

NECA ENERGY SOLUTIONS SUMMIT
Los Angeles, California
July 24-26, 2008

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The University of Kansas

INTRODUCTION

The National Electrical Contractors Association (NECA) sponsored the NECA Energy Solutions Summit (Summit) in Los Angeles, California on July 24-26, 2008. This Summit was jointly sponsored by NECA's national office and the NECA Los Angeles County Chapter and was held at the Electrical Training Institute of Southern California (ETI). ETI is a state-of-the-art training facility that is jointly supported by the NECA Los Angeles County Chapter and Local Union 11 of the International Brotherhood of Electrical Workers (IBEW). This paper will summarize the discussions and recommendations that resulted from this conference. It is intended that this paper serve as a basis for the development of policies and initiatives by NECA at the national, district, and local chapter levels that will help member electrical contracting firms successfully enter or expand their existing work in the emerging energy solutions market.

SUMMIT OBJECTIVES

The objectives of the NECA Energy Solutions Summit were threefold:

- Understand the potential role of electrical contracting firms in the emerging energy solutions market.
- Identify strategies for electrical contracting firms to successfully enter the emerging energy solutions market.
- Identify ways that NECA can assist member electrical contracting firms that want to enter this market to be successful.

SUMMIT AGENDA, PARTICIPANTS, AND SUMMIT RECORD

In order to achieve the Summit objectives, an agenda was developed with the goal of encouraging interaction and a free flow of ideas by all participants. The Summit agenda is provided in Appendix A. As can be seen from the agenda, there were a number of presentations throughout the Summit but most of the time was spent brainstorming in breakout sessions that involved all participants. The list of participants is provided in Appendix B. NECA member contractors from around the United States along with representative officers and staff from NECA national and chapters, ELECTRI International, National Joint Apprenticeship Committee (NJATC), and academia attended the summit. A record of all of the breakout sessions and select presentations is provided in Appendix C. The remainder of this paper will summarize the outcomes of the breakout and whole group discussions.

ENERGY SOLUTIONS PROVIDER

Three-Pronged Approach to Addressing Customer Needs

The electrical contracting firm needs to become an energy solutions provider for its customers. To do this, the electrical contracting firm needs to take a three-pronged approach to addressing its customers' needs that includes the following:

- Conservation
- Efficiency
- Production

The electrical contracting firm can provide services to its customers in one or more of these areas. Currently, NECA members are providing services in one or more of these areas depending on their in-house expertise, customer needs, and geographic market. Customers in different parts of the country are faced with very different energy challenges when dealing with traditional utility-supplied electric energy. These challenges include cost, reliability, availability, environmental, and other issues that affect people's quality of life and economic well-being in the electrical contracting firm's geographic market area.

Balancing energy production and use is a global problem that ultimately must be solved at the local level through increased energy conservation, improved energy efficiency, and responsible energy production that considers socioeconomic and environmental issues. NECA members with the support of their IBEW workers have the knowledge, skills, and abilities to help individual customers solve their energy problems and collectively help the United States address global energy supply and environmental issues. At the national level this will improve national security by reducing dependence on fossil fuels supplied by other nations and improve the quality of life in the United States by reducing the amount of our gross domestic product (GDP) spent on foreign energy supply. The reduction in the amount of GDP used to purchase foreign energy could be reinvested in developing and promoting clean energy technologies that will generate benefits like compound interest for years to come.

Conservation, efficiency, and production can each be a stand-alone market for the electrical contracting firm or the electrical contracting firm can choose to offer services in any two or all three of these areas. For the electrical contracting firm entering the energy solutions market, the decision as to which of these services to offer will depend on its customer base, geographical market, and in-house capabilities. The following paragraphs will briefly discuss each of these three initiatives and what they entail.

Energy Conservation

Energy conservation is about using less energy without impacting the occupant's everyday activities or productivity. An important part of energy conservation is advanced controls on both the utility and customer sides of the meter.

On the utility side of the meter, controls can include time-of-day (TOD) metering that encourages customers to reduce their energy use during peak demand times when the utility must use its most expensive and least efficient generating resources to meet this demand. By charging customers based on the TOD usage, customers have an incentive to shift their discretionary energy use to off-peak times of the day when the utility can supply the demand with less expensive base-load generating units. TOD metering benefits both the utility and its customers by reducing electricity production costs, reducing the need to build new generating resources and transmission and distribution systems, reducing atmospheric emissions and water use, and reducing customer demand and energy costs.

Conservation from the customer's side of the meter includes advanced lighting and HVAC controls that reduce the energy usage but do not impact occupant comfort or productivity. For example, advanced lighting controls can be used to harvest natural light more efficiently by adjusting artificial light levels in an occupied space based on the amount of daylight available at any particular time using dimming ballasts and daylight sensors. Lighting controls continually monitor and adjust artificial light levels in the space to maintain a constant light level in a space. In the past we have referred to these systems by various names including lighting control systems, building automation systems (BAS), building control systems (BCS), and others. These systems are actually energy management systems (EMS) and they should be referred to as EMS to help the customer understand that it is not just about automating building systems. EMS is about reducing building operating and maintenance costs as well as being environmentally responsible.

Energy Efficiency

Energy efficiency seeks to reduce energy use by using more efficient materials and equipment to generate, transfer, and use energy both on the utility and customer sides of the meter. Conservation can only take us so far. Electric energy is needed to provide a conditioned environment for people to live, work, and play. Therefore, there also needs to be a focus by the electrical contracting firm on making required energy use as efficient as possible.

Improved energy efficiency on the customer side of the meter can include installing or retrofitting energy efficient lighting, transformers, motors, and other electrical distribution and utilization equipment in buildings. Increased energy efficiency in buildings will reduce the customer's energy costs as well as the serving utility's load. Similarly, on the utility side of the meter improved energy efficiency can include the use of more efficient energy production processes and technologies, improved generation and interchange scheduling, smart grid, and emerging technologies such as the use of high-temperature superconducting materials in transformers, overhead lines, and underground cables when these technologies become commercially available.

Energy Production

The third prong of the three-prong approach to addressing customer energy needs is energy production. On the utility side of the meter, this means reducing the use of fossil fuels to generate electricity over time. In particular, this would involve reducing the use of natural gas for peaking units by substituting emerging generating technologies such as solar whose energy production typically peaks at the same time as utility demand. Additionally, this could mean employing emerging energy storage technologies that allow the utility to store base load generating energy in off-peak times to be used at peak times to reduce or eliminate the need for peaking units. Energy production from the utility side of the meter also means construction of new and the upgrading of existing nuclear generating units, construction of solar, wind, geothermal, wave, and other environmentally friendly generating facilities, and the construction of new and upgrading of existing overhead and underground transmission and distribution systems.

On the customer side of the meter, energy production includes the installation and use of alternative energy production and storage systems to reduce, time shift, or eliminate the need for traditional utility supplied energy. The move to localized energy production in the past couple of decades by utilities has represented a fundamental shift from the traditional central plant approach that has dominated the electric industry since its inception. This shift to localized generation has been due to utility deregulation, environmental constraints on the construction of new base load power plants and transmission lines, activist public service commissions and consumer groups, abundance of inexpensive natural gas, and other factors. While socioeconomic and environmental factors are currently curtailing the construction of small natural gas fired generating units by utilities, the advantages of small-scale distributed generation (DG) have been proven. The barriers to private grid-connected DG installations have been reduced or eliminated in most states along with the introduction of net metering, utility rebates, and government subsidies and incentives that are making green generating technologies like PV attractive to building owners.

Rising utility-supplied energy costs, improved conversion efficiencies, and reduced manufacturing costs coupled with utility and government support is making many alternative DG technologies and cogeneration more attractive for commercial, institutional, and industrial facilities. This is providing the electrical contracting firm with a new growth market if prepared to take advantage of it.

ELECTRICAL CONTRACTOR ENERGY SERVICES

The energy solutions market is providing electrical contracting firms with the opportunity to vertically integrate and get closer to the customer by providing a variety of services beyond the traditional procurements and installation services. In order to successfully compete in the energy solutions market, the electrical contracting firm will need to provide a total solution for the customer that includes the following services:

- Planning/Feasibility/Audit
- Design
- Financing
- Procurement
- Installation
- Commissioning
- After-installation Services

PROJECT DELIVERY ROLES

The electrical contracting firm can participate in energy projects in a variety of ways that include the following roles:

- Subcontractor
- Prime Contractor
- Design Builder
- Performance Contractor
- Design-Build-Operate
- System Integrator
- Other Roles

The electrical contracting firm needs to understand what the customer needs in terms of energy solutions and then tailor its services to meet those needs. That means it must assess its capabilities and either learn or acquire the needed knowledge, skills, and abilities that it does not have or partner with other electrical contracting firms, manufacturers, engineers and designers, mechanical contractors, general contractors, financiers, or others to get the necessary capabilities to serve the customer.

For example, some of the major issues with acquiring and performing PV work are the procurement of PV modules and the need to provide customers with financing. PV module procurement issues include getting a competitive price per watt, having a reliable supply that will provide modules when they are needed, having a quality product that meets the stated output requirements, and providing a reasonable lead time. With regard to financing, customers often want no up-front capital investment, no debt, and a guaranteed energy price through a purchase power agreement (PPA) similar to what they can get from system integrators.

CERTIFICATION TRAPS AND SNARES

There are a variety of certifications emerging that can serve as a barrier to electrical contracting firms getting into certain parts of the energy solutions market. Currently, these certifications include the following:

- *Certified Energy Manager (CEM)* certification sponsored by the Association of Energy Engineers (AEE).
- *Certified Solar PV Installer* sponsored by the North American Board of Certified Energy Practitioners (NABCEP).
- LEED™ Accredited Professional (LEED AP) and LEED™ green building rating systems that lead to certified buildings sponsored by the U.S. Green Building Council (USGBC).
- Manufacturer product certifications required to procure, install, and commission products and systems.
- Other certifications.

These certifications can keep the electrical contracting firm from participating in the emerging energy solutions market and allow other groups to dominate the market. The electrical contracting firm needs to be aware of how these certifications can impact the market and its ability to do the work.

NECA'S ROLE IN THE EMERGING ENERGY SOLUTIONS MARKET

NECA Services

NECA needs to play a key role in helping its members enter and grow with the emerging energy solutions market. NECA should provide services that are designed to help its members compete with manufacturers and integrators that currently dominate this emerging market. These services can be summarized generically as follows:

- Facilitator
- Advocate
- Educator/Trainer
- Information Source
- Spokesperson

The following paragraphs will describe specific services that NECA should provide its members that are either entering or already working in the energy solutions market.

Get Electrical Contracting Firms into the Market

NECA needs to develop strategies to get electrical contracting firms involved in the energy solutions market. This is a three-step process:

- Step 1 Get members to want to be involved.
- Step 2 Show members what to do.
- Step 3 Show members how to do.

The focus must be on all of its members and any programs that are developed must be scalable so that they can be adapted and used by any size member electrical contracting firm.

Develop Dynamic Case Studies

NECA needs to tell the story, through case studies, of how members and others have successfully entered the energy solutions market. Since this market is emerging, it is important that these case studies be dynamic and regularly updated to illustrate what works and does not work. In other words, what works today may not work a year from now as the electrical contracting firm grows and expands in this market. These case studies will serve as a model for members, showing them what can be done and how others have done it. These dynamic case studies should build interest in NECA member firms as well as confidence that they can profitably participate in this emerging market. The characteristics of these dynamic case studies are as follows:

- Illustrate what can be done and how to do it in practical terms.
- Drill down from the overall project to systems, subsystems, and components.
- Include not only technical aspects but also marketing, contracting, financing, project delivery, and other aspects of a successful energy project.
- Ongoing updates of the case study and outcomes over time.

Provide Information and Tools

NECA needs to provide its members with the information and tools that are needed to enter and grow in this market on an ongoing basis. Information and tools needed by electrical contracting firms that want to enter or expand their involvement in the emerging energy solutions market include the following:

- Work with the NJATC to provide the needed training in the apprenticeship program as well as journeyman continuing education.
- Provide the tools that the electrical contractor needs for marketing and sales. These tools include templates and programs that allow the electrical contracting firm to perform feasibility studies for customers as well as help the customer understand the technology and benefits.

- Assistance in procuring needed materials, equipment, and systems for energy projects. Specifically, start a buying cooperative that gives NECA members the ability to buy materials, components, and systems competitively through volume buying. This will help NECA members compete with integrators and other large volume national competitors.
- Provide information on installation and commissioning systems.

Provide Educational Opportunities

Provide educational opportunities for members in a variety of venues and using state-of-the-art delivery methods including:

- NECA National Energy Convention
- NECA Regional Energy Conferences
- NECA Convention Energy Track
- NECA MEI Chapter Education Programs
- EC Magazine Articles & Webinars
- Print & Electronic Training Materials
- EI Research Programs & Reports

In addition to educating NECA members, NECA also needs to educate chapter managers about the opportunities and challenges facing the industry in the new energy solutions market. NECA should develop case studies with best practices from successful chapters around the country to help them understand the market and how they can help their members be successful.

Market Member Capabilities

NECA should help members market their capabilities in the energy solutions market nationally. Most members cannot attend multiple national and regional conventions of industry organizations that current and potential customers attend. NECA should market member services nationally in the following ways:

- Set up a calendar and actively attend customer meetings and conventions. Set up booths and displays to promote NECA and NECA members whenever possible.
- Partner with large customers to understand their problems and involve NECA members locally in solving these nation-wide customer problems.
- Be the source for technical and product information.
- Sell the advantages of energy services to customers through meetings and publications, including reduced energy costs and improved public image.

- Develop a policy statement that will guide NECA and its members in the energy solutions market. This policy statement could be in the form of a *NECA Declaration of Energy Independence*.
- Work to recruit new people into the industry.

Spearhead Research

NECA through ELECTRI International should spearhead research in the following areas of the energy solutions market:

- New Technologies & Products
- Installation Means & Methods
- Marketing & Business Development
- Project Delivery & Financing Options
- Education Needs & Program Development
- Recruitment of Needed Talent
- Other Initiatives

RECOMMENDED IMMEDIATE NECA ACTION

The following are recommended immediate actions that NECA should take to encourage and assist members to enter or expand their participation in the emerging energy solutions market:

- Develop and publish an energy policy that will guide NECA's involvement in this market. The energy policy could be in the form of a mission statement or declaration.
- Lay out a game plan, based on NECA's energy policy, that provides for ample flexibility in this very dynamic market. The plan should not get bogged down in excessive strategic planning but rather be an action plan that starts the ball rolling and allows momentum to build quickly.
- Work with the IBEW to inform them of NECA's game plan and involve them in its implementation.
- Recruit a Director of Energy Solutions at the national level to spearhead NECA's initiatives in this market and facilitate market growth by coordinating market education, business development, government affairs, labor issues, research, involvement in customer and certifying organizations, and technological issues.
- Establish task forces at the national level to address specific issues such as market development and certifications in this market.

- NECA needs to work with IBEW to use national and local Labor Management Cooperation Committees (LMCCs) as the springboard for gaining competitive advantage in the energy solutions market. In the long term, LMCCs will play an important role in getting the tools and training needed to do energy work.
- Create a calendar of customer conventions and meetings at which NECA should be promoting its members' capabilities and services. Design and build a NECA booth for use at these conventions and meetings. Develop brochures and handouts specifically aimed at marketing NECA member services to existing and potential customers.
- Identify specific industry organizations such as AEE, NABCEP, and USGBC and get involved with them. The objective is to help them better serve their constituencies and the public by improving their certification criteria and processes.

APPENDIX A
NECA ENERGY SOLUTIONS SUMMIT AGENDA

NECA Energy Solutions Summit
Los Angeles, California - July 24–26, 2008

Rex A. Ferry, Chairman

Thomas Glavinich, Facilitator

Thursday, July 24

6:30–8:30 PM Opening Reception *Red Courtyard Patio at Doubletree Hotel*

The reception is being hosted by the Los Angeles County Chapter, NECA.

Agenda - Day One

Friday, July 25

7:00–7:45 AM Breakfast Buffet ETI of S. California

8:00–11:45 AM Morning Session ETI of S. California

1. Call to Order and Opening Remarks (10 minutes)
Rex A. Ferry, NECA President-elect & Summit Chair
2. Welcome to ETI of Southern California (10 minutes)
Jim Willson, Executive Director, Los Angeles County Chapter NECA
Marvin Kropke, Business Manager, IBEW Local 11
3. Order of the Day and General Information (10 minutes)
Rob Colgan, NECA Executive Director of Marketing
Dr. Tom Glavinich, Associate Professor, University of Kansas
4. Emerging Technology Markets—Panel Discussion (60 minutes)
Dr. David Riley, Executive Director, Center for Sustainability, Penn State
Bernie Kotlier, Director, Green Building Solutions, IBEW/NECA Greater LA
5. Break (15 minutes)
6. Emerging Technology Markets—Breakout (60 minutes)
7. Emerging Technology Markets—Recap (60 minutes)

12:00–1:30 PM Lunch with speakers

Guest Speakers—Customers’ Perspective of Need and Opportunity

Larry Eisenberg
Executive Director of Facilities Planning and Development
Los Angeles Community College District

Timothy Brick
Chairman, Board of Directors
Metropolitan Water District of Southern California

1:30–5:00 PM Afternoon Session *ETI of S. California*

1. NECA & Affiliated Resources—Panel (60 minutes)
Panel consists of NECA, ELECTRI and NJA TC staff members who will highlight resources in place that can support NECA contractors in emerging markets.
2. NECA & Affiliated Resources—Breakout (60 minutes)
3. Break (15 minutes)
4. NECA & Affiliated Resources—Recap (60–70 minutes)
5. First day closing announcements (5 minutes)

Agenda - Day Two

Saturday, July 26

7:30–10:30 AM Morning Session *ETI of S. California*

(A “working” continental breakfast will be provided.)

1. Call to Order by Chairman (Ferry)
2. Review of Conclusions from Friday (Glavinich)
3. Discussion and Development of Initial Action Steps (All)
4. Closing Comments from Chair (Ferry)
5. Adjournment


APPENDIX B

NECA ENERGY SOLUTIONS SUMMIT PARTICIPANT ROSTER

NAME	COMPANY NAME	CITY	STATE
<i>NECA Contractors</i>			
Rex Ferry (NECA President-elect)	Valley Electrical Consolidated Inc.	Girard	OH
Dick Nogleberg (NECA District 9 VP)	Placer Electric	Sacramento	CA
Jim Thiele	BW Systems	Colorado Springs	CO
Mike Thomas	Cochran Electric	Seattle	WA
Dave Washebek	Lemberg Electric Company	Brookfield	WI
Timothy Ehmann	O'Connell Electric	Victor	NY
Ron Lindberg	Rapid Electric	Escanaba	MI
Michael Curran	Red Top Electric Company Emeryville Inc.	Hayward	CA
Phil Rose	Roman Electric	Milwaukee	WI
Frank Schetter	Schetter Electric Company	Sacramento	CA
Otto Kirchheiner	Tri-City Electric Company Inc.	Miami	FL
Shawn Murphy	Wasatch Electric	Salt Lake City	UT
Troy Beall	B&D Electric	Albuquerque	NM
Matt Baker	B&D Electric	Albuquerque	NM
Bruce Baxter	Cupertino Electric	San Jose	CA
Michael Joyce	Doan/Pyramid, LLC	Bedford Heights	OH
Glenn De Soto	Morrow - Meadows Corporation	City of Industry	CA
Larry Hollis	Rosendin Electric	San Jose	CA
Jim Filanc	Southern Contracting Company	San Marcos	CA
Gene Acosta	CSI Electrical Contractors	Santa Fe Springs	CA
Tom Curran	Electrical Contractors Trust of Alameda County	Piedmont	CA
<i>NECA Chapter Executives & Staff</i>			
Bob La Lumiere	American Line Builders Chapter, NECA	Vandalia	OH
Andy Porter	Washington DC Chapter, NECA	Annandale	VA
Mark Nemshick	Chicago & Cook County, NECA	Westchester	IL
Sue King	Southern Colorado Chapter, NECA	Colorado Springs	CO
Fran McDermott	Greater Sacramento Chapter, NECA	Sacramento	CA
Don Campbell	Northern California Chapter, NECA	Dublin	CA
Jim Willson	Los Angeles County Chapter, NECA	Pasadena	CA
Russ Alessi	NECA	Bethesda	MD
Rob Colgan	NECA	Bethesda	MD
Mary Germershausen	NECA	Bethesda	MD
John Grau	NECA	Bethesda	MD
Beth Margulies	NECA	Bethesda	MD
Diane VanBuskirk	NECA	Bethesda	MD
Dan Walter	NECA	Bethesda	MD
Marty Riesberg	NJATC	Upper Marlboro	MD
Tom Martinez	IBEW/NECA Greater Los Angeles	Los Angeles	CA
Bernie Kotlier	IBEW/NECA Greater Los Angeles	Los Angeles	CA
<i>Academia</i>			
Tom Glavinich	The University of Kansas	Lawrence	KS
Dave Riley	Penn State University	State College	PA
Andrew McKay	Penn State University	State College	PA
<i>Guest Speakers</i>			
Marvin Kropke	IBEW Local 11	Los Angeles	CA
Larry Eisenberg	Los Angeles Community College District	Los Angeles	CA


APPENDIX C
NECA ENERGY SOLUTIONS SUMMIT
SUMMIT DISCUSSION SUMMARY

DATE	TIME	TOPIC	FACILITATOR(S)	ITEM CODE
25JUL08	8:30 – 9:00 a.m.	New EI Energy Strategic Initiative	Riley	Slides
25JUL08	9:00 – 9:45 a.m.	How Do We Capture The Green Energy Mkt?	Kotlier	Slides
25JUL08	10:00 – 11:00 a.m.	Emerging Tech Market Breakout #1	Riley & Glavinich	25A1-X
25JUL08	10:00 – 11:00 a.m.	Emerging Tech Market Breakout #2	Kotlier & Mackey	25A2-X
25JUL08	1:30 – 2:30 p.m.	NECA & Affiliated Resources	NECA & NJATC	Slides
25JUL08	2:30 – 3:30 p.m.	NECA & Affiliated Resources Breakout #1	Riley & Mackey	25P1-X
25JUL08	2:30 – 3:30 p.m.	NECA & Affiliated Resources Breakout #2	Kotlier & Glavinich	25P2-X
26JUL08	8:30 – 9:30 a.m.	Summary Of Yesterday's Discussions	Glavinich	Slides
26JUL08	9:30 – 10:30 a.m.	Summit Action Recommendations	Glavinich	26A-X



Energy Summit


July 25, 2008



Prof. David Riley

Background

- EI Research on green buildings and LEED
- EI / NECA sponsorship of Solar Decathlon
- Perfect storm -
 - energy cost
 - energy security
 - climate change
- New Strategic Initiative with
NECA + EI + Universities

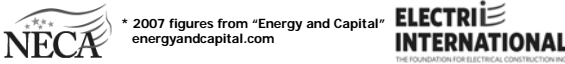


True cost of oil

Estimated Annual Costs*

- Economic cost \$10 trillion/year
- Cost of dependence \$233 billion
- Govt. subsidies \$586 billion +
- Environmental costs \$345 billion
- Climate change cost \$20-56 trillion

= up to \$65 trillion / year




* 2007 figures from "Energy and Capital" energyandcapital.com

Total U.S. PV Installations

Year	MW	Growth
2003	41.8	80%
2004	52.9	27%
2005	63.5	20%
2006	101	59%

2003 - 2006 Av. Growth Rate = 46%




Green energy economic opportunity (Continued)

- At current growth rates (40%), solar energy could provide 10x the energy the world needs by 2050
- 2007 - \$71 billion of venture capital in renewable energy tech. firms



"We can change the world (again) and get rich doing it."

Fred Krupp, President
Environmental Defense Fund




Examples of Clean, Green Energy Innovation



- PV Technology
- Wind turbine technology
- Energy Storage
- DC power distribution
- Conversion / Inversion
- Power conditioning
- Energy management
- Energy financing
- Strategic Alliances



MorningStar 2007 Penn State Solar Decathlon

Hybrid Energy Systems (HyRES) Laboratory

Solar PV

Small scale wind energy

Grid connectivity and smart metering


Geothermal energy

Car-Home Interface
Today: Plug-in Hybrid
Tomorrow: Fuel Cell Vehicles

EI Strategic Initiative

“ Renewable Energy and Green Building Power Systems”



- Three years
- Multiple university partners
- Cooperative partnership




Energy Efficiency and Green Building Power Systems



Efficient Systems	Green Technologies	Business Drivers
Lighting	Solar Photovoltaics	Energy costs
Transformers	Energy Storage	Energy security
Switchgear	Energy Management	Clean Energy
Distribution Systems		

= Need for a Proactive Strategy for the EC Industry

Three Strategic Thrusts for the Electrical Contracting Industry



- Thrust 1: Green Energy Systems Research
- Thrust 2: Workforce Development
- Thrust 3: Energy Engineering Education

Energy Market

Issues in play



- Nature of the work
- Market drivers
- Challenges
- Strategic advantages
- Roles to play

Energy Market

Nature of the work

- New technologies / manufacturers
- Increased control / service requirements

Energy Market

Market drivers

- Subsidies and Incentives
- Energy cost
- Climate change
- Corporate image



Energy Market

Challenges

- Geographic / Regional
- Changing policies
- Market share competition
- Workforce
- Economy



Energy Market

Roles to play

- NECA / IBEW / NJATC
- Manufacturers
- Universities and Colleges



Let's get to work!

David Riley
driley@enr.psu.edu



Sustainable Energy Systems Research

Create an *energy technology information source* for NECA contractors

- Providing independent performance and constructability assessment of technologies
- Advise on effective and profitable applications of green energy technologies



Energy Market

Strategic advantages

- Organization – strength in numbers!
- Training infrastructure
- Working knowledge of power systems and energy



Energy Workforce Development

Solar PV Training and Education Model

- Dual-audience online course based on NJATC book "*Photovoltaic Systems*"
- Hands-on PV system construction training curriculum in cooperation with LA IBEW / JATC



Sustainable Energy Systems Engineering Education

Increase interest of college students in green energy careers

- NECA student chapter competition and service program
- Recruiting program in coordination with EI Talent Initiative



Coordinated Research: Contract strategies for solar power systems

- Contracting and business strategies for building integrated solar power systems
- Coordinated research with National Roofing Contracting Association (\$50K match)
- Help secure market share of solar construction for NECA contractors



Deliverables

1. Energy technology info. source for NECA Contractors
2. Online PV Systems course
3. Hands-on PV training curriculum
4. NECA Student Chapter competition
5. NECA Student Chapter service program
6. Green energy talent development campaign



Green energy economic opportunity

- Option 1:** Climate change is a hoax, and we do nothing = economy doubles in 30 years
- Option 2:** We fix climate change through carbon cap and trade = economy doubles in 32 years
- Option 3:** Climate change is real, and we do nothing = we have no economy in 30 years



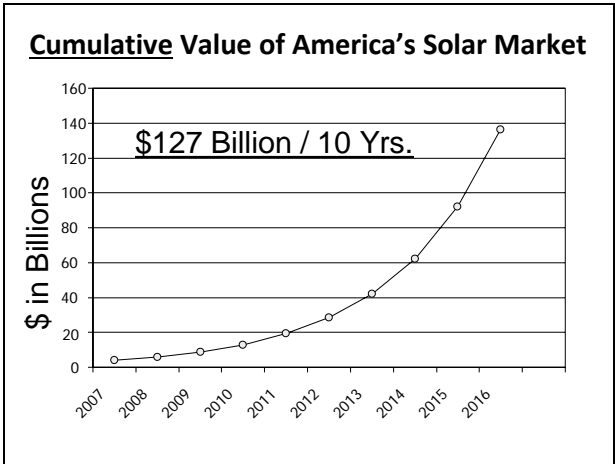
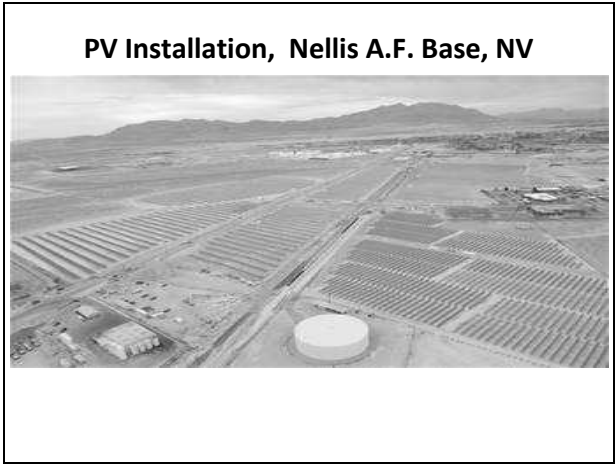
How Do We Capture The Green Energy Market?

NECA ENERGY SOLUTIONS SUMMIT

Electrical Training Institute
Commerce, CA
July 24-26, 2008

Emerging Green Energy Market

- Solar PV
- Wind
- Bio Generation
- Energy Efficiency
- Green Building
- Energy Storage
- Electric Transportation



Wind Power T. Boone Pickens Plans

- Building a 4,000 MW, **\$10 billion** wind farm in northern Texas , generating power in 2011.
- Growth in U.S. wind power has been dramatic
- U.S. in July may have surpassed Germany as the world's largest generator of wind power
- DOE: Wind could gen. 20% of U.S. electricity by 2030, only slightly less than natural gas

Renewable Energy & Energy Efficiency Economic Drivers for the 21st Century

Roger Bezdek, Principal Investigator,
Management Information Services, Inc.
for the American Solar Energy Society

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RE & EE are Driving Significant Economic Growth in the U. S.

- In 2006, these industries generated **8.5 million new jobs**
- Nearly **\$970 billion** in revenue, more than **\$100 billion** in industry profits, and ...
- More than **\$150 billion** in increased federal, state, and local government tax revenues.

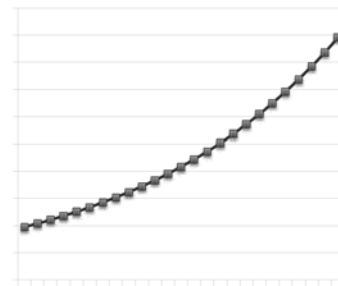
RE&EE Provided Important Stimulus to Slumping U.S. Manufacturing Industry

- Displaced imported oil, and helped reduce the U.S. trade deficit
- Put into perspective, RE&EE sales outpaced the combined sales of the 3 largest U.S. corporations.
- Total sales for Wal-Mart, Exxon-Mobil, and General Motors **in 2006** were \$905 billion (vs. \$970 for RE & EE).

Summary of the U.S. Renewable Energy and Energy Efficiency Industries in 2006

Industry	Revenues (billions)	Direct Jobs	Total Jobs Created (direct plus indirect)
Renewable Energy	\$39.2	196,000	452,000
Energy Efficiency	\$932.6	3,498,000	8,046,000
TOTAL	\$971.8	3,694,000	8,498,000

RE & EE Revenue Growth 2006 => 2030



U.S. Renewable Energy and Energy Efficiency Industries in 2030

Revenues (Billions of 2006 Dollars)		Total Jobs Created (Direct Plus Indirect)		
	Moderate Case	Advanced Case	Moderate Case	Advanced Case
RE	\$227	\$597	3,138,000	7,918,000
EE	\$2,152	\$3,933	17,825,000	32,180,000
Total	\$2,379	\$4,530	20,963,000	40,103,000

RE About 10% of Total, EE About 90%

Energy Efficiency / Lighting

- No Comprehensive Market Forecast, but ...
- Just Replacing the 400 W Metal Halide and High Pressure Sodium Fixtures (with Induction, LED, Etc.) is Estimated at **\$10 Billion**

Electric Transportation. PV to EV Ready. Solar Parking Structure 924 kW System U.S. Navy, Coronado, CA



Should We Be Worried About The American Economy?

- Bad News : Huge Waste
- Good News: U.S. Can Save 30 – 50%
- A NEW GREEN INDUSTRIAL REVOLUTION IS UNDERWAY
- New Transportation System
- New Built Environment
- New Re-Built Environment
- Electricity is the Dominant Thread

How Do We Capture Our Share ?

- California Provides Some Initial Approaches
- Why California?
- PV Rebate Program & Size
- AB 32 Global Warming Solutions ACT
- CA PUC Energy Policy – EE is FRIST Priority
- Title 24 History – At least 40% Ahead on Per Capita Energy Consumption vs. 50 State Average

California Provides Some Initial Approaches

- There is a Difference between emerging markets in CA, and in other regions
- LMCC Business Development Team and Plan. Jim Willson & Marvin Kropke
- Walk the Talk – ETI PV System, USGBC Platinum



Southern California Training Center PV System

- 456 kW
- 900,000 kW Hours / Year
- Supplies 80% of ETI's Power
- 1,540,000 Pounds of CO₂ Avoided Every Year

Commitment to Sustainability

- IBEW - NECA is a Platinum Sponsor, U.S. Green Building Council. Leadership in Energy & Environmental Design (L.E.E.D.)



First Steps

- Training & Education
- PV Installation Training
- Contractor PV Business Development
- Bus. Dev. Team Develops the business
- Lead by Tom Martinez

California Advanced Lighting Controls Training Program

- Modeled on our PV Training
- Result of Relationship with CA Lighting Tech. Center at UC Davis
- Technology is a Sophisticated System
- Saves 35 -60 % of Load
- Stakeholders: NECA, IBEW, Utilities, Community Colleges, Manufacturers
- Goal: Tying New Rebates to Certification

Strategic Alliances

- LA Bus. Journal, LACCD, LAUSD, City of LA, CLTC, CSU, U. of CA, CA CC, Private Companies – Engineering Firms, Developers, USGBC, Etc.
- Community Service and Support, Such as Cities, Educational Institutions, Habitat for Humanity, Etc.

And ...

- Marketing at Trade Shows, Conferences, Etc.
- Advertising: LA Business Journal and Others
- Partnered with New Technology Leaders Like Chaz Haba's iCel Systems
- Buying Collaborative to Make NECA Competitive in Availability and Price; Lead by Tom Martinez
- Governmental Relations – Rebates, Incentives, Workforce Development

Some Results: LA Community College District

- Total of \$3.8 Billion bond for 100 new bldgs
- Bond campaign supported by LA LMCC and LA Building Trades
- Energy upgrades on existing bldgs
- More than \$1B for LACCD Green Energy projects by 2012
- Including \$300+ Million for 43 MW of PV

City of Los Angeles

- PV Solar Plans (only)
- Goal of 100MW/year for 4 yrs = 400 MW
- 400 MW = \$3.2 Billion
- Plus EE work

Southern California Edison

- PV Solar Plans (only)
- Primarily in Inland Empire, Some in LA
- 250 MW = \$2 Billion
- Beginning this year (2008)

Los Angeles Unified School District

- PV Solar Plans (only)
- Phase 1 = 15 MW within 2 years
- 245 locations, av. Of 200 KW per school
- 15 MW = \$120,000,000
- Plus EE work

Metropolitan Water District

- Estimate up to \$9B in energy related work over next 5 to 10 years
- Work throughout Southern CA
- Electrical alone estimated to be 20%
- Total electrical in range of \$2 Billion

Kudos for Us? A Few, But ... We Have Much More to Do

- Public Relations Bonanza Not Yet Realized
- Green Leadership is Very Positive Image and Role
- Media Loves Green
- Just Scratching the Surface on Green Opportunities
- Just Beginning to Train on EE – And Only One Aspect of Lighting
- Numerous Modules Ahead ...

...

- EE on Comprehensive Automated Building Controls, Motor Controls, Power Conditioning, Heat Recovery Generation, Etc., Etc., Yet to Come!
- Yet to Begin Formal Training on Energy Storage
- Plan for Energy Auditing
- Barely Beginning to Reach Out to Engineers, Architects and Designers

So Many Directions We Can Go – Biggest Bang for the Buck?

- Focus on PV?
- Wind?
- EE?
- Combine PV & EE (Provides Major Advantage vs. PV Specialty Alone)
- Green Building?
- Energy Storage?
- All?

We in CA Took a Crack at This a Few Months Ago

- NECA contractors from around CA met in Burbank
- Shorter Version of this Brain Storming Session
- Results from that Meeting as a Discussion Catalyst for This Summit

Burbank Brain Storming Thoughts

- We are in the facilities
- We have the relationships and the customers trust and respect
- Contractors Can Benefit From Positioning their Companies as Green Energy Expert Contractors (GEEC's?), who can:
 1. Perform Energy Audits
 2. Recommend Comprehensive Energy Solutions
 3. One Stop Shopping (Should we be the corner produce stand or the Super Market?)
 4. Control the Projects
 5. Sub out Non-Electrical Work

CERTIFICATION was identified as a Key Factor in this Approach

- Example: CALCTP
- Important for Legitimacy
- What Should We Do About Certification (Follow the NABCEP Model?)
- Who Certifies?
- C.E.M.?
- Not yet widely known
- Who Should / Can Control Certification?

Upcoming Discussion

- How Do Capture This Market?
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How Do We / How Should We?

- Stay at the Leading Edge of New Technology?
- Design and Implement Installer Training and Contractor Business Development?
- Promote Our Services – Especially our NEW, GREEN Services?
- Brand Them?
- Market Them?
- Build Strong Alliances (Like USGBC- Board Seats to Determine Point Values for Green Electrical Work)?
- So ...

What are the Strategies and Tactics That Will Best Position NECA Members for a Sustainable Future?

Subject: Emerging Technology Market Breakout Session #1
Facilitators: Dave Riley & Tom Glavinich
Day/Date: Friday/June 25th
Time: 10:00–11:00 a.m.
Location: ETI Room 307

- 25A1-1 Energy storage:
- (a) Downside to some battery technologies.
 - (b) Lithium ion batteries built up using 5 watt cells and bundled to control heat buildup.
 - (c) I-Cell is promising technology.
- 25A1-2 Energy audit market is greater than the installation market. Retrofit is a big market.
- 25A1-3 Forty percent of the energy used in the United States is used in buildings. Saving 30 percent of building energy in the U.S. is equivalent to taking fifty percent of the cars off the road.
- 25A1-4 NECA/IBEW needs a multidisciplinary approach to the energy market. How do we research this market?
- 25A1-5 Energy efficiency. California Energy Commission provides millions to utilities to reduce load. Incentives drive the market.
- 25A1-6 LEED. Need to partner with an HVAC contractor. Many HVAC contractors have a LEED accredited professional (LEED-AP) on staff.
- 25A1-7 Drivers – what do we need to get started:
- (a) Feed in tariff.
 - (b) Legislation.
- 25A1-8 Sell turnkey on energy projects. Partner with architects, engineers, HVAC contractors, general contractors, and others.
- 25A1-9 Identify our brand. The energy market is a very fragmented market. The closer to manufacturers that we can get the better off we will be. NECA/IBEW needs to give input to manufacturers regarding constructability. Need to help manufacturers build equipment and materials that are easy to install. For example, the design of the PV module racks used can make a big difference in productivity and cost to the owner. Electrical contractors need to be aware of installation difficulty when bidding on a PV installation. Not all support systems are equally easy to install.
- 25A1-10 Customers want a consistent workforce around the country. Portability is important in the energy market. Need to travel with the customer. Also, need to codify training in this area so everyone is doing it the same across the country. When customers move to a different area the quality of the installation may not be the same.
- 25A1-11 Solar integrators only do a conceptual one-line diagram. NECA/IBEW need to move up the food chain.

- 25A1-12 NECA/IBEW need to have a nationwide purchase agreement with select PV module and inverter manufactures to be competitive with large owners and integrators.
- 25A1-13 Financing by integrator. Integrator is the dealmaker between the customer and the investors for the installation.
- 25A1-14 Installation labor is only a small percentage of the PV system installation cost. Most of the cost of the installation is in materials – particularly the PV modules and inverters. Labor costs are not as critical in PV installations as they are in other work. Need to have a competitive price on PV modules and inverters in order to compete.
- 25A1-15 The energy market parallels the V/D/V market. We need to understand this market in order to capture it. We need to start now.
- 25A1-16 Technology transfer. Anyone who uses energy will be looking for new technologies to save money. NECA/IBEW need to be the industry leaders in technology transfer. This would put NECA/IBEW at the forefront of the green revolution.
- 25A1-17 Google key words. NECA/IBEW need to be “googleable.” Right now if you google energy, etc. you don’t get NECA/IBEW.
- 25A1-18 Manufacturers will want to work with NECA/IBEW because they know that their technology will be installed properly.
- 25A1-19 NECA needs a strategic plan to put NECA/IBEW in the lead when it comes to new technology.
- 25A1-20 NECA/IBEW need to have a concerted effort to become the technology transfer vortex for the energy market. Lead the global market with NECA/IBEW being the technology transfer agent.
- 25A1-21 We need to look at what other industry organizations are doing in the area of technology transfer in order to find our niche.
- 25A1-22 What can we do today? How do we get our members involved? Energy market – we need to tell the story and get the word out.
- 25A1-23 Need to talk about what members need to know to be successful. Create an on-line community. Manufacturers and public learn from each other. Members need to get from “I’m interested” to “I’m capable.” Need to develop case studies to get NECA members interested. Network connected with technologies and NECA success.
- 25A1-24 Four keys to success:
- (a) Education – understand the market and technologies.
 - (b) Technical – need to understand how to install.
 - (c) Certification – avoid another BICSI.
 - (d) Vendor relations – they need to be coming to us.
- 25A1-25 NABCEP is primarily for residential PV installations but NABCEP certification requirement is finding its way into commercial specifications. NABCEP is the only national certification that there is. NECA/IBEW should partner with NABCEP.

- 25A1-26 NECA/IBEW need a national branding strategy. Use California as a model for the remainder of the country. We need to create an “image around substance.” We need a Super Bowl commercial that highlights U.S. as the leader in energy, benefits for the U.S., and use T. Boone Picken’s model.
- 25A1-27 We need a “Declaration of Energy Independence.” We declare and we invite others to join. We need to change one person at a time. Invite the candidates to address the NECA Convention this fall and invite them to sign the declaration.
- 25A1-28 “Green” is a bubble. Everyone is talking about it.
- 25A1-29 NECA needs a buying coop for PV modules and inverters. Future contract for deliver of materials. Integrators like Sun Power want NECA/IBEW to do the work.
- 25A1-30 Universities – how do we partner with them? We need a network of universities that can address local and regional energy issues.
- 25A1-31 Efficiency should be our first thrust. PV and other generation technologies should follow.
- 25A1-32 Partner with universities, engineers, construction managers and others to build power systems.

Subject: Emerging Technology Market Breakout Session #2
Facilitators: Bernie Kotlier & Andrew McKay
Day/Date: Friday/June 25th
Time: 10:00–11:00 a.m.
Location: ETI Room 308

- 25A2-1 How to capture green market?
- (a) Energy audits.
 - (b) Do energy audits without HVAC?
 - (c) Paid/fee energy audits are hard to sell.
 - (d) Bundle audits with project proposals.
- 25A2-2 Need to do HVAC? Not necessarily.
- (a) Example: Orion Lighting uses performance-based contracts.
 - (b) Financing is the key.
 - (c) Lutron is financing – hitting the school market.
 - (d) Be the general contractor on energy evaluation.
- 25A2-3 Certification?
- (a) Do it ourselves.
 - (b) Subcontract it out.
- 25A2-4 Partnerships can be helpful.
- 25A2-5 Train service to spot energy evaluation opportunities.
- 25A2-6 Be a total energy solution.
- 25A2-7 Need to give project a total financial analysis.
- 25A2-8 Take an incremental approach.
- 25A2-10 Stay up with the technology and the market.
- 25A2-11 Take advantage of the need to be green.
- 25A2-12 Need a financial tool.
- 25A2-13 Need financial resources.
- 25A2-14 Sixty percent of NECA members have ten employees or less. (Verify.)
- 25A2-15 What is the definition of a total energy solutions provider?
- 25A2-16 Enter this market through the public sector.
- 25A2-17 Buy materials for PV work through a NECA sponsored buying coop.

25A2-18 Conclusions – We need:

- (a) New technical knowledge and expertise.
- (b) Training.
- (c) Labor
- (d) Management
- (e) LEED™ Certification
- (f) Auditing capabilities.
- (g) Financial analysis:
 - (1) Tools
 - (2) Management Education Institute (MEI) covers some of this.
 - (3) A national manual of green labor units.
- (h) Financing.
- (i) Marketing:
 - (1) LEED™ Certification
 - (2) Need to change thinking: Windshield versus rearview mirror.
 - (3) NECA and IBEW working together – strengthen LMCC in some areas.
- (j) Sales – selling green package.
- (k) Build relationships – especially in the public sector initially.

NECA & Affiliated Resources/NECA & NJATC Staff/25JUL08/1:30-2:30 p.m.

NECA & Affiliated Services

Discussion slides for staff presentations on July 25, 2008

NECA Operations

Dan Walter
NECA Vice President and
Chief Operating Officer
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Magazine

- Highlight Projects by Members
- Position Contractors as Technology Leaders



Government Affairs

- Advocate for Tax incentives
- Represent members On coalitions
- Testify before Congress



Convention

- Educate members on latest products
- Services in Green Alley
- Present strategies like LEED



Standards

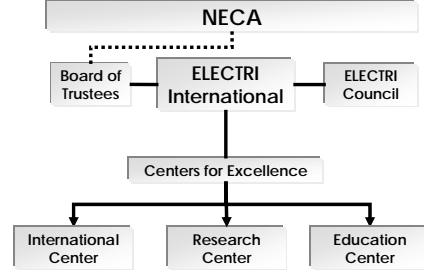
- Create new standards
- Promote Contractors as Technology Leaders



ELECTRI INTERNATIONAL
THE FOUNDATION FOR ELECTRICAL CONSTRUCTION INC.

Russ Alessi
President, ELECTRI International
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ELECTRI International STRUCTURE



ELECTRI INTERNATIONAL
THE FOUNDATION FOR ELECTRICAL CONSTRUCTION INC.

THOSE WITH VISION LEAD THE WAY
ELECTRI COUNCIL

- Provides leadership and resources
- Identifies emerging trends and key issues
- Implements valuable programs that benefit the electrical construction industry

ELECTRI International

RESEARCH CENTER

SUSTAINABLE CONSTRUCTION: GREEN BUILDING SYSTEMS

- **The Impact of Fuel Cells on ECs**
Iowa State University
 - **The Progress of Wind Generation Systems in the USA**
University of Washington
 - **Strategies for ECs on LEED and Green Building Projects**
Penn State University
 - **Energy Security and the EC**
University of Kansas
- Now in progress:*
- **Emerging Photovoltaic Market**
University of Kansas
 - **Role of ECs on LEED Projects with Focus on Commissioning and Innovation and Design Credits**
Michigan State University
 - **Strategic Initiative and Energy Efficiency...**
Penn State University

Management Education Institute

Diane VanBuskirk

Director, Marketing Outreach &
Chapter Relations

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NECA's Management Education Institute (MEI)

- Offers NECA contractors a business/professional development curriculum as dynamic as our industry
- Courses often drawn directly from the results of ELECTRI International research
- MEI courses evolve and are added to curriculum regularly, to keep up with the emerging needs of NECA contractors

Current "Green Focused" MEI Courses

- NECA 2008 Chicago Pre-Convention Workshop: *LEED for New Construction Technical Review Workshop*
- MEI online course: *Emerging Green Markets: Strategies for Electrical Contractors on LEED and Green Building Projects*
- Special presentation offered by Dr. Michael Horman, Penn State University: *Emerging Green Markets*
Possible addition to MEI curriculum

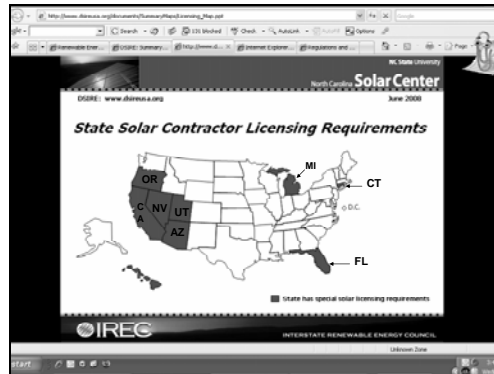
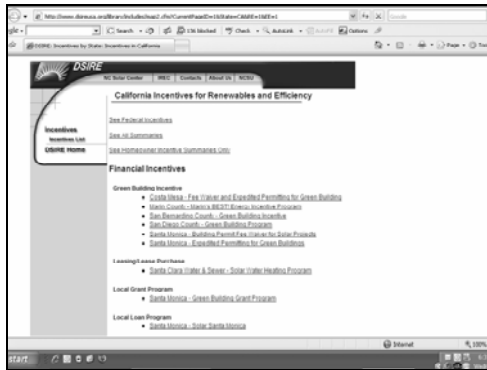
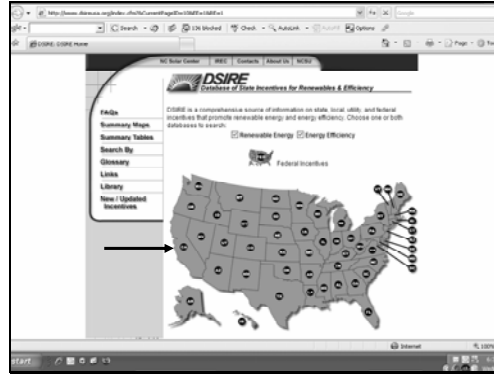
NECA-MEI

A Tool to Help Contractors Thrive In New Markets

- MEI courses can offer NECA contractors the "competitive edge" for new markets
- Ongoing and future EI research focused on green markets are leading to new courses
- MEI Course Catalog expands along with electrical contractors' scope of work
- NECA member and chapter feedback is key for future development

Renewable Energy Incentives

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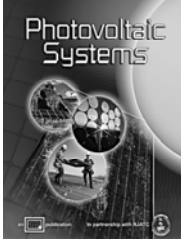
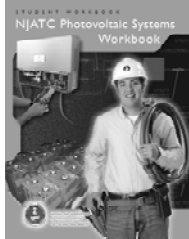




NJATC Curriculum Development

Marty Riesberg
 NJATC Director of Curriculum Development
 mriesberg@njatc.org

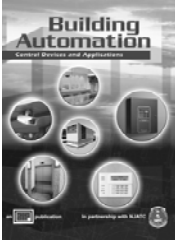
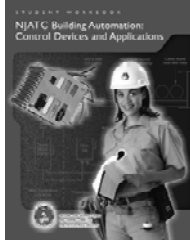
Photovoltaics

Solar Photovoltaic Systems for Contractors

- 2 Day Class
- “Suitcased”
- Offered by the **National Joint Apprenticeship and Training Committee**
- In partnership with manufacturers

Building Automation


Energy Implications

- Building Automation with LEED
- Efficiency
- Systems familiar to NECA Contractors

NECA Online Resources

Beth Margulies
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New Model for Information Delivery

- Moving from a draw-in to a push-out model
 -  RSS, opt-in/opt-out
- Robust interface supports customization
- Interactive experience for users

NECA PR Activities

- Press releases
- Media relations
- Member communications

Marketing & Business Development

Rob Colgan

Executive Director, Marketing
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Marketing Tools

- NECA Connection
 - Customer- & consumer-focused information
 - Find a qualified contractor
- Electrical Design Library
 - Overview of emerging technologies
 - Promotes NECA contractors' expertise
 - Webinar
- ElectricTV.net

An Energy Solutions Marketing Plan

- Key Audiences
 - Customers & Public (External)
 - NECA members (Internal)
 - Electrical contractors (External/Internal)

Key messages

- Energy solutions is electrical work. (All audiences)
- NECA contractors are “green” experts. (External audiences)
- NECA provides resources & support for members. (Internal)
- NECA is source for the latest, reliable information on energy solutions. (All)

Channels for Delivery

- News media (via PR)
- Industry publications
- NECA publications
- NECA websites & electronic communications
- ElectricTV.net
- Trade allies
- Tradeshow

Subject: NECA & Affiliated Resources Breakout Session #1
Facilitators: Dave Riley & Andrew MacKay
Day/Date: Friday/June 25th
Time: 2:30–3:30 p.m.
Location: ETI Room 307

- 25P1-1 Roles of NECA, IBEW, NEATC, and EI:
- (a) Public Relations
 - (b) Marketing
 - (c) Government Relations
 - (d) EC Magazine
 - (e) Annual Convention & Trade Show
 - (f) Education & Training
 - (g) Meetings & Projects
- 25P1-2 Los Angeles is an example of change.
- 25P1-3 Press releases and conferences – Public relations supports:
- (a) Invite news media and legislators.
 - (b) Leverage event: multiple distribution, RSS web feed formats, websites, videos, local papers. Look for biggest payoff.
- 25P1-4 Green issues are covered by many reporters. Need NECA contractor contacts as an example. Have NECA member company contacts. Provide success stories and examples.
- 25P1-5 Internal media relations.
- 25P1-6 Education and marketing training.
- 25P1-7 Need a standard NECA national message and identified spokesperson(s). Identify talking points and assign public relations people.
- 25P1-8 How can NECA contractors get to customers directly?
- (a) Renewable energy/energy efficiency NECA trade booth.
 - (b) Branding – NECA knows energy efficiency.
- 25P1-9 NECA should:
- (a) Categorize NECA contractor member list on NECA website.
 - (b) Develop a skills inventory.
 - (c) Have NECA members list what they don't do. For example – residential. Non-calls are bad for our image.
- 25P1-10 NECA needs to develop a generic “green” advertisement that can be used nationwide.
- 25P1-11 NECA needs “green” brand.
- 25P1-12 NECA needs to teach NECA members how to promote themselves in the green market.

- 25P1-13 Hire more “green” people. We need more Bernies.
- 25P1-14 Identify market barriers so that they can be overcome. Also, NECA needs to develop markets to keep others out of this market like roofers.
- 25P1-15 Electrical work should be performed by qualified electricians only. Need to get code officials to understand this.
- 25P1-16 Fire departments should be a natural ally for PV licensing requirement.
- 25P1-17 NECA Government Affairs is looking at state level regulations.
- 25P1-18 NECA chapters need to develop a “local lobbyist.”
- 25P1-19 NECA needs to look at governmental budget policies.
- 25P1-20 NECA needs to seek cooperation from IBEW.
- 25P1-21 NECA “green” trade booth:
 - (a) Presentation.
 - (b) Target and pick conventions and trade shows.
 - (c) Focus on owner’s facility management and CFOs.
 - (d) Establish criteria for convention and trade show attendance and measure success somehow.
- 25P1-22 California and Los Angeles should be national models for market development.
- 25P1-23 LMCC market development.
- 25P1-24 Compliance and certification tactics.
- 25P1-25 Are we prepared to be “green”?
- 25P1-26 What can we do without a PLA?
- 25P1-27 Social responsibility.
- 25P1-28 NECA needs to get involved to shape future:
 - (a) NABCEP – Show their limitations. Is it a benefit?
 - (b) Get on USGBC point panel.
 - (c) Get involved – shape the future.
- 25P1-29 What is feasible now? Can we have a NABCEP certified person on each crew?

Subject: NECA & Affiliated Resources Breakout Session #2
Facilitators: Bernie Kotlier & Tom Glavinich
Day/Date: Friday/June 25th
Time: 2:30 – 3:30 p.m.
Location: ETI Room 308

- 25P2-1 How can national NECA facilitate:
- (a) Education
 - (1) Management
 - (2) Labor
 - (b) Certifications
 - (c) Research & Development
- 25P2-2 Training – two parts:
- (a) Apprentice training – part of curriculum.
 - (b) Journeyman continuing education.
- 25P2-3 Reliable training material as “green”
- 25P2-4 Make training interesting to young people. Attract young individuals to “energy” and “green.” Rename power engineering “green energy engineering.”
- 25P2-5 Marketing – We have to get our message out to the world. High school students don’t understand the connection between electrical contracting and green.
- 25P2-6 Guidance counselors and career advisors need to be educated about green and energy opportunities in NECA and IBEW.
- 25P2-7 We need new NECA contractors to pursue this work. We need to encourage journeyman electricians who are interested to become NECA contractors and pursue energy and green work. We need to help them become smart business people, good marketers, and good competitors.
- 25P2-8 How do we get to CEOs of potential and existing customers? CEOs want to go green. How do we market our green and energy services? Need “green business marketing.”
- 25P2-9 JATCs need to provide green training:
- (a) PV
 - (b) Building Automation
- 25P2-10 What should we be training? What are the topics?
- (a) PV
 - (b) Building Automation (Rename “Building Efficiency”?)
 - (c) Need to identify other topics.
- 25P2-11 NECA needs to introduce PV opportunities at the NECA Convention this fall. We need to reach out to NECA contractors and let them know what the opportunities are.


- 25P2-12 NECA contractors need help with:
- (a) Green business development.
 - (b) Customer financing.
- 25P2-13 Need to get a large percentage of NECA contractors excited about the possibilities and the market. Need to reach out to the average NECA contractor. Need to get programs in place for small NECA contractors. Small NECA contractors are the key to capturing the energy and green market. Typically different customer base than large NECA contractors.
- 25P2-14 NECA contractors need to get into energy audits and energy efficiency retrofits for customers.
- 25P2-15 NECA should consider sponsoring mini conferences for members on various topics.
- 25P2-16 California should be the model for the other parts of the U.S.
- 25P2-17 NECA needs to get members up to speed on the green and energy markets as soon as possible.
- 25P2-18 Case studies that tell a story are important. Case studies should be developed to demonstrate the various dimensions of the energy market and how NECA members are currently getting involved with customers and doing the work. Case studies show that it can be done and give concrete examples. Follow up case studies on getting and doing the work with case studies on various technologies, how they can be applied, and how they can be marketed.
- 25P2-19 NECA needs to centralize and facilitate NECA member entering this market.
- 25P2-20 NECA needs to put an educational track together on green and energy at this fall's convention.
- 25P2-21 Rapid response – we need to get Larry to write what he is doing. ELECTRI International should fund Larry to write what he is doing throughout Los Angeles Community College system. Need to keep following up with Larry over the coming years to find out how things are going. Make a living case study.
- 25P2-22 Partner with United States Green Building Council (USGBC) over points for PV and other electrical technologies. NECA/IBEW should be on USGBC to help them out on the electrical side.
- 25P2-23 ELECTRI International currently has a study underway with Michigan State University on how LEEDTM applies to electrical construction and impacts the electrical contractor.
- 25P2-24 NECA national needs to work with chapters around the country. Chapters know local needs and requirements. Energy and green markets are not homogeneous. Energy and green markets are different geographically across the U.S.
- 25P2-25 Training and education for green and energy markets. We need a timeline.
- 25P2-26 Need to put case studies in EC Magazine.

- 25P2-27 North American Board of Certified Energy Practitioners (NABCEP):
- (a) Need to review NABCEP certification.
 - (b) Difficult for electrical contractors to do two PV installs per year in order to qualify for certification.
 - (c) Starting to see NABCEP certification a requirement in specifications for commercial PV installations.
 - (d) Why should anyone but an electrical contractor be allowed to have a NABCEP certification? Should be a requirement that anyone doing PV installations is a licensed electrician.
 - (e) Identify who within NECA is NABCEP certified and partner with those contractors to get PV work.
- 25P2-28 NECA contractors need to market themselves in the green and energy markets. PV installer – if all graduating apprentices were “certified PV installers” we would have around 8,000 certified installers per year.
- 25P2-29 Other aspects of various certifications. Don’t forget manufacturer and product certifications that are required for various manufactured systems. NECA needs to get involved with manufacturers and product certifications.
- 25P2-30 NECA needs to understand where we failed in the voice/data/video (V/D/V) market and learn from our mistakes. We need to avoid the failures and false starts that we had in the V/D/V market. We need to focus on “lessons learned.”
- 25P2-31 Reemergence of fluorescent lighting. Orion is pushing fluorescent lighting. Don’t have to be a rocket scientist to sell lighting retrofits.
- 25P2-32 Lighting controls and LED and induction lighting are the next big things.
- 25P2-33 NECA members need installation and business development training.
- 25P2-34 Advanced lighting controls is going to be a huge market. Can’t just put in. Need qualified people to install, commission, and maintain. In California, customer needs to use a certified lighting control technician for installation in order to qualify for rebates. California Community College system will certify and local JATCs are all tied to a community college.
- 25P2-35 Energy audit certification. Certified Energy Manager (CEM). NECA needs to get a better program going.
- 25P2-36 Energy audit – joint trade initiative. Create our own program.
- 25P2-37 Investigate partnering with existing certification organizations.
- 25P2-38 CEM? What is this certification all about? We need to learn more.

- 25P2-39 Research:
- (a) R&D information needs to be given to electrical contractor in a usable format.
 - (b) Specific tools are needed for green and energy markets.
 - (c) New product information needs to be provided to electrical contractor. This information should include not only information about the technical aspects of the product but also installation information.
- 25P2-40 Why aren't NECA contractors doing this work? Find out why and develop a strategy to address those reasons and get members excited about doing this work.
- 25P2-41 Demand Response Education:
- (a) What is it?
 - (b) What does it mean to me?
 - (c) Where are the opportunities?
 - (d) How can I be part of the solution?

**NECA Energy Solutions Summit
Los Angeles, California**

**Summary Of
Yesterday's Discussion**



Thomas E. Glavinich, D.E., P.E.
The University of Kansas
July 26, 2008

Friday's Agenda

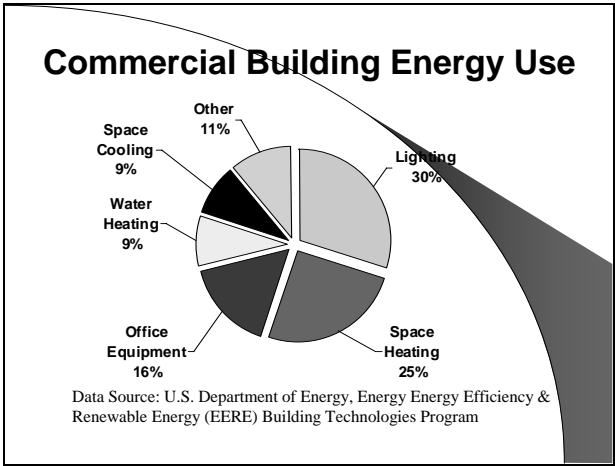
- Rex Ferry Opening Remarks
- LA NECA/IBEW Overview:
 - Jim Willson
 - Marvin Kropke
- Emerging Technology Markets:
 - Dave Riley
 - Bernie Kotlier
- Emerging Technology Markets Breakout
- Larry Eisenberg/LA Community Col Dist
- NECA & NJATC Staff/Available Resources
- Marketing & Resource Needs Breakout
- Tour Of ETI PV Array Installation

**Electrical Contractor
=
Energy Solutions
Provider**

Electricity = Energy

**Three-Pronged Approach
To Addressing Customer
Energy Needs**

- Conservation (e.g. controls)
- Efficiency (e.g. light source)
- Generation (e.g. PV)



**DG Is Only Part Of The
Solution & Opportunity**

- Light Sources
- Lighting Controls
- Distribution System:
 - Layout
 - Components
 - Operation
- Building Automation
- Energy Storage
- Electric Vehicles
- Other Solutions & Opportunities

EC Energy Services

- Planning/Feasibility/Audit
- Design
- Financing
- Procurement
- Installation
- Commissioning
- After-Installation Services

Provide Total Solution For Customer

Project Delivery Methods

- Subcontractor
- Prime Contractor
- Design Build
- Performance Contracting
- Design Build Operate
- Other Methods

*Understand & Meet Customer Needs
One Size Does Not Fit All*

Major Issues PV Work

- Procurement Of PV Modules:
 - Competitive Price Per Watt
 - Reliable Supply
 - Quality Product
 - Reasonable Lead Time
- Customers Want Financing:
 - No up Front Capital Investment
 - No Debt
 - Off Balance Sheet
 - Guaranteed Energy Price Through PPA

Certification Traps & Snares

- CEM
- NABSEP
- USGBC
- Manufacturer Product
- Others

*Need To Be Aware Of How These
Certifications Can Impact Market &
EC's Ability To Do The Work*

LEED 2009

- Commercial Interiors
- Core & Shell
- Existing Buildings: O&M
- New Construction
- Schools

Projected Adoption Early 2009

LEED-NC Categories

Category Designation	Category Name	Possible Points	Percent Total
SS	Sustainable Site	14	20
WE	Water Efficiency	5	7
EA	Energy & Atmosphere	17	25
MR	Materials & Resources	13	19
EQ	Indoor Environmental Quality	15	22
ID	Innovation & Design Process	5	7
Total Possible Points		69	100

Plan For Addressing Certifications

- Be aware of existing and emerging industry certifications.
- Understand certification and certification requirements.
- Understand certification organization and operations.
- Develop a plan for addressing the certification.
- Implement the plan.
- Measure results.

Getting ECs Involved In Energy Market

- First Step – Get Them To Want To Be Involved
- Second Step – Show Them What To Do
- Third Step – Show Them How To Do

Focus Must Be On The Typical NECA Member

Dynamic Case Studies

- Case studies that illustrate what can be done.
- Drill down from overall project to systems, subsystems, and components.
- Include not only technical aspects but marketing, contracting, financing, project delivery, and other aspects of successful energy project.
- Keep updating case study and outcomes over time.

Need To Tell Story – Provide A Model For EC

Provide EC With Needed Information & Tools

- Trained Workforce:
 - Apprenticeship
 - JW Continuing Education
- Marketing & Sales:
 - Feasibility Study Capability
 - Understanding The Technology & Benefits
- Procuring Materials
- Installation
- Commissioning

Educate ECs

- National NECA Energy Convention
- NECA Regional Energy Conferences
- NECA Convention Energy Track
- NECA MEI Chapter Programs
- EC Magazine Articles
- Print & Electronic Training Materials
- EI Research Reports & Programs

Educate Chapter Managers & Business Managers About Opportunities & Challenges

Develop Case Studies With Best Practices From LA And Other Chapters To Help Chapters Understand The Market And How They Can Help Their Members

Market EC Capabilities

- Attend Customer Meetings & Conventions
- Partner With Customers – Solve Their Problems
- Be **The** Source For Technical And Product Information
- Sell Advantages Of Energy Services:
 - Reduced Energy Costs
 - Improved Public Image
 - Others
- Develop *Energy Declaration Of Independence*
- Recruit Young People Into Industry
- Others

Spearhead Research

- New Technologies & Products
- Installation Means & Methods
- Marketing & Business Development
- Project Delivery & Financing Options
- Education Needs & Program Development
- Recruitment Of Needed Talent
- Other Initiatives

NECA National Role

- Facilitator
- Advocate
- Educator/Trainer
- Information Source
- Spokesperson

What Next?

- Short Term Objectives?
- Long-Term Objectives?
- Action Plan?
- Schedule?

Subject: Summit Action Recommendations

Facilitator: Tom Glavinich

Day/Date: Saturday/June 26th

Time: 9:30–10:30 a.m.

Location: ETI

- 26A-1 NECA should establish task forces to address the various issues that have been discussed during the summit. Each task force should be assigned a particular task and time frame to report back.
- 26A-2 NECA should create a task force to investigate PV certification and recommend possible courses of action.
- 26A-3 Immediately NECA should have a booth built that highlights NECA/IBEW energy capabilities and can be used at the upcoming conventions such as the USGBC Convention.
- 26A-4 NECA should design an ad that highlights NECA/IBEW energy capabilities and begin running it in trade publications and newsletters that get in front of our customers.
- 26A-5 NECA should have a presence at the Construction Users Roundtable (CURT) in Palm Springs in November.
- 26A-6 NECA should create a calendar of conventions and meetings that NECA should have a presence at. This would allow planning and would avoid missing any important ones.
- 26A-7 NECA and IBEW need to coordinate project labor agreements (PLA). There have been some recent problems when IBEW has not notified the local NECA chapter that it is working on a PLA with the owner and it has caused problems bidding the project.
- 26A-8 NECA needs to get involved with the Design Build Institute of America (DBIA).
- 26A-9 NECA needs to develop brochures and other handouts that can be given to prospective customers.
- 26A-10 NECA needs to develop and publish an energy policy, mission, or declaration.
- 26A-11 NECA and NECA chapters need to have experts in the energy field to market NECA's capabilities to customers. Bernie Kotler has done an excellent job for the Los Angeles Chapter. Need to clone Bernie.
- 26A-12 NECA needs to be at the center of technology transfer. NECA needs to attract the latest technologies, evaluate these technologies, and publish findings.
- 26A-13 NECA task force need to look at how we can attract the best talent to our industry in this area.
- 26A-14 NECA needs to develop a strategy for getting all NECA members involved.
- 26A-15 NECA needs to identify emissaries that can show potential customers and customer organizations what we can do. We need to change NECA/IBEW's "union image."
- 26A-16 NECA Board of Governors needs to draft and promote a Declaration Of Energy Independence.

- 26A-17 NECA needs to develop an “elevator speech” that can effectively summarize NECA/IBEW capabilities in the green and energy markets in just a couple of minutes.
- 26A-18 NECA needs a market development task force. There are large contractors all over the country that want to partner with us on energy projects. NECA needs a system for identifying these potential customers and build relationships with them. NECA contractors could work all over the country with these customers.
- 26A-19 NECA/IBEW need to tap into the approximately \$50 billion market in the Southwest U.S. Integrators and nonunion contractors will get a large share of this market if NECA/IBEW does not actively pursue it.
- 26A-20 The green energy market can be broken down into three segments:
- (a) Utility/Process
 - (b) Commercial/Industrial
 - (c) Residential & Light Commercial
- Need a strategy to address each of these market segments because they are very different.
- 26A-21 NECA/IBEW must develop the expertise to do energy work. The market needs to recognize NECA/IBEW as the expert.
- 26A-22 In the long term, LMCC is the key to getting the tools and training to do the work.
- 26A-23 Labor relations need to be an important consideration in NECA’s plan. Need better crew ratios to be competitive. Need a statewide PV agreement with full portability.
- 26A-24 NECA needs a task force to address the trade jurisdiction issue. Look at licensing. PV is electrical work.
- 26A-25 NECA needs to get competitive and go do the work.
- 26A-26 Need financial modeling tools so that NECA contractor can sell to customer. Integrators have these tools. Need to be able to show cash flow, payback, etc. California has a software tool for small systems but it does not work for large systems.
- 26A-27 NECA needs to develop proprietary software tools for energy analyses. Having a tool like this would give NECA contractors a huge advantage.
- 26A-28 NECA needs to develop an election strategy that takes into account energy issues and market over the coming months. Need to start now.
- 26A-29 Need to get NECA’s energy policy out at spring council meetings, district meetings, chapter meetings, and other meetings.
- 26A-30 LMCC is the “tool box” for capturing the energy market.
- 26A-31 Look at NECA member capabilities and NECA national, regional, and local should complement members. Provide what is missing, be the glue that binds members together and helps them compete, among other things.

- 26A-32 Four California utilities require training in advanced lighting controls and certification of both the contractor and installer for the owner to get its rebate from the installation.
- 26A-33 Check out “Green Advantage” of the Delaware Valley Chapter of the USGBC. Field oriented training. Lew Tagliaferro knows about this.
- 26A-34 Whatever solution NECA comes up with it must be scalable so that it will work for all NECA members.
- 26A-35 LMCC is the key incubator of ideas and initiatives to capture the energy market.
- 26A-36 NECA needs a Declaration of Energy Independence.
- 26A-37 NECA chapters need to hire an energy spokesman.
- 26A-38 NECA needs to take an active role on USGBC committees.
- 26A-39 NECA should become a bulk purchaser of PV panels, inverters, and I-Cells. A buying coop would level the playing field for NECA members competing with large integrators.
- 26A-40 NECA should hire an “Energy Czar” at the national level. His person’s primary responsibility would be to market NECA/IBEW and help other chapters around the country emulate the LA Chapter’s success. This would be a full-time position.