

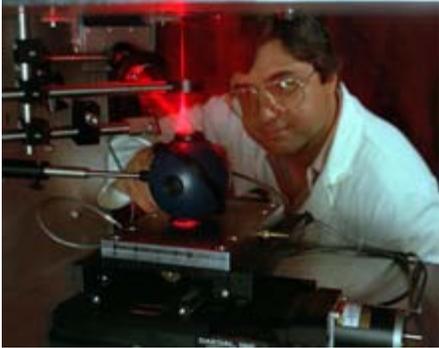
EERE-PMC News

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August, 2007

Editor: [Jack Jenkins](#)

Associate Editor: [John Horst](#)



DOE's national laboratories have developed many gateways to commercialize EERE technologies. PMC-News highlights how you can partner with the labs.

While the National Renewable Energy Laboratory ([NREL](#)) is the only national laboratory devoted solely to developing energy efficiency and renewable energy technologies, other labs offer related assistance in these fields.

Lawrence Berkeley ([LBL](#)) and Oak Ridge National Laboratory ([ORNL](#)), along with NREL, participate in the [Technical Assistance Program \(TAP\)](#), a quick way for states and localities to effectively access lab expertise on energy efficiency and renewable energy projects.

PMC-News this month explores some of the other ways state and local government, business and industry can work with the national labs to get new energy technologies into the marketplace. While this issue places emphasis on NREL, ORNL and LBL, we encourage you to also check out the other national laboratories for applicable energy efficiency and renewable energy research and technologies.

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News

NREL to host Industry Growth Forum in Denver, Nov. 6-8

Building upon the success of previous Forums, NREL anticipates more than 450 professionals, including start-up companies, venture capitalists, investment bankers, energy executives, and government officials will attend this year's three-day event.

The Forum has become a premiere event, attracting a high caliber of investors and entrepreneurial companies and also offering a unique format and window on the energy future. Its rich educational content leaves all participants - entrepreneurs, venture capitalists, and corporate investors - with a deeper understanding of the evolving energy market and what a business must do to thrive.

[Additional information and forum registration](#)

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DOE readies first big U.S. projects in CO2 capture and storage

DOE is preparing to commission America's first large-scale demonstrations of CO2 capture and deep geologic storage. This will fulfill a commitment announced last October to move forward with Phase III of the Carbon Sequestration Regional Partnerships Program.

Proposals for the Phase III demonstrations, part of the President's Climate Change Technology Initiative, include the world's earliest examination of on-shore geologic storage in deep saline reservoirs, large-scale carbon dioxide capture in coal-based power generation and the first commercial-scale linking of monitored storage with enhanced oil recovery in the United States.

Project negotiations are now underway and specific awards will be announced this fall.

[Additional information, NETL](#)

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Sugar to hydrogen points to possible transportation fuel



Sugar, whether grown as cane or from other sources, might one day be used as a source of hydrogen to fuel our cars and trucks.

Research projects at Virginia Polytechnic Institute and State University, Oak Ridge National Laboratory (ORNL), and the University of Georgia point to possible use of biomass-based carbohydrates (sugars) to produce low-cost hydrogen for transportation fuel.

Enzymatic production of hydrogen is not new, but by adding a unique combination of 13 enzymes to a mixture of starch and water, Virginia Tech Assistant Professor Y.H. Percival Zhang has demonstrated that it may be possible to use starch as a practical source of hydrogen fuel for transportation. The idea is that you could fill your vehicle tank with starch and then break it down into hydrogen on board.

Explaining the research, Zhang said, "The enzymes use the energy in the starch to break up water into carbon dioxide and hydrogen at a relatively low temperature." In the process, a membrane bleeds off the carbon dioxide and the resulting hydrogen is used by a fuel cell to create electricity that powers the vehicle. Preliminary calculations indicate a 12-gallon tank would hold enough starch to produce the energy equivalent of 10 gallons of gasoline.

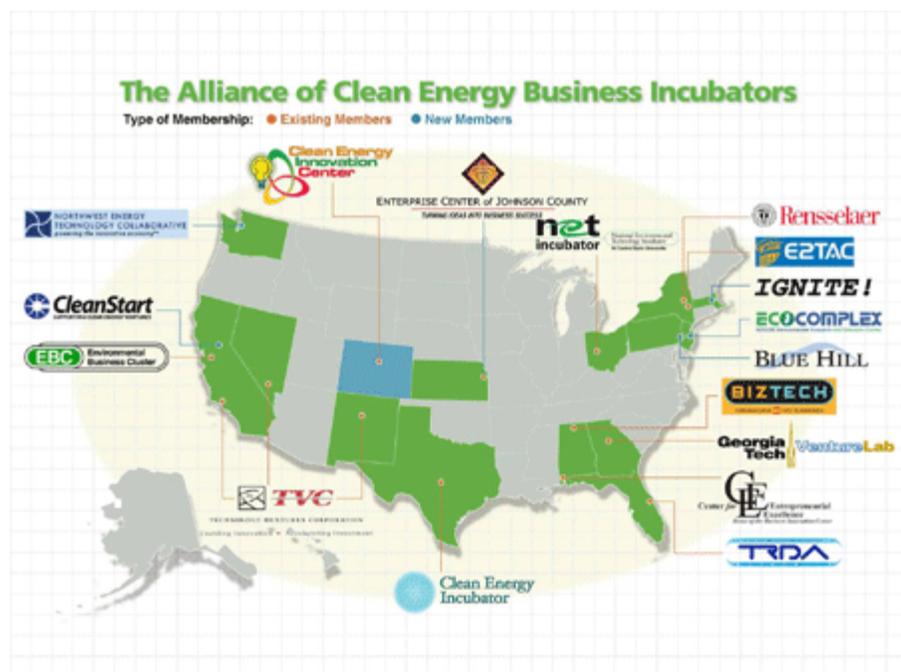
Zhang's ideas stemmed from his prior work pertaining to cellulosic ethanol. He combined that knowledge with hydrogen fuel research done at ORNL and enzymatic hydrogen production work done in the laboratory of Professor Mike Adams at the University of Georgia.

Jonathan Mielenz, who heads ORNL's Bioconversion Group and had worked with Zhang at Dartmouth College previously, said, "Pairing ORNL's Biosciences Division biomass conversion capabilities with the Chemical Sciences Division facilities for studying renewable hydrogen production was a key to the success of this project. The project also demonstrates the value of forming partnerships with universities such as Virginia Tech and the University of Georgia."

[See full story](#)

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Features



For small businesses wanting to bring new energy efficiency and renewable energy products into the marketplace, the labs' business incubator programs offer many advantages.

How to use the national laboratories to your advantage

DOE's national laboratories can be great resources for states, localities and businesses wanting to commercialize energy efficiency and renewable energy technologies.

The question for many people, though, is how best to gain access to lab resources. The labs, meanwhile, puzzle how best to help move their research results into the marketplace.

Fortunately, the labs have developed a number of effective transfer mechanisms for working with state and local governments, business and industry. Broadly speaking, any company or entity wanting to collaborate with the national laboratories can make use of:

- [Publicly available research and technology documents:](#)
- [Technical Assistance Program \(TAP\):](#)

- [Resources and information for renewable energy entrepreneurs:](#)
- [Research partnerships:](#)
- [Licensing agreements.](#)

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Get free information from national labs

Need help writing a business plan? Looking for sources of funding to finance start-up or growth? Want information about strengthening marketing efforts or targeting new customers?

Countless informational and how-to resources—from Web sites and databases to books and periodicals—are available to renewable energy entrepreneurs, often at little or no charge. Below is a sampling of such resources. One of the real problems is taking the time to winnow through web sites to even begin to find what you want.

Three good places to start looking are:

- [NREL Resources and Information for Entrepreneurs](#)
- [Oak Ridge National Laboratory Review](#)
- [Lawrence Berkeley National Laboratory Publications and Reports](#)

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Technical Assistance Program opens gateway to labs



ORNL collaborates with roofing partners to apply different coatings for reflective testing.

[DOE's Technical Assistance Program \(TAP\)](#) provides state and local agencies quick access to the national labs for crosscutting assistance in energy efficiency and renewable energy projects and programs. TAP helps states with individualized, short-term assistance in areas not directly covered by Energy Efficiency and Renewable Energy programs, such as:

- System benefit charges or other rate-payer funded utility efficiency and renewable programs;
- Renewable or efficiency portfolio standards;
- Using clean energy technologies to address air emissions challenges;
- Using renewable energy of state and local public lands;
- Using renewable and energy efficiency for disaster relief, mitigation and planning;
- Activities supported by DOE's State Energy Program.

Projects are limited to \$5,000 or between 30-60 hours of staff time. Funding is used to cover staff time and travel for laboratory experts and is not distributed directly to the applicant.

The application process is quick and simple; many projects receive assistance within a week or two. For more information, contact:

- Julie Riel
- DOE Golden Field Office
- 303-275-4866
- julie.riel@go.doe.gov

or,

- James Ferguson
- DOE National Energy Technology Laboratory
- 412-386-6043
- james.ferguson@netl.doe.gov.

[More information available on the TAP web site.](#)

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Resources and information for renewable energy entrepreneurs



National laboratories offer a number of business incubator programs to help introduce EERE technologies into the marketplace.

The national labs have a number of tools and programs for working with small companies and entrepreneurs. They can help with something as basic as writing a business plan or help in finding the funding to finance a start-up. NREL has put together an excellent list of links that will help an entrepreneur get started. (The list below is provided by NREL as a service only and does not constitute an endorsement of any particular resource or organization.) Please choose from the following categories:

- [Resources for Starting and Growing Small Businesses](#)
- [Directory of Clean Energy Investors](#)
- [Business Incubators](#)
- [Market Development and Marketing](#)
- [Financing: Understanding the Ins and Outs](#)
- [Financing: Government Grants and Other Funded Programs](#)
- [Strategic Alliances](#)

A good example of lab incubator success can be found in [NREL's Clean Energy Alliance Program](#). It is dedicated to helping early-stage clean energy companies develop strong business strategies.

NREL helps companies redefine business plans and tailor their enterprises to make them more attractive to private sector investors, as well as to key stakeholders in the commercialization process.

The Clean Energy Alliance has helped 104 companies commercialize more than 102 clean energy technologies. These 104 companies currently employ almost 2,400 workers dedicated to the development of clean energy technology. More than \$173 million in capital has been raised; generating more than \$254 million in revenue. [A list of involved companies shows the extensive scope of the program.](#)

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Research partnerships lead to new technologies

National laboratories seek industry partners in research through a number of different methods. NREL is a good example; it collaborates with industry in a variety of ways that leverage its research technology and facility capabilities.

The lab's Technology Partnerships team works with prospective industry partners to develop an appropriate agreement that provides information and technical support for both proprietary and nonproprietary research work.

NREL does not, however, provide funding assistance to potential research partners under these types of

partnerships.

If you would like to conduct joint research with NREL, you may want to consider a [Cooperative Research and Development Agreement](#) (CRADA). If you want NREL to conduct all the research work, with no collaboration from your organization, a [Work-for-Others](#) (WFO) agreement would be best.

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Get lab licensing agreement to commercialize new technology

The national laboratories license a wide array of cutting edge technologies into the marketplace by licensing them to private companies and industry partners. While details of each licensing agreement vary, the general process follows a similar path, regardless of which lab you might be working with. [Lawrence Berkeley Lab's licensing process](#) gives a good overview of the steps an industry partner might expect if seeking to use and sell a national laboratory-produced technology. [NREL's licensing process](#), and [ORNL's](#) offer similar opportunities

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Lab partnership provides "near zero energy" homes -- today

Jeff Christian was one of three Oak Ridge National laboratory representatives to go to Washington, D.C. in 2002, where they were told that DOE was going to fold all of their buildings research under the umbrella of the zero-energy house.



This near zero energy home is the first of five to be built by a partnership between ORNL, TVA, and Habitat for Humanity.

Jeff thought that, "Not only was this a good idea, but I came back and approached the Tennessee Valley Authority (TVA) and Habitat for Humanity about being the first on the block to get something on the ground that was very near zero-energy and affordable."

Guided by the belief that energy-efficient homes should be affordable to working families, he partnered with Habitat for Humanity in neighboring Lenoir City, building five homes to test the latest in renewable energy producing and energy-efficient technologies.

In an [Oak Ridge National Laboratory Review interview](#) Jeff recently explained more about the program and houses that have been constructed and are now being lived in by ordinary families. It is a good example of how national laboratories can help move energy efficiency and renewable energy technologies into the marketplace.

[A Glimpse of the Energy Future \(life in a culdesac of 40 energy efficient homes\)](#)

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