

Nanocellulose: Where it Stands

At the recent Tech Connect World Innovation Conference, (Washington, DC, May 22-25) Dr. Kimberly Nelson, VP Nanocellulose Technology, American Process Inc. (and an alumna of IPST, one of the founding institutions of CPBIS) updated the audience on progress in commercialization of nanocellulose composites production and applications.

She began with a refresher on the nature and production of the material. Briefly, it originates in the structure of wood pulp fibers. At the microscopic level, pulp fibers are composed of cellulose “microfibrils,” each of which is composed of long cellulose molecules in a parallel arrangement. Deconstruction of the microfibrils yields two kinds of nanocellulose, nanofibrils and nanocrystals. They possess many desirable properties: as well as being abundant, renewable, recyclable, reusable and nontoxic, they have high strength, light weight and low oxygen permeability. Potential applications are numerous, including strengthening of paper, plastics, and concrete, edible barrier coatings, superabsorbent materials and many others. Such versatility makes it reasonable to expect a huge near-term market potential, nearly four million tons per year.

There has been an explosion in patent and commercialization activity. In 2009, approximately 25 nanocellulose patents were issued. The number grew to approximately 350 in 2014 and 2015. Commercialization, beginning in 2014, has proceeded unabated: Oil and gas giant Schlumberger invested in Celluforce, the Canadian company established to foster applications research by producing and providing samples to potential users. In 2015 biomass refiner American Process Inc. (API) followed suit. Japanese companies have undertaken commercialization activity in the areas of adult incontinence products, cosmetics and ink thickeners. European players in France and

Finland are pursuing uses such as lightweight paper packaging, and biomedical applications.

At the conference, Nelson proceeded to outline API’s prominent role as a leader in nanocellulose development, ranging from lab scale development and application trials to semicommercial production and larger scale application trials (reinforced plastics composites, vehicle light weighting, strong lightweight foams, high strength concrete, strengthening of corrugating medium) and ongoing patent activity. She summed up by reiterating her main points: rapid growth in commercial interest, huge market potential, low production cost, strong lightweight materials applications, and geopolitical relevance.

Trend Indicators from Industry Intelligence Inc.

Industry Intelligence Inc. 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 sampling of recent Industry Intelligence headlines, chosen to mirror significant trends and other interesting developments in and around the paper and forest products industries.

Kruger investing C\$55M to add 20,000 tonnes/year tissue paper machine at its Crabtree mill in Lanaudière region of Québec, expected to be commissioned by end of summer 2017; C\$39.5M loan for project received from Investissement Québec

The machine will produce tissue products primarily for the away-from-home market.

Kotkamills starts up new consumer board machine at its mill in Kotka, Finland; PM No. 2 is reportedly first worldwide to be able to make dispersion barrier

coatings directly on machine, boards produced will be fully recyclable as they contain no plastic

The boards will be used for packaging of food, confectionery, pharmaceuticals and cosmetics. They will also be suitable for disposable cups and plates.

Stora Enso begins to plan most efficient way to manage its paper business in the future, as it's the only one of company's five divisions that is declining; CEO says paper business could be sold if buyer with a high enough offer could be found

In Q2 2016 paper sales decreased by 8.3%.

Clearwater Paper's Q2 net earnings jump to US\$20.9M from year-ago US\$15.6M, amid productivity improvements, lower input costs in pulp and paperboard business, maintaining healthy inventory and customer service levels; Q3 net sales down 1.8% to US\$436.7M

The increase was due primarily to the absence of scheduled major maintenance, lower input, and reimbursement of previously incurred costs related to recovery boiler performance, all of which was partially offset by lower paperboard pricing.

Italy's 2015 paper and paperboard production up 2.2% year-over-year to 8.8 million tonnes; this is first increase in many years, with packaging paper and board, tissue driving the growth, but still 1.3 million tonnes lower than pre-crisis 2007: report

Italy's tissue output represents 20% of the tissue produced in Europe, putting it in second place behind Germany's 20.5% market share.

Mile-long conveyor that moves woodchips to staging areas at Domtar's paper mill in Hawesville, Kentucky, from barges on Ohio River, estimated to help slash CO2 emissions by eliminating need for more than 0.5 million miles of truck traffic annually

The mill has received national attention for its strong efforts in sustainability.

Russia's H1 paper production up 4.1% year-over-year, with paperboard and pulp output up 7.4% and 6.3% respectively; during the period, production of books, other printed materials grows 5.3% and copybooks surge 19.1%, but newspapers decline 6.3%: report

This was reported by the Russian Federal State Statistics Service.

Some UK paper mills taking long view on Brexit vote and maintaining current pricing on paperboard while realizing that could change if currency exchange rates move, says chief at UK paper merchant Warren Board, noting situation calls for 'calm heads'

The Brexit fallout in the business community appears to have escalated, with business leaders expecting to cut capital spending in the next year.

Saica orders Andritz FibreFlow drum pulping system for new OCC line at its paper mill in El Burgo de Ebro, Spain, with startup set for September 2017; scope of supply from Andritz also includes complete erection, training, startup and commissioning

SAICA Group is the leading European company for the production of recycled paper for corrugated cardboard, with an annual production of 2.5 million tons of paper.

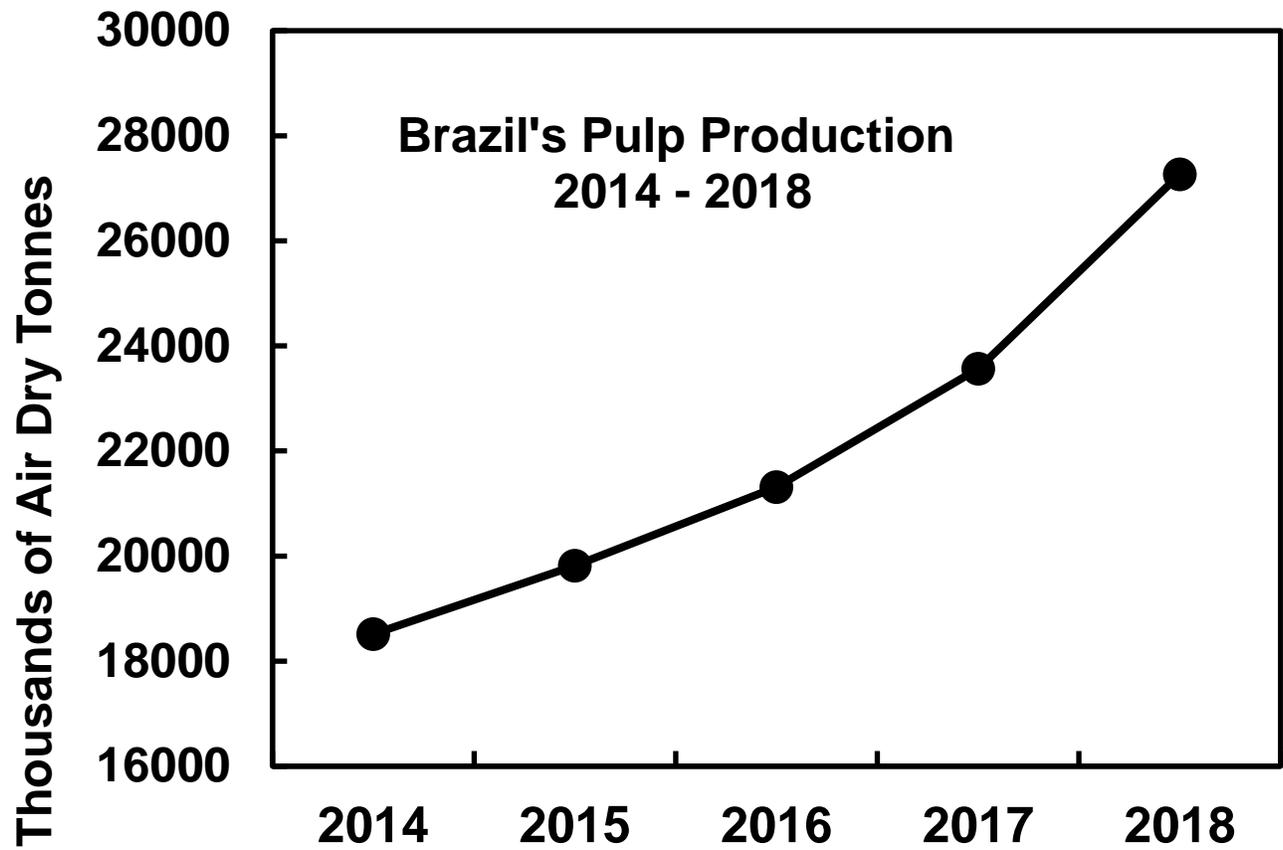
Consumer demand for packaging made with renewable materials could be a tipping point toward accelerated adoption of such packaging, according to new report; when educated on resource scarcity, consumers become a willing partner to help mitigate the matter

Paper Quote

“... there are millions of people that absolutely reply on print and paper for their communications (my parents being among those). Forcing these people online just won't work, and they should not have to pay to receive paper bills.” – *Phil Riebel, Two Sides North America* (<http://www.twosidesna.org>)

Statistics Corner: Brazilian Pulp Production

Brazil's total pulp production is projected to increase from 19.8 million tonnes in 2015 to 27.3 million tonnes in 2018. Of the 2015 total 99.4% was hardwood, presumably all eucalyptus, and only 0.6% was softwood, presumably radiata pine. In 2018 the percentage of softwood is projected to increase to 2.1%, perhaps reflecting a growing interest in domestic production of paper (which requires softwood pulp for strength and paper machine runnability).■



Brazil's Pulp Production, 2014 - 2018

(Source: FAO)

<http://www.fao.org/3/a-i4794t.pdf>