

North Carolina State University

CREM: Certificate in Renewable Energy Management

Instructor Information

Bob Kingery

Co-Founder and President of Southern Energy Management
(Overview of Renewable Energy Technology and Project Development, 2 on-site classes)

Bob co-founded Southern Energy Management (SEM) in 2001 with his wife, Maria, and currently serves as President. With over 25 years' worth of experience, contacts and expertise in the sustainable energy industry, Bob has a valuable perspective on what contributes to long-term success in this rapidly growing and always evolving field. Accordingly, he focuses on strategic planning for SEM, identifying genuine opportunities for growth while filtering out short-term trends. Giving back to the industry and community at large is also important for Bob: you can often find him organizing initiatives for workforce training and development, or providing advice to policymakers looking to expand the role of renewable energy and efficiency in North Carolina.

Prior to starting SEM, Bob was part of the founding team of the Burt's Bees office in North Carolina. As Director of Manufacturing, he managed all aspects of production, including purchasing, distribution, and materials management for the fast-growing personal care products manufacturer and distributor. Over the course of his ten years at Burt's Bees, he helped grow annual revenues from less than \$1 million to over \$60 million per year.

Bob received a degree in Mechanical Engineering from N.C. State University, but his energy education started long before then. Looking back, Bob fondly remembers an old School House Rock episode that made an impression that has stayed with him over the years - and he can sometimes be heard singing the show's theme song around the office.

John Gajda

Manager, Operational Impacts, Distributed Energy Resources at Duke Energy Corporation
(Understanding the Utilities, online class)

John leads generation, transmission, and distribution impact studies to investigate and assess the near term and long term impact of DER (distributed energy resources) to Duke Energy's system. He is also responsible for developing mitigation plans and interconnection policies to accommodate DER while maintaining the reliability and integrity of the system.

Throughout his extensive career in the electric utility system, from that of an industrial customer, to an N.C. State University power systems graduate student & lecturer, John brings a unique perspective in understanding of the needs of customers, the coming future of the utility grid system, and the challenges of maintaining the current grid.

Jay Lucas

North Carolina Utilities Commission – Public Staff
(NCUC Application process, online class)

Sterling Bowen

Sales at PowerSecure
(Sales and Marketing online and onsite class)

Sterling has over 10 years of experience in energy and sustainability w/ public and private sector enterprises. His current focus at PowerSecure is on distributed generation projects in both Government and Commercial space. He is responsible for project development from prospect stage through contract negotiation, and account management through pre-construction process, execution, commissioning and operation.

Sterling was previously the Federal and Services Senior Manager at Southern Energy Management, until SEM sold its

commercial accounts to PowerSecure. Sterling was NABCEP PV Technical Sales certified. Legend has it that NABCEP was so impressed with his test scores that they invited him to sit as a member of the NABCEP PV Technical Sales Review Committee.

Betsy McCorkle

Director of Government Affairs, NC Sustainable Energy Association
(Solar Business Basics – North Carolina Energy Policies, On-site Class)

Betsy directs the North Carolina Sustainable Energy Association's (NCSEA) governmental affairs work. As a registered lobbyist, she works with legislators, state, and local government officials, state agencies, and allied organizations to educate them on clean energy issues to ensure passage of the NCSEA's legislative agenda. Previously, Betsy managed the North Carolina Clean Energy Technology Center's Economic Development Program, delivering client-based services to businesses and organizations engaging in the renewable energy industry in North Carolina. Betsy received a Master Degree in Environmental Management from Duke University, and she holds a Bachelor Degree in Environmental Economics from the University of Georgia, where she graduated magna cum laude. Betsy was the 2012 Recipient of the J.W. Fanning Distinguished Young Professional Award; she is a member of the Natural Capital Investment Fund Advisory Committee and the NC Economic Developers Association.

Brian Lips

Senior Policy Analyst, North Carolina Clean Energy Technology Center
(Solar Business Basics - Federal Energy Policies, On-site Class)

Brian is a policy analyst for the North Carolina Clean Energy Technology Center (NCCETC). His work involves the research of government and utility incentives and policies for the Database of State Incentives for Renewables & Efficiency (DSIRE). After working with the policy team and the wind research team for a year as a temporary worker, Brian joined the NCCETC full time in January 2007. Brian received a degree in Integrated Science and Technology from James Madison University in Harrisonburg, VA, with a focus in Energy and Environmental Science. He moved to Raleigh after graduating and worked for some time at Progress Energy as a software contracts manager.

Henry Tsai

Associate Director of Finance, NC Clean Energy Technology Center
(Solar Business Basics – Financial Modeling of Solar Projects, On-site class)

Henry is responsible for the financial, economic, and business strategy development of the overall renewable energy initiatives at the North Carolina Clean Energy Technology Center. Henry is also the lead for the sponsored research team at N.C. state working to examine the role of biofuels across different industry behaviors and market conditions. Henry joined the NCCETC in 2004 to serve as Principle Investigator for several state and federally sponsored policy research projects. His key experiences and expertise include: valuation of commercial and industrial scale projects in biofuels and solar; portfolio and financial risk management in capital projects and capital markets; development of strategic relationships in higher risk business models; financial modeling and contract negotiations in large scale power projects that are significantly tied to emerging federal and state legislation; capital budgeting processes for complicated investment and ownership structures. Before joining the NCCETC, Henry managed the export department of a Fortune 500 logistics company, where he also served as a financial analyst. During his tenure at the company, Henry designed and initiated export protocols for the Central American business lane, cross-trained and merged services between the domestic and international divisions, and initiated export processes that resulted in year-to-year positive gains in revenue, profit margin, and overall net income for the department. Henry has a B.A. from Duke University and an MBA from N.C. State University.

Johnathan Gross

Director of Tax Credit Finance at State Tax Credit Exchange
(Project Financing – Ownership structures, online class)

Jon is responsible for identifying and vetting renewable energy projects in which State Tax Credit Exchange can invest, as well as tax credit placement with taxpayers, particularly in North Carolina. Prior to joining State Tax Credit Exchange, he served as partner at CohnReznick and led the Renewable Energy Transaction Advisory Group of their Charlotte office. During this tenure, provided financial consulting and modeling, tax structuring, equity placement, accounting, attestation, cost certification and other relevant financial and accounting services on behalf of investors, developers, solar and other renewable energy project sponsors, general partners and community development entities on all aspects of their transactions. Involved in the financing and development of more than \$500 million worth of renewable energy facilities that have been built in North Carolina since

2008.

Jim Barber

Fifth Third Bank

(Project Financing – Bankable Renewable Energy Projects, online class)

Jim is currently a credit officer at Fifth Third Bank after serving as a portfolio manager for over three and a half years in Charlotte, NC. In this position, he was given the Horizons Award. This employee recognition program rewards top performers within The Bancorp who exceed performance standards and live the Fifth Third Bank core values each day.

Jim received his MBA from Kellogg School of Management at Northwestern University in 2006 and his undergraduate degree from the University of North Carolina at Chapel Hill in 1999.

Bill Guiney

Artic Solar, Inc.

(Project Financing – Performance Contracting and Renewable Energy, online class)

Bill is the President of Artic Solar, Inc. a high temperature solar thermal company. Previously he was the Director of the Solar Heating & Cooling Business at Johnson Controls, Inc. where he was involved in over 250 commercial solar projects. His areas of responsibility have included both Photovoltaic and Solar Thermal technologies. At Artic solar, Bill is currently developing high temperature (+350°F) solar cooling and industrial process heating projects. Bill has 33-years of experience in the solar industry as a retailer, contractor, distributor, manufacturer and educator.

Bill has provided many Renewable Energy and Energy Efficiency training programs and has been an instructor for solar thermal energy systems at the North Carolina and Florida Solar Energy Centers. Bill has served on the solar thermal technical committee of the North American Board of Certified Energy Professionals (NABCEP), committee chair of the Texas Renewable Energy Industries Association and he has been a certified Home Energy Rater and previously held a Solar Contractor license in the State of Florida.

Cullen Morris

Strata Solar, LLC.

(Practical Aspects of Renewable Energy Project Development, on-site class)

Cullen currently serves as the Vice President of Development at Strata Solar, LLC in Chapel Hill, NC. In this role Cullen works to grow Strata's development opportunities and strategic partnerships in the US solar market by building a diverse portfolio of solar projects. Previously, Cullen was the Director of Project Development at Strata where he oversaw and managed the project development staff on a variety of construction-ready solar projects. While serving as an Energy Analyst at the Climate Change Policy Partnership, he coauthored a paper exploring the economic viable resource potential in the Southern United States.

Cullen received his Master of Environmental Management from the Nicholas School of the Environment at Duke University in 2010 where he studied the environmental and economic interactions of energy systems. He received his B.S. in Computer Science and Mathematics from Virginia Polytechnic Institute and State University in 2000.

Course Information

Course Description

This 40-hour course is one of eight courses housed under the award-winning Renewable Energy Technologies Diploma Series. Business professionals and students are keenly aware of the changing energy landscape. Many professionals want to know more about the renewable energy industry but find that available workshops on renewables are too technical or geared for the installer. The goal of the CREM program is not only to provide a sound foundation of how existing renewable energy technologies work, but also to have a firm grasp of policies and financial options so they can make informed decisions as a manager and businessperson in the renewable energy industry.

Required Text & Materials

Presentation copies will be provided. Online classes will require a computer and internet connection.

Structure

This is an onsite and online course that have classroom lectures in Raleigh, and online classes. A group project presentation is required at the completion of the course.

STUDENT LEARNING OUTCOMES. *Students will be able to:*

1. Understand the fundamentals of how solar electric and solar thermal technologies work.
2. Describe renewable energy policy terminology.
3. Understand how federal, state and local policies, incentives and regulations can affect the health of the renewable energy industry.
4. Navigate the current financial landscape and assess different financial models.
5. Get NABCEP Technical Sales education credits for the NABCEP PV Technical Sales Certification Exam (must meet other NABCEP requirements)

Grading

Course Grading and Assessment

Participants will need to submit a project with their group. The project will be presented in front of guest commentators from the industry. Participants who do not submit or participate in a project are not eligible to receive a certificate.

Scale

The grading scale is consistent with University policy (<http://www.ncsu.edu/grad/handbook/sections/3.18-grades.html>) and is as follows:

Attendance

Policy

Students are responsible to keep up with course materials and meet course required deadlines. Per the University, attendance will be taken at every class. Per the NC Clean Energy Technology Center, students must be present 90% of the class in order to receive credit for the course.

Students who successfully complete course:

1. Receive an NCSU Certificate of Completion for the course.
2. Have completed 1/3 of requirements to earn a [Renewable Energy Technologies Diploma](#).
3. Be eligible for the education requirements for NABCEP PV Technical Sales Certification.
4. Be eligible for continuing education credits: 40 hours for AIA, PDH and CEU and 24 for Licensed Electrical Contractors.

Course Agenda

Detailed schedule for the year found on [Website](#)

Class Name	Topics discussed
Overview of Renewable Energy Technology and Project Development, Day 1. <i>Onsite, 7 hrs.</i>	Definition of renewable energy technologies in NC law How does it work? Solar Thermal and Photovoltaic (PV) technical review
Overview of Renewable Energy Technology and Project Development, Day 2. <i>Onsite, 7 hrs.</i>	How to site and choose the technology and products Common technical issues Tour of FREEDM Center and other installations
Understanding the Utility. <i>Online, 1.5 hrs.</i>	Rate structures Net metering Interconnection Demand charges Concerns of utilities in RE technologies
NCUC Application Process (Elective for out-of-state). <i>Online, 1 hr.</i>	Understanding the filing procedures for renewable energy systems in North Carolina
Solar Sales and Marketing. <i>Online and onsite, 4.5 hrs.</i>	Strategies for marketing and selling residential and commercial systems, including non-monetary value of solar.
Solar Business Basics. <i>Online and onsite, 8 hrs.</i>	Overview of policy landscape Putting Renewable Energy in Context Introduction to Public Policy Snapshot of International Policies Types of Energy Policies Understand how Policy drives the Solar market by learning the basics of financial modeling.
Project Financing: Ownership Structures. <i>Online, 2 hrs.</i>	What are the ownership structures used in North Carolina to maximize the federal and state tax credits?
Project Financing: Developing a Bankable Renewable Energy Project. <i>Online, 1.5 hrs.</i>	Project Financing: Understand what Banks look for in a Renewable Energy Project
Project Financing: Performance Contracting and Renewable Energy. <i>Online, 1.5 hrs.</i>	How do you make energy efficiency pay for a renewable energy project?
Practical Aspects of Renewable Energy Project Development. <i>Onsite, 3.5 hrs.</i>	What should developers be thinking of when putting together a renewable project? Who are the players and what are their roles? How do developers put it all together?
Group project presentation. <i>Onsite, 6 hrs.</i>	Group project presentations

Academic Policies

Honesty & Integrity

Students are required to comply with the University policy on academic honesty and integrity found in the Code of Student Conduct, outlined at http://www.ncsu.edu/policies/student_services/student_discipline/POL11.35.1.php.

Accommodations for Disabilities

Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, student must register with the Disability Services Office (<http://www.ncsu.edu/dso>) located at 1900 Student Health Center, Campus Box 7509, 515-7653. For more information on NC State's policy on working with students with disabilities, please see the Academic Accommodations for Students with Disabilities Regulation at http://www.ncsu.edu/policies/academic_affairs/courses_undergrad/REG02.20.1.php.

Non-discrimination Policy

NC State University provides equality of opportunity in education and employment for all students and employees. Accordingly, NC State affirms its commitment to maintain a work environment for all employees and an academic environment for all students that is free from all forms of discrimination. Discrimination based on race, color, religion, creed, sex, national origin, age, disability, veteran status, or sexual orientation is a violation of state and federal law and/or NC State University policy and will not be tolerated. Harassment of any person (either in the form of quid pro quo or creation of a hostile environment) based on race, color, religion, creed, sex, national origin, age, disability, veteran status, or sexual orientation also is a violation of state and federal law and/or NC State University policy and will not be tolerated. Retaliation against any person who complains about discrimination is also prohibited. NC State's policies and regulations covering discrimination, harassment, and retaliation may be accessed at www.ncsu.edu/policies/campus_environ or http://www.ncsu.edu/equal_op. Any person who feels that he or she has been the subject of prohibited discrimination, harassment, or retaliation should contact the Office for Equal Opportunity (OEO) at 515-3148.

Course Evaluations. *Your evaluations matter and do result in changes to this course.*

If you have concerns or suggestions for this course, please contact Maria O'Farrell, NCCETC Training Program Manager (mdofarre@ncsu.edu).