

EFFICIENCY

THE OFFICIAL MEMBER MAGAZINE OF THE
ASSOCIATION OF ENERGY ENGINEERS

Technical Articles
Member Stories
Events Run Up
Chapter News

<< COVER IMAGE STORY

EFFICIENCY

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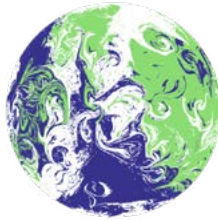
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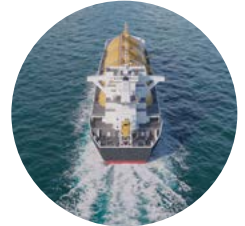


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Welcome

From Tim Janos, J.D., FAEE, CEM,
CEA, CIEP, CRM, CDSM, BEP, CSDP

Welcome to AEE's Efficiency Magazine. I am honored to be composing the Introduction to this issue, given the 45 year history and having been an active member for 40 years I can personally remember many of the milestones shown in the AEE timeline (pg. 14). I can genuinely say AEE has benefited my career in the energy field. My first contact with was when I signed up to take the CEM exam in 1982 which was held at Georgia Tech. I recall receiving a shipment of books with an outline that suggested the most important sections of each book as more or less required reading for those attempting to earn the certification. I can tell you that the test was intimidating, and I was truly unsure if I was successful until I got the notice that I passed.

Fast forward to today and I am an AEE Fellow, member of the Hall of Fame, a Senior Instructor, and I currently serve on the AEE Board as Treasurer, CEA Board Chairman and Co-Chair of the Certification Committee. During this journey I have served as Regional Vice President and President and CEM Board Chairman. I have loved every minute, made too many friends and business associates to count and greatly benefited both personally and business wise from this association.

Over the term of these 40 years, I have lived the history of AEE. I have traveled extensively with AEE's Founder, AL Thumann, and enjoyed meeting with Chapters and Members worldwide while serving as Tour Leader for the AEE Trade Missions. Those of you who had the pleasure of meeting Al and perhaps traveling with him, will have an "Al story" and understand his philosophy of never missing an opportunity to experience what is in front of you today. He would often say "You can sleep when you are dead."

During our Trip to China and Southeast Asia, I remember how determined Al was to visit the Forbidden City and how we almost had to reschedule an important meeting with some high-ranking Government Officials in order to fulfill that desire! Fortunately, everything worked out for the best and we accomplished both goals.

Like Al, I am hoping to inspire those not yet part of AEE to get certified or become a member.

As an instructor teaching in the US and Internationally, I understand the passion of other Instructors, some of which we feature in this issue (pg. 29). I frequently encounter my students and I am sometimes embarrassed to not remember all of their names on these occasions simply due to training thousands of candidates. Invariably, these students are grateful for the training they received and always comment on the positive influence the subsequent earned certifications have had on their careers.

I encourage you to embrace the many advantages of involvement with AEE the Family. You perhaps have heard our Executive Director, Bill Kent, mention how AEE is a family and not just your basic membership in the association. I can personally assure you this is completely true! If you are not yet a member you are missing out on a wonderful and fulfilling experience.



Connect with Tim



Chapter News

Connecting on Climate

AEE **Tunisia** Chapter hosted WENERCON 2022, an event that aims to provide a common understanding of climate change, its impacts and effects on business, innovative instruments, and funding sources for environmentally friendly projects. The event also had a training workshop for professionals interested in climate change financial impacts and the implementation of corporate social responsibility. The hands-on training allowed for professionals to develop and structure their skills for adaptation and mitigation projects. Congratulations to the AEE Tunisia Chapter on hosting a successful event. §

10th Annual Golf Networking Event

The AEE **Baltimore** Chapter hosted their 10th annual golf outing on Monday October 4th, 2021. Industry professionals and long-time golfers gathered for an early shot gun. The tournament is a long-standing tradition that began 20 years ago on the Renditions Golf Course in Davidsonville, Maryland. This fun celebratory event was followed by an indoor picnic as well as cash & door prizes for those in attendance. The AEE Baltimore Chapter found a way to consistently combine networking & fun within their local energy community. §



GORD Leads CEM in Qatar

AEE Qatar Chapter, led by the Gulf Organisation for Research & Development (GORD), hosted the first professional CEM program. The intensive, virtual workshop lasted four days.

Speaking on the sidelines of the event, Dr. Yousef Alhorr, Founding Chairman of GORD, said, "Scalability of energy-efficient technologies has improved radically over the last decade, but effective deployment is necessary to leverage their full potential. How well our market absorbs latest technological trends depends on the knowledge, skills and competence of energy professionals engaged in building and energy projects. The idea behind AEE Qatar Chapter's training series is to educate and empower energy professionals who can then work



as change makers enabling smart and sustainable energy systems. Through our capacity building exercises such as the CEM workshop, we envision a community of energy leaders who will synergize their efforts in reshaping Qatar's sustainability landscape."

The attendees, all energy professionals working on building projects and energy systems within Qatar, benefited from topics focusing on aspects related to building envelope and insulation, building automation and control systems, thermal energy storage systems, and building operations including maintenance and commissioning. Visit: <https://www.gord.qa> for the full story and to inquire about CEM training in Qatar. §



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COP26

REVIEW



Zero Emissions Require a “New Green Revolution”

By Javier Cervera

The 26th Climate Summit (COP26) held in Glasgow has been the key meeting to maintain the ambition to limit global warming to 1.5°C until the end of the century, despite the fact that the environment has shown skepticism regarding the real possibilities of achieving it. In this sense, two key factors have been put on the table. First, that we have already achieved a 1.2°C increase in global temperature in 2021. Second, the report published by the United Nations at the end of October, which warns that we are on our way to a warming of 2.7°C.

The Paris Agreement, the result of COP21 held in 2015, requires countries to communicate their nationally determined contribution (NDC), which is the heart of this pact and which shows the ambition and

the path that each country will follow to fulfill with that goal. This pact has been ratified by up to 196 states—including some exit and re-entry (as in the case of the United States). Countries like India, which had not shown their NDCs until this summit, has stated that it will reduce coal consumption by 45% in the short term and reach carbon neutrality by 2070.

Every country and region of the world is presenting to its own citizens’ commitments, strategies and plans to mitigate and impact climate change, with lower emissions in power generation, better techniques in agriculture, livestock, and transportation. But it is not until the Conference of the Parties (COP), where the country presentations are examined by the rest of the world’s countries. And to the concern of

the worlds’ citizens, the general conclusion is that this examination has not been passed. Furthermore, there are many pending subjects left to address.

Faced with this assessment of achievements at the political level, if someone was active at COP26, it was the business sector. There are many agreements and initiatives from different sectors to advance in the decarbonization of the economy, assuming their responsibility and promoting models that allow acting before the alarming forecast of the UN. In Glasgow they have participated from industries essential in the transition (such as energy, transport and mining) to the financial and investment world, many of which were absent in this type of meeting just a few years ago.

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& Funding Professional



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What Makes You Stand Out?



And it is that, despite the feeling of alert and urgency, with the Paris Agreement in 2015, we have advanced in certain aspects. There is a general consensus that reaching the net zero emissions targets by 2050 implies a new revolution, in which we decarbonize practically the entire physical economy: how we produce, how we generate electricity, how we get around, how we grow food, and how we heat our homes. The planet already has some of the tools to address that change, but we need a host of new solutions and inventions.

One big change is that clean energy innovation is higher on the agenda than it ever has been. The transition towards a system based on renewable energies is making steady progress and we have witnessed an acceleration in the objectives of its contribution to the global mix. Global and national strategies and policies are contributing to this impulse, as well as the growing involvement of companies and citizens, with models of decentralized and local production.

A clear example is the push that renewable energy communities is having throughout Europe, built on the basis of cooperation between public and private agents and citizens and considered by the European Commission as key to achieving the energy transition. Spain is clearly betting on the development of this model and, in the absence of a common national framework, autonomous communities.

In the transport sector, agreements have been established by groups of countries and manufacturers to eliminate the sale of internal combustion engine vehicles by 2035.

In the maritime sector, agreements have been signed that press to achieve neutrality of emissions by the year 2050—despite not having existing commercial ship technology that can achieve this. Further, agreements have been signed to achieve 5% caboneutral navigation in the short term or the creation of navigation corridors with zero emissions for end of this decade. It is important, in the face of these challenges, to have already begun to act to reduce emissions.

Another great advance is the awareness that the objectives set in the fight against climate change are global and so must the strategies to achieve them.

In this sense, an important tool in the COP is the financing fund by a group of the most advanced countries. So that those less affluent countries may have access to financial resources and the technology necessary transform their economic systems and reduce emissions.

An annual contribution to this fund of \$100 billion by 2025 is under negotiation. From another way, some countries with fewer resources would have no tools to stop burning coal. Those countries would continue with double-digit annual increases in their emissions. This is something that the richest states have done in the past to grow, which presently causes the richest states to emit more CO₂ per capita than poorer states. Spain plays an important role, because the third vice president and minister for the Ecological Transition of the Government, Teresa Ribera, has been named as one of the two facilitators in the negotiations at this summit.

Energy Events 2022

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Seattle, WA
June 15-16

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WORLD

Atlanta, GA
Conference Sept. 21-23
Expo Sept. 21-22

Georgia World Congress Center
aeworld.org



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Europe

Dublin, Ireland
Oct. 26-27

RDS (Simmons Court)
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The worst tragedy of rising temperatures is that the greatest negative impacts will affect the territories and the people who have contributed the least to causing them. If we do not implement this global strategy, the world will lose not only the fight against climate change, but also the fight against extreme poverty.

To summarize the work done during COP26, we can list Glasgow Climate Pact in 8 points (See Opposite).

But in Glasgow much more happened:

120 countries representing 90% of the world's forests have committed to investing in reducing deforestation by 2030.

100 countries, including the United States and the European Union, agree to reduce methane emissions by 2030.

40 countries agree to abandon the use of coal, including Poland, Vietnam, and Chile.

500 financial services companies agree to align with the Paris Agreement 130 trillion dollars, which means about 40% of the world's assets.

The United States and China are committed to boosting climate cooperation over the next decade. They will work as a team on everything related to methane, the transition to clean energy and decarbonization.

More than 100 national governments, as well as states, cities and large companies agree to end the sale of internal combustion engines by 2035.

11 countries set a date to end the exploitation and extraction of oil and gas in their territories.

Clydebank declaration to support maritime navigation routes without emissions and create green maritime corridors by 2025. There are 22 countries and 200 companies in the maritime sector that have signed it, in addition 9 brands have joined (such as Amazon, IKEA, Michelin, Unilever and Patagonia among others). They have announced that they will change 100% of their maritime transport to ships with zero carbon fuel by 2040.

In aviation, 10% of the global demand for jet fuel should be green by 2030. This sector wants to achieve

zero net emissions by 2050.

1,049 cities have pledged to be zero emissions by 2050 and reduce 50% of their emissions by 2030. All of them have explained what they are doing and investing in the fight against climate change.

All these agreements and commitments are very important. They all add up. On a personal note, what seems most relevant to me is that in Glasgow it was agreed that the review of the national commitments of each country that we should present in 2025 due to the climate emergency and furthermore, because with current plans the average world temperature rise would increase between 2.4°C and 2.7°C by the end of this century. In Glasgow, it was agreed that all countries should present their national upward commitments by next year in 2022.

We continue to advance, but we still have a long way to go.§



Glasgow Climate Pact in 8 points

1. Science and urgency

There is an urgency to improve ambition and action on mitigation, adaptation and financing in this critical decade to address the gaps between current efforts and the objective of the Convention.

4. Mitigation

The objective of not exceeding 2°C is reaffirmed, but the effort is made not to exceed 1.5°C of global temperature increase. Quick, deep measures and sustainable reductions in global emissions are needed, this implies a 45% reduction by 2030 compared to 2010 and a 100% reduction by mid-century. An important inclusion is the requirement for methane reduction. Most importantly, the adoption of policies to make a rapid transition to low-emission energy and the effort to eliminate the use of coal, and the gradual elimination of fossil fuel subsidies.

7. Implementation:

Need to ensure fair transactions that promote sustainable development and poverty eradication, the creation of decent work and quality jobs, making financial flows consistent with a path to low emissions, including through deployment and technology transfer and support to developing countries.

2. Adaptation

Concern with the conclusions of Working Group I of the Sixth IPCC Report, extreme weather events and their adverse impacts increase dramatically with each degree of temperature increase.

5. Finance, technology transfer and capacity building

Developed countries must increase their support, including financial support, to the most vulnerable countries that are increasingly suffering from the growing impacts of climate change. The need to mobilize the 100,000 million dollars that the Paris Agreement marked for 2020 that has not yet been achieved. All developed countries are asked to increase this amount starting in 2025.

8. Collaboration

International collaboration in climate action must be innovative and must involve all actors in society, sectors, and regions to achieve the goals of the Paris Agreement. It recognizes the importance of stakeholders such as civil society, indigenous peoples, local communities, youth, children, women, local and regional governments, etc., all to achieve the objective of the convention and the objectives of the Paris Agreement.

3. Adaptation financing

We are aware that current financing is insufficient to respond to the impacts of climate change, which are needed with urgency. Developed countries are urged to increase climate finance, transfer technology and build capacity for adaptation, including the formulation and implementation of national plans in less developed countries. Multilateral banks, financial institutions, and the private sector are called upon to mobilize the necessary resources to achieve climate plans.

6. Loss and damage: Climate change causes and will cause more and more loss and damage as the temperature rises. The social impact and the economic and environmental threat will be greater and greater. The importance of local, regional, indigenous, etc., stake-holders is recognized in avoiding, minimizing, and addressing loss and damage associated with a changing climate. It reiterates the urgency of expanding action and support to the most vulnerable developing countries (Red de Santiago).

AUTHOR BIOGRAPHY



Javier Cervera, is the director of energy transition at Baleària shipping company and vice president of the Valencian Cooperative Sapiens Energía, specialized in the design and management of renewable energy communities. Javier also serves as vice president of the Association of Energy Engineers, Spain Chapter. He is a telecommunications engineer and has developed his professional life in the field of energy, working in commercial and innovation areas in large companies, and in the development of renewable energy projects.

AEE Employee Spotlight

Connect with Teniece

Have you taken an AEE training course or exam through one of our outstanding international training partners or renewed your certification?

Teniece Price-Williams has been the International Certification and Renewal Administrator since August 2017. She personally reviews all candidates' applications and prints all new certifications and international renewals. She wishes that she could congratulate every single person individually for gaining certification as she prepares the certificates for each candidate! Teniece enjoys hearing stories about how AEE certifications

have changed the lives of so many throughout the world. It inspires her to see just how important her work is beyond her computer.

Teniece and her family lived in Odessa, Ukraine and fell in love with the people, culture, and language. Learning the Russian language gave Teniece a new appreciation for those who are bilingual. This is important when considering AEE's international department deals with different languages and cultures from all over the world!

Teniece has been happily married to David for 24 years and they have three children, Megan, Jacob, and Emily. Teniece enjoys traveling, and



**Teniece and Family
Christmas 2021**

spending time with her family and friends.

Teniece can be reached at teniecepw@aeeecenter.org or (770) 447-5083 ext. 230.



Member Q&A

with Elin Shepard, LEED AP BD+C, CEM. Account Management Consultant, CLEAResult

How long have you been an AEE member?

7 years; I started out as chapter member and quickly joined the board to increase my engagement.

What made you want to join AEE?

I obtained my Certified Energy Management (CEM) designation in late 2014 and through that experience received an AEE membership. That experience was just the beginning of a rewarding experience and multitude of industry connections.

What is your favorite part of being an AEE member?

The global engagement and member

connections facilitated by the organization is bar none. As I am writing this on International Women's Day, I have to say that I could not be more proud of the amazing women in CWEEL.

What is the most underrated member benefit?

I have two! One, being a part of CWEEL, and two, the opportunity to share thought leadership through contributing articles to AEE journals.

What local chapter are you part of?

I am proud to be the President of the Columbia River Chapter – the latest recipient of the National Award for

Best Chapter Website!

What would your advice be to a young professional new to AEE?

I recommend they sign up for the mentoring programs and reach out to make connections - this is an incredible community of energy industry professionals.

What are you looking forward to doing with your AEE membership in 2022?

I'm excited to be the newest member of the CWEEL Board and I look forward to coordinating the scholarships and awards programs.

U.S. Becomes Leading liquefied Natural Gas Exporter

by Stephen A. Roosa, Ph.D., CEM, CSDP, REP, CRM, CMVP

As the winter of 2021-2022 began, Europe faced the potential of high electric prices and a shortage of natural gas. In France, several atomic power plants were off-line and some industries were asked to curb production. Europe's natural gas production has declined because of production limits on the Groningen Field in the Netherlands and declines in the mature fields in the North Sea^[1].

To meet demand, the Europe Union (EU) countries have increased their reliance on natural gas imports, particularly from the Russian Federation^[1]. The 27 European Union countries, as a block are the world's largest importer of natural gas. The EU imported 41% of their natural gas from Russia. In 2019, the countries of Hungary, Finland, the Czech Republic, Slovenia, Romania, Bulgaria, Estonia, Latvia, Slovakia, Macedonia, Bosnia-Herzegovina and Moldavia, imported over 90% of their natural gas from Russia, primarily via pipelines. However, imports from Russia began to be restricted, creating a natural gas supply shortage. Europe's harsh winter of 2021 to 2022, created a significant premium for natural gas^[2]. Poland recently decided not to renew a contract to import Russian natural gas beyond 2022.

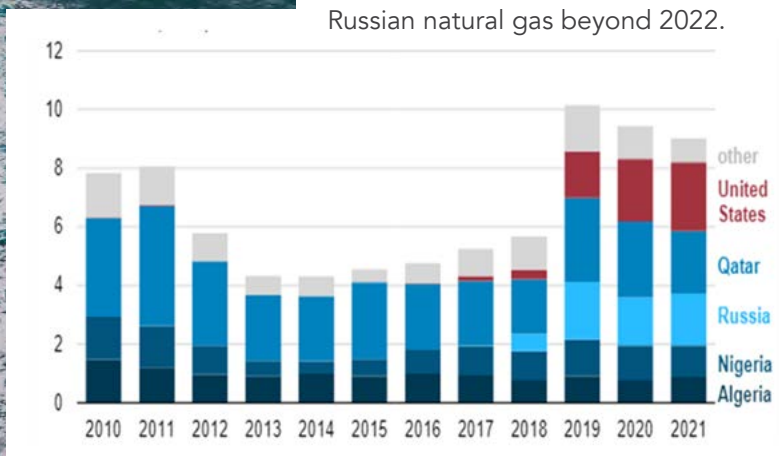


Figure 1. European (EU plus the UK) LNG imports by source country (BCF/day)^[1].

Natural gas prices are much lower in the U.S. and supplies of liquefied natural gas (LNG) for export are available. LNG is fast becoming an import addition to the world's energy supplies. It is natural gas that is compressed, making it easier to ship in large quantities. To be readily transported, it must be piped from the field to a facility capable of cooling, compressing and loading the product in a super-chilled state from a terminal onto a specially designed ship. Once it reaches its intended destination, the cargo is offloaded to a receiving terminal and the process is reversed. The product is re-gasified, essentially changed from its nearly frozen state back into a gas and then piped to the point of use. Losses in this multi-stage process must be minimized.

In 2021, a large share of Europe's supply of LNG originated in the United States, Qatar, and Russia^[1]. Combined, these three countries accounted for almost 70% of Europe's total LNG imports (see Figure 1)^[1]. In December 2021, natural gas was trading for about \$57.54/MMBtu on the European continent, 14 times higher than the prices quoted on the U.S. market^[2].

The U.S. expanded its infrastructure to support LNG exports during the last decade. Rising U.S. LNG exports are the result of both natural gas supply challenges in Europe and the large price differences between natural gas produced in the U.S. and prices at European trading hubs^[1]. To obtain higher prices for product, U.S. cargoes were shifted away from Asia and South America toward Europe, with 20 tankers carrying 3.3 million m³ crossing the Atlantic^[2].

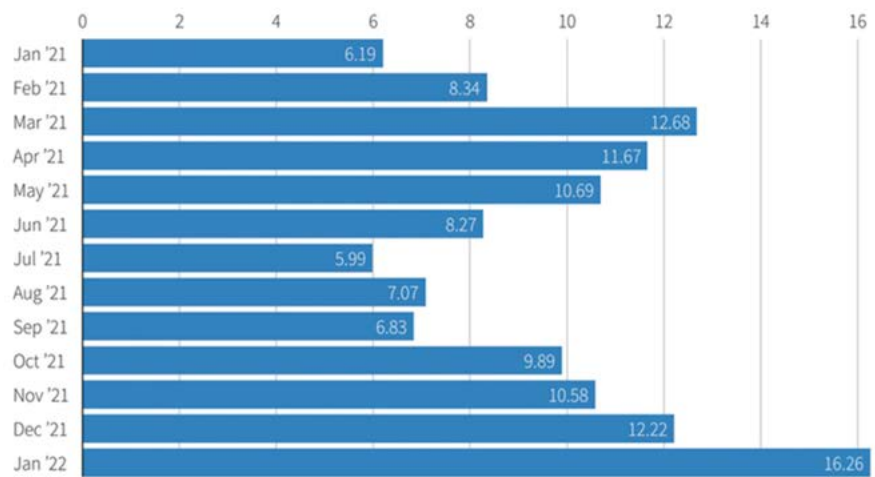


Figure 2. European monthly LNG imports in billion m³ (sources: Refinitive, Reuters Graphics).

The U.S. has seven operational LNG export terminals. They are located in Alaska, Georgia, Louisiana, Maryland, and Texas and have recently been operating at their maximum uploading capacities.

At least half of U.S. natural gas exports are being shipped to European markets^[3]. Most of Europe's LNG terminals are operating at full capacity and their terminals have only limited capacity to absorb additional supplies from the U.S.^[3]. The countries with the largest capacities are Spain (over 60 Bm³), the UK (50 Bm³) and France (33 Bm³). Though Spain has six LNG terminals, it has only one pipeline that offers a connection to the rest of Europe via France^[3]. Figure 2 shows the rapid increase in monthly European LNG imports.

Germany, Europe's largest user of natural gas, has no LNG terminals. The country planned on importing more Russian natural gas supplied via the new Nord Stream 2 pipeline. The pipeline was constructed at a cost of over \$11 billion, has not yet been commissioned, and is not yet operational^[4]. As a response to Russia's incursions in Ukraine, in

February 2022, Germany chose not to certify the pipeline. Certification of the pipeline was initially estimated to be valued at \$2.7 billion annually to the Russian economy.

This situation leaves the European countries in a quandary. They lack adequate natural gas supplies and must import large quantities from Russia. For the last decade, Europe has focused on decarbonizing its energy infrastructure. These efforts have led to the development of locally available and more sustainable energy resources such as solar and wind power. The development of these intermittent generation resources has not happened quickly enough to displace electrical generation from coal-fired and nuclear thermal plants.

We now see the potential of natural gas supplies from Russia to the EU being weaponized not unlike crude oil in the 1970s after the Iranian Revolution. A partial backstop is Russia's need for hard currency in light of the recent devaluation of its ruble. With the destabilization of the government in Ukraine and Russian military incursions there, Europe's short-term focus will likely

shift away from use of Russian natural gas toward improving domestic energy efficiency and supply security. Germany has recently announced that it is considering construction of two LNG terminals and increasing its reserves in storage^[5]. The country has the capacity to store 24 BCF in underground caverns but this capability is underutilized^[5].

In the interim, natural gas costs will increase unless demand subsides. Some EU countries may selectively subsidize natural gas costs. Europe will likely attempt to obtain more natural gas from internal sources, increase storage capacities, and import more LNG from Qatar and the U.S. Germany's Economy Minister, Robert Habeck, stated that the energy crisis will strengthen the case for customers of Russian fossil fuels to pursue energy independence by boosting renewable sources^[6]. In combination these options are insufficient to totally replace Russian natural gas. North Sea natural gas production has been declining since 2000. Without new discoveries and their development, it might decline to

negligible amounts by 2030. Denmark plans to suspend North Sea natural gas production by 2050. The Baltic Pipe project is designed to carry natural gas from Norway to Poland has been authorized with a capacity of 10 BCF^[7]. Partially funded by the EU, it is expected to be fully operational by January 2023^[7].

Increasing LNG exports to the EU may be difficult. Qatar has indicated that under the best of circumstances, its exports of LNG to Europe can increase only 10% to 15%, which falls short of meeting the demand for natural gas in Europe. As the U.S. economy improves, the country may be unable to increase shipments of LNG to Europe without finding ways to increase domestic production. Finally, European LNG infrastructure has been operating near its capacity and increasing offloading capabilities will require investments in new infrastructure and distribution systems. Unfortunately, infrastructure improvements intended to diversify energy supplies and reduce shortages on a regional scale requires years if not decades to complete.§

AUTHOR BIOGRAPHY

Dr. Stephen Roosa has worked in the energy industry for over 35 years as an energy engineer, designer, manager, educator, and consultant. His experience includes energy studies and projects for over 3,500 buildings with over \$100 million in energy conservation, energy management, and alternative energy projects developed for industrial, institutional, and commercial customers. Dr. Roosa is a past AEE president and the present AEE Director of Sustainable State and Local Programs, the current Chairman of the Renewable Energy Professional Certification Board, editor of the 9th edition of the Energy Management Handbook, editor-in-chief of AEE's new International Journal of Strategic Energy and Environmental Planning, and a member of the Energy Managers' Hall of Fame. Contact him via email at sroosa@aeecenter.org



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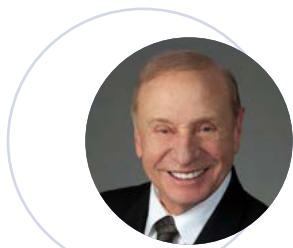
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Connect with AEE

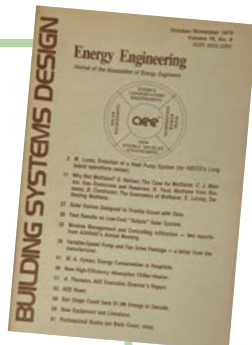


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Timeline



1977 **AEE was founded.** The National Energy Policy & Conservation Act (1978) defines what an "energy manager" should be. AEE, a nonprofit professional society, is founded by Albert Thumann. In the same year, the US Department of Energy (DOE) and governments grapple with the 1970's Oil Crisis.

1978 **AEE hosts its first event**, the World Energy Engineering Congress (WEEC) - an energy conference and expo at the Royal Coach Inn, Atlanta, Georgia, creates its awards programs and publishes the Energy Engineering Journal.

1979 **AEE creates its first chapters** in Atlanta, Chicago, Houston, Kansas City, Metro Detroit/South Michigan, New England, New Jersey, New York, Washington DC/National Capital Chapter, San Francisco & Southern California.

CEM[®] 1981 **AEE creates the Certified Energy Manager[®] (CEM[®]) Certification**, gains its first Corporate Member and establishes the AEE Foundation to support young professionals. AEE establishes its first international Chapters in Hong Kong, Brazil, and Canada.



1985 **The AEE Journal** for Distributed Generation and Alternative Energy is published.



1990 **AEE creates the Energy Managers Hall of Fame** with first inductee Richard Aspenson.



1991 **AEE Works to promote Energy Managers in US law at the federal level.** Senator Glenn invites AEE to help craft the federal energy management section of EPCA. After months of pro bono effort by the AEE National Capital Chapter, AEE's language requiring "trained" energy managers in all federal facilities nationwide was entirely accepted by both houses of Congress and included in the law. AEE also organizes its first Trade Mission to Eastern Europe.

1993 AEE first female president, MaryAnne Lauderdale.



1995 First US government focused CEM Training Program is hosted by the US State Department Foreign Service group and AEE hosts its First Energy Management Congress Event on the West Coast US.

1996 AEE begins capacity building abroad in conjunction with USAID through a CEM Course Ukraine.

1997 AEE celebrates its 20th anniversary.



2001 The Certified Measurement and Verification Professional (CMVP®) program is established as a global standard to meet the growing needs of the energy industry. AEE conducts a Trade Mission to South Africa.

2005 **CWEEL is formed.** The Council on Women in Energy & the Environment holds its first meeting in Austin, Texas.



2006 The Business Energy Professional (BEP®) certification program is released to recognize those managing businesses, people and projects in the energy industry and AEE conducts a Trade Mission to China and South East Asia.

2007 Sustainability becomes a mainstream. AEE's Certified Sustainable Development Professional (CSDP®) certification program recognizes individuals working to address environmental issues, alternative energy and carbon reduction, sustainable building development, and the impact of sustainable development policies. Due to its members' generous donations over the years, AEE Foundation awarded over \$500,000 in scholarships.





2008 Mrs. Fotouh Al-Raqom

is an AEE Foundation scholarship recipient; she became AEE's First international female President in 2022.



2009 AEE leads the industry by defining and releasing the Certified Energy Auditor (CEA®) program, which focuses on professionals undertaking efficiency assessments of large buildings and industrial facilities.

2011 AEE focuses on the development of student chapters and young energy professionals. The World Student Scholarship was introduced by presiding AEE president Dr. Eric Woodroof.

2012 AEE creates the Fellows community to support networking and friendship - a core value of AEE.

2013 A first for the CEM. It became the first energy management personal certification program awarded ANSI accreditation.

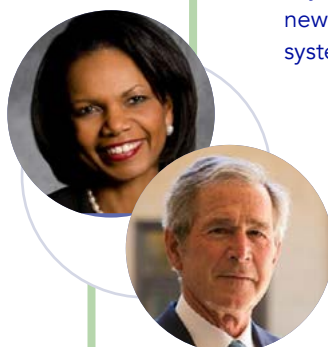


ANSI Accredited Program
PERSONNEL CERTIFICATION
#1088

2014 Energy efficiency and energy management grow to unprecedented levels in the workforce. Once considered niche, energy management principles now become mainstream. AEE supports this industry growth with 3 new certification programs. President Bill Clinton, 42nd President of the United States, is the keynote presenter and Star of Energy. AEE moves to its new international headquarters. Many of the building's systems are automated and energy efficient.



2015 Condoleezza Rice, the 66th US Secretary of State, is the keynote presenter and Star of Energy, to international delegates from more than 60 countries.



2018 President George W. Bush, 43rd President of the United States & Founder of the George W. Bush Presidential Center is a keynote presenter and Star of Energy.



2019 AEE Foundation awards surpass \$1,000,000 to date. After 40 years of successful energy conferences and expos, AEE rebrands and relaunches its annual events to AEE World, East, and West.

2021 AEE acquires the SEP 50001 credential and associated certifications that support the US Department of Energy's Superior Energy Performance 5001™ programs.

YOU ARE PART OF

We have hosted over

120 **Events** with over
1,000,000
participants.



We have recognized over

1,900
individuals, companies, or
organizations through
our **Awards** program.



There are now **70**
Inductees into the AEE

**Energy Managers
Hall of Fame** and

over **100** AEE **Fellow**
members.

The

CEM[®]

program is now
presented in over

60 countries and
offered in **10**
languages.

It continues to be a **global standard** for energy professionals.

Over **750**
Scholarships have
been awarded to young
professionals.



We now have more than
25,000
active **certified professionals**
that hold over

32,000
certifications between them.



2022

45 years
aee[®]

NCCx

/Administration
/Human Resources
/Accounting
/Finance
/Marketing
/Publicity
/Promotion
/Research
/Business
/Development
/Engineering
/Manufacturing
/Planning

NCx

789.51

ReCx

VCx

EBCx

BLC2x

279.82

PMCx

555.74

NBCx

818.71

TBCx

ICx No.1

559.83

MBCx

454.87

826.04

536.85

301.56

RCx

PCx

215.79

LCBCx

43.67

120.89

286.21

Is BCx at a Cross Roads with some Interesting Times Ahead?

A Building Commissioning Q&A with Song Deng, MS, PE, CBCP, CMVP, CEA, REP, AEE Hall-of-Fame

Since its inception, Building Commissioning (BCx) has evolved into a veritable alphabet soup of categories depending on the stage of the life cycle of a building, central plant, or campus. Domain expert Song Deng, a practitioner, instructor, certified professional, and member of the AEE Hall of Fame, helps us sort out some of the complex details and provides a dynamic view of the current state and future of BCx.

What is so interesting about Building Commissioning today?

As an instructor for AEE's Certified Building Commissioning Professional (CBCP®) course, I hear firsthand how different professionals approach commissioning. An ancient, unattributed proverb says: "May you live in interesting times!" 2022 certainly represents interesting times with the disruption of economic systems, global supply chains, geopolitical controversies, and climate concerns. These issues come up in conversations because they affect our building and facility development, real estate management, and operations industry. The need for BCx has incubated into a perfect storm for buildings crying for modernization (can you say "deferred maintenance") with technology breakthroughs available for new and existing building stocks worldwide.

What is the AEE CBCP BCx Matrix?

To remain an unbiased professional training and certification body, AEE doesn't own or publish specific guidelines or standards in BCx. The CBCP course and certification's reputation supports AEE's brand of providing quality BCx training and best practices. The way I see it, it is an integrated and organic combination of proven Cx quality control techniques and state-of-the-art energy efficiency/management expertise. I like to summarize and represent it as YCx in the formula (fig 1), with Y representing many circumstances, characteristics, timing, strategic considerations, and approaches.

Why BCx?

When asked this question, I quote AEE certified professional and trainer Ziad Haddad, Senior Director of Physical Plant at Lebanese American University, a friend and colleague. "The best-built project, if not commissioned properly, can turn into

the worst nightmare for its tenants and operators."

What is BCx?

The Commissioning Process (Cx) is a quality-focused process for boosting the delivery of a building-related project. BCx is a Quality Assurance (QA) and Quality Control (QC) approach recently created and applied in the building industry, real estate management, and facilities O&M. BCx adds another notch of enhanced confidence compared to traditional QC. It validates and documents subject systems and assemblies to ensure they are planned, designed, installed, tested, operated, and maintained to meet the Owner's Project Requirements (OPR) or Current Facility Requirements (CFR). BCx applies an interactive and quantified process, coordinating and facilitating essential milestone activities and events. Examples include Basis of Design (BoD) review, design review, submittals review,

pre-functional checklists, TAB review, functional performance testing (FPT), systems manual, training, issues and resolution log, etc. Instead of going to "expensive" lawyers and attorneys as an "after-fact," BCx deploys an orchestrated "technical" process proactively.

With QA and QC in mind, a CBCP will consider existing processes and the history, and then finely balance and trade in each factor dynamically. Or at least I hope they do to reflect today's world's challenges!

Why is there a sense of urgency for RCx?

I want to quote another friend and colleague, Dr. Dave Dong, CEO of Vision Building energy efficiency, LLC, DBA Bee®. "There is so much that can and needs to be done! it's all about the future generations." He developed BCx expertise while working on public and private projects worldwide. As AEE CBCP global training and certification course co-

$$\begin{aligned} & \mathbf{YCx = \{ \}} \\ & f(\text{functionality, operability, reliability, maintainability, efficiency, sustainability, resiliency, ...}) \\ & f\left(\frac{\text{Owner}}{\text{PM}}, \text{CBCP, planner, designer, } \frac{\text{GC}}{\text{subs}}, \frac{\text{FM}}{\text{O\&M + Contractors}}, \text{occupants, other stakeholders}\right) \\ & f\left(\frac{\text{ORP}}{\text{CFR}}, \text{Cx Plan, } \frac{\text{issues}}{\text{resolution}} \text{ log, BoD, } \frac{\text{design}}{\text{submittal}} \text{ Review, } \frac{\text{PFC seasonal}}{\text{FPT deferred}} \text{ testing, } \frac{\text{systems manual}}{\text{training}} \dots\right) \\ & f\left(\frac{\text{IAQ}}{\text{IEA}}(T, RH, CO_2, VOC, PM_{2.5}, POE, SBS, \dots), \$, kW, kWh, Btu, GHG, \text{other performance KPIs}\right) \\ & f \sum_{\text{Pre-0}}^{\text{end of life Cycle}} \left(\frac{\text{buildings}}{\text{subsystems}}, \frac{\text{campuses}}{\text{central plants}}, \frac{\text{electrical grids}}{\text{thermal loops}} \text{ nodal, ISDs, cities, states, agencies, ...} \right) \end{aligned}$$

Figure 1. YCx Formula to Building Commissioning.

developers and co-instructors, Dave and I have worked in the building Cx/RCx and energy management/efficiency services fields since the 1990s, so we often dialogue through a historical kaleidoscope and with an “old school” mindset.

In February 2022, after a successful on-site RCx investigation, Dave’s team was caught by a snowstorm in the NE US that canceled their flight. Dave and a teammate decided to take a 28-hour road trip from Connecticut back to Texas so that the young teammate that had just learned of becoming a father could see his new child.

Dave shared this of that experience, “This kind of situation [extreme weather] is now a regular occurrence, almost everywhere. I see Facility management and the O&M crews get frustrated in these harsh environmental conditions. The RCx process could solve some of these issues right away, and open the doors for remedies and

modernizations to the others.” CBCPs could coordinate and facilitate all stakeholders, especially the Owner, to attack the ongoing problems and challenges differently. They could make concerted moves on the to-do lists and the wishlists that have been long on the shelf or under a desk. It’s a past due to revamp, modernize and upgrade infrastructure and assets where we live and breathe. We see this urgency globally (while we travel and work on an actual project, or teach a CBCP certification course), whether in the USA, Canada, Europe, the Middle East, Central America, Japan, Korea, China, Hong Kong, or Taiwan.

What is unique about AEE’s CBCP certification?

Firstly, I think a certification offers a “license” that recognizes and qualifies (as requested by the Owner) you to perform modern-day technical QA and QC in both new and existing buildings and on building systems.

Secondly, there are good training and certification programs and a lot of literature, documentation, and case studies available. In my opinion, AEE’s CBCP certification offers a unique view with double features: A quality assurance and control approach plus an energy flow, management, and conservation theme. It represents a convergence of BCx, energy efficiency, and energy management. It also offers candidates a great career path and opportunities to secure a “Golden Collar” or “Green Collar” job, whichever way you prefer to call it. To quote Dave again, “The recent globalization of the certification provides informative and up-to-date materials and learning resources, and presents a clear road map on the BCx development that is designed for entry-level learners, highly skilled engineers, or savvy energy managers.”

I would add that recently, I came to the idea of Blockchain Commissioning

During mid-year of 2021, US FEMP Released a Report on Monitoring-Based Commissioning. What did you think of Cx & MBCx Applications in Projects Financed by Energy Savings Performance Contracts (ESPC) and Utility Energy Service Contracts (UESC)?

The report points out:

1. Effective energy system commissioning is critical to ensuring that system performance meets its design intent;
2. Monitoring-based commissioning (MBCx) is the ongoing application of the commissioning process to a building or energy system;
3. MBCx typically automates monitoring, data collection, and analysis to inform the commissioning process with timely information and insights;
4. FEMP recently published Enhancing Performance Contracts with Monitoring-based Commissioning to provide information on the benefits and process of integrating MBCx as an energy conservation measure into energy performance contracts;
5. An overview of MBCx capabilities and process, MBCx energy savings potential, and advantages of implementing MBCx within energy savings performance contracts and utility energy service contracts, including considerations for use of MBCx in each performance contract phase.

More Info:

<https://www.energy.gov/eere/femp/articles/enhancing-performance-contracts-monitoring-based-commissioning>

I applauded “policy-making” as another bright example of combining the QA/QC commissioning process with energy management/conservation services through possibilities enabled by the latest technology advancements, such as power-harvesting sensors and quantum computation. We saw it’s coming, and should not regret one day that we didn’t get on it.

(BLC2x); back in 2009, I created the term Nodal Commissioning (NCx). So what are they, and where are they in the YCx family and matrix? Consider coming to a session at an AEE conference or attending a CBCP certification training course. You'll get to join the open dialog, discussion, and debate with the instructors, your peers, and me.

What is MBCx?

Monitoring-Based Commissioning (MBCx) is the new buzzword in building performance. Commissioning professionals realize new buildings may not operate as designed. This may be due to a wide range of factors, including organizational issues, technology, or training. Darren Oliveri, Facility Performance Team Manager of Synergy Consulting Engineers sees this a lot. He told me, "Facility Managers shouldn't have to struggle with new buildings failing prematurely. Traditional Commissioning is generally completed at the end of construction with very brief training, leaving facility managers to figure out their buildings. MBCx gives facility managers an advocate (throughout the warranty

phase) to ensure the building sequences, flows, and mechanics perform efficiently. Through the MBCx ("setup" and) process, via Data Analytics, the issues identified empower the client to navigate problems early on and take action without disrupting the end-user. For example, potentially damaging high humidity or expensive over-cooling should be identified before those issues impact an organization's bottom line."

How can MBCx expand within the industry?

MBCx concepts and applications deserve more white papers, books, seminars, and forums to cover the topic comprehensively while evolving, being subjective, and spawning the same or related topics of "digital twins" and BIM/BEM, etc. We could benefit from being more informed and updated on MBCx at AEE conferences and CBCP certification workshop presentations.

What is the bigger picture and your vision for BCx?

Similar quality control and assurance concepts, processes, and procedures

are applied in all industries. If we do not implement, there is a danger QC problems could hurt building performance, as they have in other industries, with recent examples being the VW exhaust emission scandal, Boeing's 737 Max negligence, Target's BAS/BMS cyber breach, or the Texas 2021 "Deep Freeze".

While MBCx is a "crown jewel," it only represents the tip of the iceberg – to build up to it, there are deep in-field "hard" and "soft" work, philosophical and budgetary planning, resources, and a delicate balance behind it. Undoubtedly, the current world trend in buildings is electrification and digitization. MBCx will lead these trends in building industry into the future. §

AUTHOR BIOGRAPHY

For over 30 years, Song has been in energy management and is recognized globally for his knowledge of building commissioning. He has assessed over 600 buildings and campuses globally and led programs that have resulted in measured and documented avoided costs and energy savings of over \$300 million. As Associate Director at the Energy Systems Lab of Texas A&M University, he led the team and saved the university in excess of \$90 million over a 17-year period. In 2010, Song and Dr. W. Dan Turner co-founded the Theory of Nodal Partners, reflecting their view of today's world, IT, energy and utility supplies, transportation, storage and consumption, the smart grid of everything, interplay, and readiness. His work for AEE includes developing certification courses and instructing on building commissioning and energy audit. Currently, Song is the Technical Advisor at Austin, TX-based Bee® (Vision Building energy efficiency, BeeUSA.com).



Building Commissioning Categories

- New Building (Construction) Commissioning (NBCx or NCCx)
- Existing Building Commissioning (EBCx)
- Retro-Commissioning (RCx)
- Re-Commissioning (ReCx)
- Piece-Meal Commissioning (PMCx)
- Comprehensive Cx Programs (or Cx-Lite)
- HVAC, Controls & MEP, BECx to Total Building Commissioning (TBCx)
- Physical Commissioning (PCx)
- Remote or Virtual Commissioning (VCx)
- Monitoring-Based Commissioning (MBCx)
- Inward Commissioning (ICx No.1)
- Nodal Commissioning (NCx)
- On-Going Commissioning (OCx)
- Life-Cycle Building Commissioning (LCBCx)
- BEM/BIM, IOT, ML & AI, and Blockchain Commissioning (BLC2x)

Warning! The recommendation of this book is intended for awareness and education, not to overly frighten or shock. However, the title of the book could cause thoughts of an apocalyptic world.

Recommended Reads

By Ray Segars, CEM, FAEF | AEE's Director of Business Development

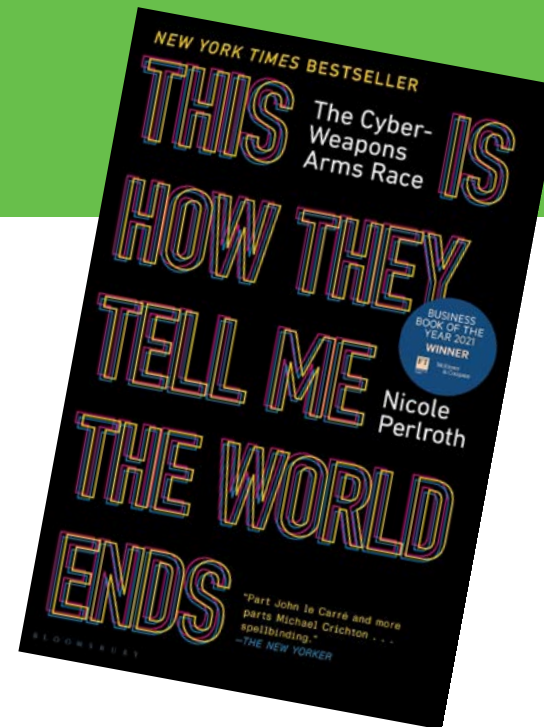
Recently, I watched the techno thriller movie *Blackhat* that starts out with an explosion at a nuclear power plant in China. The event reminded me of the Three Mile Island and Chernobyl incidents that occurred due to a combination of technical and human failures. Spoiler alert! In the movie however, the event is caused by a hacker breach of a PLC (programmable logic controller) on a pump motor. Interesting stuff for energy nerds. The remainder of the movie is an action-packed journey to find the hacker and their motive. This was very timely for me as it relates to the subject book and how vulnerable our interconnected world has become.

As energy professionals, we have become enamored with smart buildings, smart cars, and smart grids as integral components of a more efficient and low carbon future. As all of these become interconnected, the system is only as strong as weakest connection. Perlroth's book, *This Is How They Tell Me The World Ends*, reminds us that the most important feature of our interconnected future should be security.

If you didn't know the book, *This Is How They Tell Me The World Ends*, was based on journalistic research

and facts, it would seem more like an espionage novel. Basically, the book is telling of various pieces of the development of cyber security. Beginning pre-internet, she connects spy craft with the vulnerabilities of technology and information. She takes the reader on a journey of meeting with hackers, cyber security experts, and many of the other players involved in the evolution of technology. Hers is a cautionary tale how we got to where we are on technology security and the awareness needed to minimize future risks. Two of the greatest initial risks pointed out could have been avoided. First, the denial by many software companies early on of weaknesses pointed out in most cases by well meaning programmers. (Listen to your engineers!) Second, how tools developed by hackers and even government agencies have gotten out of control to cause cyber havoc. Most notably, she provides a history of "zero-day" software bugs that allows hacker access to technology. In this case, think about the risk of ransomware attacks. This book was released prior to the Colonial Pipeline ransomware attack in the spring of 2021. If they had only known.

Our objective as energy



professionals is to recommend effective and efficient solutions. Nearly all solutions today include some form of connected technology. Therefore, we should also consider the security of these technologies. A read of the above book is a good reminder of why it is important to include security in our energy plans. §



AEE
BOOKS

AEE Members gain discounts to purchases, and subscriptions to over 200 technical reference books focused on Energy Management, Energy Efficiency, Engineering, Renewables, Clean Energy and Sustainability.

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West

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Returns to Seattle

Delivering **Energy Efficiency**
for **Strategic Impact**



Event Host



June 15-16, 2022

Seattle Convention Center | Seattle, WA

AEE West focuses on key energy issues and the latest developments from business, industry, and government sectors in across the region. So, we decide to ask our host sponsor, Puget Sound Energy (PSE), how they are committing to carbon emissions reduction.

As Washington's largest and oldest utility, Puget Sound Energy has provided safe and reliable energy to one of the world's most dynamic regions for more than 145 years. We currently serve nearly 2 million electric and gas customers across 10 counties in the northwestern part of the state. The affordability of operations and maintenance remains a key driver of our energy efficiency programs, and the threat of climate change is increasingly shaping the way we support our commercial customers.

The energy sector plays a critical role in developing and implementing long-term strategies to meet climate

goals. PSE aspires to have a 100 percent carbon-free electric supply and achieve net zero emissions for end customer natural gas use by 2045, goals that align with state regulators' efforts in recent years. In 2019, Washington passed the Clean Energy Transformation Act (CETA), requiring electric utilities to phase out greenhouse-gas emitting generation. PSE recently filed our first CETA implementation plan committing to 60 percent clean electricity by end of 2025. New and expanded energy efficiency programs are a key part of reducing emissions and reaching our climate goals.

Clean Buildings

As part of a comprehensive effort to reduce greenhouse gas emissions in Washington, lawmakers also passed energy performance standards for the state's commercial



building sector in 2019, called the Clean Buildings Act (HB1257). In conjunction, PSE developed the Clean Building Accelerator program to help customers comply with the law. Participants learn how to benchmark in ENERGY STAR® Portfolio Manager and develop energy management practices required by the law. As customers identify buildings that are far above the law's targets, they are encouraged to leverage PSE's financial incentives through other programs like Pay For Performance, which targets deep retrofits that are measured at the meter. This program leaves customers and contractors to creatively bundle efforts to dramatically lower energy usage. Another series of programs incentivize low- and no-cost commissioning of building management systems in existing buildings and new construction.

New Construction

Reducing emissions in the built environment requires programs that specifically target new construction, especially in a fast-growing region like the Puget Sound. PSE is pushing building performance even further by offering builders the opportunity to recoup up to 100 percent of their costs for efficiency improvements that yield energy savings beyond what is required by state code. Builders can benefit from a whole building approach or pursue specific upgrades. Custom incentives for specific system upgrades such as energy efficient lighting and HVAC systems are also available.

Fostering Organizational Change

Part of PSE's strategy is enabling customers to take a comprehensive approach to energy efficiency. In

Plan Your Time at AEE West

AEE West 2022 | DAY 1 SCHEDULE

Wednesday June 15 | All Times Local Seattle Time, US (PT)

Opening Session

9:00 - 10:40 am

Free Technology Expo

10:30 am - 4:00 pm | Expo Hall

Networking Luncheon

12:00 - 1:30 pm | Expo Hall

Conference Tracks

2:00-4:00 pm | Speakers Announcing Soon

Track A
Policy, Trends & Local
Initiatives

**Energy Policy in the
Pacific Northwest**

Track B
High Performance & Green
Buildings

**Commissioning and
Auditing**

Track C
Trends and Leading Edge
Initiatives

**How Technology
Enables Modern
Energy Management**

Track D
The Grid in Transition

**Decarbonization and
The Grid**

Opening Night Networking Reception

4:00 - 6:00 pm | Location TBD

AEE West 2022 | DAY 2 SCHEDULE

Wednesday June 16 | All Times Local Seattle Time, US (PT)

CWEEL Breakfast and Keynote Presentation

7:30 - 9:00 am

Conference Tracks

9:00-11:00 am | Speakers Announcing Soon

Free Technology Expo

10:00 am - 2:00 pm | Expo Hall

Track A
Policy, Trends & Local
Initiatives

**Incentives, Financing &
Utility Programs**

Track B
High Performance & Green
Buildings

**Solving the Problem of
Quantifying Efficiency**

Track C
Trends and Leading Edge
Initiatives

Announcing Soon

Track D
The Grid in Transition

**Renewables & Energy
Storage**

Networking Luncheon

12:00 - 1:30 pm | Expo Hall

AEE Chapter Luncheon, Presentation and Networking

12:00 - 1:30 pm

Conference Tracks

2:00-4:00 pm | Speakers Announcing Soon

Track A
Policy, Trends & Local
Initiatives

ESG & Carbon Reporting

Track B
High Performance & Green
Buildings

Building Success Stories

Track C
Trends and Leading Edge
Initiatives

Hydrogen

Track D
The Grid in Transition

EVs and Transportation

“PSE is increasingly focused on developing programs that increase energy efficiency through organizational change.”

In addition to incentivizing capital improvements, PSE is increasingly focused on developing programs that increase energy efficiency through organizational change. Our Commercial Strategic Energy Management program targets energy performance improvements through low- and no-cost operations, maintenance and behavioral opportunities. PSE customers with building portfolios that consume more than 1 million kilowatt-hours or 135,000 therms annually may receive start-up and performance-based financial incentives, training, technical support and resource-accounting software that allows them to drastically reduce their energy costs year after year. The Bellingham School District, for example, has saved nearly half a million dollars annually since joining the program in 2008.

Expanded Lighting Offerings

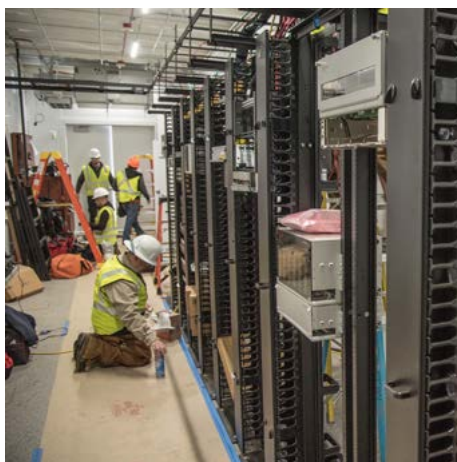
Upgrading to LED lighting remains one of the easiest ways for any business to quickly reduce



its energy consumption and costs; and advancements in lighting control technology offer even more opportunities for energy efficiency. With this in mind, PSE expanded its Business Lighting program to include Exterior Networked Lighting Controls (ENLC) in addition to its Luminaire Level Lighting Controls (LLLC) offering. ENLC can save an additional 27 percent above traditional photo sensor and astronomical time clock controls, while LLLC can save up to 70 percent above traditional on/off or time clock controls. On top of these performance-based savings, PSE offers customers a \$75.00 bonus for every ENLC and LLLC qualifying fixture installed at their facility.

Efficiency at Scale

In order to meet our climate goals, PSE is scaling our impact by designing



programs for Washington’s largest and most energy-intensive industries, from tech to agriculture. Our new Telecommunications Efficiency Program, for example, optimizes energy use at medium and large telecommunication facilities such as data centers. With the help of industry experts at Willdan, qualified facilities receive a clear-cut roadmap for HVAC and cooling improvements

“In order to meet our climate goals, PSE is scaling our impact by designing programs for Washington’s largest and most energy-intensive industries, from tech to agriculture.”

and incentives. Our new approach to Horticultural Lighting Grants takes fixture efficacy into account, and awards additional savings and incentives for more effective fixtures. Additionally, we continue to find new ways to deliver energy efficiency programs to customers of all sizes. PSE now offers Virtual Commissioning, a complimentary remote service that provides customized operational energy saving recommendations based on smart meter data for small- to medium-size businesses in partnership with Power TakeOff. A key component of this program is that it does not require site visits, equipment or paperwork.

Climate change is an existential threat that cannot be ignored, and utilities, contractors and customers have a unique roles to play in reducing emissions and facilitating the transition to clean energy. PSE will continue to partner with commercial customers to meet this challenge by equipping businesses with the tools they need to use energy more cost-effectively and adapt to this new energy landscape. §

To learn more about PSE’s commercial and industrial energy efficiency programs, visit **pse.com/mybusiness**.

2023 Events

The Cities You Love, with a New Twist

By Lauren Lake, | AEE's Director of Events

March 29-30, 2023

LONG BEACH
CALIFORNIA



June 7-8, 2023

BOSTON
MASSACHUSETTS



October 25-27, 2023

ORLANDO
FLORIDA



Have you ever searched “Definition of Association?” The first result from Oxford Languages:

“a group of people organized for a joint purpose.”

It’s a simple concept. We are a group of people with a common purpose: energy efficiency, sustainability, and other like-minded pursuits. As an association, AEE “organizes” us, and I get to help take that further by bringing us together. Isn’t networking the best way to advance a shared vision and help each other achieve personal goals?

I’m excited to announce we’ll be back, face-to-face in some of your favorite cities in 2023, with an exciting change for AEE East and West. You’ve asked for a Northeast event in early summer when the weather is mild with NO snow! We listened. I’m thrilled to announce a new pattern for the East and West events in Long Beach and then Boston. The 46th AEE World returns to Orlando, a perfect location and time for doing business, networking, and experiencing the fun of the easy-to-access destination city.

If you’re involved with AEE, we consider you family. The AEE staff and volunteers always love to meet you or get to know you better at these events. We hope you’ll join us to learn, connect, build lasting relationships, share ideas, and get to know more people who share a common purpose.

WHEN SWITCHING GEARS IS SCARY BUT WORTH IT

A CWEEL Member Story

by Hadas Webb, CWEEL Membership Committee Chair

Last December, I became a statistic. I was one of over 38 million people in the US to leave their jobs in 2021, a trend that became known as the Great Resignation. While many of those left their jobs due to family care responsibilities or health issues, I was fortunate to work at a company with a supportive and flexible work environment, which even afforded me personal growth opportunities and had competitive benefits. So why did I leave? Call it cliché, or perhaps a mid-life crisis, but I had an increasing drive to “do more”; to leave the world a better place for my children.

I’m now incredibly proud and still a bit shocked to share that I have joined Browning the Green Space as a Deputy Director. BGS is a regional nonprofit taking a system-based approach to diversifying the clean energy sector. I’m focused on small business support, startup acceleration, fundraising, and internal infrastructure. Most importantly, I am more closely aligning my professional interests with my personal values around sustainability and energy equity. I’ve admired the mission and leadership of BGS since its launch in 2020, and when an opportunity arose to join the organization as one of its first full-time hires, I was rewarded for the time I had invested over the past year on

personal branding and career exploration.

Not only is this a pivot from a for-profit company to the world of nonprofit, but my new role is also a career pivot. I started at Cimetrics as an HVAC/Energy Analyst and climbed the ranks to my final position as Managing Director of Analytics. While many of the management and leadership skills from Cimetrics are transferable, my involvement with CWEEL played a valuable role in finding my path. Through my participation on the CWEEL Fundraising and Membership Committees and my experience standing up the CWEEL New England group, I had the opportunity to play in a sandbox I wasn’t exposed to at work and gain insight into the mission-based organization structure.

When I announced to one of my colleagues that I was leaving Cimetrics, he lamented, “That’s too bad, you’re really good at your job.” It likely wasn’t his intention, but that comment, more than any other experience over the past year of soul-searching, validated my decision to move on. It was time for me to hand over the position to someone else and move into a more challenging role.

I’m only a month into my new job, but so far, it’s truly everything I hoped it would be. It’s gratifying



work; I learn something new every day and am exposed to a much larger circle of connections with diverse backgrounds and experiences (one of our committee members is an ethical AI expert and previously lived in Paris as a professional photographer!). Henry David Thoreau wrote, “Go confidently in the direction of your dreams!” I’m grateful for this opportunity to follow my calling in the clean energy transition. §



Instructor Q&A

Do You Remember Your Instructor?

Instructors can have a big impact on your success. Members tell us they always remember the instructor from their certification training program. They often connect and keep in touch long after the class. **Interviews by Laurie Beth Nix | AEE Marketing Communications Specialist**



Scott Dunning is the Director of the undergraduate Electrical and Computer Engineering program at Virginia Tech.

What is your history with AEE?

About 20 years ago, I began working with the Association of Energy Engineers because I recognized that as an organization, they are devoted to trying to help individuals gain expertise in energy efficiency. I've been involved in several of the programs offered by AEE over the years, including the Certified Energy Manager program and Certified Energy Auditor program. Besides helping develop content for those programs and working on assessing candidates for those programs, I've created specialty programs for specific clients such as the Government Operator of High Performance Buildings (GOHP) and the Building Energy and Sustainability Technician (BEST) program. Lastly, I am an instructor for the Energy Efficiency Practitioner program.

Who are EEP's?

People certified as Energy Efficiency Practitioners are individuals who

have gone through an introductory training offered by AEE. They understand where energy savings are found in commercial buildings, residential buildings, and even industrial buildings. They can identify additional savings and are exposed to the technology used to reduce energy consumption in buildings and operations, et cetera. The best part is that they don't need to be engineers. We know that a wide range of individuals are working in different capacities in the energy efficiency profession. While some certifications through AEE are more appropriate for an engineer, the Energy Efficiency Practitioner is for individuals that

"..they don't need to be engineers."

work in operations affected by energy efficiency.

Someone who receives this certification will be able to identify energy savings opportunities. They can then contact a specialist such as an engineer to calculate the specific savings if necessary. Thus, these individuals have value for companies because they understand the savings opportunity and can be involved with supervising energy savings projects.

Why should someone become an EEP?

When we developed this certification, we realized there

are many individuals that wish to better understand energy efficiency opportunities and wish to be recognized for their knowledge. The EEP credential tells an employer the individual understands energy efficiency principles and can be the eyes and the ears on the floor looking for savings.

So I think it gives a person a competitive advantage over their peers. Also, sometimes people get hired into a new position, and their role relates to energy efficiency. They haven't had training in this subject yet, so this is an excellent way to be exposed to the basics and get up to speed. And then, once they have this under their belt, it opens up the opportunities to pursue other certifications within AEE that may directly align with their career goals.

Is there anything else that people should know about the EEP program? Why might companies want their employees to take this certification?

We realized that you can have a plant manager or a CEO knowledgeable about energy efficiency that may say we want to reduce energy costs in energy efficiency. But the people who will implement the energy savings are the boots on the ground. They see things every day, and if we can raise their experience and knowledge, they can identify those problems you may not have seen. So I think we can help your

base-level people that will find those savings projects and expand their knowledge of what's going on in your operations.

They can go into a space and look and say, hey, why do we use these lights? As an employer, I'd like to have an employee such as an accountant that has the additional ability to look at my energy bills and can suggest a better rate structure. Or, they look

“...the people who will implement the energy savings are the boots on the ground.”

at the costs of an operation and say we seem to be spending a lot on energy here, and do a quick check on benchmarking software and see that we don't seem to be performing as

well as our peers. Energy efficiency crosses many disciplines and a lot of work titles. Having individuals with the EEP certification in your company can make a big difference in the company's bottom line.§



Mark R. Roche is the Chairman of the Board and instructor for the Certified Demand Side Manager (CDSM) program, Chairman of the Board and instructor for the Business Energy Professional (BEP) program, and an instructor of the Certified Energy Manager program.

How long have you been involved with energy management?

Since the late 80s, even when I was in the nuclear Navy, we did practical sessions with the reactor plant to determine the most energy-efficient system configurations. When I moved on from the Navy to working for two investor-owned utilities, my involvement with energy management skyrocketed.

Do you enjoy being in energy management?

Most definitely, it is an excellent field to work in, as I share in all of the courses I teach; it contains all

positive aspects of the profession. For example, you help a customer save energy, this saves them on their costs - so they like it, it also reduces the impacts to the environment, so that's a great thing, and it also helps the local community and nation in its cost competitiveness with products and services so again - it's an overall great field to work in.

Are you involved with energy management in your current work?

Yes, in my current role, I am the Manager, Regulatory Rates for Tampa Electric Company. I am responsible for leading all of the Demand Side Management activities for the company and covering the company's Storm Protection Cost Recovery Clause.

What is Demand Side Management?

I like to use the United States Department of Energy's definition, which defines Demand Side Management (DSM) as "The planning, implementation, and monitoring of utility activities designed to encourage consumers to modify patterns of electricity usage, including the timing and level of electricity demand. This

refers to also energy and load shape modifying activities undertaken in response to utility-administered programs."

So, is DSM really about saving Demand or the Power used?

That's part of it. Initially, when DSM Programs first came about, the main emphasis was on saving or shifting demand so the utility could either avoid or eliminate the need for a future power plant or, at a minimum, maybe delay it from being built. In today's world, DSM also includes many other facets of energy management, such as saving energy, reducing fossil fuel dependency, reducing environmental impacts, assisting low-income customers, leveraging renewable energy resources and/or other distributed energy sources.

Do Certified Demand Side Managers (CDSM) work in this field?

Yes, CDSMs are energy professionals who work in this field and have demonstrated how to plan, manage, administer, execute, or support DSM, load management (LM), or demand response (DR) programs. These energy professionals also know

how to propose DSM, LM, or DR strategies, technologies, or projects to utilities or local, state, and federal government clients and end-use customers. CDSMs are also involved in monitoring, evaluating, and deciding which energy procurement, energy utilization, and energy cost reduction projects get approved or modified. This includes using a range of energy principles to demonstrate the impact on utility and customer costs, resiliency, capacity, reliability, and project financials.

What are the job titles of CDSMs?

There are many energy professionals that are involved with DSM programs; these include:

- DSM Program Managers and Directors
- DSM Analysts and Inspectors
- DSM Energy Analysts and Supporting Personnel
- Utility Regulatory Department Personnel
- Utility Conservation Employees
- State Commission Regulators and Staff
- Federal Energy Regulators and Staff
- Energy Service Consultants and Sales Representatives

That's quite a list; are there any others?

Yes – I think it's a good idea for manufacturers of new technologies to understand how DSM programs are developed. Then, as they create new products, they will understand the steps required to make this happen if they want these products to be a part of a DSM portfolio.

Does the CDSM course cover this material?

Yes, the CDSM course is a practical training and career-enhancing opportunity for those responsible for developing, planning,

designing, implementing, managing, administering, and evaluating DSM, DR, and LM programs. The course is comprised of lecture portions, many practical sessions, and a comprehensive case study done as teams, which enables participants to gain a significant amount of knowledge during the course.

Is the CDSM course designed just for electric DSM programs?

No, the course is very applicable to gas utilities as well. The majority of the information in the course can be readily applied to any fuel, and we do discuss what and how cost-effectiveness would be performed for gas DSM programs.

What are the main topics of the course that participants will learn?

The course is made up of the following sections:

- History of DSM
- Planning and Evaluating DSM Program
- Designing DSM Programs
- Implementing DSM Programs
- Managing DSM Programs
- Verification and Analysis of DSM Programs
- Future DSM Programs



Why should someone become a CDSM?

I think it is important for energy professionals in this field to understand as more and more DSM and DR programs are being implemented by utilities, states, and government entities. Having a comprehensive and broad understanding of all of the critical facets of such programs is vital. Especially now, with many organizations setting net-zero carbon goals and introducing programs that leverage renewables (beneficial electrification) it becomes even

more important to understand the methodologies used to develop, direct, manage, and administer these programs. It is also important for CDSMs to understand how to effectively retire programs, which must be considered during the initial design.

Who should take the CDSM course?

I think the course is really valuable to those energy professionals that are currently facilitating DSM programs and who want to distinguish themselves through accreditation, those energy professionals that want to enhance their current knowledge, those that are interested in entering this great field to work in, and to those that want to learn and understand the steps needed to effectively develop and manage DSM, DR, and LM programs. §



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Steve Kromer, Energy Efficiency Consultant at SKEE, and one of AEE's lead CMVP instructors.

How is M&V part of energy management?

The world obviously runs on energy - that's just a trivial observation. What's less trivial is that the procurement of energy is closely aligned with the procurement and operation of all the assets that use energy. So, energy management encompasses energy generation, transmission and consumption. Over the years, people have developed methods of saying how much energy they're using, whether that's in buildings, transport, or manufacturing. Once you know that, you consider ways of investing to improve systems, or reduce energy use. M&V uses a scientific and repeatable method to help identify if those improvements worked. The globally accepted method is called the counterfactual method, longitudinal benchmarking, or comparing yourself to yourself over time.

How does M&V work?

Put simply, M&V starts with your current operations. Maybe they can be improved with new products, technology, or strategies. A CMVP would document the operation before you make changes, so that in the future, you can compare it to how it would have operated without improvement. M&V is a critical

function in assessing whether the investments you make in energy management are working. M&V protocols, such as the IPMVP give M&V professionals the tools and methods to assess how well the improvements worked.

What is the IMPVP®, and how was it developed?

The International Performance Measurement & Verification Protocol (IPMVP®), first established by the U.S. D.O.E., is one of a group of the internationally recognized protocols. M&V protocol documents aim to provide a consistent, reliable approach and tools for applying performance measurement and verification (M&V) worldwide.

How important is the understanding or application of the different M&V protocols?

The CMVP Certification program and associated training was originally created in 2002. At that time, the organizations and individuals involved emphasized the application of measurement and verification, such as what a baseline is, how long it should be measured, or how much to measure in the post period, through one specific document, the IPMVP.

The IPMVP is very general. Its generality allows it to be applied in many contexts. But being general, it doesn't really fit without additional instructions on how to use it. Users can find it difficult to comply with, unless additional information is known about how it's going to be applied to a specific scenario, such as in a utility or a government program. Over the past two decades other protocols have been developed, such as ASHRAE, or ISO standards.

Like the IPMVP, they aim to provide a common language and understanding of concepts. Customers or a project might dictate the application of the ASHRAE protocol, or application of the ISO standards, or you might be required to apply an earlier version of the IPMVP, or a more recent version of it. Each of these is going to have a slightly different language, or way of addressing the fact that you've got to make judgments in your M&V plan

How does AEE's CMVP Training program address the M&V protocols?

The previous training program content was very theoretical. It addressed the core fundamental concepts of M&V, but not actually how to apply a protocol. The new AEE training program is much more practical and now covers all major protocols. Attendees will be able to understand and articulate how they are different and how they are similar, with examples of how to apply them in very specific contexts.

How beneficial is AEE's CMVP to M&V?

AEE's re-developed effort supports the growth of an individuals and M&V in general. The CMVP is a dedicated certification program for M&V professionals. A lot of M&V, and the CMVP program is just common sense. It is a basic skill formed into a discipline, like playing a musical instrument. You can play something simple, make music or develop into a maestro. It would be a misconception to think the CMVP is US focused. There are individuals around the world that, 5 or 10 years ago, gained their CMVP certification, which enable them to take M&V as a general concept and apply it to their

specific situation. The seed grew it into something that works across their economy, no matter the local context, the political setting, how the regulators work, how government works, or what legal requirements there are. These programs, such as what they are doing in South Africa or Belgium are breaking new ground, they are the maestros of M&V.

AEE has 40-years' experience developing global certification programs. So, coming out of an AEE program, if you've learned concepts in India, you can apply it in Africa, you can apply it in Australia or any other country. These skills we are teaching in CMVP are interchangeable around the world, there's a real value to that. We hope everyone that goes through the program has a role to play in the future development of M&V and hand it off to the next generation.

Tell us about how CMVP's are applying M&V at different levels?

M&V has evolved over the past 20 years. There are a lot of CMVPs practicing M&V. The gamut goes from

someone that can apply protocols depending on the situation, someone who needs to apply M&V very specifically, or someone that just needs to be a manager or facilitator to an M&V team.

An example of an M&V practitioner might be someone who creates site specific M&V plans for a performance contractor. You will see a lot of that across the Middle East, India, and other places where they're doing performance contracts. That's one level of M&V that requires a specific skill set. Some companies have multiple employees focusing on energy savings. A CMVP might lead a team, bringing together energy managers, energy auditors, or individuals that specialize in data analysis, or building simulations to develop a detailed M&V plan.

A second example seen a lot in the US is the application of M&V for utilities. A CMVP will manage what's called "pay-for-performance" utility programs. The program rewards people who participate, if they can

prove they've saved energy against a baseline, which looks a lot like option C, of the IPMVP, but it may have very different requirements, restrictions for how it's applied, or it may come down to how a utility operates. For instance, the baseline might be dictated by local codes, there might be different savings available downstream based on the reporting period, or they may not require non-routine adjustments.

A third example might be an individual that needs to manage contractors performing M&V plans. They do not practice M&V directly, but need to understand the fundamentals and be able to talk M&V. An example of this is how facility managers work in the US is Army, Navy, or Air Force. They may hold a Certified Energy Manager (CEM) certification and know a lot about energy management. But their job is to manage an M&V contractor and may not be specialized in M&V. So, they need to understand what they're getting from their contractor and how they are communicating with their team.

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Why does the new training program include a focus on communication?

Communication is invaluable to anyone performing M&V, no matter where they are on the M&V ladder or what context they practice M&V. The M&V professional needs to get everyone to remove presuppositions and agree to baseline measurements. Then also understand that, as conditions change, so do M&V requirements. So, documentation and communication are critical up and down the chain for a project to be successful and work smoothly, whether you are talking to an energy manager, government regulator, a utility program administrator, performance contractor, procurement agent, field technician, or CFO.

How does the CMVP interact with CEM or CEA?

All three disciplines are interrelated. It is very beneficial for an energy manager or energy auditor to layer M&V training and certification on top of their base knowledge. They help to practitioners understand the nuisances involved in M&V, accounting for energy efficiency, management, and auditing.

What is the focus of the Job Task Analysis (JTA) in the certification and training program re-development?

AEE maintains, updates, and validates its certification exams by conducting a Job Task Analysis (JTA) every five years. AEE forms a committee of subject matter experts to work closely with a psychometrician, to conduct an evaluation of the certification program. The committee identifies the domains, tasks, knowledge, and skills essential to the performance of a certified professional, in this case a CMVP®. The JTA assures the CMVP is meeting the current state of the measurement and verification including the competencies, knowledge, and skills required to fulfill those responsibilities. Basically, making sure the content matches the market need.

How is this different from previous updates?

The existing M&V materials have been developed via committees and volunteers slowly and deliberately over the past 20 years. With the updated job task analysis, AEE brought together and paid nine experts from around the world,

all of whom now have a lot of practical experience in M&V. They gave us direct feedback through a standardized process I've never seen done before in this program. What came out of the JTA was very focused, up-to-date-materials. The program now focuses on and articulates how to take the very simple fundamental concepts and apply them globally, with practical examples and case studies, from countries such as India, Spain, and South Africa, covering government tax incentive programs, performance contracting, negotiating contracts, software development to name a few.

It's AEE 45th anniversary. In a nutshell, what has your journey with AEE been like?

Well, I started with a local chapter in the 80's. I found it very good for my career and it was fun. I've ended up knowing people all over the planet. Being an instructor and helping others grow is rewarding. I've been able to develop materials for the next CMVP and push the industry forward. So, for me, and please ignore the cliché, I've gone from local to global through one organization.§



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Bob Henderson is the Director of Training for RAB Lighting and the lead instructor for the Certified Lighting Efficiency Professional (CLEP™) training program.

Who are CLEP's?

CLEP's make up a wide variety of personnel that I call lighting practitioners, focusing on energy efficiency in lighting. We are all about saving energy by changing from traditional lighting, and even maybe the earlier LED versions to the latest LEDs and control technology. And then, we are expanding into other things like UV treatments, circadian lighting, and other topics of interest in the lighting industry.

Who should take the CLEP course?

Retrofit lighting contractors, lighting sales agents, and utility personnel focusing on energy efficiency programs are great candidates for the CLEP course. Anyone in sales of lighting could benefit by learning the latest technologies and how to utilize these technologies for controls and energy-efficient lighting in the most up-to-date manner possible.

Why should someone take the course and become a CLEP?

This is the most updated lighting efficiency course in the country, maybe even worldwide, with both a US and SI version. The course is also expanded for 2022, and provides tools for customer calculations. When working with customers, you want to

demonstrate your knowledge about the latest technologies and provide an excellent service for the value they pay. The bottom line — get the latest and greatest in a simplified form.

What is new with the CLEP course?

I want to share the different modules to give people an idea of the topics in the course. First, we will talk about the language of light and lighting. This gives a basic understanding of lighting terminology and move into color visibility and health. Did I mention that we have a new metric in light and color, and it is not just CCT and R9 anymore? So we will cover the TM-30 metrics and introduce what that means and the visibility. For instance, is there a difference between warm white and cool white, and how does that affect your visibility? We provide a tool to help with that.

Next, you have probably heard the buzzword of circadian lighting. What does that mean? How can this be applied to help your customers? We will then go over the lighting and quality, talk about how many foot candles or lux you have on a task and the quality associated with this and finish the module by looking at more traditional technologies. While we are moving away from traditional technology to LEDs, it is essential to know something about the operating characteristics of traditional technology in order to be able to provide a proposal and understand the LEDs. Next, we will move into how LEDs operate and how best to use them.

After covering the basics, we will learn different lighting calculations. For example, both point calculations

and the zone cavity lumen method. And then every lighting change out is associated with financial metrics. Finally, this section will end with how to perform an energy audit in lighting.

There is not as much maintenance as there used to be in the lighting world, but the environmental side of lighting is a big topic, especially with UV. We will visit older topics regarding disposal, lamps, and photometrics, answering questions like how to read a photometric report and last lighting controls. This is covered in three days, so it is jam-packed with information!

CLEP was recently globalized. So what does that mean for anyone who wants to become or already has a CLEP certification?

This means we have two versions, one for the US and one for SI (outside of the US), they do not talk about foot candles. They talk about lux. The US also uses feet, not meters. So those are two of the simple things, but there are other things that we talk about, like different products and the different ways of measuring and some other standards in Europe and other parts of the world that the US may not recognize.

Lighting continues to change at a very rapid pace, more so than other technologies. So that is why we have worked very hard over the last year to provide this up-to-date course to the US and International communities. Lighting is still considered one of the low-hanging fruits of energy efficiency but continues to have a place in payback and ROI, and it is evident in more than just LED lighting. So I encourage you to join us in the next CLEP offering. §

Bringing Humanity into Energy Branding

Dr. Friðrik Larsen, the founder of CHARGE Energy Branding.



Utilities need help in undertaking a customer transformation, moving them from distant bill payers to engaged business partners. Historically in our industry, customers have been fairly disengaged with their utilities—until recently. The issues relating to the customer relationship is now more on the agenda of utilities, but that discussion has not yet reached the boardrooms. I view branding as the best conduit to connect with customers. Similarly, it can be argued that brands don't have enough airtime in the boardrooms. While I do agree that brands are differently important for a commodity product, like energy, then they are for products that we select from the supermarket shelves every day, I argue that the concept of branding is just as important for a utility as it is for other more classical B2C industries. Covid-19 has surprisingly had a positive effect on this and some utilities have even done a remarkably good job of reaching out and actually talking to their clients. It will be curious to observe if this new dialogue will still exist after we've left the pandemic completely behind us. The danger here for utilities is that others, that do understand the value

of having a strong relationship with buyers, will enter the field and will capitalize on this.

But here we need to ask ourselves, what is it that engaged customers want from their utility providers? If I look at this from the perspective of the marketing, branding, and communication literature, the energy customer is not so different from customers of any other product. What customers want is that the companies they do business with understand their needs, they are responsive if something comes up, and that and that they have a human appearance. Interestingly enough, all those brands that have been nominated and won the CHARGE Awards, have one thing in common; they approach the clients like a human being and in return they are perceived as more humane. In a modern era where everything can be customised and tailored to our needs. If I were forced to name two things to be included in the recipe for success, then that's that being transparent, and the human factor I mentioned earlier. We should be using top of the line IT to service our clients better because we do not want to appear faceless.

The top lesson from the emergence

of retail markets, that I believe would help all utilities in engaging customers more meaningfully, is that we learn to walk before we run. That is, before starting fancy marketing campaigns to engage your clients, you first need to look inwards. Internal culture is what is stopping the utilities from being progressive consumer facing companies who are on their toes and service people with a smile. You'll find that certain behavior has been reinforced for decades within these companies. This is what the CHARGE Energy Branding conference is all about. We bring together executives at energy utilities, retailers, developers, power producers, e-mobility leaders and many more in dialogue about the challenges we face during the global energy transition.§



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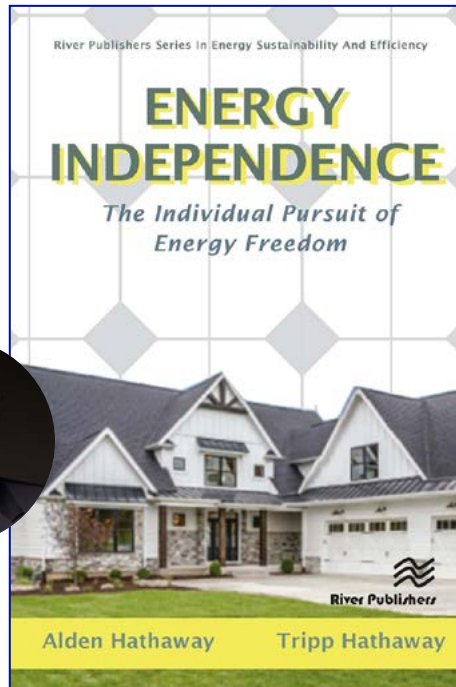
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In the midst of the war in the Ukraine, financed by fossil fuel sales to the west; environmental catastrophic warnings and heat waves from increasing greenhouse gases in the atmosphere; and worry over inflation, driven largely by quickly rising energy prices, comes a new book, **Energy**

Independence – the Individual Pursuit of Energy Freedom, written by energy veteran, Alden Hathaway, PE, C.E.M. and his solar energy expert and national guardsman son, Tripp Hathaway. The book provides a layman's review of the energy industry and the new energy technologies, from LED light bulbs to electric vehicles and solar photovoltaics that enable all Americans to achieve energy independence.

The 20th century is known to the entire world as a century of American greatness. Innovations in energy drove that American superiority; innovations such as oil pipelines, petroleum-based fuel, the light bulb, electricity, and the electric grid. However, the legacy energy economy leaves the world wanting in the 21st century. Centralized vulnerability, wasted generation capacity, dependence on foreign fuel often from countries hostile to the American way of life, and climate change, are financed by every American citizen at the pump, the natural gas meter, the fuel oil tank and in the monthly utility bill. Many look to the federal government for leadership and direction. But why do



so many expect the government to solve these problems?

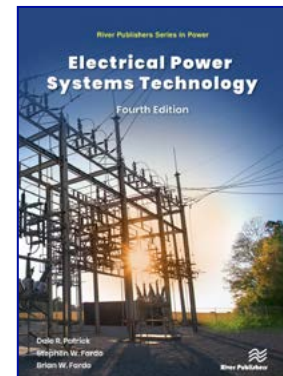
Every household for the fifty – sixty years they live and work will spend an average of \$1.00 every hour for the energy necessary to sustain their livelihoods. If invested, instead, in a mutual fund or 401k with returns averaging 10% per year, by the time retirement rolls around, this amount will yield over \$1.6 million. Why do so many consider the clean energy – renewable energy technologies as being a waste?

According to co-author Tripp Hathaway, it may be because homeowners wishing to save money the environment or be independent from their utility, rush out to invest in solar energy completely out of sync with other energy saving options and get sticker shocked with the cost and slow return. They get discouraged and check out. The Hathaway's point out that one must create the momentum for energy investments by starting with the low hanging and fast energy returning fruit first, and, working one's

way down the list of options, until, when one gets to solar energy, the funds are suddenly there to pay for it.

"Energy Independence" is not about what is wrong with our current energy economy; rather it describes a bright future that is waiting to be unlocked. It presents a plan, developed, based on data and experience from Hathaway's own two and half decade journey through two solar homes, one actually displayed on the National Capitol Mall in 2001 for Earthday 31. Following the plan, the average homeowner will not only achieve energy freedom for their household, but usher in the new energy economy. They will achieve up to an 80% reduction in that \$1 per hour spend, building up their own equity, such that they have the \$1.6 million in investment savings rather than the energy companies that they had been supporting before they took the journey. All one has to do is to take personal responsibility and follow the plan from beginning to end. §

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By Mel Claus, EEP | AEE's Membership Director



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The Council on Women in Energy & Environmental Leadership (CWEEL) supports career development for women across the energy industry. This includes mentoring, networking, and scholarships for aspiring women to pursue technical education and careers in the energy and environmental fields. CWEEL is just one way AEE supports a greater diversity of experience, talent, and ideas across our industry. AEE Member Cost \$50/year. Learn more about how you can support CWEEL and the benefits the division offers.



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Institute
EEMI**

publishes the newsletter Environmental News three times per year. The newsletter focuses on the integrated approach to pollution prevention. Subjects of interest to members include emission credits, trading, monitoring and control, greenhouse gases, recycling, global climate change strategies and improving indoor air quality of buildings. The division also sponsors AEE events with environmental content. AEE Member Cost \$30/year.



**Energy Services
Marketing
Society**

The ESMS
aim is to keep it's
members up-to-

date on industry news and information for energy services, power and natural gas marketing, performance contracting, and energy project financing. ESMS members receive the ESMS e-newsletter four times per year. AEE Member Cost \$30/year.



**Energy Managers
Society**

EMS brings
together both
energy engineers
and non-engineers

that have been recognized as experts or leaders in their field to improve the practice of energy management. As an EMS Member you will receive the Energy Managers Digest e-newsletter four times per year. AEE Member Cost \$50/year.





Certified Energy Manager® Training Program



About this Program

AEE's premium training program is recognized across industry for providing energy professionals a holistic "big-picture" view of energy management for non-residential buildings and facilities. Over five days, attendees learn everything they need to know to optimize systems to help reduce costs, improve profits, and increase occupant satisfaction.

What You Will Learn

- Learn energy management from a global perspective, but also understand applicable codes, standards, and policies for your region or country.
- Learn how systems and energy-saving technologies can be used throughout a building, such as HVAC, lighting, motors, boilers, energy storage, CHP, etc.
- Learn how energy management strategies and practices, such as energy audits, or M&V, can help identify energy savings and reduce costs.
- Understand the economic aspects of energy management that you need to know for procurement, supply, and project financing.

Instructor Value

This program offers a premium experience with two instructors. Both instructors have greater than 20 years of experience in the industry. They present the latest practices, strategies, and theories, while leading discussions in an open, interactive environment. You also spend valuable time connecting with and learning from other program attendees. In each topic covered, the instructors focus on the most "useful" and "proven" activities that an energy manager should pursue to improve profits.

At-a-Glance

- » This training program prepares attendees to take the Certified Energy Manager® (CEM®) exam.
- » This program is held over 5 days.
- » You earn 3.3 CEU | 33 PDH | 6.6 AEE Credits for completing this program.

Key Takeaways

- » Work through practical examples to demonstrate the topics and procedures covered.
- » Review the various areas of the Body of Knowledge associated with AEE's certification exam.
- » Discuss one-on-one with an instructor how to apply what you have learned to your business and applications to improve profitability.
- » Leave with a course workbook, updated in 2022, that will become an invaluable desk reference.

Registration

Candidates should contact their local AEE approved training provider for information about available training programs, the certification application process, exam registration, and associated fees. To find your local training provider visit

aeecenter.org/training

A photograph of two people, a man and a woman, standing on a metal platform of a wind turbine. The man, on the left, is wearing a blue hard hat, an orange safety vest over a plaid shirt, and blue jeans. The woman, on the right, is wearing a green hard hat, a yellow and black striped safety vest over a white shirt, and black pants. They are both looking towards the right, where the blades of the wind turbine are visible against a clear blue sky. The platform has a white metal railing. On the left side of the platform, there is a white electrical box with the number '4' on it.

Young Energy Professionals

Inspiration from an Industry Veteran

By Bob Starling, CEM, CDSM, President at B. Starling & Associates, Inc.

So, you have worked hard and made good grades in college, and you are ready to begin your professional career. Maybe you have been working in a job for a few years already. What now? Where do you go from this point in your life? You may find some books written on this topic, but today I'm going to share a few nuggets learned from over fifty years from the school of "hard knocks". The very fact that you are a member of the Association of Energy Engineers and are reading this article tells me that you already know what is important in life and where to focus your efforts.

The hard part is where to begin. Let's start with the basics. It is simple, really, not difficult at all. We begin with ethics. So how do we describe ethics? Ethics means that you do the right thing even/especially when nobody is looking. Don't cheat, don't lie, always tell the truth no matter how inconvenient it may be at the moment. I told every new employee that if they told me that it was snowing in Alabama in July, I'd get up from my desk and go look out of the window expecting to see snowflakes. If there were no snowflakes, then everything that they told me from that point on would be suspect. You can't buy ethics, and respect. You must earn

them and if you don't earn them every single day, you don't deserve them.

Set your goals early in life. Now is that time. Spend some time thinking about where you want to be in five years, ten years, twenty years, what you want to achieve during that time and develop your goals. But don't stop with just thinking about those goals. Write them down and keep that list current as you move through life. A study was done with graduate students at Harvard University regarding goals and life's accomplishments. The study found that those students who wrote down their goals were over 80% more likely to achieve their written goals than students who failed to simply write down their goals. Determine where you want to end up at the end of your career and work constantly towards that/those goals. As a young boy plowing rows in our home garden in rural North Carolina, I learned that for me to make the straightest rows I had to fix my gaze on a point at the end of the garden and plow towards that direction never taking my eye off of that point. When I looked around or failed to focus on the end point, I had chosen, the rows got crooked. Life works much the same way. You may have heard the saying, "Begin with the end in mind."

Bad news doesn't get better with time. It's not like cheese or fine wine. Deal with problems immediately. Yes, get the facts and consider the options, but act right away or the bad news will only get worse, and you will have a larger issue to deal with. Discuss the issue with your supervisor, and perhaps your peers. When you do

"Never back off from challenges. Instead volunteer for the difficult tasks."

meet with your supervisor, if you do, bring your supervisor some options. Don't just dump the problem on him/her.

Never back off from challenges. Instead volunteer for the difficult tasks. Those that nobody wants to tackle. Why? Because you can't possibly lose if you do that. Here's why. If you are unsuccessful in resolving the challenge nobody expected you to be successful anyway. No one else wanted to even try and at least you tried. You will gain the admiration and respect of your peers and your supervisors just for taking on the difficult tasks. On the other hand, if you are successful in resolving the challenge, you will be a hero! See you can't lose.

Do the most difficult part of the job first rather than last. Why would you do that? Once the most difficult part of the job is done, the rest of the job will seem easy. Every day, tackle the hardest thing that you need to do and get it out of the way early. You won't have to worry and fret about that action all day; it will be done, and you will be free to move forward with less challenging actions. You will find that life in general will become much more fun and much richer.

When you complete a job, no matter how simple or how difficult, stop and take a minute to look back on what you have accomplished. You may be sealing an important

business deal. Finishing the design of a complicated HVAC system. You may only be cutting the grass in your yard or trimming the bushes. Stop. Take time to look at what you have accomplished and take pride in that accomplishment. Nobody else may care, or even notice, but you can momentarily take pride in a job well done. There is personal satisfaction in doing that.

Never give in to the temptation to join the "crowd". Be yourself, think for yourself, accept responsibility for your decisions. If you follow the "crowd", you meld in with the herd and you lose your identity. Don't be afraid to take an unpopular position on a topic, that you sincerely believe in and have facts to support your position. People, even those who do not necessarily agree with you, will respect you for your individualism.

That said, develop a support structure. You will never accomplish your goals by yourself. You will need to surround yourself with individuals whose opinion you respect, yes even those who often hold a contrary opinion to yours, to be successful in life. If you surround yourself with individuals who are better at certain technologies, certain theories, certain personnel skills, you will be the better for it. You don't have to know everything—you never will know everything—you just have to know where to find the answers and know where to go to get the information that you need. The old adage, "Surround yourself with people who are smarter than you are and listen to them and you will be successful" rings true.

Treat everyone you meet in life with respect. You can learn something from every single person you meet in life if you will only take the time to listen, really listen, to them and understand them. People don't care how much you know until they know how much you care. We all bring a myriad of experiences and knowledge from life with us as we move along. If you fail to open your mind and learn from those you meet, you will be less of a person and less successful in life.

Seek out a mentor for yourself now, if you don't already have one, and listen to that mentor. Learn

"Seek out a mentor for yourself now, if you don't already have one, and listen to that mentor."

from that mentor. There is a reason that the apprentice programs are so successful. Become a sponge and learn from someone who has been there and done it. Ask the mentor questions and try the ideas that the mentor provides. Also, as you move along in your career, take time to mentor someone yourself along the way. Give back to others.

Don't give up, don't ever give up! In 1983 a young man from New York led a rag tag bunch of basketball players from North Carolina State University to a NCAA Championship by beating the number one ranked team in the nation. His name was coach Jimmy Valvano. His team was not all that great, in fact they were referred to as the "Cinderella" team, because

nobody expected them to win, but they kept on winning game after game until they found themselves in the NCAA Championship game. They were down by one point with three seconds to play in the final half and one of the players took a shot that was short. Another player grabbed the ball and slammed it through the basket just as time ran out and Coach Valvano's team won the championship. His motto was, "Never give up—don't ever give up!" Coach Valvano died a few years later of cancer. There will be times when you want to give up. When it will be much easier to give up than to keep fighting. Don't do it. Keep your eye focused on the goal and move forward. Every step you take makes you that much closer to your goal in life. §

AUTHOR BIOGRAPHY

Bob served for three years in the US Army at Ft Knox, KY developing prototype equipment and worked as a Civil Servant for 33 years in design and management jobs for several Army Garrisons in the United States and in Germany. Utilizing knowledge gained from AEE, he led a team in the development of the Corps of Engineer's Energy Program. Upon retirement from Civil Service from the Huntsville Corps of Engineers as a Division Chief, Bob became a Regional Director for Ameresco. He started his consulting company in 2005 providing consulting services to companies desiring to work with the Government assisting both large and small companies in securing \$94 Billion in ordering authority. He started a second business and won a 5-year contract with the Corps of Engineers in the Commercial Utilities Program. Along with two partners, he has developed and patented small scale automatic solar tracking equipment in yet a third company. Bob has a BS degree in Engineering from NC State University in Raleigh, NC and a MS degree in Engineering Management from the University of Alabama in Huntsville, AL.

He is a Certified Energy Manager and a Certified Demand-Side Management Professional. Bob is a founding member of the Huntsville, AL AEE Chapter serving as vice president and president of that Chapter. He has served as an AEE Regional Vice President and has been blessed to be awarded International Energy Manager of the year in 2018, in 2020 Bob was granted the grade of AEE Fellow. Today among his other duties, he participates in managing the AEE International Chapter Officers webinar. Email Bob at bobstarling@knology.net or connect with him on LinkedIn.



Connect with Bob



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Do you have a technical article, research paper, success story, or news that you think would be of interest to AEE Members?



Tell us about Your Chapter

Tell us your stories. Maybe your chapter or its members has been instrumental in an energy efficiency project or defining policy that impacts your local communities.



Share Your Stories and Photos

Do you have something unique to share? The easiest way is to post to your social accounts while adding a relevant tag, such as @AEE, #AEEworld, #AEEChapters, GetAEECertified. Or you can email them to marketing@aeecenter.org with a short story.



Advertise in Efficiency

As a non-profit organization, advertising helps offset production costs and enables us to do more for our members. Email inquiries to marketing@aeecenter.org.

Only products and services relevant to our members will be considered for placement. Space is limited.



Speak and Present at AEE Events in 2023

Do you have a success story, case study or technical presentation to share with other energy managers or energy efficiency professionals?

Call for Papers

Visit AEE event website for details.

aeecenter.org

Get Involved Locally

Chapters promote AEE's goals and programs on the local level while establishing themselves in their various communities as the "go-to" organization for all energy related matters.

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SUDOKU CHALLENGE

The origin of number and puzzle games goes back as far as 190 years B.C. The Chinese called them Magic Squares. It took until 1913 for a western publication, the *New York World*, to be the first to publish a crossword puzzle. Today, Sudoku frustrates and exercises the brain cells. There have been many variations of the game throughout the years, but it was not until 2006 that it became mainstream. Try these increasing difficult magic squares.

		9		1	8			
			9	3				
8	1			6		2		
		2			3	8		
						4	2	9
4					2			
	9		6				5	
7	3			5	4		1	
			3		9			

Medium

4				3		5		6
	1			5	4	7		2
			9			4		
			4	6		9		
1			3	9		6		
5								
			2					5
	9				6	2		

Hard

			5			8		1
3	4			9				
1						2		4
7	1		9	6		4		
				5			1	
4			6			3		
2					5			
				7				

Very Hard

Energy Zingers

Our apologies... the Internet's best worst Energy Jokes.

What do wind turbines think of renewable energy? They're big fans.

What's a solar panel's favorite type of exercise? Circuits.

Why didn't the LED light bulb get top student? The halogen was brighter.

What do wind turbines talk about? Nothing. They just shoot the breeze

We Need To Start Investing More In Solar Energy...But It's Not Just Going To Happen Overnight

What did the Battery say on his Blind Date? I have a lot of energy and I am a pretty positive guy. But I do have a negative side.

Wastewater jokes aren't my favorite, but they're a solid #2

Our accountant keeps setting fire to her utility bills. ...I said to her "you need to stop doing that Bernadette!"

I Don't joke about power outages because it's just dark humor.

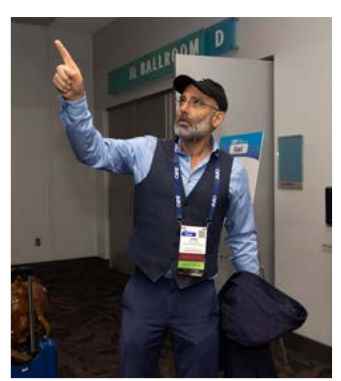
I don't have a Carbon Footprint... Because I drive everywhere.

ae ENERGY
CONFERENCE & EXPO

East



Find yourself
and colleagues
in the Event
Photo Albums



COVER STORY
PREDICTIVE CONTROL
HONG KONG INTERNATIONAL AIRPORT

One of CLP Power's key roles is helping their customers manage their energy consumption, which is why it is no surprise that CLP Power has been awarded AEE's Energy Project of the Year three years in a row. CLP Power, in conjunction with the Airport Authority Hong Kong and the Hong Kong Observatory, installed a predictive control system for air conditioning in the Hong Kong International Airport (HKIA). Using big data analysis of meteorological data, flight schedules, and electricity consumption data, the innovative system accurately predicts the cooling demand for the Terminal 1 at HKIA, achieving energy saving while maintaining the comfort of the terminal and enhancing passengers' airport experience. The predictive control system collects various operation data of HKIA, which includes the flight information and weather conditions, such as air temperature, solar radiation, cloud amount, humidity, and wind speed and direction.

This system allows a "just-in-time" chiller operation. That means there is no need to turn on the chillers early. The system can pre-adjust for starting the chillers and output to provide the most comfortable cooling volume and temperature. Similarly, the chillers will be switched off in advance to reduce energy wastage and improve the system efficiency. Together with the upgraded chiller system, it will save an estimated 5.1 million kilo-watt hours (kWh) of electricity a year.

CLP Power works with its customers to help Hong Kong achieve carbon neutrality by 2050. Hong Kong International Airport is the first airport in the world to adopt a predictive control system for its

air conditioning based on real-time passenger flow and weather information. More and more businesses put an emphasis on ESG, and CLP Power works to help companies achieve lower operating costs while increasing their energy efficiency.

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