

Program will start at 10:00 am



ETCC QUARTERLY MEETING: *THE CHANGING ENERGY LANDSCAPE FOR INDUSTRIAL CUSTOMERS*

September 20, 2017
Pacific Energy Center
HOSTED BY: Pacific Gas & Electric

Wifi: geco WIFI code: 26500628

Welcome, Safety and ETCC Updates

Tarun Kapoor

Expert Product Manager, Emerging Technologies |
Pacific Gas & Electric

WELCOME!

Before we get started....
housekeeping and safety

FOR OUR ONLINE MEETING PARTICIPANTS

- Quick logistics
 - Phone lines are muted
 - Please use question field to ask questions during Q&A or if any technical issues

HOUSEKEEPING FOR ALL PARTICIPANTS

- Please **turn off** or **silence** your phone, and **step outside** for any non-program conversations
- Audio recording today's session
 - Will be posted on www.etcc-ca.com
- Slides will be posted to www.etcc-ca.com
- Don't forget to fill out evaluations!

SAFETY MESSAGE

- In the event of an emergency:
 - Earthquake
 - Fire
 - Other evacuation
- Meeting point
- 911
- CPR

TODAY'S AGENDA

10:00 AM	Welcome, Safety & ETCC Updates
10:15 AM	Understanding Customer Energy Management Needs
11:15 AM	Implementation Opportunities
12:15 PM	LUNCH (provided)
1:15 PM	Utility Solutions for the Industrial Sector
2:15 PM	BREAK
2:30 PM	ETCC Focus for Industrial Customers
3:30 PM	WRAP UP

EMERGING TECHNOLOGIES COORDINATING COUNCIL (ETCC)

The ETCC supports ETP efforts in the advancement of energy efficiency and demand response initiatives through its leadership, impact and influence in the emerging technology domain. It pursues this objective by strategically engaging with a wide range of external ET stakeholders and effectively and efficiently managing coordination among ETCC members.

Members include:



EMERGING TECHNOLOGIES PROGRAM MISSION

“...to increase energy efficiency market demand and technology supply through evaluation of *emerging* and *underutilized* advanced technologies to increase customer savings...”



Zero Net Energy



LED Lighting



EE Rebates



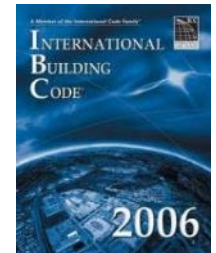
Retail and Manufacturer Strategy



Appliance Standards



Building Codes



HVAC



Home Energy Report



Contractor Training and outreach

ET PROGRAM DESIGN

Technology Development Support

- Provide resources to transform early-stage technologies / concepts into saleable products
- Develop forward-looking product specifications
- Provide outreach to early-stage entrepreneurs, investors, and analysts (TRIO)

Technology Assessment

- Evaluate performance claims
- Generate energy savings and cost data required for regulatory approval of a new EE measures

Technology Introduction Support

- Conduct scaled field placements to foster market traction
- Build demonstration showcases to create visibility / market awareness
- Conduct third-party solicitations using competitive bidding (TRIP solicitation)

UPCOMING ETCC EVENTS

Date	Event	Location & Host
December 6, 2017	Q4 Meeting: Residential	San Diego, SDG&E
February 13, 2018	Q1 Meeting: Commercial	Sacramento, SMUD

To sign up for the ETCC Insight newsletter, check the box on the sign-in / registration sheet or sign up online at: www.etcc-ca.com/subscribe

Check the ETCC website for updates: <http://www.etcc-ca.com/events>



UNDERSTANDING CUSTOMER ENERGY MANAGEMENT NEEDS

Peter Therkelsen, Research Scientist | LBNL – *facilitator*

Dan Teeters, Regional Sales Manager | Grundfos

Megan Arora, Channel Sales Manager | Digital Lumens

Andrew Sheaffer, Senior Engineer | APTIM

Peter Therkelsen
Research Scientist | LBNL



LBNL believes the best way to achieve the fullest EE potential is to adopt programs & policies that improve energy performance on a continuing basis

- An Energy Management System is the best way to accomplish this
- ISO 50001 is best available - consistent / proven / recognized
- Operational excellence
- Improved shareholder value
- Reduction of business risk
- Improved employee satisfaction



50001 Ready
U.S. DEPARTMENT OF ENERGY

[Energy.gov/50001Ready](https://www.energy.gov/50001Ready)

- Voluntary program that recognizes a facility's self-attestation to the requirements of ISO 50001
- 50001 Ready tools and resources available to help U.S. facilities move towards ISO 50001 preparedness
- Support market deployment by service providers, utilities, states, municipalities by offering 50001 Ready tools which can be rebranded, owned, and self-managed.



Dan Teeters
Regional Sales Manager | Grundfos

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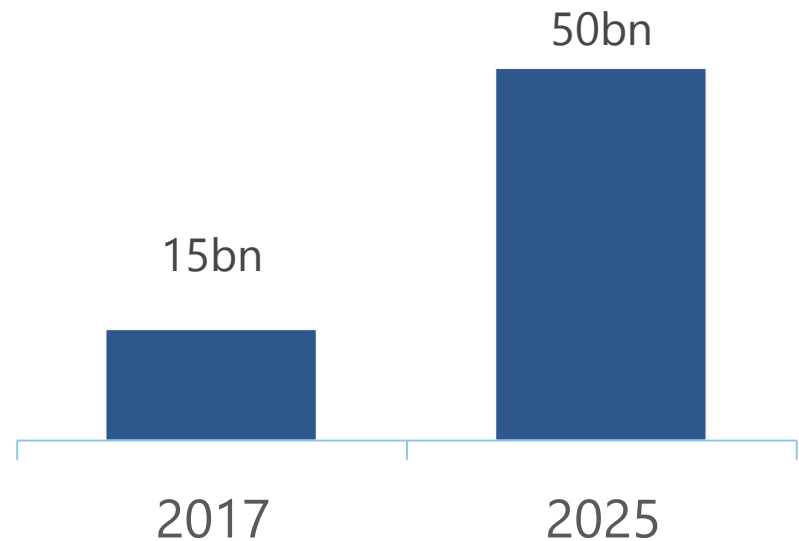


Megan Arora
Channel Sales Manager | Digital
Lumens

The World is Becoming More Connected



Connected smart devices worldwide



The annual economic impact of the "Internet of Things by 2025:
\$4tn to \$11tn

Source: McKinsey & Company, May 2017

Customized Control with M&V

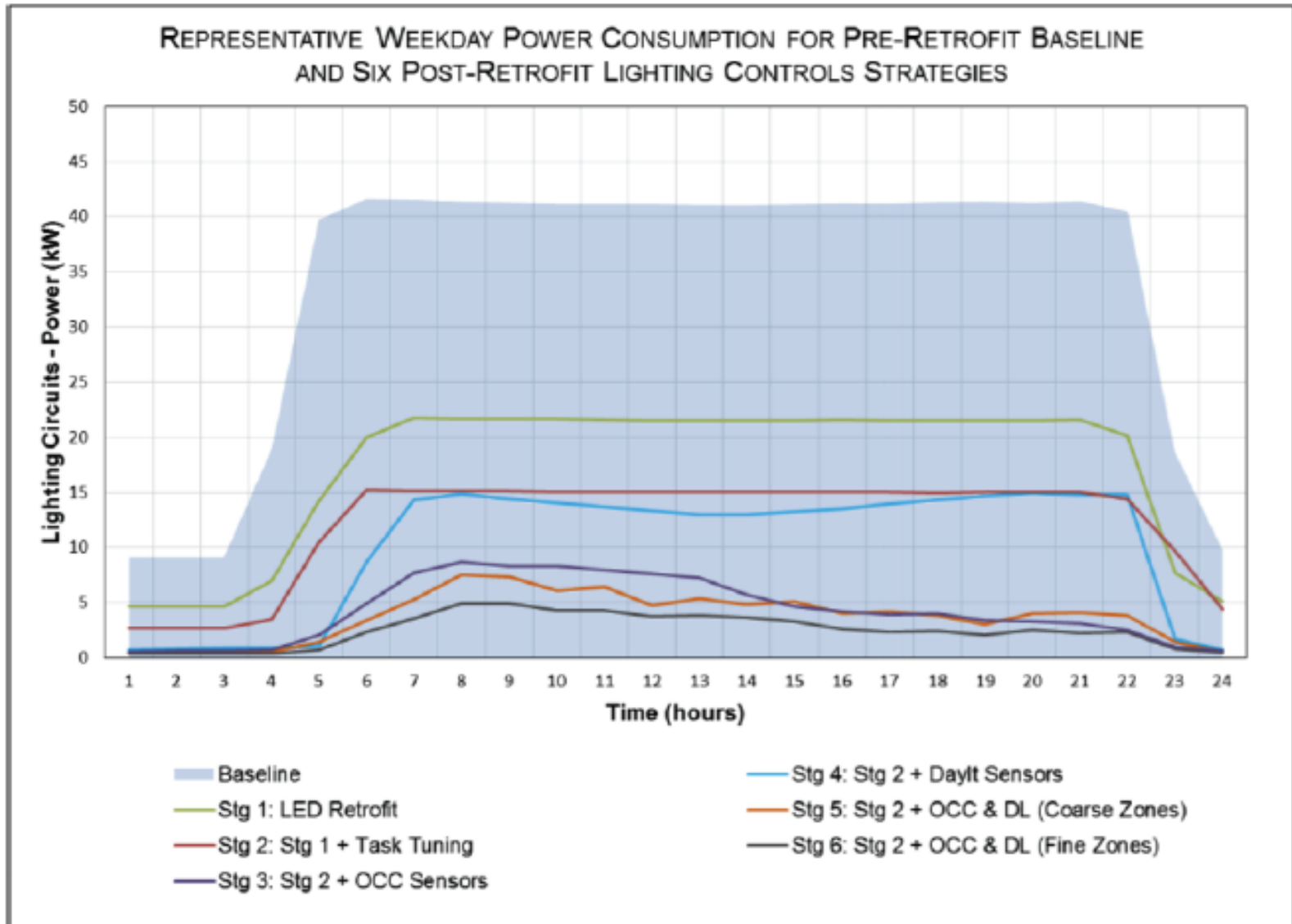


Table 1: Energy consumption comparison across strategies

Andrew Sheaffer
Senior Engineer | APTIM

NEW TECHNOLOGIES

Challenges Facing Industrial Energy Consumers

9/19/2017



IoT

The image features a stylized graphic design. On the left, there is a large orange triangular shape pointing towards the top right. The letters 'IoT' are written in a bold, dark blue, sans-serif font within this orange area. Below the 'IoT' text, a horizontal dark blue line extends to the right, crossing the boundary of the orange shape. The background is white, with several overlapping, semi-transparent light blue and grey geometric shapes, including triangles and lines, creating a modern, abstract look. A second horizontal dark blue line is positioned higher up on the right side of the image.

IoT IN THE INDUSTRIAL SPACE – AN OPPORTUNITY AND MANY CHALLENGES

The Opportunity

- ▶ Optimization of equipment, systems, processes, facilities

Challenges

- ▶ What, exactly, is Industrial IoT?
- ▶ Data, data everywhere and not a byte to eat,



DATA

WHAT HAPPENS WITH THE DATA?

One terabyte per day – what is to be done?

- ▶ Edge vs cloud storage
- ▶ Analytics and AI
- ▶ Security

DISCUSSION AND Q&A

Peter Therkelsen, Research Scientist | LBNL – *facilitator*

Dan Teeters, Regional Sales Manager | Grundfos

Megan Arora, Channel Sales Manager | Digital Lumens

Andrew Sheaffer, Senior Engineer | APTIM



IMPLEMENTATION OPPORTUNITIES

Marek Samotyj, Program Manager | EPRI - *facilitator*

Siva Sethuraman, Director of Utility Engagement | Cascade Energy

Aaron Daly, Global Director of Energy Management | Whole Foods

Christopher Cole, Strategic Account Advisor | SMUD

Siva Sethuraman
Director of Utility Engagement |
Cascade Energy

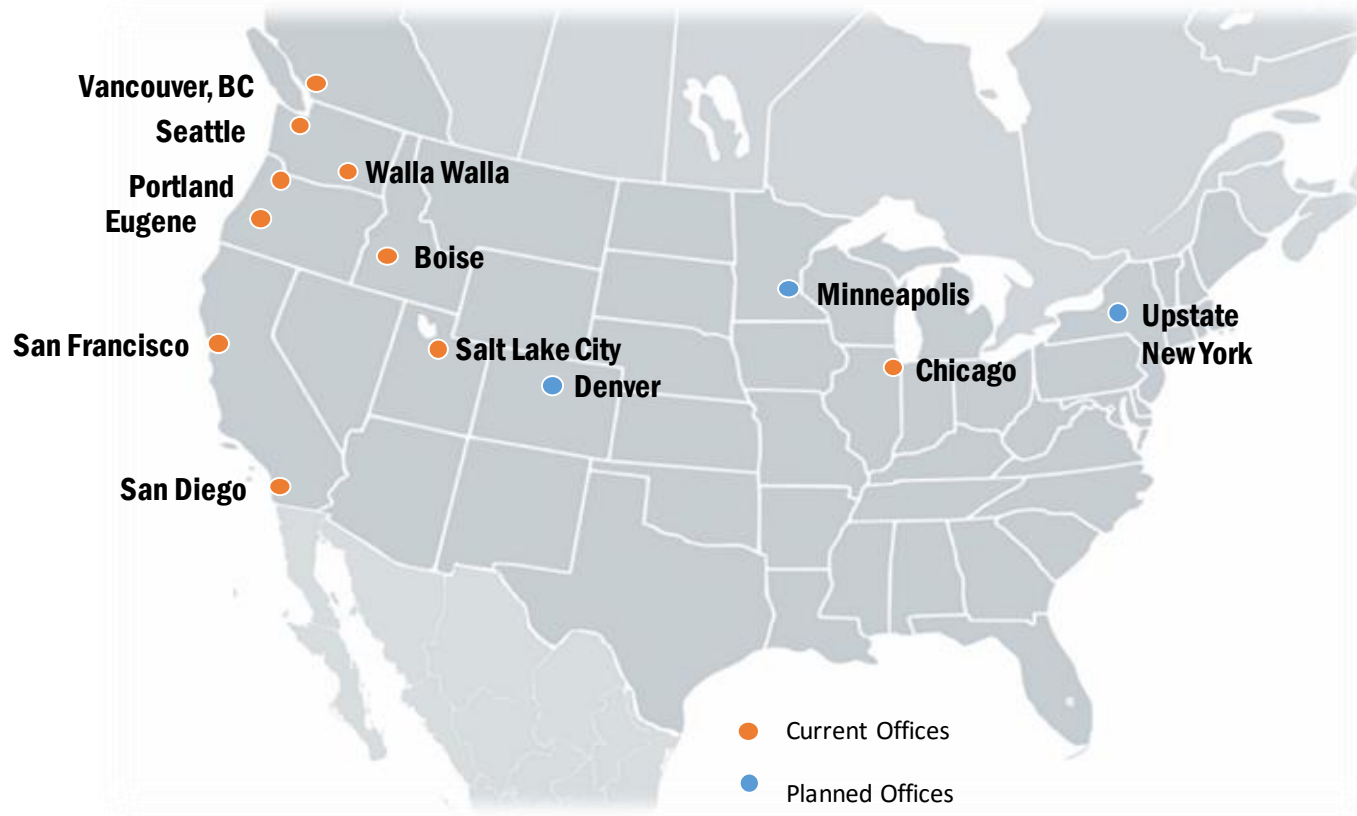


**ETCC Meeting
Pacific Energy Center**

September 20, 2017

Siva Sethuraman
Cascade Energy

Cascade Energy Introduction



Utility Clientele: BPA, ETO, Idaho Power, SDG&E, Xcel Energy, PG&E & Others
Corporate Clientele: Sysco, Kroger, Nestle, Americold, OSI, Lineage & Others

Implementation Strategy

- Keep it Simple
- Make it easy
- Check of basics: Needs, Budgets, Financials, Champions

Proactively Find
Customers



Leverage Vendors



Partnerships



Aaron Daly
Global Director of Energy
Management | Whole Foods



Implementing Energy Efficiency Looking Forward

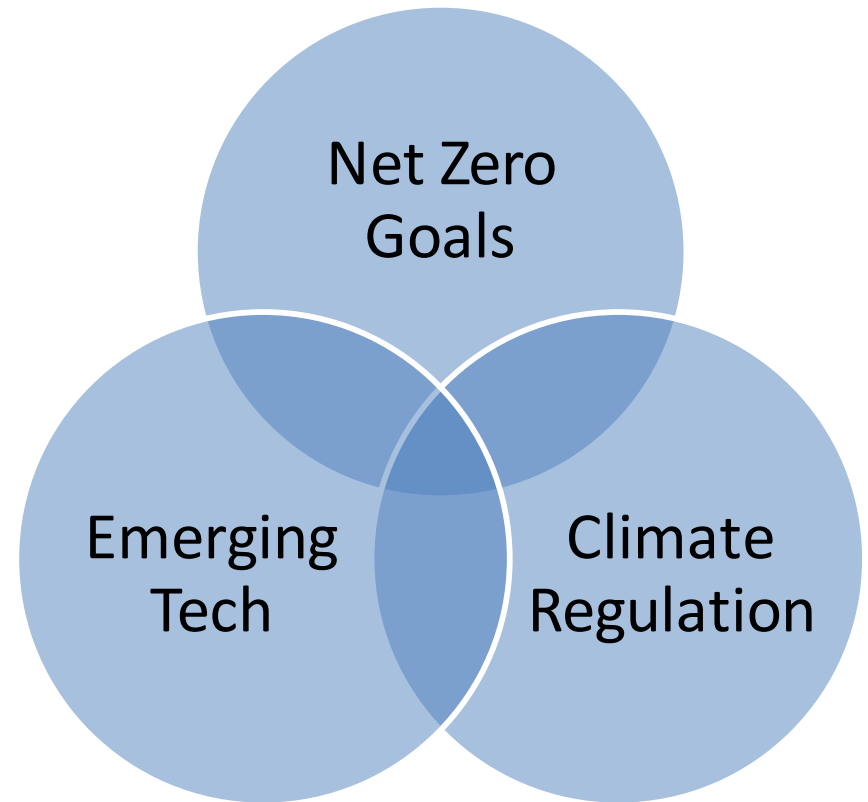
ETCC, September 2017

Aaron Daly

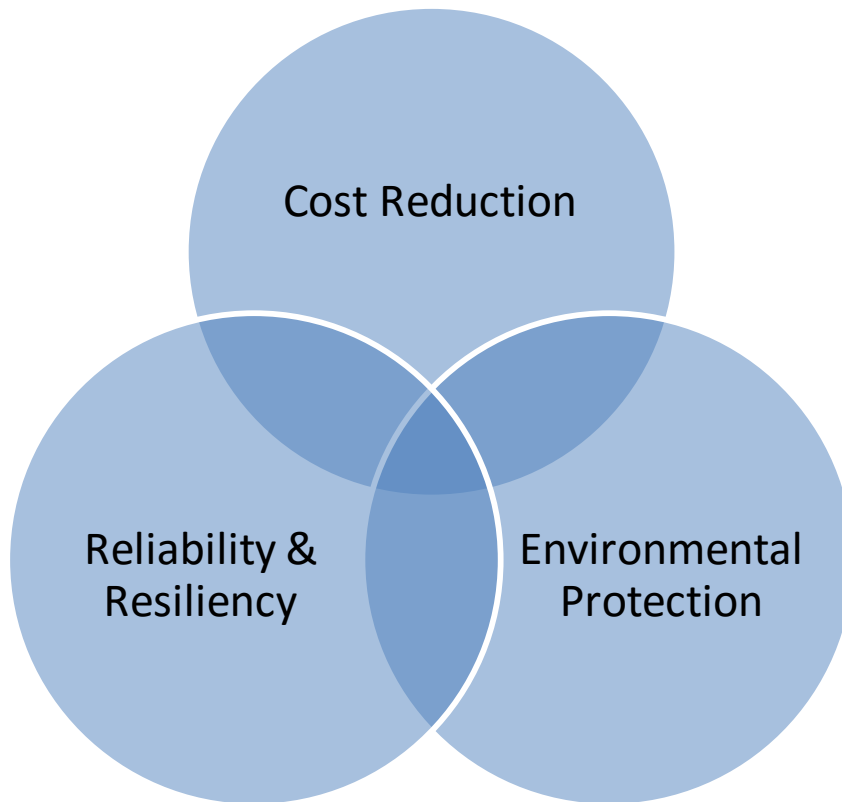
Global Director, Energy Management

Programmatic Context

- Confluence of change
- Potentially competing objectives
- Rapidly changing technology
- Market transformation



Internal Goals



- Expanding scope under management
- Need for coordination across initiatives
- Potential trade-off's vs. synergies



From Widgets to Systems

- HVAC & Refrigeration
- Lighting & HVAC
- Onsite Resources & Utility Demand Programs/Markets
- Target: Net Zero
- Integrative – Energy, Water, Waste, Refrigerants

Case Study: “MarketZero”



SF Environment



ARUP



With funding from the California Energy Commission, we are collaborating to retrofit a store to scalable near-zero net energy use.



Thank You!

Christopher Cole
Strategic Account Advisor | SMUD

Customer Challenges

- Electric Upgrades and Service Options
- Financial Payback
- Utility Incentives
- Utility Relationship



DISCUSSION AND Q&A

Marek Samotyj, Program Manager | EPRI - *facilitator*

Siva Sethuraman, Director of Utility Engagement | Cascade Energy

Aaron Daly, Global Director of Energy Management | Whole Foods

Christopher Cole, Strategic Account Advisor | SMUD

LUNCH

Program will resume at 1:15 pm

SLIDES WILL BE POSTED AT ETCC-CA.COM

PLEASE FILL OUT EVALUATIONS!

UTILITY SOLUTIONS FOR THE INDUSTRIAL SECTOR

Michael Lozano, Senior Mechanical Engineer | CEC - *facilitator*

Jarred Ross, Strategic Energy Management / Energy Advisor | SCE

Warren Fish, Program Manager | NEEA

Ethan Rogers, Industrial Program Manager | ACEEE

BREAK

Program will resume at 2:30 pm

SLIDES WILL BE POSTED AT ETCC-CA.COM

PLEASE FILL OUT EVALUATIONS!



ETCC FOCUS FOR INDUSTRIAL CUSTOMERS

Mark Martinez, Manager of Emerging Markets and Technology | SCE - *facilitator*

Kay Hardy, Regulatory Analyst | CPUC

Prakash Rao, Principal Scientific Engineering Associate | LBNL

Todd Thompson, CEO | Carnot Compression

Kay Hardy
Regulatory Analyst | CPUC

CALIFORNIA SEM PROGRAMS



R.13-11-005: Industrial CEI (now called "SEM") programs will obtain, track, and claim savings from a broad group of customers

Cohort and 1x1 customer discussion to support O&M and Custom Capital projects

Long-term customer engagement providing sustained energy savings



SEM COLLABORATION

- Although not a statewide program (as defined in D.16-08-019), IOUs will implement SEM consistent with each other, ensuring best practices and lessons learned are shared, but allowing each service territory to modify based on their unique industrial customers.

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SEM DESIGN AND M&V

Sergio Dias & Peter Therkelsen

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CPUC CONTACT AND DOCUMENTS

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415-703-2322, keh@cpuc.ca.gov

SEM program and M&V design guidance documents
available at <https://pda.energydataweb.com/#/>
Search for Strategic Energy Management

Prakash Rao
Principal Scientific Engineering
Associate | LBNL

ET Focus for Industrial Customers

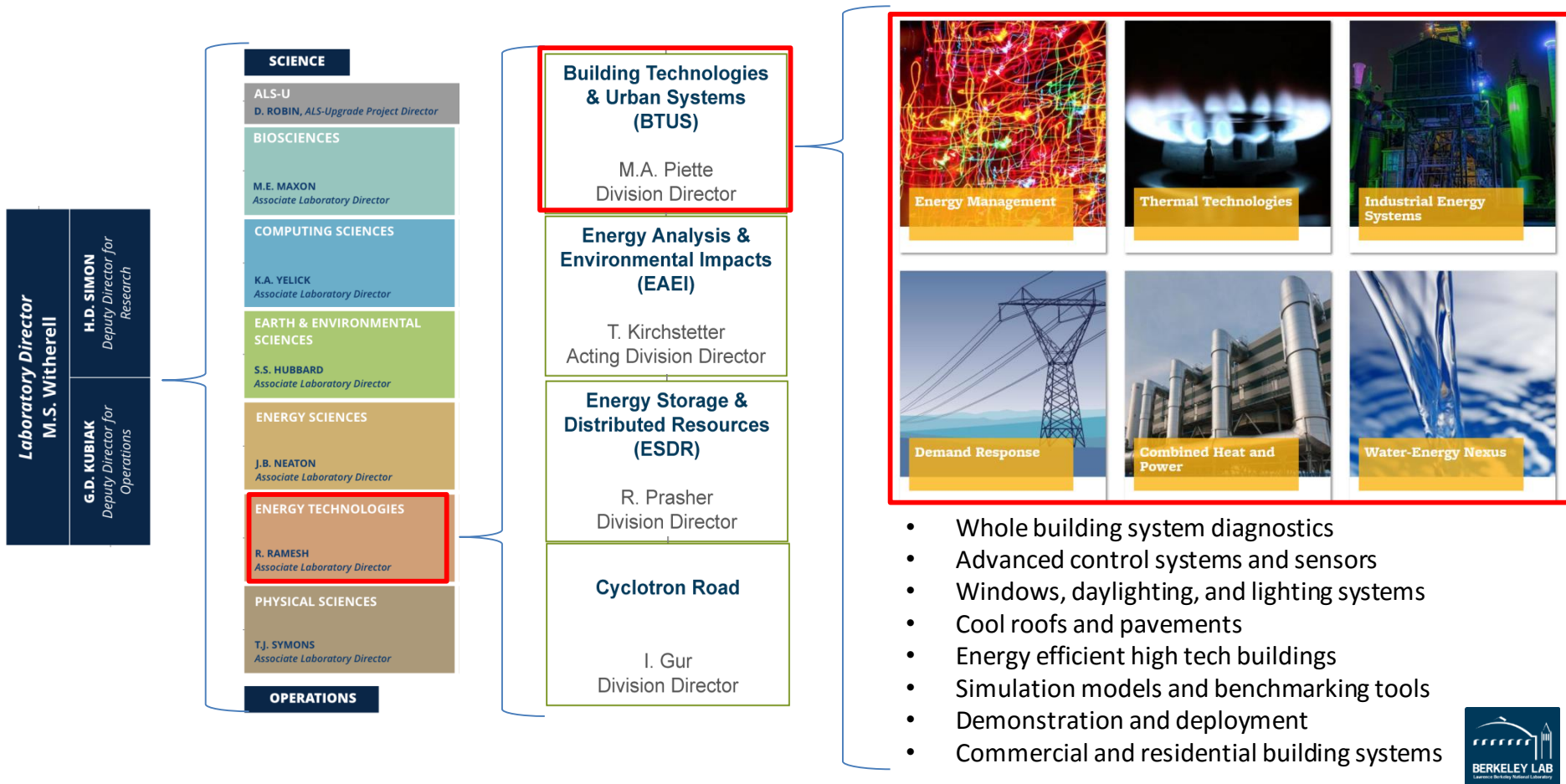
Prakash Rao, PhD

Lawrence Berkeley National Laboratory

September 20, 2017

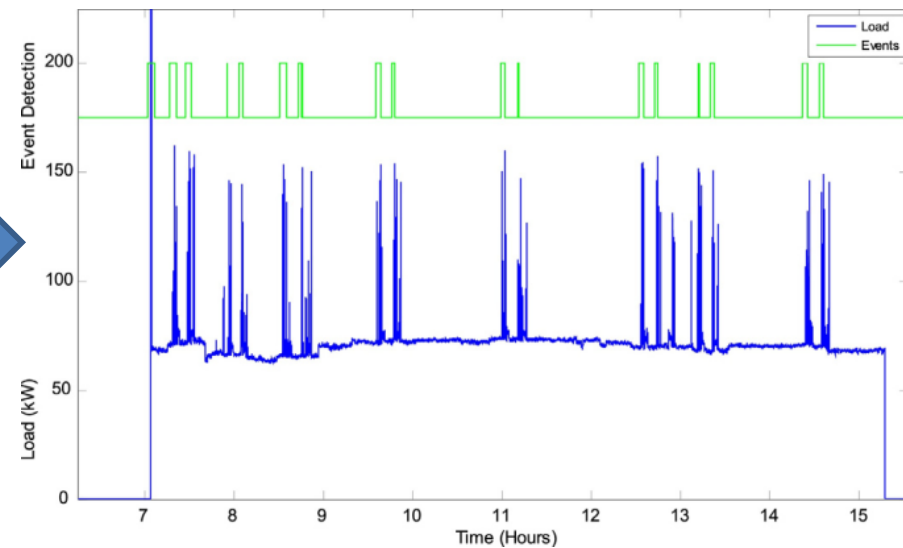
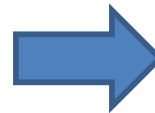
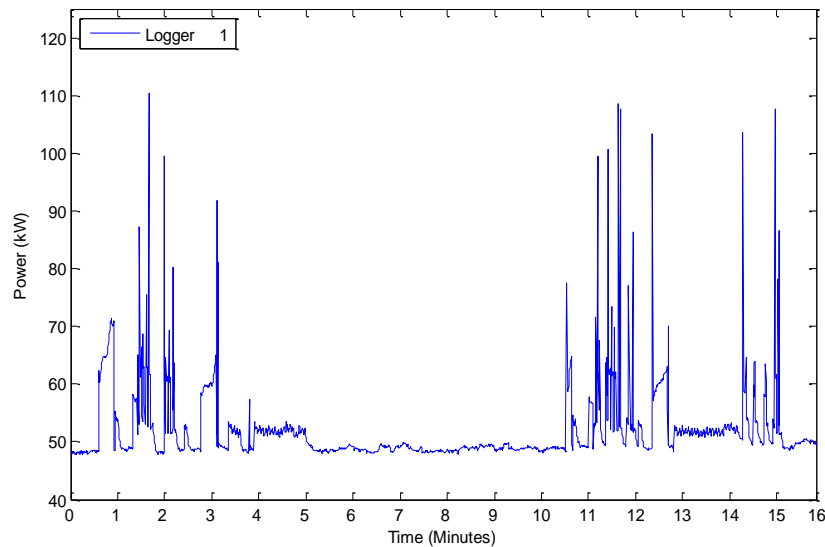


LBL Industrial Applications Team



Intelligent data analysis: the all-in-one approach

SEM → *EE + DR* → *Productivity improvements*



Source:

Rao, P., Muller M., Gunn, G. 2017. Conducting a metering assessment to identify submetering needs at a manufacturing facility. CIRP Journal of Manufacturing Science and Technology.

Yeah, we know...but how?? Some ideas...

- Metering assessments
- Typical electricity profiles for standard machines
- Machine learning algorithms to identify electricity signatures

Todd Thompson
CEO | Carnot Compression

Carnot Compression LLC

- Novel, patented isothermal compression technology
- Phase 2 SBIR Funding from National Science Foundation
- CEC Funding to field test technology at an industrial site in CA
 - In partnership with Gas Technology Institute

DISCUSSION AND Q&A

Mark Martinez, Manager of Emerging Markets and Technology | SCE -
facilitator

Kay Hardy, Regulatory Analyst | CPUC

Prakash Rao, Principal Scientific Engineering Associate | LBNL

Todd Thompson, CEO | Carnot Compression

SESSION WRAP-UP

PLEASE FILL OUT EVALUATIONS!

SLIDES WILL BE POSTED AT ETCC-CA.COM
WITHIN 48 HOURS