brazil performed better, reports CEPI

The pre-crisis production in 2008 totalled 97.9 million tonnes.

Tech vs. Trees: Woody Harrelson unveils wheat-straw paper in US

Though the paper is currently made at a mill in India, Phase Two of the project is to build a "100% tree-free, state-of-the-art, eco-mill in North America, where millions of tonnes of leftover straw are readily available," according to a press release.

Paper packaging mills in Canada average 76.4% recycled content in 2012, unchanged from 2010, according to PPEC's semi-annual report; recycled-content averages by grades were 81% for containerboard, 70% for boxboard, 35% for kraft paper

The average recycled-content for domestically-shipped, paper-based packaging in Canada was 57% in 1994, 63% in 2000, 66% in 2006 and 76% in 2012.

Two Sides reports its ad campaign 'No Wonder You Love Paper' promoting the sustainability of print, paper has been making a positive impact; green printing company PrintFirm.com joins organization

The promotion launched in May of 2013, and has appeared in Inc magazine, National Geographic and other publications. In early 2013, Two Sides wrote an

open letter to Google's chairman, Eric Schmidt, which resulted in all green claims being removed from the Paperless2013 website and campaign. A social media movement led by the PrintMediaCentr, a Two Sides allied member, was instrumental in this achievement.

Global digital printing market to grow to US\$187.7B in 2018 from US\$131.4B in 2013, with a CAGR of 7.4%; digital share of total print market to grow from 9.8% in 2008 to 20.6% in 2018, with inkjet growing faster than electrophotography

Smithers Pira forecasts that digital print will continue to grow strongly from 2013 to 2018, led by inkjet technology.

GP Cellulose Group to end previously-announced tender offer for Buckeye Technologies, convert pending acquisition to merger as result of US Dept. of Justice's second request regarding nonwovens business; merger deal requires Buckeye shareholders' vote

The "long form" merger affords Buckeye Technologies' shareholders the opportunity to vote to approve the merger.

Newsletter Subscription Terms Changed

Since the inception of the Center, CPBIS has made its Newsletter available to all subscribers free of charge. This was made possible by generous financial support provided by the Alfred P. Sloan Foundation, as well as by pulp and paper companies. Under current conditions, however, this model is no longer sustainable.

As part of its continuing efforts to create a sustainable operating model that will cover basic operating costs, CPBIS is implementing a one-time charge for new subscriptions to the Center's Newsletter. To be added to the list of subscribers, new subscribers are asked to contribute \$9.95 via [***CPBIS Market Place***](#).

Current subscribers will continue receiving the latest Newsletter issue at no charge, delivered directly to their inboxes. All subscribers will receive the latest issue of the newsletter as an e-mail attachment instead of being prompted to download the file from the Center's website. New subscribers will also have access to the archive of past issues. Current subscribers who wish to gain continued access to the archive are asked to contribute \$9.95 via CPBIS Market Place.

Please note that we have already taken down the Center's website page with the Newsletter's full

archive and the old sign-up box, and are in the process of adding the new Newsletter sign-up mechanism through CPBIS Market Place.

Subscription terms are subject to review in case CPBIS operating costs significantly increase in the future.

Statistics Corner: Planted Forests of the World

The figures on the next page show 2009 data on planted forest area compiled by Bracelpa, the Brazilian Pulp and Paper Association. Brazil, often cited for its vast eucalyptus plantations, actually trails China, India, USA, Japan and Indonesia. Notably, China outranks all other countries in this respect. In terms of the proportion of the country's total area that is devoted to forest plantations, Brazil ranks last among the countries shown. According to Bracelpa, Japan's plantation areas amount to a remarkable 27% of the country's land area. ■

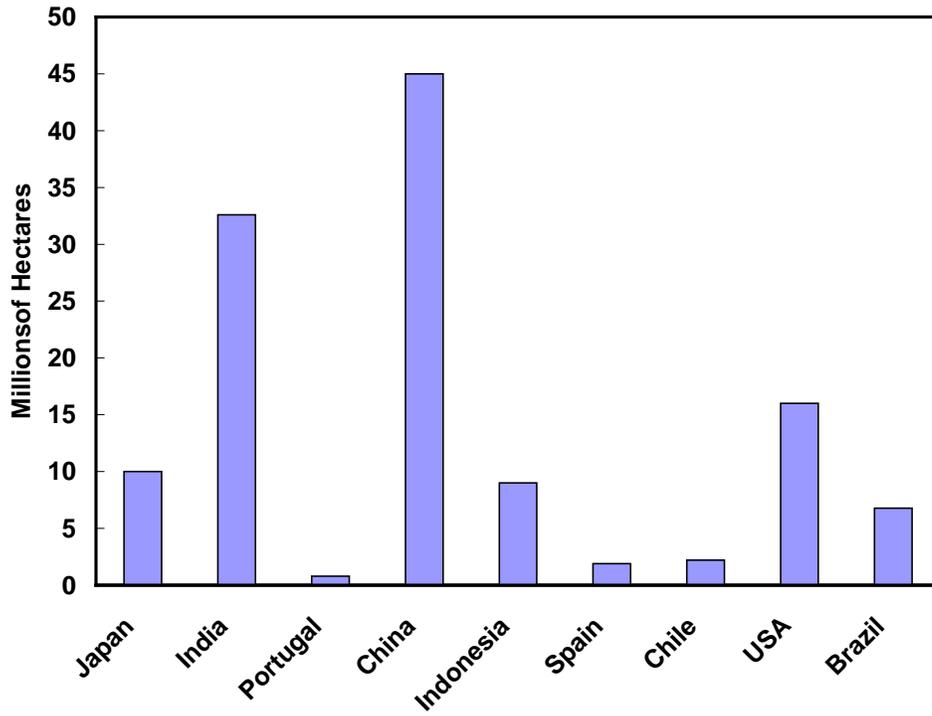


Figure 1. Area of planted forests by country (Source: BRACELPA)

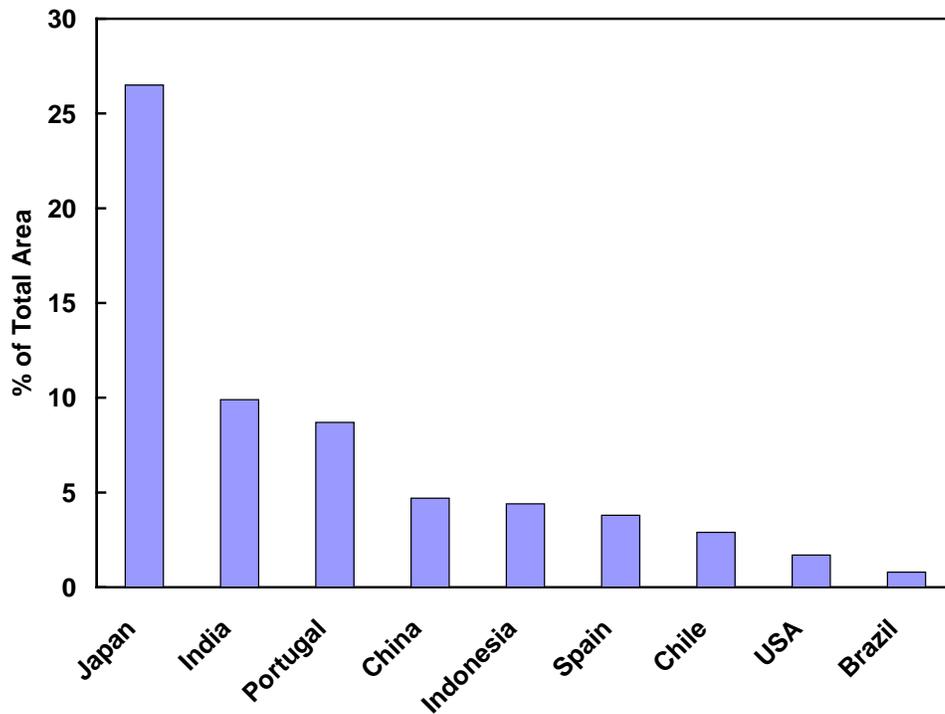


Figure 2. Area of planted forests as percent of country's area (Source: BRACELPA)