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Energy University: An Innovative Private-Sector Solution to Energy Education

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Abstract

Energy use is one of the most critical issues facing our world. The U.S. Energy Information Administration forecasts that the world's energy consumption will double by 2050, with electricity use also doubling by 2030. Energy prices will grow accordingly, with oil reaching as much as \$125 per barrel by some forecasts.¹ We often focus on efficiency in transportation, which is an important goal, but industry and buildings consume nearly three times as much energy as transportation does. By focusing on clean, efficient energy we can reduce CO₂ emissions and also meet the increased demand.

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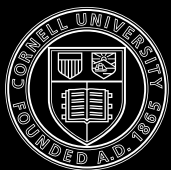


Energy University: An Innovative Private-Sector Solution to Energy Education

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by R. Sean O’Kane and Susan Hartman

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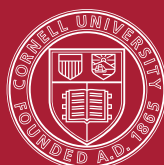
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Energy University:

An Innovative Private-Sector Solution to Energy Education

by R. Sean O’Kane and Susan Hartman

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As a global specialist in energy management with operations in more than 100 countries, **Schneider Electric** offers integrated solutions for many markets, including hotels, energy and infrastructure, industrial processes, building automation, and data centers and networks, as well as a broad presence in residential applications. Focused on making energy safe, reliable and efficient, the company’s more than 110,000 employees achieved sales of €19.6 billion in 2010 through an active commitment to helping individuals and organizations “Make the most of their energy.”™ Schneider Electric is a partner of the Cornell University Center for Hospitality Research.



EXECUTIVE SUMMARY

Seeing the need for energy education in all industries, Schneider Electric developed Energy University, a virtual, professional, college-level training program focused on energy consumption and efficiency for building and facility managers at all levels (www.MyEnergyUniversity.com). Critical to the success of this idea, the information available through Energy University is vendor neutral, unlike much information available on the internet. This unusual step was paired with the idea of opening the courses to all people, whether customers or not. Courses were developed both by Schneider's own subject-matter experts and those of partners. The result was an unmatched depth and breadth of courses. Among the industries that can benefit is the hospitality industry, which can realize dramatic savings from energy controls. Given the comprehensive courses in Energy University, the Educational Institute of the American Hotel and Lodging Association is using these courses as part of its industry certification programs. Individual hospitality companies, such as Marriott International have also adopted Energy University's courses, and other firms, such as Wyndham International, make use of them.

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Energy use is one of the most critical issues facing our world. The U.S. Energy Information Administration forecasts that the world’s energy consumption will double by 2050, with electricity use also doubling by 2030. Energy prices will grow accordingly, with oil reaching as much as \$125 per barrel by some forecasts.¹ We often focus on efficiency in transportation, which is an important goal, but industry and buildings consume nearly three times as much energy as transportation does. By focusing on clean, efficient energy we can reduce CO₂ emissions and also meet the increased demand.

¹ U.S. Energy Information Administration, “International Energy Outlook 2011,” September 19, 2011 (<http://www.eia.gov/forecasts/ieo/>)

Despite the extreme importance of the issue, three years ago, it was apparent there was a lack of available educational resources on energy efficiency and sustainable operations. Too many resources were either inaccessible or contained an underlying sales motive. Certainly the general public can benefit from energy knowledge, but more critically, so can business owners and facilities managers who must cope directly with the cost and impact of energy use.

One of the chief problems in disseminating energy information is that much of it is academic in its approach. “In the field of sustainability, there is a serious need for more and better information,” according to Nancy Scanlon, associate professor at Florida International University’s Chaplain School of Hospitality and Tourism Management. “Most of the educational materials about energy are geared toward civil engineering and science-based programs. There has been little for the general business person who must make real decisions daily about energy use.”

To fill this gap Schneider Electric company launched Energy University in June 2009. This innovative education program is an online educational resource providing university-level coursework on energy management and efficiency. Although the program was designed with Schneider Electric’s customers in mind, in just a few years, Energy University has reached far beyond the company’s clients and deep into numerous industries—notably, the hospitality business. It has trained more than 120,000 people and has grown to include more than 70 courses in 11 languages on a wide array of energy topics. The courses are being embraced and used by various universities as a supplement to their existing curriculum, and professional and industry organizations around the world have endorsed Energy University for continuing education credits toward their own certifications.

Among the industry associations working with Energy University is the Educational Institute of the American Hotel and Lodging Association. In fact, the hotel industry has shown strong interest in Energy University, due to its valuable contribution to hotel energy management. But interest is also growing in other industries as well, and many firms involved in the project, both inside and outside of Schneider Electric, see Energy University as a model that can be applied by many companies worldwide.

The Seeds of Success

To understand why this program has had such an impact, we need to review two critical decisions that have fueled the program’s widespread acceptance and success. Those decisions involved vendor neutrality and open availability.

First, the company chose to develop high-quality, university-level coursework that is vendor-neutral. As an international company and a leader in energy management solutions, Schneider Electric is well aware of the importance

Energy University offers university-level coursework that is vendor neutral and is open to everyone.

of energy efficiency to its customers, who typically operate large buildings and must deal directly with the cost and impact of energy use. Although making the courses vendor-neutral was an unusual step, given that most companies focus on their own products, this principle was never in question. We had no interest in creating a veiled plug for our products. Instead, we wanted to produce serious course material about energy issues, because so many building owners and operators need that help. We see this every day in our business.

The second decision that led to success was to make the courses available to everyone. That meant the courses should be online, free, and available to both noncustomers and customers alike. We decided, if we’re going to remove the barriers of training budget, travel time and cost, why not do it for everyone? With this decision we have eliminated any barrier to taking a class on energy, anywhere there is internet access. Given Schneider Electric’s corporate philosophy, the decision to open the courses to all makes sense. While as a company we can provide any number of services, products, and support, our belief is that the greatest impact to be made on sustainability and energy savings is through behavioral change and greater education of the population. This idea of education was the basis of Energy University.

The Educational Institute of the American Hotel and Lodging Association has included Electricity University courses in its professional certification programs.

A Diverse, Multi-Disciplined Team

To create the necessary university-level courses, we sought out a wide range of subject matter experts (SMEs) in various disciplines from throughout the company and our partners. Johanne Greenwood was brought in as curriculum developer, to cultivate the contacts needed across the organization and to support the segments of knowledge being created. To facilitate the user interface, a team of instructional designers with master's level training worked with the SMEs in developing course materials that use both standard learning practices and innovative techniques for course presentation. To date, more than 70 individuals company-wide have been involved in developing the curriculum and course content. This effort brought together a diverse team of people from throughout the company and network of partners. That level of involvement has helped to make our course content and presentation thorough, accessible, and professional.

The mission of Energy University is to give people information and tools for understanding energy consumption and efficiencies. Each course is geared to a particular level of knowledge and responsibility. The most popular courses include Energy Efficiency Fundamentals, Alternative Power Generation Technologies, Lighting Basics, Measuring and Benchmarking Energy Performance, and Going Green with Leadership in Energy and Environmental Design. There is also a special curriculum for data centers, which are major energy consumers. (The full curriculum can be viewed online at www.MyEnergyUniversity.com, and course titles are listed in the appendix.)

While the courses are vendor-neutral, they do convey Schneider Electric's philosophy for creating an immediate impact through energy efficiency. Thus, every class contains practical, quickly implemented solutions to save energy or

improve efficiency—actions that often pay for themselves in one to three years, according to industry experts. In addition, the courses emphasize the need for a total approach to energy efficiency through ongoing monitoring and maintenance, yielding savings over the long term.

Checking into the Hotel Industry

We could quickly see the potential of Energy University for hotels. With a 24-year career as a hotelier, co-author Sean O'Kane was well aware of the importance of energy education in the hospitality industry. Energy costs can represent 3 to 8 percent of a hotel's total revenue, depending on the hotel's type, location, and the services it offers. Compounding the challenge, many hotel owners and operators don't have access to information about energy efficiency. At the same time, facilities management staff are busy coping with ongoing maintenance, and rarely have time to think about strategic improvements. In our experience, energy is one of the least well managed expense lines in a hotel's operating performance.²

In addition to limited access to information, many hoteliers are concerned that any efforts toward energy reduction might diminish guest comfort or would be badly received by guests. That is far from the truth, especially since the number of seamless occupancy-sensing and automated controls available today can actually enhance the guest experience and generate a strong ROI.³

The bottom line is that with the tight controls on payrolls, F&B, and supply costs in the hotel industry, there is no greater way to dramatically improve a hotel's GOP than through reduction and management of energy consumption. The comment of one senior hotel executive is quite telling: "It is time to stop worrying about saving money and time to start thinking about how to stop losing it."

The response of the hotel industry to Energy University has been both positive and speedy. In June 2010, a team from Schneider Electric presented the concept of Energy University to the American Hotel and Lodging Association (AH&LA) and its Educational Institute (EI), which provides educational certification to hotel operators on a wide range of topics.

² While a substantial portion of energy use is a function of guest activities, a Cornell study identified a set of energy expenses that are under management control. See: Jie J. Zhang, Nitin Joglekar, and Rohit Verma, "Developing Measures for Environmental Sustainability in Hotels: An Exploratory Study," *Cornell Hospitality Report*, Vol. 10, No. 8 (2010), Cornell Center for Hospitality Research.

³ A study at Cornell's Statler Hotel found that guests either did not notice or were highly receptive to the hotel's efforts to reduce energy use with updated lamps. See: Alex M. Susskind and Rohit Verma, "Hotel Guests' Reactions to Guest Room Sustainability Initiatives," *Cornell Hospitality Report*, Vol. 11, No. 6 (2011) Cornell Center for Hospitality Research.

Schneider Electric felt that energy education was a natural fit for the EI, and this has proved to be the case. Said one member of the EI committee: “This clearly puts Schneider Electric at the top of vendors who are supporting the hotel industry.” Schneider and the EI agreed to develop a learning path of courses, and to make these courses applicable for education credits for AH&LA certification. The organization has created links on its own site to Energy University, recommends specific learning paths, and offers more than two dozen courses for its members, on topics as diverse as Fundamentals of Energy Efficiency, Codes and Standards of North America, and Measuring and Benchmarking Energy Performance. Thus, hospitality professionals who hold the professional designations of Certified Hotel Administrator (CHA), Certified Lodging Manager (CLM), Certified Engineering Operations Executive (CEOE), and Certified Maintenance Manager can earn continuing education units (CEUs) toward their re-certification, mandated every five years, by completing Energy University courses outlined in learning paths on the program’s website.

“Energy management is essential to the profitability and sustainability of today’s lodging operations,” said Robert L. Steele III, CHA, the EI’s president and COO. “Schneider Electric, as a member of American Hotel & Lodging Association’s energy and environment committee, is the ideal resource to provide certified hospitality professionals with the energy management knowledge they need to keep their operations profitable and sustainable.”

The Hotel Connection Grows

In addition to the Educational Institute courses, individual hospitality firms are connecting with Energy University. Faith Taylor is vice president of sustainability and innovation at Wyndham Hotels, as well as chair of the AH&LA Environment and Engineering Committee. Wyndham lists energy efficiency as one of its top five corporate strategic goals and has an active program already in place for educating its staff throughout the world. She sees the Schneider Electric offering as a valuable educational tool for the industry: “Energy is a primary operational expense to run a business, especially a hotel. The more efficient you are, you can actually save money and see results on the bottom line. This program from Schneider Electric directly helps hotels accomplish this.”

Marriott International is working with the Energy University program team to develop a customized set of learning paths for their global personnel. Paul Hildreth, Marriott’s global director of engineering and facilities management, says that Energy University is “an excellent opportunity to take advantage of in-depth training from a leader in the industry. The curriculum is rich in depth and variety; and being able to access it online while gaining CEUs from other industry-recognized organizations (e.g., IEEE) is another

plus. I don’t anticipate any downside to this offering... with content that is relevant and timely...”

Academic Connections

Energy University is also capturing the attention of university professors. Florida International’s Scanlon decided to integrate Energy University’s curriculum into the classes she teaches on hotel management, after hearing about it through the AH&LA. She frequently assigns material from Energy University for out-of-class studies, and often uses slides from the courses to supplement her own classroom instruction.

“Most of my students are not scientists,” she explains. “The materials need to be presented in a way that is comprehensive, not heavy on terminology, yet with the language and vocabulary of energy conservation that these students will need going forward in their careers. I find Energy University to be a valuable resource for that kind of education.”

Creating an Impact with Energy Professionals

Beyond the hotel industry and education, professional associations and organizations in several other industries have reviewed the courses and approved them for their membership to gain continuing education credit beyond degree programs. The following groups have either assigned credits or approved of the program to fulfill continuing their organization’s education credits requirements:

- **The Italian Federation for the Rational Use of Energy (FIRE)**, a non-profit association that promotes energy efficiency, supporting energy managers, ESCOs, and other companies dealing with energy.
- **The Renewable Energy and Energy Efficiency Partnership (REEEP)**, a global non-profit specialist change agent aiming to catalyze the market for renewable energy and energy efficiency, with a primary focus on emerging markets and developing countries.
- **The U.S. Green Building Council (USGBC)**, a Washington, D.C.–based nonprofit organization committed to a prosperous and sustainable future through cost-efficient and energy-saving green buildings.
- **IEEE**, the world’s largest professional association dedicated to advancing technological innovation and excellence for the benefit of humanity. IEEE and its members inspire a global community through IEEE’s highly cited publications, conferences, technology standards, and professional and educational activities.
- **BOMI International**, a not-for-profit educational institute that has earned a reputation as the trusted property and facility educational resource for top corporations, government agencies, property management firms, unions, and trade associations.



The Energy University home page

- The **Chartered Institution of Building Services Engineers** (CIBSE), a global organization based in the U.K., which received its Royal Charter in 1976.
- The **American Council on Renewable Energy** (ACORE), a membership non-profit organization headquartered in Washington, DC, dedicated to bringing renewable energy into the mainstream of the U.S. economy and lifestyle through research and communications programs and membership committees.
- **Engineers Ireland**, with over 24,000 members from every discipline of engineering in Ireland.
- The **Association for Facilities Engineering** (AFE), a professional organization of 5,000 members.
- The **CPD Certification Service**, an independent organization operating across all market sectors in the U.K. to be complementary to the CPD policies of professional and academic institutions.

Perhaps the success of the program can best be measured by those who have used the site. Records of course completions show that registered users come back to take additional classes. Thousands of users per month now visit the site and take courses, and the people are as diverse as college students, facility managers, and CEOs.

Energy University Continues to Grow

Schneider Electric plans to continue expanding the Energy University curriculum as long as there is a need for more courses. We see no sign that we will run out of course material any time soon. We are releasing new courses every quarter, and many topics are in the pipeline for development.

The company considers the program a success on every level. Most important, it has created a real impact in energy efficiency. Energy University reaches a global audience, and many users would not have had access to this level of learning and depth of information. Since we're international, we've translated much of the material to make it as accessible as possible. The growth figures for usage tell us we're succeeding in helping people to understand how they can make a difference for the environment, to become more energy efficient, and to know

how to look at and identify ways to create levels of sustainable energy use.

Conclusion: A Model for the Future

Schneider Electric is now looking at creating collaborative efforts in other industries, such as residential housing, manufacturing, and commercial offices. Given the successful collaboration with the hotel industry, we believe that the Energy University model can be replicated for other industries. Any facility owner or operator in any industry should be able to derive the same benefits from Energy University as the hotel industry has seen. Just as the hotel sector has companies that take industry leadership in this area, so are there leaders in other industries that can make a difference. There's no reason why a company in any vital market—say healthcare or manufacturing—can't collaborate with us to fill a need for information. There's a hunger for knowledge in every industry. Already the Energy University curriculum includes a course for retail building managers, "Strategies for Saving Energy in a Retail Environment."

To conclude, the important keys to Energy University's success are as follows: high-quality content that is vendor-neutral, and free availability to anyone who wants it. A critical final ingredient is collaboration. We worked across Schneider Electric and across industries to create something that has real value. By bringing these different entities together, we created something greater than we could have done by ourselves. In the process, we have become a knowledge base and partner for people who must make serious decisions about energy use everyday. That is a win for everyone. ■

Appendix

ENERGY UNIVERSITY COURSE OFFERINGS

As noted in the accompanying article, the Energy University curriculum is under continual development. Here is a list of courses as of the time of this writing. A comprehensive list with descriptions can be found at our website: MyEnergyUniversity.com.

Alternative Power Generation Technologies	Financial Analysis of EE Projects I
Active Energy Efficiency Using Speed Control	Financial Analysis of EE Projects II
Building Controls I - An Introduction to Building Controls	Going Green with Leadership in Energy and Environmental Design
Building Controls II - Control Sensors	Going Green: Energy Efficiency in the Data Center
Building Controls III - Introduction to Control Loops	HVAC and Characteristics of Air
Building Controls IV: Two Position and Floating Control Responses	HVAC and Psychometric Charts
Building Controls V-Proportional and PID Responses	HVAC and Psychometric Charts- SI Version
Building Controls VI-When to Use Each Response	HVAC Geothermal Heat Pumps
Building Controls VII-Interactive Illustration of PID Response	Increasing Data Center Efficiency through High Density Power Distribution
Building Controls VIII: Controllers and Controlled Devices	Industrial Insulation I
Building Envelope	Industrial Insulation II: Design Data Calculations
Combined Heat and Power (Cogeneration)	Industrial Insulation III
Combustion Processes	Lighting I: Lighting Your Way
Commissioning For Energy Efficiency	Lighting II: Defining Light
Compressed Air I: An Introduction	Lighting III: Lamp Families: Incandescent and Low Pressure Discharge
Compressed Air Systems II: Compressor Types	Lighting IV: Basic Lamp Families: High-Intensity Discharge and LED
Data Center Efficiency: Reducing Electrical Power Consumption	Maintenance Best Practices for Energy Efficient Facilities
Demand Response and the Smart Grid	Measuring and Benchmarking Energy Performance
Distributed Generation	Measuring Data Center Efficiency
Efficient Motor Control with Power Drive Systems	Measuring Data Center Electrical Efficiency
Electric Vehicles: Plugging into Smarter Energy Management	Measurement and Verification
Energy Audits	Power Factor Correction and Harmonics
Energy Audits Instrumentation I	Pumping Systems I: Pump Types and Performance
Energy Audits Instrumentation II	Pumping Systems II: Efficient Flow Control
Energy Efficiency Fundamentals	Pumping Systems III: Improving System Efficiency
Energy Efficiency Units and Concepts	Steam Systems I: Advantages and Basics of Steam
Energy Efficiency with Building Automation Systems Part 1	Steam Systems II: Impact of Boiler Sizing
Energy Efficiency with Building Automation Systems Part 2	Steam Systems III: Distribution Control & Regulation of Steam
Energy Procurement I	Steam Systems IV: Condensate Removal -Prevent your energy from going down the drain
Energy Procurement II	Steam Systems V: Condensate Removal - Maximizing Your Recovery
Energy Procurement III- Balanced Hedging Strategies	Steam Systems Part VI: Recovering Energy from Flash Steam
Energy Rate Structures Part I: Concepts and Unit Pricing	Strategic Energy Planning
Energy Rate Structures Part II: Understanding and Reducing your Bill	Strategies for Implementing Energy Efficient Data Centers
Establishing Benchmarks for Data Center Efficiency Measurements	Strategies for Saving Energy in a Retail Environment
Fan Systems I: Introduction to Fan Performance	Thermal Energy Storage
Fan Systems II: Fan Types	US Energy Codes and Standards
Fan Systems III: Improving System Efficiency	Waste Heat Recovery
Fan Systems IV: Improving System Efficiency	
Financing and Performance Contracting for Energy Efficient Projects	

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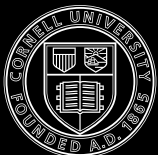
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