



MADISON'S TIMBER PREVIEW

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An article this week in the Globe and Mail caught Madison's attention with the headline, "The new oil? Wood fuel makes a quiet comeback." Curious, considering wood fuel never left. Rather, producing energy from biomass is a remarkably wide-spread, fast-growing field.

Governments around the world have issued mandates to reduce the use of traditional fuels in favour of green, or carbon-neutral, energy sources. Commercialization of cellulosic ethanol is currently in its initial stages and is expected to scale up in the near future.

The global market for biofuel enzymes is projected to exceed US\$900 million by the year 2017, according to a report published this week by Global Industry Analysts. Developments in the production of cellulosic ethanol continue to contribute towards rapid growth of the biofuel industry, says the report. Ethanol manufactured from cellulosic biomass is a substitute likely to address the limitations of corn-based ethanol and fulfill the requirement for extra liquid fuel sources. Cellulosic biofuels are obtained from sources that include wood chips, agricultural waste, as well as prairie grasses. A shift toward cellulose as well as related enzymes, which is required for refining bio-ethanol, is expected to drive future gains. Moreover, cellulose is available in abundance on earth.

A critical issue in the speed of development of biomass fuel production is the concern of feedstock availability. Investors have been wary of putting millions of dollars and several years' effort into building plants that might run out of fibre supply in fifteen years' time. The biofuel processes which can use a variety of fibre sources are more likely to succeed than those geared toward strictly cellulose, corn stover, or any other single material. In addition, if that feedstock can be put on a high-rotation harvest schedule then the risks of decreasing availability over time are reduced.

One material that fits in all these categories is switchgrass. Fast-growing and hardy, switchgrass quickly produces a great deal of biomass. It can be planted or grows naturally in the understorey of a forest and can be repeatedly harvested without impacting the primary, and more valuable, timber stands.

One company working in this field for the past two years is ArborGen, out of Summerville, SC, a joint project of timber corporations International Paper, MeadWestvaco and Rubicon. ArborGen is a global supplier of seedling products to the commercial forest industry, and a developer of biotech seedlings. The company is developing products that significantly improve the productivity of a given acre of land and enable the growth of trees that yield more wood per acre in a shorter period of time. Most of its customers are in the US, New Zealand and Australia, and it has an increasing base in Brazil.

ArborGen suffered a major public relations blow last year when various environment and legal groups, including the Sierra Club and the Dogwood Alliance, filed a lawsuit against the US Department of Agriculture for allowing the company to go ahead with planting a quarter of a million genetically modified cold weather-resistant Eucalyptus trees in the southern US. The planting permits were issued on June 10 and the lawsuit was filed July 1, tying up execution of the permits seemingly indefinitely.

In the midst of all this, the company on June 13, 2010, decided to withdraw its proposal to sell stock to the public and raise capital due to a shaky stock market the previous month. ArborGen said in a statement at

the time that it made more sense to pull the offering rather than "proceeding at a below-value price today simply to meet current market conditions."

Not easily deterred, ArborGen has moved forward with research and development on another front, to explore the potential of Loblolly Pine as a sustainable biofuel source, adding a new dimension to its value. The company is part of a University of Florida-led research team awarded three-year US\$6.3 million grant by the US Department of Energy's Advanced Research Project Agency Tuesday. The research team's goal is to bring about a five-fold increase in the amount of terpene produced by Loblolly Pine, making it cost-competitive with petroleum-based fuels. The scent of pine trees comes from terpene, a chemical that is naturally produced and stored in the tree. The liquid terpene can be directly blended with transportation fuels like gasoline. The researchers hope to develop tree varieties that accumulate terpene in the tree to more than 20 per cent, from the existing 3 to 5 per cent. At a 20 per cent level of terpene content, pine trees can produce about 100 million gallons of fuel from about 25,000 acres of planted pine.

ArborGen will lend its expertise to the research team by developing and implementing novel and complementary approaches to increase terpene in Loblolly, an economically important tree species throughout the US southeast because it is widely used for lumber and wood pulp. ArborGen is involved in finding ways to maximize the productivity of trees so that emerging industries can obtain the resources they need, while conserving the supply required by traditional industries such as wood and pulp and paper.

Also announced Tuesday, ArborGen has been named as a core member of the recently formed Southeast Partnership for Integrated Biomass Supply Systems. Created through a US\$15 million grant from the USDA's National Institute of Food and Agriculture to accelerate the supply of bio-based renewable energy, the IBSS partnership will develop sustainable feedstock production systems for dedicated energy crops, specifically purpose grown trees and switchgrass. ArborGen's role in the partnership will focus on exploring the inherent performance and cost advantages of short-rotation woody crops such as Eucalyptus, Pine and Poplar, matching the economic and environmental performance of each feedstock with a preferred conversion platform.

On April 26 this year, the company unveiled estimated terms for its initial public offering, as it seeks proceeds to repay debt and fund potential expansion. In filings with the Securities and Exchange Commission, ArborGen said it believes its biotechnology products would revolutionize standards for the forestry industry. The company plans to sell about 5.1 million shares for US\$16 to \$18 each. In October 2010, it had registered to raise up to an estimated US\$75 million in its debut and applied for listing on the Nasdaq Global Market under the symbol ARBR. ArborGen historically has not been profitable, according to Matt Jarzemsky at *MarketWatch*. In the nine months ended December 31, 2010, its loss widened as revenue jumped 16 per cent but expenses also rose.

These new research partnerships, injections of money from government sources, and improved PR, will surely improve ArborGen's financial standing in the future.

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