Steve Exum

Kim Jones and her husband, Scott, are researching ways to grow algae as a source of oils to make biofuels.

FUEL TIME

The state's Green Business Fund nourishes fledgling companies working on sustainable products.

Kim Jones likes to joke that she grows slime. Now, the state of North Carolina has given her a $60,000 grant to grow it more efficiently.

It turns out that certain types of slime — or technically, algae — are rich in lipids, the oils that can be extracted to make biofuel. The challenge Jones and her husband, Scott, are tackling is how to grow enough of the right kinds of algae to make extraction commercially feasible.

That's where the new North Carolina Green Business Fund comes into play. In July, it awarded $950,000 in grants to 13 small businesses seeking to develop and market promising green and other alternative energies. The money will help bridge the so-called "valley of death" that exists between a company coming up with an idea and actually putting it into production, says John Hardin, acting executive director of the N.C. Department of Commerce's Board of Science and Technology, which oversees the grant program.

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Sencera is developing solar technology.

The inaugural grants ranged from $18,000 to $100,000. They will help fund projects that include a highly efficient, lower-cost electric switch for hybrid vehicles and other power supplies, and a process for converting hog manure into electricity.

The Joneses' Southport-based company, Alganomics LLC, will build a photobioreactor, a closed system for growing large amounts of algae in a controlled environment. By culturing algae in long, clear tubes instead of open ponds, the Joneses expect to be able to grow just the types that are highest in lipids, increasing efficiency and laying the groundwork for large-scale culturing and production.

They then hope to link their bioreactor to an ethanol production plant, a hog-waste lagoon or a sewage treatment plant, capturing the methane and carbon dioxide byproducts and other nutrients to fuel algal growth. The concept has worked in the laboratory, says Kim Jones, a chemistry instructor at Brunswick Community College. The Green Business Fund grant will help prove whether it can work on a larger scale. "Algae can double its mass in a day," she says. "I think there's real potential with that."

It also has the potential to produce higher yields than other products being considered as sources for biofuels. Algae can produce 5,000 gallons of fuel per acre per year, Jones says, compared with 127 gallons for canola and 48 gallons for soybeans. "The whole idea with the grant is to do a pilot project and a feasibility study. We'll do ours over a year. We hope to step up production incrementally, starting with 1 ton per day and then up to 10 tons per day," she says.

As production ramps up, the Joneses expect to add a handful of employees. They also are working on ways to use their algae for other products, including nutriceuticals and pharmaceuticals.

The Alganomics proposal fell into one of three priority areas for the Green Business Fund program: biofuels, green building and alternative and renewable energies. Hardin says the 85 applications were about evenly split among those three categories, as were the awards.

The applications were first reviewed for compliance by grants administrator R.V. Rikard, who gave applicants a chance to clear up any minor problems, and then by Hardin. The 63 requests passing that review were forwarded to a 26-member advisory committee with expertise in the priority areas.

Each application was scored by at least two committee members on technical merit and feasibility, experience and qualifications of the personnel and facilities, effectiveness of the proposed work plan, and budget realism, according to Hardin. Secondary factors were commercial merit and market opportunity, and the potential to promote economic development.

If the two reviewers' scores were too far apart, a third committee member with expertise in the same field

Commerce launches a network to coordinate efforts to help businesses

Starting an Internet business selling spices? Need help buying raw materials and containers, not to mention finding the labor to get them filled? Maybe you're unsure about what permits you need or how best to tailor the company to handle its taxes? What about selling overseas?

These are the kinds of questions entrepreneurs ask when starting small businesses these days. Existing businesses considering expansion or even larger companies looking for new markets are confronted by similar uncertainties. The problem is, there has been no easy way to find experts with the answers to specific business problems.

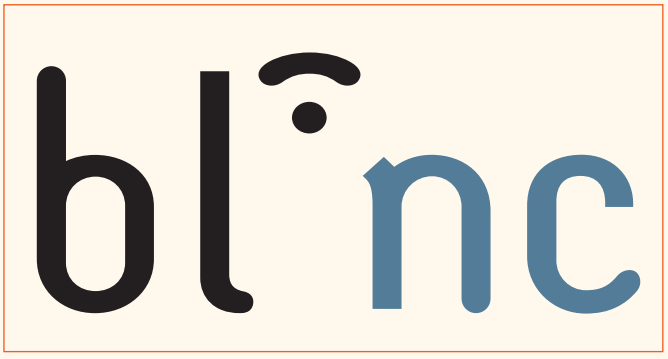
The N.C. Department of Commerce and other state agencies are working to change that with a new online project called Business Link North Carolina. It's designed to give owners of small and large businesses access to experts on finance and capital, government contracting, international trade, minority certification, business operations, sales and marketing, licensing, taxes, technology and workforce issues.

A team that includes officials from the Commerce Department, N.C. State University, the Small Business and Technology Development Center and several other organizations is developing the program. "Our department works with numerous partners in a coordinated way to deliver value-adding programs and assistance to these companies," says Commerce Secretary Jim Fain. "We are getting ready to 'turn it up a notch' in terms of optimizing our collaborative efforts and initiating a branding and awareness campaign to make sure more businesses know what's available."

Business Link North Carolina, or BLiNC, will establish a network of experts and services that can be accessed through a Web site designed so users can find information in three clicks.

The site will provide a portal to the state's many business services. Participating are the N.C. Biotechnology Center, the N.C. Community College System, the state Department of Agriculture, the Commerce department's Business ServiCenter, the state Department of Revenue, the North Carolina Institute of Minority Development, the state Community Development Initiative, N.C. State's Industrial Extension Service and the UNC Economic Transformation Council. Many of these agencies already have resources in place to help small businesses. The ServiCenter, for example, pools Commerce Department experts and other resources to answer questions from business owners, while the Community College System runs a network of small business centers around the state.

"Most of the pieces are already in place," says Gene Byrd, the Commerce Department's director of retention and expansion. "We've got strong relationships with our partners. This just formalizes them."



Commerce Secretary Jim Fain says Business Link North Carolina will coordinate state help efforts.

also scored the application and the scores were averaged. As a final step, the full committee reviewed all the applications, starting with those with the highest scores, and determined the grant amounts.

"What I think was toughest was there were a lot of proposals that were really good that didn't get funded," Hardin says, noting the grant requests totaled $7 million. "Even the ones that didn't get funding are doing some incredibly innovative things. It just makes you feel confident about the future state of the environment."

"The grant showed us North Carolina was very interested in this field and very interested in having us in North Carolina."

Blue Ridge Biofuels LLC of Asheville, the recipient of a $77,737 grant, is working on developing a more cost-effective way to turn waste-trap grease into biodiesel. Only a fraction of cooking oils is suitable, says Brian Winslett, the managing partner. The company has been in business since 2004, collecting cooking oil from restaurants and turning it into enough biodiesel to open western North Carolina's first commercial biodiesel pump in July 2005. Blue Ridge Biofuels is developing a pre-treatment process that converts more of the free fatty acids in waste grease — material that currently can't be used — directly into biodiesel.

The money will help fund laboratory research leading into prototype testing, as well as pay for some chemistry consultants to evaluate the results. The whole idea is "local resources to local fuel," Winslett says.

In Charlotte, Sencera International Corp. is betting on the sun as an alternative energy source, working on more cost-effective ways to manufacture solar panels and bring down the cost of solar energy. The company's thin-film technology uses about 1% of the amount of silicone found in traditional photovoltaic solar panels, says Rusty Jewett, the company's chief executive.

Sencera received a $100,000 grant to help build a seven-chamber prototype system to develop and test its manufacturing methods, which Jewett says are similar to those used in the computer-chip industry. "It costs several million dollars to build these tools," he says. "The grant showed us North Carolina was very interested in this field and very interested in having us in North Carolina."

The company returned the favor. It plans to expand its operations in

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Sencera plans to add 65 employees in Charlotte by mid-2011.

the state, spending $36.8 million to build and equip a factory that will make solar modules in Mecklenburg County. The modules are used to generate electricity for residential, commercial and utility-scale applications. The company, which employs 10 people, plans to add 65 employees by mid-2011. The new jobs will pay an average of $73,462 a year. "The cost of electricity generated by solar panels has been decreasing more than 5% every year, which has resulted in an emerging industry growing close to 50% annually," says Jewett. "Sencera will be able to manufacture solar panels that generate electricity at a cost that is competitive with power from natural gas, coal and nuclear power but without carbon emissions or waste-disposal concerns."

Other recipients of the first round of Green Fund grants were:

• OrganoFuels Inc. of Asheville, which received $81,944. Like Alganomics, it works with algae. It hopes to make fuel for gasoline engines.

• EcoCurrent Inc. of Raleigh, which was awarded $100,000 to continue developing a cheaper process for converting hog manure to electric power. The process also produces byproducts such as fertilizer and building materials.

• Evans Environmental Energies Inc. of Wilson, which received $75,000 to remove residual water in the final stage of making biodiesel. This process can increase the production of commercial-grade biodiesel by as much as 300%.

• Kyma Technologies Inc. of Raleigh, which was awarded $60,000 to work with researchers at N.C. State University to develop an efficient, lower-cost electric switch to be used in a broad range of applications — including hybrid and other electric vehicles, existing and renewable electric grids and power supplies. It also makes semiconductors.

• 3F LLC of Raleigh, which received $100,000 to develop a natural fiber-reinforced concrete formula. The resulting product will be stronger and weigh less.

• Piedmont Biofuels Inc. of Pittsboro, which was awarded $75,000 to develop a cavitation reactor to produce biodiesel fuel. Cavitation reactors use spinning cylinders that create pressure differences to form tiny bubbles that are used to heat and mix products. Scientists say the process uses less energy than traditional methods and causes a more complete reaction with higher fuel yields.

• Nextreme Thermal Solutions Inc. of Durham, which received $57,319 to manufacture a thin-film thermoelectric power generator capable of converting waste heat from computers and other electronics into usable electrical power. The film can be engineered at the nanoscale level, providing improvement options not available in traditional thermoelectric manufacturing processes.

• Rain Water Solutions Inc. of Raleigh, which was awarded $18,000 to develop a process for making rain barrels that will allow mass production to meet increasing demand.

• NanoTechLabs Inc. of Yadkinville, which received $70,000 to develop and commercialize an energy-storage device that has high capacity but small dimensions.

• PhazeTek Inc. of Greensboro, which was awarded $75,000 to develop a new class of thermal-efficient building materials. The nontoxic materials can be used in wallboard, insulation and solar panels. The nanotechnology company says the products will generate energy savings and improve heat management in buildings.

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