



Advancing Greener Careers and Campuses

Piedmont Community College Roxboro, North Carolina Curriculum

SCHOOL

Piedmont Community College (PCC), a public 2-year college, is part of the North Carolina Community College System (NCCCS). PCC enrolls over 8,500 credit and non-credit students and has campuses in both Roxboro and Yanceyville, North Carolina.

ABSTRACT

The project goal is to obtain Fourier Transform Infrared Spectrophotometry (FTIR) and Karl Fisher Titration training for testing content and purity of BioDiesel and ethanol products. Training of biotechnology faculty in this methodology will help PCC increase rural education and training opportunities related to BioDiesel and ethanol production in PCC's rural service area. Through Greenforce grant funding, the lead contact, who is a full-time biotechnology faculty member, learned to use the College's existing FTIR and Karl Fisher titrator equipment for biofuels applications. The faculty has trained 16 Biotechnology and Laboratory Technology associate-degree students in this technology, and has offered this service to the community. PCC's Small Business Office is scheduling an October 2012 community class to serve local residents. The lead contact is adding additional information on fermentation of BioEthanol as a fuel source, along with the BioDiesel, to increase the scope of class content. These public offerings are an ongoing community service.

PCC collaborates with green-sector employers, and is currently trying to establish a partnership with the North Carolina BioFuels Center in Oxford, NC.

GOALS AND OUTCOMES

Goals

The short-term goal of the project was to provide faculty training in the use FTIR and Karl Fisher titration training for testing content and purity of BioDiesel and ethanol products. The grant provided the funding for the lead contact to receive specialized training in the use of existing equipment at Piedmont Community College to test the purity of BioDiesel produced on the Piedmont Community College-Roxboro Campus. This was completed, and the lead contact passed this training along to the Biotechnology and Laboratory Technology students in these programs.

The long-term goal is to increase rural education and training opportunities related to production of BioDiesel and ethanol. Now that the lead contact has learned to use both the FTIR and Karl Fisher titrator to test biofuels for content and purity, he will make a "confirmation of purity" source available to local producers of biofuels. With the assistance of the Business Development Entrepreneurship Center (BDEC), the Continuing Education (non-credit) and the curriculum (credit) instructional programs,

the lead contact is establishing partnerships and collaborations for the promotion and usage of sustainability, “green” technologies and biofuels from renewable sources. This will contribute to the process of creating new employment opportunities in the area.

Accomplishments and Outcomes

The short-term goal of training for the lead contact was completed successfully. The FTIR training was completed September 2011, and the Karl Fisher training was completed successfully in March 2012. In the Fall 2011 and Spring 2012 semesters, the lead contact began training curriculum students to perform the same tasks using the same equipment. Sixteen curriculum students have been trained to date and another 16 are expected to enroll in Fall 2012.

For long-term goals, the lead contact has established ongoing meetings with the BioFuels Center, Piedmont Electric Membership Corporation, and local/regional economic development agencies. The purpose of these meetings is for developing and submitting grant proposals that will enable PCC to be more proactive in regional, rural economic development, to promote green sector employment, and to develop PCC as a center for green-sector training.



Challenges and Responses

PCC's first community (non-credit) offering in Spring 2012 was cancelled due to insufficient enrollment. After revamping the course content and the promotion plans, a new course offering to include both biodiesel and ethanol from sustainable sources is being offered in Fall 2012.

Campus Climate Action: Your School's On-Campus Sustainability Projects

Now that the lead contact has been trained on this equipment, the curriculum students will be involved in future production and testing of ethanol and BioDiesel to be used by PCC Buildings and Grounds staff. Credit students will also be available to assist participants in the community service (non-credit) classes with testing procedures, which will reinforce their classroom and laboratory training and better prepare them for employment.

Commentary and Reflection

In looking back at this journey, the lead contact found that partnering with instrumentation providers has been very beneficial. He has received much information on the testing of different biofuels, especially BioDiesel from FTIR manufacturer Shimadzu, Inc. Shimadzu trainers provided the lead contact with invaluable procedures and techniques for testing these materials. The Karl Fisher trainers were very helpful in training both the lead contact and curriculum (credit) students in using this piece of equipment. In fact, the Metrohm, Inc. (Karl Fischer) trainers actually offered guidance to the students in employment opportunities using the Karl Fisher equipment, which is certainly value-added for the investment.

To begin similar programs on other campuses, the lead contact would start with basic things like recycling and progressing into areas of sustainability consistent with local policy. As done at PCC, the Biotechnology faculty recommends using existing equipment, taking advantage of vendor training opportunities, and partnering with local economic development to promote sustainability in local communities.

ENGAGEMENT AND SUPPORT

Leaders and Supporters

This initiative received support from these PCC staff:

Dr. Walter Bartlett, President, Piedmont Community College

Mr. Mike Dossett, Vice-President, Instruction and Student Development

Dr. Sherry Stout-Stewart, Dean, Business Studies and Emerging Technologies

Dr. Karen Bowen, Executive Director, Resource Development and Accreditation

Ms. Bonnie Davis, Director, Public Information

Ms. Beth Townsend, Executive Director, PCC Foundation, Inc.

Mr. Randy Reynolds, Director, Business Development & Entrepreneurship Center

Mr. Reynolds and the BDEC staff assist in advertising, developing public contacts, and assisting community members to enroll in continuing education (non-credit) BioDiesel training.

Funding and Resources

PCC provided additional funds for the lead contact's salary support and class coverage for the FTIR training in Columbia, MD. For the Karl Fisher training, PCC provided the lab space necessary for the training on the Karl Fisher Titrator. Previous BioNetwork equipment grants were used to purchase the equipment on which the lead contact was trained.

Employer and Other School Partnerships

PCC is one of 58 colleges of the North Carolina Community College System (NCCCS) and a part of the NCCCS BioNetwork. BioNetwork supports the NCCCS mission of aligning world class workforce training and education to the biotechnology, pharmaceutical and life science industries. BioNetwork trains at all levels of this industry, upgrading the skills of incumbent workers, from entry level to management. As such, PCC and the lead contact are active participants in this community. The lead contact, Randy Durren, was named 2011 Biotechnology Instructor of the Year for NCCCS BioNetwork. Sharing ideas with

others in NCCCS and BioNetwork is a valuable partnership. For example, PCC receives support and encouragement from the BioFuels program at Central Carolina Community College.

James McCormick, Instructor, Electrical Power Production Technology, received photovoltaic installation certification which will enable further sustainability instruction at the College.

Community professionals are being invited to participate in the community (non-credit) training now scheduled for October 2012.



PCC is in the beginning stages of collaboration with the NC BioFuels Center in Oxford, NC. As plans continue to evolve for the making and testing of BioDiesel and ethanol, partnering with the BioFuels Center will be an important aspect of these goals.

Education and Community Outreach

PCC, through the Business Development and Entrepreneurship Center (BDEC), continues to offer information and training in the making and testing of BioDiesel. Each year, new credit students will receive training in making and testing of BioDiesel and Ethanol as a result of the lead instructor's training in methods for using FTIR and Karl Fisher Titrator.

We are encouraged that two former PCC students who transferred to NC State University and still work in PCC's service area are interested in testing BioDiesel for local agricultural use. Methods learned from the generous support of this Greenforce grant will assist in further developing rural agricultural applications for sustainable practices.

CONTACT INFORMATION

Contacts

Lead Contact:

Randy L. Durren
Curriculum Coordinator/Instructor, Biotechnology/Laboratory Technology/Biology
Piedmont Community College
PO Box 1197
1775 College Drive
Roxboro, NC 27573
336-322-2192
Randy.Durren@piedmontcc.edu

Project Partner for Continuing Education Training:

Randy Reynolds
Director, Business Development and Entrepreneurship Center (BDEC)
Piedmont Community College
PO Box 1197
1775 College Drive
Roxboro, NC 27573
336-599-1181, ext: 293
Randy.Reynolds@piedmontcc.edu

MORE ABOUT YOUR SCHOOL

Campus Sustainability History

Piedmont Community College (PCC) provides educational and training programs for today's global workforce. PCC offers and develops green workforce and sustainability training to meet local workforce and community needs. The lead contact has attended "train-the-trainer" workshops for including sustainability instruction across the curriculum and is developing new course materials. PCC started a recycling program through the Student Government Association. Also, PCC received two federal ARRA grants totaling \$313,218 plus \$68,631 in Progress Energy rebates to install energy-efficient lighting and

equipment to lower electrical usage. Based on comparison of utility expenses to the prior year, PCC has seen a reduction of \$27,184 in heating and electricity costs as a result, and the College has yet to enjoy a full-year of savings.

Image Credit: Piedmont Community College Photo