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Courtesy Midwest Renewable Energy Association (2)

Classroom and hands-on experience is invaluable if you want to join the ranks of renewable energy professionals.

Get *Your* RE Start

COURSES, CLASSES & TRAINING OPPORTUNITIES

Laurie Stone

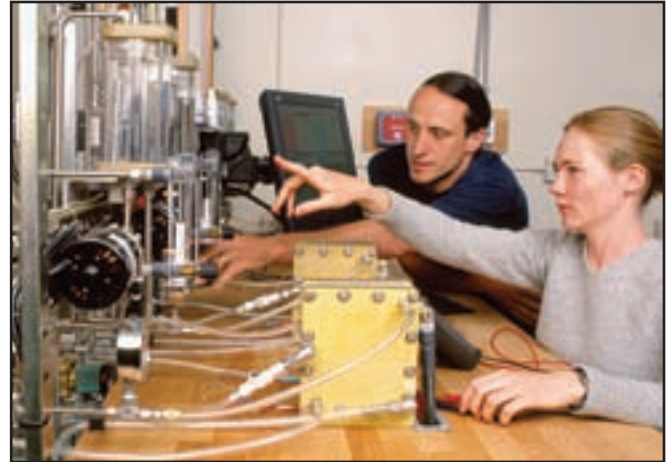
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The renewable energy (RE) industry is growing rapidly, and a wide variety of employment opportunities—from system design and installation to hardware development and engineering—are opening up on a regular basis. The first step in finding a career in RE is to assess what skills you have, what skills you'd like to learn, and what type of position would be most satisfying. But no matter what your chosen career path, a solid foundation in RE system design, component specification, and installation basics will make you a more attractive candidate to potential employers.



Courtesy Appalachian State University

This Appalachian State University student puts his RE skills to work on a wind tower.



Courtesy Humboldt State University

Many university degree programs include laboratory components, allowing students the ability to experiment with and test various renewable technologies.

implement PV design protocol. In addition to coursework, students also complete a cooperative education requirement, which provides relevant field experience and networking opportunities with professionals.

The Renewable Energy program at San Juan College in Farmington, New Mexico, bases their curriculum on the science of the technologies, and then pairs this knowledge with design and installation techniques. Offerings include a concentration in Photovoltaic System Design and Installation, either as a two-year associate of applied science degree or a one-year certificate. The certificate program is appropriate for students who already have a college degree, or who currently work in a related industry. Coursework includes introductory physics, and PV theory and system design, as well as two courses on interpreting the *National Electrical Code*.

Going Pro

PV installation accreditation is one of the newest developments in the RE education movement. The nonprofit North American Board of Certified Energy Practitioners (NABCEP) has led this effort by establishing a certification program for PV installers and setting national standards by which PV installers with skills and experience can distinguish themselves.

NABCEP offers two PV exams—one for PV installer certification and one dubbed the Entry Level Certificate of Knowledge. To qualify for the 4-hour written exam required for PV Installer Certification, candidates must meet a few prerequisites, such as hands-on experience. Fees for the exam start at \$250, which includes a one-time application cost. For more information, visit www.nabcep.org

PV installers who want to receive NABCEP-approved training must study at an ISP-accredited institution. The ISP (Institute for Sustainable Power) oversees the accreditation process, and monitors programs to make sure they meet several requirements.

Get Your RE Degree

If you're really serious about renewable energy, a handful of programs offered through universities provide degrees in renewable energy technologies.

Two-Year Degrees & Certificates. Lane Community College in Eugene, Oregon, offers a two-year associate of applied science degree in renewable energy technology, under their Energy Management Technician program. Lane's program prepares students for careers in the energy management field or as renewable energy system installers, with courses in electrical theory, PV design and installation, and energy efficient methods. Students learn to evaluate energy use patterns and make energy efficient retrofit recommendations for both residential and commercial buildings, and size and recommend PV systems, as well as

Coconino Community College in Arizona provides an associate of applied science degree in Alternative Energy Technology, a 58-credit-hour program that covers PV & wind-electric systems, as well as solar home design.

Many other community colleges are in the process of developing associate degree programs. Through a grant from the National Science Foundation, the Center for Sustainable Energy at Bronx Community College in New York is currently working to establish a degree program in Energy Services Technology and Alternative Fuel Vehicle Technology. Cape Cod Community College in West Barnstable, Massachusetts, also is establishing a broad-based Renewable Energy (RE) education and training program. For more listings of coursework offerings across the country, search the Interstate Renewable Energy Council's Web site at <http://irecusa.org/courses.php>.

Undergraduate & Graduate Degrees. Earn a bachelor or master of science degree in Environmental Resources Engineering at Humboldt State University in Arcata, California. Upper-level undergraduate courses include energy analysis of buildings, principles of hydro, wind, and photovoltaic energy production and systems, and solar thermal systems analysis and design. Humboldt's Campus Center for Appropriate Technology showcases environmentally friendly technologies, from solar cookers to PV systems, and provides experiential learning opportunities for students enrolled in university classes.

If you want more than just PV training, an undergraduate degree in Appropriate Technology at Appalachian State University (ASU) in North Carolina provides curricula in energy conversion systems, waste and water management, community and shelter design, technology assessment,



Courtesy San Juan College

Students at San Juan College get practice with PV along with earning their associate of science degree or certificate.

small-scale production systems, and technology transfer. ASU defines appropriate technologies as being "smaller scale technologies, that are ecologically and socially benign, affordable, and often powered by renewable energy," and says that their unique interdisciplinary program draws from the physical and social sciences, as well as engineering, architecture, and technology. Students gain exposure to drafting and design techniques, as well as a thorough background in PV design and installation, microhydro- and wind-electric systems, and solar thermal system design.

Higher Learning

Appalachian State Univ., Department of Technology, Boone, NC • 828-262-6361 • scanlindm@appstate.edu • www.teh.appstate.edu/at/app_tech.html • Bachelor of science, Appropriate Technology

Coconino Community College, Flagstaff, AZ • 928-526-7696 • www.coconino.edu/collegecatalog/0607/AASALTENERGY.htm

Colorado State Univ., Solar Energy Applications Lab, College of Engineering, Fort Collins, CO • 970-491-8617 • seal@lamar.colostate.edu • www.colostate.edu/Orgs/SEAL/ • Bachelor of science??, Mechanical Engineering

Georgia Inst. of Technology, Univ. Center of Excellence for PV, Atlanta, GA • 404-894-4658 • ucep@ee.gatech.edu • www.ece.gatech.edu/research/UCEP • degree???

Humboldt State Univ. Env. Resources Eng. Dept., Arcata, CA • 707-826-3619 • ere_dept@Humboldt.edu • www.humboldt.edu/~ere_dept • Bachelor and master of science, Environmental Resources Engineering

Lane Community College, Science Division, Eugene, OR • 800-769-9687 • www.lanec.edu/instadv/catalog/science/programs/energy.htm • Associate of applied science, Renewable Energy Technician

Royal Inst. of Technology, Dept. of Energy Technology, Stockholm, Sweden • www.energy.kth.se • Master of science, Sustainable Engineering

San Juan College Renewable Energy Program, Farmington, NM • 505-566-3003 • munsont@sanjuancollege.edu • www.sanjuancollege.edu/reng • Associate of applied science, Photovoltaic System Design & Installation; One-year certificate in PV Design & Installation

Sustainable Systems, Dept. of Parks & Recreation/ Environmental Education, Slippery Rock University, Slippery Rock, PA • 724-738-2068 • daniel.dziubek@sru.edu • <http://academics.sru.edu/pree/ssgrad.htm> • Master of science, Sustainable Systems

University of Massachusetts, Mechanical Engineering Dept., Lowell, MA • 978-934-2968 • john-duffy@uml.edu • www.eng.uml.edu/dept/energy • Master of science, Energy Engineering

Univ. of New South Wales Centre for PV Engineering, Sydney, NSW, 2052 Australia • 011-612--93-85-4018 • pv.labs@unsw.edu.au • www.pv.unsw.edu.au • Master of science, PV Engineering

Univ. of Wisconsin Solar Engineering Program, Madison, WI • 608-263-1589 • beckman@enr.wisc.edu • <http://sel.me.wisc.edu> • Master of science, Mechanical Engineering???

At the graduate level, Slippery Rock University's master of science degree in Sustainable Systems in Pennsylvania is an interdisciplinary program that addresses building design for energy efficiency and "alternative" energy technologies, along with ecosystem management and sustainable agriculture. Students at SRU can apply their studies in projects at the real-world lab—the aptly-named Harmony House, a demonstration center that integrates various sustainable designs and technologies, from a composting toilet to a 1.5-kilowatt PV system.

Graduate students in the mechanical engineering program at the University of Wisconsin–Madison get to practice solar science at the Solar Energy Laboratory (SEL), which has been recognized nationally and internationally for accomplishments in researching practical applications that use the sun's energy. SEL "emphasizes applications of engineering fundamentals to energy problems, and leads students to advanced degrees in mechanical and chemical engineering."

If you'd like to learn about PVs and other renewable energy systems outside of the United States, you can earn a master of science degree in Sustainable Energy Engineering at the Royal Institute of Technology in Sweden, or a degree in PV engineering at the University of New South Wales in Australia.

Many programs offer students the opportunity to work in the field, installing renewable energy systems.



Courtesy Appalachian State University

More and more colleges and universities are adding renewable energy programs into their curricula, and the listings below and on the opposite page are by no means exhaustive.

Basics for Beginners

Internet Learning. Online courses may be your best bet for introductory or refresher courses. Several RE organizations offer Internet courses, from how to design a solar-electric (photovoltaic; PV) system or a passive solar home to how to implement renewables in the developing world.

Online courses generally run from four weeks to several months. Most online courses allow you to work at your own pace, on your own schedule. Instructors are generally available

Workshop Offerings

Florida Solar Energy Center*, Cocoa, FL • 321-638-1000 •
info@fsec.ucf.edu • www.fsec.ucf.edu

Iowa RE Assoc., Iowa City, IA • 319-341-4372 •
irenew@irenew.org • www.irenew.org/workshops.html

Great Lakes Renewable Energy Assoc., Dimondale, MI •
800-434-9788 • jeremy.wittrock@glrea.org •
www.glrea.org

Midwest Renewable Energy Assoc.*, Custer, WI •
715-592-6595 • info@the-mrea.org • www.the-mrea.org

New Mexico State Univ. SW Technology Dev. Inst., Las
Cruces, NM • 505-646-1049 • tdi@nmsu.edu •
www.NMSU.Edu/~tdi

North Carolina Solar Center, Raleigh, NC • 919-515-5666 •
ncsun@ncsu.edu • www.ncsc.ncsu.edu

Northeast Sustainable Energy Assoc., Greenfield, MA •
413-774-6051 • nesea@nesea.org • www.nesea.org

Solar Energy Center*, Farmingdale State
Univ., Farmingdale, NY • 631-420-2450 •
dathatyn@farmingdale.edu •
www.tech.farmingdale.edu/depts/met/solar

Solar Energy International*, Carbondale, CO •
970-963-8855 • sei@solarenergy.org •
www.solarenergy.org

Solar Living Inst., Hopland, CA • 707-744-2017 •
sli@solarliving.org • www.solarliving.org

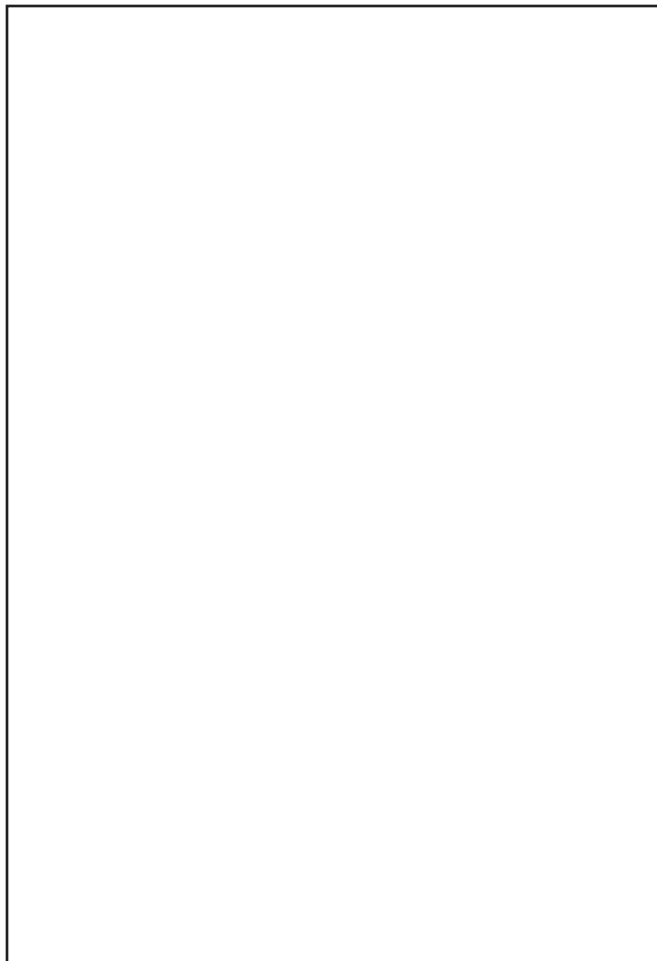
SóLEnergy, Carbondale, CO • 559-751-2001 •
sol@solenergy.org • www.solenergy.org

Sunnyside Solar, Guilford, VT • 802-254-4670 •
info@sunnysidesolar.com • www.sunnysidesolar.com

West Texas A&M Univ. Alternative Energy Inst., Canyon,
TX • 806-651-2295 • aeimail@mail.wtamu.edu •
www.wtamu.edu/research/aei

For more workshop offerings, read "Happenings" in each issue of Home Power or go to www.homepower.com/events/index.cfm. The IREC Web site (www.irecusa.org/courses.php) also posts course listings.

*ISP-accredited organizations



Courtesy Solar Energy International

These SEI workshop students put the finishing touches on installing a roof-mounted PV array.

to answer questions, and grade quizzes and homework. However, don't always expect an immediate response to your questions—you may have to wait a couple of hours or a couple of days, depending on how many students are in the course, and when you are online. SoL Energy offers six-week online courses on basic PV and utility-interactive PV. Solar Energy International (SEI) offers six-week-long courses on both PV design and solar home design. Prices range from \$300 to \$675.

Hands-On Opportunities. While online courses can provide you with a basic understanding of RE, hands-on training is necessary if you want to install systems, either at your own home or professionally. Hands-on workshops can range from two-day workshops (starting at \$160) up to two-week-long workshops (starting at \$1,500). While weekend workshops give a good overview of the technology, longer workshops will provide more hands-on instruction and more in-depth coverage of the different components.

For snowbirds and other southerners, the Florida Solar Energy Center offers one-day to weeklong courses at their research and training facility in Cocoa, Florida. Their workshop offerings cover a range of topics: from PV installation to using RE for disaster relief to specific code issues. Most of

their courses are geared toward professionals—journeymen, contractors, and inspectors.

Midwesterners can tap into offerings from the Midwest Renewable Energy Association, which facilitates one-day to two-week-long workshops, many at their solar- and wind-powered headquarters in rural Wisconsin. Coursework includes beginner, intermediate, and advanced PV classes, women-only workshops, and PV site assessment. The Great Lakes Renewable Energy Association in Dimondale, Michigan, and IRENEW in Iowa City, Iowa, are other regional organizations that sponsor and host RE workshops, trainings, and seminars.

Solar Energy International (SEI), located in the mountains of western Colorado, also offers a series of PV workshops focused largely on hands-on instruction. In their PV Design & Installation workshop, students spend a week in the classroom learning about PV and a week out in the field learning how to install a system. SEI offers workshops in several states and internationally.

On the West Coast, the Hopland, California-based Solar Living Institute offers short, weekend workshops, such as beginner's PV courses for non-electricians and do-it-yourselfers, as well as a variety of others. Their Solar Living Center features a 132-kilowatt grid-tied PV array, as well as a number of other solar energy technologies.

Get Your RE Start

Once you decide what outcome you want from your training, you need to sift through the ever-growing number of schools, organizations, and institutions that offer training programs. The listings and Web resources provided will help you find the courses, seminars, or trainings that are right for you. Contact the organizations individually to find out more about the programs they offer.

Access

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