

# Biofuels Center of North Carolina

by Linda Hoke

“We’re the nation’s only comprehensive biofuels agency, and I say that more out of surprise than for the purpose of touting North Carolina,” said Steven Burke, President and CEO of the Biofuels Center of North Carolina, drawing attention to opportunities in the biofuels sector that have yet-to-be fully explored and developed by many states across the nation. “Targeted, incisive long-term thinking is needed for change...towards an ultimate goal of national competitiveness in a significant, long-term sector,” he emphasized.

Leaders in North Carolina came to the realization in 2006 that they had given little attention to capturing the relatively new biofuels sector, and with it, opportunities that played to North Carolina’s strengths in agriculture, forestry and manufacturing. The first step was a biofuels summit, convened by the North Carolina Biotechnology Center in June 2006, that brought together 15 key government, academic and corporate leaders to talk about the potential of this sector for North Carolina. There were a number of positive signs, from both demand and supply perspectives, which suggested the state might well be advantaged to pursue biofuels.

On the demand side of the equation, state leaders saw the need for additional biofuels to meet the U.S. Renewable Fuel Standard, a provision of the U.S. Energy Policy Act of 2005. The mandate at that time was for 7.5 billion gallons of renewable fuels by 2012, since expanded and extended by the Energy Independence and Security Act of 2007 to 36 billion gallons by 2022. They recognized that the significant difference between that demand and the current ethanol supply—primarily from corn in the Midwest—represented a large window of opportunity for states in other parts of the country, as well as for non-corn sources such as energy grasses, wood, municipal waste and algae.

In addition to the national market for biofuels, state leaders also saw a lost opportunity in terms of producing fuel within their own borders. They were looking at figures that showed that all of the 5.6 billion gallons of petroleum-based liquid fuels consumed by North Carolinians each year were coming from out-of-state, contributing nothing to the state's agricultural, forestry or manufacturing economy. At the same time, they saw the state's potential in the biofuels arena, counting among the state's resources 48,000 farms and 17 million acres of trees—in addition to a manufacturing heritage and strengths in biotechnology.

The June 2006 summit served as the impetus for August 2006 legislation that called for a statewide biofuels strategic plan. The planning process took place from September 2006 to March 2007 under the leadership of five co-conveners: North Carolina State University's College of Agriculture and Life Sciences, North Carolina A&T's School of Agriculture and Environmental Sciences, the North Carolina Biotechnology Center, the North Carolina Rural Economic Development Center, and North Carolina Secretary of Revenue Norris Tolson. A 24-member steering committee brought in additional perspectives

and expertise to help guide the process. In all, more than 70 leaders from varied sectors were involved in the plan's development.

The final report, *North Carolina's Strategic Plan for Biofuels Leadership*, issued in April 2007, envisioned a potential leadership role for North Carolina—and the South—in the biofuels arena:

*North Carolina is remarkably well-positioned to shape science, biotechnology, agricultural and biomass resources, smart participants, and policies into an internally strong biofuels sector. In fact, more is realistically possible. With the right grouping of vision, strategy and resource commitment over time, North Carolina can gain Mid-Atlantic and Southern leadership in a growing biofuels industry in coming years.*



Oxford Biodiesel Plant

The report went on to highlight nine recommended strategies, anchored by an overarching vision and commitment:

*By 2017, 10 percent of liquid fuels sold in North Carolina will come from biofuels grown and produced within the State.*

The plan also recommended the creation of a Statewide Biofuels Commission to guide and oversee the plan and its recommendations. The North Carolina Biofuels Center was created shortly thereafter to fulfill this oversight and implementation function, receiving an initial \$5 million appropriation from the NC General Assembly, as well as operational funding in subsequent years.

With the state's agricultural heritage in mind, Oxford, North Carolina was selected as the Center's location. USDA had deeded its Oxford agricultural experiment station to the North Carolina Department of Agriculture and Consumer Services (NCDA&CS) in 2005. This site became the foundation for a 426-acre Biofuels Campus to be developed via a partnership

between the Biofuels Center and NCDA&CS. Plans for the campus include trial plant growing and other agricultural research, incubation of new biofuels companies, pilot and demonstration facilities to test and verify new products, and spaces for public education and engagement. Parts of this vision are beginning to take shape: agricultural research is underway on the Campus; the partners recently completed renovations of 6,500 square feet of office and laboratory space that they are marketing as an incubator, called the Biofuels Company Accelerator; and the Oxford Biodiesel plant opened in May 2012, with an annual production capacity of approximately 35,000 gallons of biodiesel, using recycled cooking oil from the State Fair, from other smaller events, and from crops grown on the Campus. The plant also serves as an educational resource to farmers and the public.

The Biofuels Center, which began operations in January 2008, was created as a private, non-profit corporation. It draws together diverse interests and areas of expertise in its governing board—including academics, environmentalists, forestry and farming representatives, economic developers, biotechnology companies, and venture capitalists. “It’s impossible to develop a sector from any one vantage point,” emphasizes Steven Burke. “We can’t will this to happen; our success will only happen if others succeed,” he explains.

Partnerships—and relationship building—have been particularly critical since the state is exploring new territory and has no blueprint to follow. Burke likens it to a Whac-a-Mole game: just when you think you have one thing under control, another thing pops up. The work has required coordinating agriculture, forestry, environmental, science and research, logistics, production, distribution, banking and finance, and retail sectors, among others.



A Duke University researcher stands with Oregon State University Poplar trees planted at North Carolina’s Biofuels Campus in Oxford.

One concrete example of the power of bringing together groups with varied perspectives has been the development of a consensus around best management practices for energy crops. The Biofuels Center convened a group of approximately 30 people from across the Southeast in April 2011 to address concerns about new bioenergy crops and whether they might be invasive. The resulting *Voluntary Best Management Practices for Energy Crops: Minimizing the Risk of Invasiveness*, issued in September 2011 by the NC Department of Agriculture and Consumer

Services, NC Cooperative Extension and Biofuels Center of NC, has been recognized nationally as a model for other states to follow.

Among the Center’s other key activities have been:

**1. Research:** “Biofuels in North Carolina are not going to be based on corn,” Burke says, emphasizing the need to find feedstocks and biomass for conversion to fuels that are better suited to the state. The challenge is that nobody nationally knows how to grow large amounts of alternative feedstocks for fuel, he continues, noting that this is the “biggest nut to crack.” The Biofuels Center has funded research on 15 feedstock alternatives—from industrial sweet potatoes to duckweed to tropical sorghum. Two that seem to be most appropriate for

North Carolina are trees (woody biomass) and energy grasses, such as sorghum, miscanthus, switchgrass and *Arundo donax*. Working in partnership with North Carolina State University, the Biofuels Center has helped establish an *Arundo donax* nursery at the Williamsdale Biofuels Field Lab in Duplin County that is attracting national and international attention. Funded research is not limited to crops, but has also included production and processing technologies. In addition, the Biofuels Center has facilitated research by biofuels companies, such as its assistance to GrassRoots Biotechnology, an

emerging agricultural biotechnology company, in securing field space to correlate feedstock yields with differences in root architecture.

**2. Sector development:** “This is a sector as well as a technology,” Burke says, and accordingly, the Biofuels Center has focused its attention not just on research and technology development, but also on business sector development. This has included conducting research on current resources and markets, developing economic model tools for producers and companies, and holding targeted meetings with industry leaders, elected officials and farmers. The military, which has a strong presence in North Carolina, has also been a focal point in terms of sector development. The military has been a leader in the alternative fuels arena, seeking to reduce the vulnerability that goes along with dependence on foreign sources of fuel. The Biofuels Center is working to help develop a biofuels sector in the state that can meet the military’s purchasing needs and specifications.

**3. Public education:** “We’re working to change the actual and figural landscape of North Carolina,” says Burke, talking about a broad view of the Biofuels Center’s mission. He observes that they’ve come to the realization that “doing so is as much a civic enterprise as an economic or agricultural enterprise.” Public education around biofuels has taken a number of forms—from the traditional (a monthly newsletter and talks to school groups) to more unconventional approaches, such as the

production of a CD entitled from *Bluegrass to Switchgrass*, featuring North Carolina musicians, and the use of placemats in the General Assembly cafeteria to familiarize legislators and the public with biofuels. One of the highest visibility efforts has been the airing of a series of 30-second PSA TV spots during ACC basketball’s “March Madness” in 2012. The spots featured everyday citizens, filmed at the State Fair, talking about why they thought biofuels were important.

“We’re working to change the actual and figural landscape of North Carolina.”

Steven Burke  
President and CEO, Biofuels Center of NC



Giant Miscanthus

“To make this a viable enterprise takes an incredible amount of infrastructure,” observes Philip Benfey, founding CEO of GrassRoots Biotechnology and a member of the Biofuels Center’s Board, in talking about the development of a biofuels sector in the state. “Gaining large capacity for biofuels across North Carolina is more complex than we ever dreamed,” Burke has said. We’ve gone from “let’s make some fuel, that’s a good idea” to “is this hard, or what?”

But there are signs that the effort is gaining traction.

“Prior to 2007, this place was on nobody’s radar in biofuels,” Burke said.

So, when Chemtex International, part of the Italian multi-national M&G Group, recently announced plans to locate the nation’s first commercial-scale cellulosic biofuels center in Clinton, North Carolina, Burke saw this as a verifiable sign that “North Carolina has developed credibility.” If all goes according to plan, the 20 million gallon cellulosic ethanol plant is slated to open in 2015, employing 65 and creating an additional 250 indirect jobs through feedstock

supply, maintenance and transportation. The Biofuels Center is working with area farmers to begin growing feedstock for the new facility, which will require approximately 30,000 acres of land producing up to 300,000 dry tons of biomass annually.

## Lessons Learned

Burke offers the following lessons to other states that are looking to develop a strong biofuels sector:

- This work is harder than it seems. There is no precedent or blueprint.
- A comprehensive approach is required; partnerships are critical. It's as much a civic enterprise as an economic one.
- Recognize that it will take a long time to establish a biofuels industry. Plan for at least a ten year time horizon: five years developing credibility and capabilities, and the next five actually making fuels. Legislative support is important to sustain the effort across gubernatorial administrations.



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SAFER's vision is to position the South as the national leader in renewable energy production. SAFER works toward this vision by providing strategic leadership to the agricultural and forestry sectors in advancing renewable energy initiatives. These initiatives focus on better policy, targeted research, efficient commercialization, and outreach and education.

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