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SENT TO LSU AGCENTER/LOUISIANA FOREST PRODUCTS DEVELOPMENT CENTER - FOREST SECTOR / FORESTY PRODUCTS INTEREST GROUP

Nice synopsis of the conference presentations.

wood bioenergy Wood Bioenergy | a Hatton-Brown Publication

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Wood Bio Conference: The Big Dogs Were There

ATLANTA, Ga.

Two-hundred twenty-five industry personnel, including executives from the leading industrial wood pellet producers in the world, along with 60 exhibitor companies participated in the fifth Wood Bioenergy Conference & Expo held April 11-12 at the Omni Hotel at CNN Center in Atlanta, Georgia, USA.

The event was hosted by *Wood Bioenergy* magazine and Georgia Research Institute.

It included 25 presentations on a range of topics and included speakers from industrial wood pellet producers Enviva, Drax, Pinnacle Renewable Energy, Highland Pellets and Fram Renewable Fuels. All of them painted a picture moving forward of increased worldwide demand for industrial wood pellets.

Endorsing that projection was leading wood energy consultant William Strauss of FutureMetrics, who noted that almost exactly 20 years to the day of the conference, in April 1998, the first oceanic bulk shipment of wood pellets from North America arrived at the port of Helsingborg, Sweden.

Strauss—noting that the two major markets for pellets are industrial pellets as a substitute for coal in large utility power stations, and premium heating pellets used in pellet stoves and central heating systems—said global wood pellet demand in 2017 was nearly 16.9 million metric tons for industrial pellets and 13.9 million metric tons for premium heating pellets.

Those numbers, Strauss said citing various forecasts and analyses, could escalate to 44.8 million metric tons of industrial pellets and 24.4 million of heating pellets by 2025. Most of that new demand is expected to come from Japan and South Korea, while in the United Kingdom and Europe demand will flatten somewhat.

He said the total "new" demand in Europe and England will be 5.85 million tonnes per year, with demand settling at about 19-20 million tonnes per year by 2022. In the UK, the EPH Lynemouth and MGT Teeside biomass power plant projects are either in construction or commissioning. Lynemouth will bring 1.54 million tonnes and MGT Teesside another 1.16 million tonnes. Also, Drax plans to convert its fourth unit from coal to pellets at its Selby power plant, bringing in another 625,000 tonnes of pellets per year. Meanwhile co-firing (coal and wood) projects in the Netherlands will add 2.53 million tonnes, with much of that at the RWE Essent and Uniper projects.

Strauss reported that in 2017 North America supplied

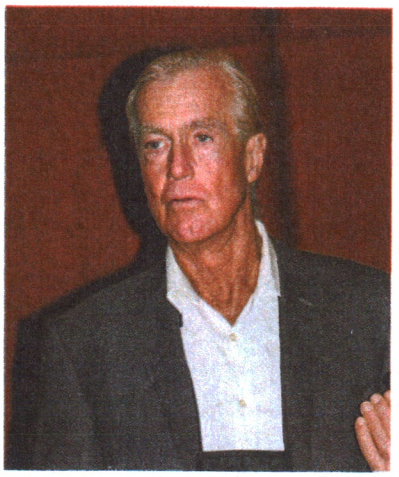
Sixty exhibitor companies participated.

Pellet production was on everybody's mind.

81% of the UK demand, with the U.S. at 62.4% and Canada at 18.4% combining for more than 5.5 million tonnes. U.S. producers exported nearly 5 million tonnes worldwide in 2017.

The growth in industrial wood pellet demand will come from Japan and Korea, Strauss said, adding that the U.S. has not been a significant participant in the NE Asian markets, but that's expected to change. Total potential demand in Japan could exceed 12 million tonnes per year by 2025, while South Korea could demand 9 million tonnes.

He said biomass demand in Japan is driven by a Feed in Tariff support scheme for renewable energy, coal thermal plant efficiency standards and carbon emission targets. There is more uncertainty with regard to South Korea demand, given that the current modus operandi there is short-term supply contracts, whereas producers need long-term agreements to support additional production capacity.



Strauss: Here comes Asia.

Meth: Europe has more to give.

Strauss also addressed the possible influx of black pellets, either steam explosion or torrefied. He cited numerous advantages: pellets don't disintegrate when they get wet; higher volumetric and gravimetric energy density; significantly less dust and fines when handled; lower power requirements for pulverizing at a coal power station. He said there is technology that has overcome the technical shortcomings that have prevented the production of cost competitive steam explosion pellets.

Strauss said the power grid needs steady, reliable low-cost baseload carbon power, as opposed to the potentially dramatic fluctuations in wind and solar renewable energy.

He said the net carbon added to the atmosphere from the combustion of wood pellets is zero, and that the foundation for zero carbon emissions is the sustainability of the forest resources.

"As long as the growth rate equals or exceeds the harvest rate, the net stock of carbon held in the forest landscape is constant or is increasing and the atmosphere sees no new net carbon dioxide," Strauss said.

Enviva's Meth Upbeat

Thomas Meth, co-founder and executive vice president of sales and marketing for Enviva, told of the company's history, and how it was decided early on that they needed to control their own raw material supply. This is one of the reasons Enviva has developed into the largest industrial wood pellet producer in the world, he said. Enviva will run eight production plants once the Hamlet, NC facility comes on line this year, pushing Enviva toward 4 million tonnes of production annually, complementing the company's four terminal assets at four ports along the East Coast. The company has also announced intentions to develop additional plants in the Southeast.

Meth noted that while the current conventional wisdom is that Europe is slowing its biomass utilization growth and Japan and Korea are the future hot markets, "We have more optimism about Europe than others, but you need patience," he said, adding that in 2017 for the first time, renewable energy sources there exceeded coal in power production.

Europe appears to be implementing more demanding greenhouse gas emission targets and renewable energy targets, which unlikely will be met without a big contribution from biomass, Meth said. He added that while there will still be a role for biomass electricity, growth in electricity-only biomass power plants will slow, and the emphasis will tilt to more efficient CHP and district heating.

He also noted that Germany appears to be getting serious about reducing its coal power production, announcing it will pursue a policy to reduce coal-fired generation to reach the country's 2030 carbon emissions target. At the same time, other European countries are continuing with GHG emissions reductions programs that provide biomass power producers with opportunities. Another big factor for EU's renewable power industry, he said, was lack of natural gas as a coal alternative outside of Russian supplies.

Overall, Meth cited a Hawkins Wright forecast that European industrial wood pellet demand is expected to grow to 19 million tonnes by 2021, a 14% annual growth rate.

Looking further ahead to 2027 when several key EU subsidy programs are scheduled to expire, Meth presented several possible scenarios of what may happen then:

Governments facing tightening emissions targets may extend supports past 2027; generators will be better able to absorb loss of subsidies since they will have written down investments in plants, capacity and supply chains; and the pellet industry may see some shift in markets to meet a growing demand for heating fuel.

Meanwhile, Meth concurred with many analysts that Asia, mainly Japan and South Korea, provides the most potential for near-term renewable energy growth and

biomass power production. Both Japan and South Korea need to reduce their reliance on fossil fuels if they are to meet the GHG emission targets agreed to in the Paris conference, he said.

Meth noted that Enviva has opened a Japanese office, delivered its first shipment to Japan (Hitachinaka, Ibaraki) on March 30 and Enviva has entered into a contract to supply pellets to a new power plant in Japan through Marubeni Corp.

Meth also cited Japan's Feed-In-Tariff that provides support to biomass power generators, a renewable energy surcharge and a target to reduce C02 per kilowatt hour by 35% by 2030. He added that the Japanese government target of 6 to 7.5 GWs of biomass-fired capacity by 2030 equals demand for 15 to 20 million tonnes annually of biomass.

Challenges for the development of the Japanese market, according to Meth, include higher shipping costs, competition from lower-cost suppliers in SE Asia, little track record, a currently less-than-robust port infrastructure for receiving, tightness of boiler and EPC availability and cultural differences.

He said the keys to success in Japan will be trust in contractual relationships, fair competition, additional port infrastructure, and strong counterparty reputations to drive credit.

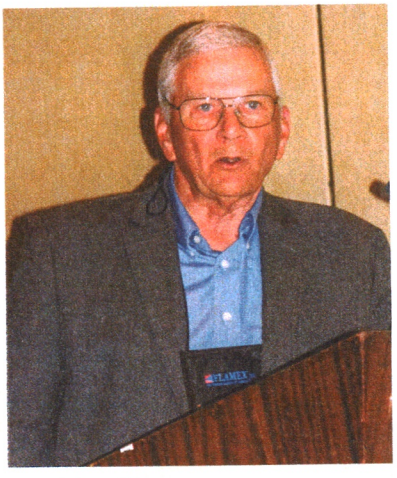
In South Korea, an expanded RPS (Renewable Portfolio Standard) and efforts to reduce carbon emissions are adding to increased demand for sustainable energy production. Several major biomass-fueled projects are expected to be operational in the country by 2020, Meth said, adding that the combination should drive demand for wood fuel pellets, and consequently an excessive demand would cause a shift from short-term tender to long-term contracting.

Meth said a 3 million metric ton market in Korea is expected to grow to 8 million tonnes annually.

Industrial wood pellet demand from Europe, the UK, Korea, Japan and Canada could average 2.65 million tonnes annually from 2010 to 2025, Meth said.

Pellet producers in the Southeast U.S., most especially Enviva, are in good position to meet growing international demand thanks to stable wood costs, the decline of pulp and paper fiber demand and high quality port infrastructure, Meth said. Citing the pellet industry's sustainability, he noted a 24% net volume of wood fiber growth from 2000-2015 in Enviva's procurement areas.

Peberdy: Openness and transparency


Arnold: Still learning

Peberdy On Sustainability

Richard Peberdy, vice president sustainability with Drax, reviewed the evolvement of Drax Biomass, including most recently the startup of its LaSalle Bioenergy wood pellet plant in Urania, La., which gives Drax 1.5 million metric tons of production capacity from its three plants in the Southeast, a substantial percentage of the 2 million metric tons shipped annually from its port in Baton Rouge.

Peberdy addressed in detail the four key components to an effective sustainability program. First on his list was responsible feedstock sourcing and utilization. He emphasized the importance of maintaining sourcing standards during market volatility and of ongoing supplier training and compliance monitoring.

Second was contribution to healthy and productive forest stock and demonstrating commitment through industry certifications, audit programs and landowner outreach. "The benefits of forest management aren't obvious to people," he said.

Third was to fully account for supply-chain greenhouse gas emissions in the biomass lifecycle, including sourcing, manufacturing and transportation.

Fourth was to establish a social license to operate, through focus on local economic development as a core component of the Drax mission and to aggressively pursue a reputation for openness and transparency. Challenges persist, Peberdy said, pointing out that the pellet industry is routinely targeted with false narratives and intentional misrepresentation of science; however, in response, biomass sustainability is complicated and a difficult, long story to tell concisely and accurately.

But Peberdy said it's imperative that the industry effectively communicate its role in sustaining forests and supporting rural economies; and should even engage the environmental community through collaboration.

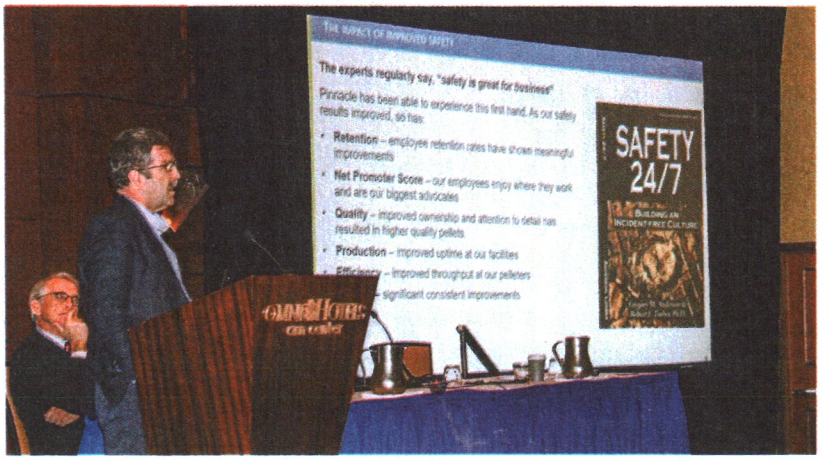
It's been approximately 10 years since Fram started up the first industrial wood pellet production plant in the U.S. Southeast, at Baxley, Ga., known as Appling County Pellets. The company operates three plants today, including its latest, Hazlehurst Wood Pellets in Hazlehurst, Ga.

Harold Arnold, president of Fram Renewable Fuels, addressed, humorously at times, what they've learned in 10 years and what anybody getting into wood pellet production should be aware of. Quoting Michelangelo

when he was 87, Arnold said, "I am still learning."

Arnold said the experience of starting and running a wood pellet operation at times is much like a confusing crossroads sign and always like a roller coaster ride.

"Plan for challenges, they will arise," Arnold said. He pointed to challenges with raw material such as scattered supply, dry storage, particle size, drying requirements, material blending of various species; dust and safety issues; trucking and rail transportation logistics; loading of vessels, ocean freight and trade routes. "Beware of pirates."



McCurdy: Pinnacle's pursuit of safety has improved overall operations.

He also said to be flexible enough to change end markets from industrial to residential and back again if necessary.

Arnold said the industrial market is characterized by government subsidies, diverse geographics, very large buyers, heavy competition; while the residential market is fickle, seasonal and unforgiving.

His numbers from Hawkins Wright showed industrial and heat global pellet annual demand increasing from 31.1 million tonnes in 2017 to 48.1 million tonnes in 2021 with Asia accounting for 7 million additional tonnes of annual demand by 2021.

He said Japan will have added 5 million tonnes of demand annually by 2025 with South Korea approaching 3 million tonnes.

Arnold noted that the future could be impacted by various economic and supply factors, such as the growing percentage of Europe gas demand supplied by Russia (already at 30% and more pipeline coming).

Looking inward, Rob McCurdy, CEO of Pinnacle Renewable Energy, showed the results of "taking on safety as a business core," which has improved Pinnacle's work force and overall plant performance.

Pinnacle has worked to grow an "owning safety" program at its facilities since 2014, and the effort has shown improvements in employee retention rates, reflected in employee surveys on the workplace and also how employees are now some of the company's biggest advocates, McCurdy said. "As we improved safety, we became more desirable as an employer."

Quality, production and efficiency are all on the increase along with the emphasis on safety, McCurdy noted. "Improved ownership and attention to detail has resulted in higher quality pellets, improved uptime at our facilities and improved throughput," he said.

Commenting on markets and future growth potential, McCurdy said he's excited about the future and he's seeing more than just the EU driving the industry. "The more countries you have involved, the easier it is to get new ones involved," McCurdy said.

McCurdy cited a forecast that puts global wood pellet demand at 48.2 million tonnes in 2021, up from 31.1 million in 2017. Industrial pellets could account for 29 million in 2021, including nearly 10 million in Asia; heating pellets account for 19.2 million, two-thirds of it in Europe.

Giving a presentation on the state of the wood-based energy sector in North America, Richard Vlosky, director of the Louisiana Forest Products Development Center, noted that in North America wood is the most commonly used fuel for biomass heat and power. About 84% of the wood waste fuel utilized in the U.S. is consumed by industry, commercial businesses and electric power producers—and most of that is through cogen facilities at forest products plants.

Overall, biomass accounts for 2% of electrical generation by fuel type in Canada, he said. In the U.S., renewable energy accounts for 10% of energy consumption, with biomass accounting for almost half (46%).

Vlosky showed how renewable energy policy in the U.S. can be looked at from the "supply" and "demand" side:

Drivers of renewable energy supplies include federal and state mandates, incentives and subsidies, plus production and investment credits, Vlosky said. The federal Agriculture, Defense and Energy agencies are also big supporters of next generation biofuel development and other bio-based products, he added.

Overall federal energy subsidies are weighted toward wind (33%) and solar (23%), with low-income energy assistance taking up another 24%. Meanwhile biomass (3%) and biofuels (1%) make up just 4% of federal energy subsidies, Vlosky noted.

On the demand side are EU mandates, incentives, subsidies and other policies, Vlosky said, including overall climate change policies to decrease carbon emissions and a commitment to cut C02 emissions by 40% by 2030.

Other EU countries are moving to restrict "fracking" which hampers natural gas production, and Germany is seeking to phase out nuclear energy, he added. Both developments add to long-term biomass growth potential.

Vlosky also noted that EU renewable power genera-

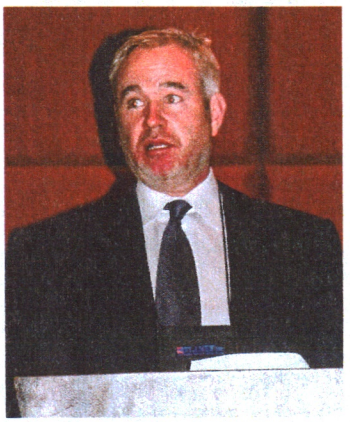
tion was more than all combined non-gas fossil fuel power generation in 2017. Germany, the UK and Italy were the EU's top three consumers of biomass power.

Vlosky also pointed out that an additional key to EU renewable energy growth is public attitude about clean energy: According to 2017 EU surveys, 92% see climate change as a serious problem; 79% believe fighting climate change can boost the economy and create jobs; and 79% want more public support to transition to cleaner energies.

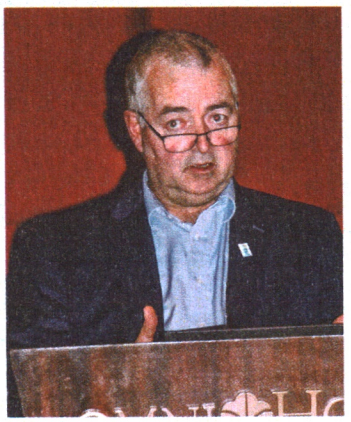
"The EU is mixed—some people are doing more biomass, some doing less—but it's very green overall," Vlosky said. "People there will pay a premium for clean, renewable energy."

Citing world pellet trade flows, Vlosky noted that North America supplies the bulk of pellets to the EU (approaching 6 million tonnes). The UK is the largest Euro consumer of pellet production, estimated at 7.8 million tonnes in 2017, followed by Italy with 3.4 million tonnes, Denmark 2.3 million and Germany 2.2 million.

Looking at total North American production capacity including projects under construction as of early 2017, U.S. pellet capacity is 15.9 million tonnes, and Canada has 6.1 million tonnes, he reported.



Reilley: Impressed and inspired



Johnson: A learning curve

In the U.S., the South is "where the action is" when it comes to pellets, Vlosky said. He added that more than 75% of U.S. wood pellet production capacity is in the Southeast U.S., and 98% of wood pellet exports ship from Southeastern U.S. ports.

Vlosky added that the new wood pellet industry in the U.S. South has brought in 22.6 million green tons, somewhat offsetting a loss of 30 million green tons due to wood products industry mill closures (including pulp & paper) since 1990.

"Wood as a biomass input for energy, particularly pellets, is on an upward trajectory," Vlosky said. "The long-term view is also bright if mandates and policy support remain in place."

Generating Support

Thomas Reilley, founder and chairman of Highland Pellets, reviewed his career in financial investment before co-founding Highland Pellets, which started up an industrial wood pellet plant in Pine Bluff, Ark. in 2016.

"I consider myself a relative newcomer to the industry," Reilley said. "I got into it because I desired to do something more important. Today I'm more impressed and inspired by this industry than ever."

He said it has been a challenging journey, but economic development and sustainable fuel make a great story. "We need to tell that story aggressively," he said. "I challenge you all to become better story tellers."

Reilley said National Public Radio did a piece on Highland and the pellet industry. Reilley said it was fair, but it was a challenging undertaking. "We need to put greater emphasis on cultivating our own story."

Asked if Highland Pellets is considering other sites for new wood pellet plants, Reilley said they have 300 acres in hand at Stephens, Ark., about 100 miles southwest of the current plant, and also continue to look at other sites. Reilley didn't commit that Highland was definitely building a plant in Stephens, but said it depends on developments with off-take markets.

Andrew Johnson, vice president of dryer island manufacturer TSI Inc., addressed the challenges and opportunities of the industrial wood pellet industry. He said challenges stem from the relative newness of the industry, though much of the technology is a newer version of older particleboard technology. He said the industry has attracted engineers from the pulp & paper and power industries, but not so much from the engineered wood products industry, such as particleboard. This has created a "new learning curve on an old topic." He referred to subtle differences such as drying southern yellow pine to 10% moisture content target instead of 2% as with particleboard.

"With pellet (wood) you stop it half way through the curve," Johnson said. "It's a lot more difficult to hit the correct moisture."

He said the search for optimum emission control goes on.

As to managing the capital cost of pellet plants, Johnson noted that as the economy gets busy the fabrication costs soar; real or imagined trade wars drive up the cost of material and components; customized designs for plants always cost more. Some of this may give way to more standardized equipment designs and simplified plant design and control.

Looking at markets, Johnson expects more production capacity to be built in North America to meet increased demand from Northern EU countries. He said North America has an opportunity to supply some of Japan's anticipated boom in industrial wood pellet demand.

Johnson said China has a projection plan for a market of 40 million tonnes of pellets, but said it bans the im-

ports of white pellets, while allowing torrefied pellets.

Potential markets? One is in our own backyard, Johnson said, referring to North America. He said Russia has the largest forest resource but lacks the infrastructure to fully exploit it. Brazil has all the natural resources to be a major player but is hamstrung by onerous bureaucracies and interstate tax burdens. And what about Africa? Johnson asked, leaving it at that.

Johnson also addressed the industry's image problem. "We are being pilloried by an unholy alliance of environmental lobbyists and the fossil fuel industry," he said. "'Scientific' reports that have a predetermined agenda are recirculated and rehashed ad nauseum by supposedly respectable news outlets."

Yet he said it is industry that has numerous positive points to take to the public, such as the increasing biomass in the forests, thus protecting not degrading the carbon sink while sustaining a recreational and wildlife haven. "The alternative is more fossil fuel, nuclear or variable power generation supported by battery technology, which is probably not so green," Johnson said.

Johnson said the industry should generate educational material, engage the news media with real data and even reach out to environmental organizations. "We should do more than we have to tell a positive story," Johnson said.

Jenkins, Dale and Lang addressed the state of Southern forests.

Astec's impressive model was front and center.

Where The Forest Stands

The subject of sustainability was prevalent throughout the conference but took center stage in the session, "Southern U.S. Forests & Sustainability: The Real Impact Of The New Industrial Wood Pellet Industry," featuring presenters Jennifer Jenkins with Enviva, Virginia Dale with the University of Tennessee and Amanda Hamsley Lang with Forisk.

Jenkins, vice president and chief sustainability officer at Enviva, provided an overview of the U.S. Southeast forest landscape, which is roughly 99 million hectares, accounting for 45% of the total land area in the region. It contains 11.4 billion metric tons of growing stock inventory and 86% of it is privately owned. Jenkins pointed to a more than 100% increase in growing stock inventory in the past 50 plus years, and a more than 4 million acre increase in forest areas.

Jenkins addressed Enviva's three pillars of sustainability: certification, care for the forest landscape and transparency. Enviva's manufacturing facilities hold multiple certifications through industry forest and biomass sustainability programs.

She detailed a science-based sourcing framework that allows Enviva's procurement and sustainability teams to take a given tract and make individualized decisions based on what's best for the land. Enviva has refined this process over the last few years with input from not only the Enviva staff but also solicited academic and forest conservation experts. This leads to the final pillar of Enviva's approach, transparency, and specifically its Track and Trace supply chain monitoring system, in which Enviva tracks every ton of primary wood back to its origin in the forest or sawmill. Starting in January 2017, Enviva launched a website, updated quarterly, to complement this initiative.

By utilizing this system Enviva is able to give anyone with access to the internet 100% visibility into Enviva's biomass supply and sourcing practices. Included in the data on a given tract is the county, landowner type, forest type, harvest type, age class, harvest acreage, and percentage of the total volume to Enviva's facilities. By pulling this data, Enviva is able to ensure all feedstock aligns with its forest stewardship values.

Speaking of feedstock, Jenkins said Enviva's source of wood includes 39% from mixed pine and hardwood forests, 35% southern yellow pine forests, 5% upland hardwood forests, 2% bottomland hardwood forests and 20% sawdust/shavings/residuals from wood manufacturing.

"The most recent data confirms that Enviva's

sourcing practices are encouraging sustainable forest management, with forests continuing to grow faster than they are harvested," she said.

Dovetailing nicely with Jenkins, Virginia Dale with the University of Tennessee at Knoxville gave an in-depth look at research she and others at the Center for BioEnergy Sustainability at Oak Ridge National Laboratory (ORNL) have been conducting as part of the effects wood pellet production has on forest conditions in the Southeastern U.S.

Crosby: Introducing NanoMass

The research is centered on three key questions: How does the Southeastern U.S. pellet production for export to EU differ from a business-as-usual case of no pellet production? Are there significant changes to key environmental indicators? How can forest conditions be monitored and good practices implemented?

In part, the questions led to other questions, Dale said, such as, Will the pellet industry alter the amount of land staying in the forest? Under what conditions does the pellet industry complement or compete with pulpwood use?

Findings both surprised Dale and proved what those working in the industrial wood pellet industry know to be true. In 2014, for example, the pellet industry constituted less than 1% of total U.S. forest products by weight—however, that number has grown significantly over the last four years and continues to climb. Historically, Dale asserted, the effects of woody biomass "deforestation" are not on the shoulders of pellet producers. Past agriculture cleared much of the Southeastern forests (only 3% of original longleaf pine forests remain) and the remaining old-growth forests are largely protected by the government. Currently, high-value forest products—not pellets—drive the dominant factor in forest management decisions.

As to the overall status of forests in the U.S., Dale pointed to 1,500 state government entities who implement forest policies and programs, including the USDA's Forest Inventory & Analysis, a long-term survey with information on various forest types across the country and statistics relating to removals by harvest, carbon accumulation, tree size, growth health and mortality.

Dale's research went a step further, focusing on the two fuel sheds that supply over half of the total pellets exported to Europe: Norfolk, Va. and Savannah, Ga. Starting in 2009 and continuing to present day, volume, area, number of dead trees, and carbon were measured in both natural stands and plantations. Findings across the board showed that as the years progressed, both fuel sheds saw increases in timberland volume, timberland area and million of metric tonnes of carbon. Pine plantations saw a significantly smaller number of standing dead trees as well. In conclusion, Dale believes that further study of the effects on biodiversity with regard to declining numbers of standing trees needs to be done.

Dale concluded her presentation by saying, "There is no one key for effective timber management, but having a bioenergy market can help. As demand for wood increases, net forest area typically expands."

Rounding out the session, Amanda Hamsley Lang, COO & vice president of Client Services at Forisk Consulting, offered her take on wood use and supply chain implications related to pellet industry in the South. Forisk is projecting pellet capacity in the U.S. South to steadily increase to 2020 before leveling off at more than 10 million tonnes.

Lang also presented Forisk's projections of pulpwood and chip demand by the pulp & paper, OSB and bioenergy markets. Combined, they've shown a gradual uptick since 2011 and will start running fairly level as of about 2020 at 225 million green tons. She noted that mill residues have surpassed pulpwood/chips in annual wood pellet feedstock.

In-Woods

Clay Crosby, CEO of Twin Rivers Land & Timber in Georgia, spoke about his company's evolvement into a major producer and supplier of wood chips and biomass, both in-woods and mill residuals. In 2016 the company secured a supply agreement with the new Procter & Gamble 50 MW biomass power plant in Albany, Ga. that generates electricity for the P&G plant and for Georgia Power.

Crosby said his company carries two to three million tons of inventory ahead of current market need.

He also announced his company's current collaboration in the manufacture of NanoMass biomass dust, which is sterilized in a dry powder to make it suitable for co-firing in coal power plants. Crosby referred to Malaysian-based K. Marcus Chee as the founder and CEO of NanoMass Corp., the developer of the technology.

Jerry Morey, president of Bandit Industries, spoke on his company's chipping and grinding lines, including new developments for land clearing applications.

Morey recalled speaking in Atlanta about biomass energy in the mid 1970s, when biomass was booming and oil and gas prices had escalated. Today, Morey said, the biomass market for power generation in the U.S. is at a low point.

Morey expressed contempt for how U.S. energy policy is focused on wind and solar, especially when "wind doesn't make any sense," he said, adding, "Policy should be more focused on wood. Maybe we need to get Donald Trump involved."

Jeremy Sapp and Jerry Sapp, principals in Sapp's Land & Excavating, discussed their company's diversification from a traditional logging operation into a major ➤ 36

26 ➤ supplier of microchips to the Enviva (formerly Green Circle) pellet facility in Cottondale, Fla. They run four chipping crews and one roundwood crew, and with 40 employees and 21 trucks deliver 250 loads weekly.

They addressed the procurement-supplier relationship and the importance of open and honest communication on matters such as planned maintenance outages at the plant and holiday schedules.

The Sapps built their headquarters and shop at the entrance to the pellet plant. "When we built outside the mill, we committed to be there for the long haul," Jeremy said.

Jerry said their employees appreciate such stability, which makes them feel more confident about their jobs. This leads to greater longevity in the employment ranks, adding that it is a time-consuming and expensive exercise to train new employees just to three-quarters proficiency.

Education Factor

Looking toward the future and developing younger personnel to find skilled opportunities, the conference included a session that looked at industry's relationship with academia.

According to Dr. Richard Vlosky, Director of the Louisiana Forest Products Development Center, there are two sides to the issue, and both need to do more. "The industry doesn't do a good job of telegraphing their in-demand jobs, and faculty members who have spent their careers teaching can be a bit insulated," he noted.

As employer requirements change, there needs to be a better way to update academic requirements or emphasis, Vlosky said, adding that information technology has made it easier to communicate and match faculty skills with market demands.

Improving materials technology and related new generation technologies like genetics and nanotechnology are bringing new

Vlosky: Knowing what industry needs

capabilities and opportunities, Vlosky said. Areas needing more emphasis in future education efforts include manufacturing and processing systems, material sciences, environmental issues, sustainability, marketing and modification technology.

"I believe a forest products education should offer what the industry wants," and not simply faculty knowledge, Vlosky said.

Dr. Brian Via, Regions Bank Professor and Director of the Forest Products Development Center at Auburn University, detailed a new curriculum just beginning at Auburn, "Sustainable Biomaterials and Packaging,"

The new major aims to create a multidisciplinary program that incorporates forestry and wildlife, chemical engineering, biosystems engineering, architecture and design and business classes that will give graduates the knowledge to take on new industry challenges.

The curriculum follows a supply chain strategy to expose students to all aspects of the forest products industry, beginning with raw material growth and development, harvesting and supply chain management; industry processes and segments such as solid wood, composites, engineered wood products and pulp and paper for packaging; and concluding with marketing and business economics, recycling and sustainability concepts.

Other Presentations

Participating in the Ten Year Report Card session, Eric Estes, project manager with Mid-South Engineering, emphasized that new plants should give more consideration to wood yards, avoiding some of the issues that earlier plants encountered.

Estes pointed to five main considerations for effective wood yards: wood receipt; truck dumping and conveying; crane and roundwood storage; log (chipper, hog) line; and chip storage/reclaim.

"Plant road design is a critical step in the overall arrangement," Estes said.

As part of the same session, Bijan Shams, president of Cogent Industrial Technologies, said new and existing plants are calling for greater emphasis on safety, adding that the biggest safety challenge in industrial pellets is fire and explosions.

Shams said the foremost safety goal is to protect people and assets. He spoke about methods and technologies for prevention, protection and response, as well as the recovery plan.

He pointed to the main areas to focus on for fire safety: civil & building; dry material handling; process control; hot oil & hydraulics; equipment reliability; operator effectiveness; and electrical.

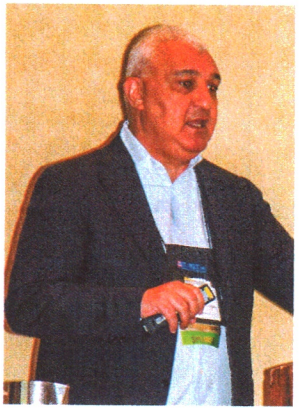
In-woods chipping was a major part of the conference conversation.

Jeremiah Redman, senior consultant with Trinity Consultants, addressed today's EPA and administrative environmental policy. He said the current intent is to turn more authority back to the states. He noted severe planned budget cuts in EPA programs.

However, Redman added that the Trump administration will have to work within the confines of the major statutes, such as the Clean Air Act, and that regulatory changes takes significant time. He said EPA scientific advisory boards may be more industry-friendly.

Tyler Player, president of Player Design Inc., shared a

Player: Shipping technology



Shams: Safety implementation

study of his technology for shipboard heat treating of wood chips for export. The propane-powered system cycles for 30 minutes keeping chips fresh. It include five damper zones, three return air zones, 16 locations at varying depth for temperature readings and and active process optimization. The portable nature of the system can be prepped in as little as 24 hours.

Also in the heat energy session, David Digdon, VP business development for Atlantic Combustion Technologies, spoke on improving the operating efficiencies of industrial biomass-fueled furnaces and boilers, focusing on hard ash deposition and slagging and its alleviation through an ash modifier, a clay-based mineral compound designed to be pneumatically injected directly into the combustion zone in the furnace, and fed on a continuous basis.

Digdon noted that in addition to operational improvements, the ash modifier results in improved final product quality, often an overlooked benefit of the technology.

Francisco Ripoll, export manager with Sugimat, spoke on thermal oil and steam efficiencies in fluid heaters. He said oil is low pressure and offers high performance at high temperature with modest investment and reduced thickness tubes. He said it offers low probability of leakages, almost non-existent heater maintenance, and longer pump life due to constant lubrication. It also has low risk of explosion.

Wood Bioenergy *editors Jessica Johnson, Dan Shell, Jay Donnell and Rich Donnell contributed to this article.*

The sixth Wood Bioenergy Conference & Expo will be held March 10-11, 2020, again at the Omni Hotel at CNN Center in Atlanta.

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