

Technology Resource Innovation Outreach

TRIO Symposium

June 10, 2014

Hosted by Southern California Gas Company



***Pacific Gas and
Electric Company***

Safety Message



Rodney Davis



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Gas Company



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Agenda

- 8:30 AM - Registration & Breakfast**
- 9:00 AM - Welcoming Address, Safety Message**
- 9:15 AM - SoCalGas 2015 EE Program Guidelines**
- 10:00 AM - Emerging Technology Program (ETP) Update**
- 11:00 AM - TRIO / TRIP Success Stories**
- 11:30 AM - Investor Perspective on Utility Program Value**
- 12:00 PM - Lunch**
- 1:00 PM - SoCalGas Technology Program Priorities**
- 2:00 PM - CEC RD&D Program**
- 3:00 PM - Q&A and Evaluations**
- 4:00 PM - Networking & Mixer**

Welcoming Address



A. Y. Ahmed



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SoCalGas Overview

- » Nation's largest natural gas distribution utility; fifth largest in the world
- » 21.3 million consumers
- » 5.8 million gas meters
- » 136 BCF of gas storage capacity (3% of national storage capacity)
- » Over 3,500 miles of transmission pipeline⁽¹⁾
- » Nearly 100,000 miles of distribution pipeline⁽¹⁾
- » Ratebase of \$3.7 billion in 2013 ⁽²⁾

1) DOT defined as of year-end 2012

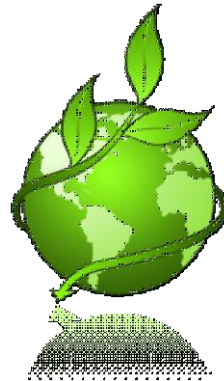
2) 2013 weighted average



SoCalGas Technology Solutions Group

- » **Market Development: Biogas Conditioning Services Tariff**
 - Providing biogas conditioning and upgrading service to wastewater treatment facilities, dairies, landfill diverted food/green waste and landfills
- » **Market Development : Compression Services Service Tariff**
 - Providing compression service to compressed natural gas (CNG) vehicle fueling stations, combined heat and power (CHP) systems and peaking power plants
- » **Market Development : Natural Gas Vehicle Program & Growth Initiative**
 - Market development program focused on accelerating the adoption of CNG vehicles throughout Southern California.
- » **Emerging Technologies: Product Development**
 - Continued evaluation and demonstration of various types of customer end-use equipment in support of Customer Programs
- » **Research and Development: Technology Demonstration**
 - Providing customer technology development solutions that support Residential, Commercial, Industrial, Combined Heat and Power, and Alternative and renewable fuels

SoCalGas 2015 EE Program Guidelines



Kevin Shore



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Natural Gas Energy Efficiency

Delivering innovative energy efficiency programs that are valued by customers, sensitive to the environment, stimulate the economy, and make a difference in the communities we serve.

- » Assist customers with reducing energy usage and costs
- » Reduce greenhouse gas emissions
- » Achieve market transformation to accomplish longer-term savings
- » Use energy efficiency to grow the economy

Energy Efficiency Program Portfolio



Rebates

- Receive money for choosing efficient equipment



New Construction Programs

- Design, architecture and engineering assistance, incentives for comprehensive high efficiency



Custom Incentives

- Early involvement, complex projects. Detailed design and calculation for optimal efficiency



Third Party Programs

- 20% of the EE budget contracted out, variety of program designs and customer segments



Codes and Standards

- Support code updates and “reach” codes for buildings and equipment



On-bill finance

- Allows zero interest financing of energy efficient equipment to business customers using utility bill



Institutional & Government Partnerships

- “Partnerships” with state agencies (IPs) and local govts (retrofits, outreach, strategic plan support).



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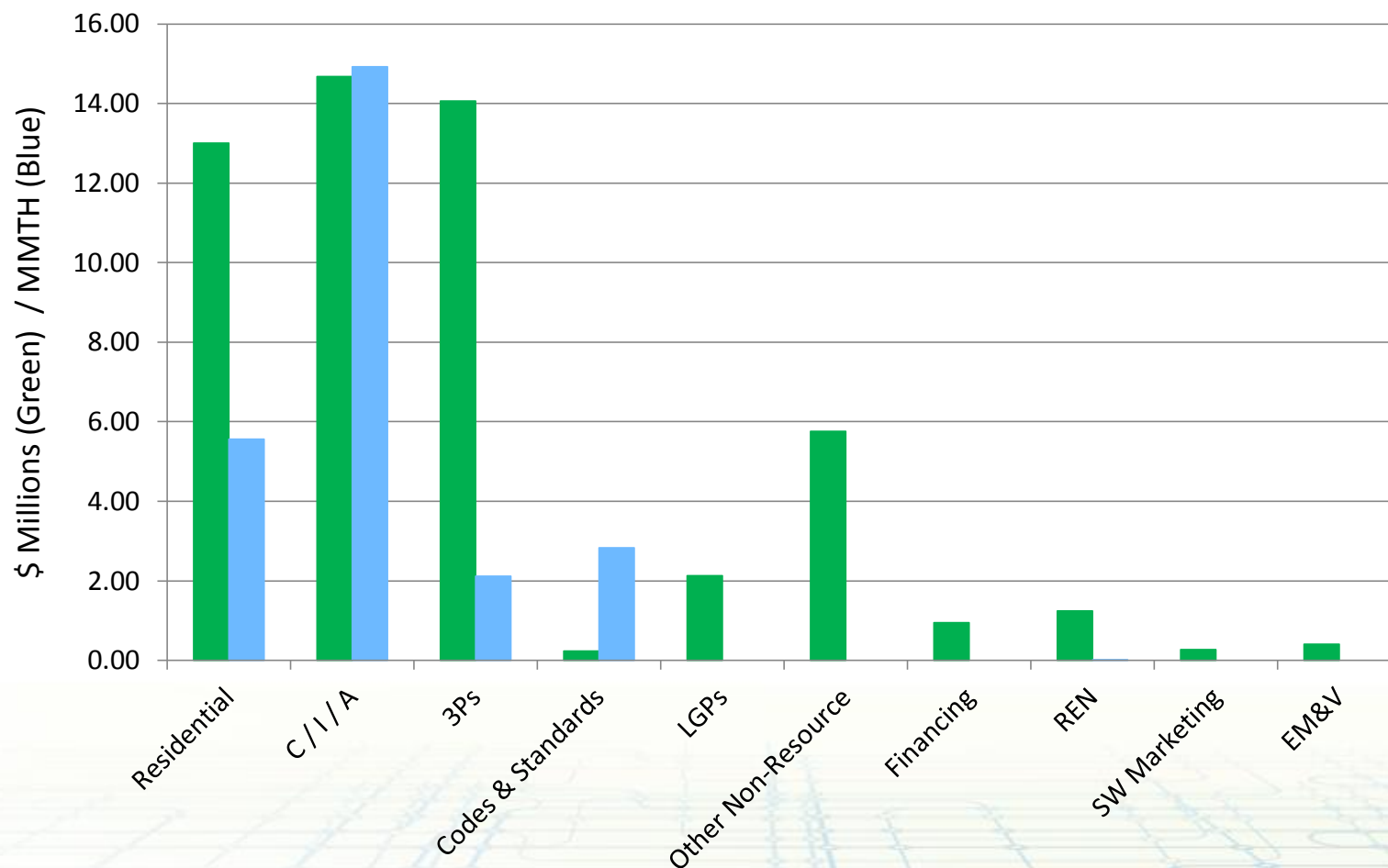


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Current SoCalGas Portfolio

(Based on 2013 Actuals)

■ Expenditures ■ Savings

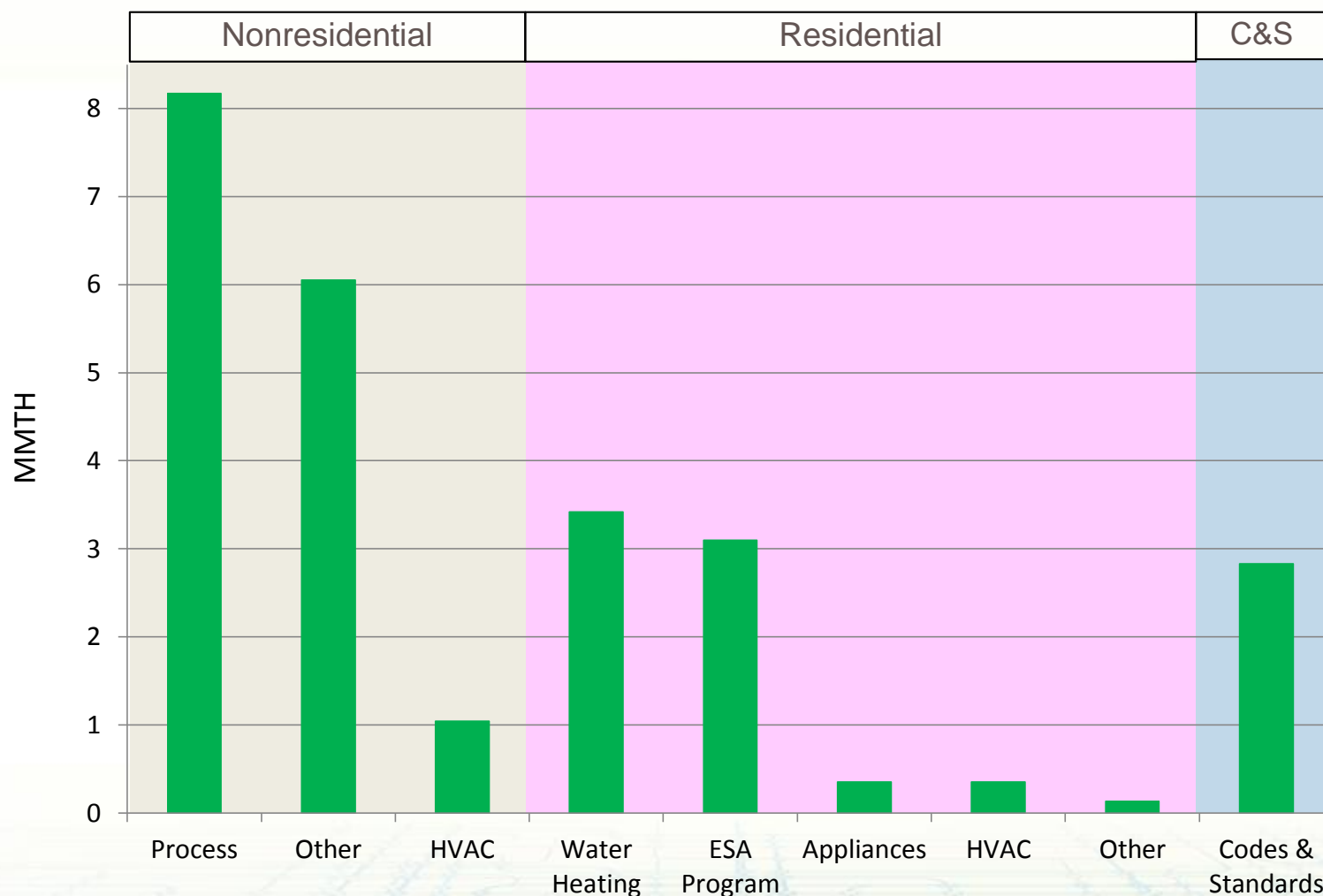


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2013 EE Savings by End Use



* Industrial - Other primarily consists of steam traps, heat recovery, regenerative thermal oxidizers, and boiler economizers.

2015 Energy Efficiency Filing

- » Move from triennial portfolio budget cycles to “Rolling Portfolios.”
 - Phase I = Funding for EE Portfolio program year 2015 (Decision in June)
 - Phase II = Rolling cycles framework (Stakeholder process in progress)
 - Phase III = Rolling cycles policy matters

Cost-Effectiveness = 1.23 (or 1.27 w/ updated AT-WACC).

Proposed 2015 Budget* (\$ MM / MMth)

Segment	Annual Budget (2013/14)	Annual Savings (2013/14)	Annual Budget (2015)	Annual Savings (2015)
Residential	\$19.6	5.4	\$19.6	4.7 **
C / I / A	\$26.1	17.5	\$26.1	18.9
3rd Party Programs	\$16.9	3.6	\$16.4	3.0
Codes & Standards	\$0.8	3.0	\$0.8	1.7
Local Partnerships	\$4.8	0	\$4.8	0
Other Non-Resource	\$5.4	0	\$6.0	0
Finance (OBF/ARRA)	\$2.5	0.4	\$2.3	0
EM&V	\$3.7	0	\$3.3	0
Subtotal ***	\$79.7	29.9	\$79.3	28.4
* Actual request does not contain incremental 2015 revenues to fund New Financing Pilots or SW ME&O.				
** Includes estimated savings level from authorized Energy Savings Assistance Program.				
*** Values may not sum to totals due to rounding. Table also does not represent SoCalREN proposal.				



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Phase II - Rolling Cycles

- » Greater funding stability for EE administrators & implementers;
- » Reduced transactions costs for program implementation;
- » Coordination with energy procurement and delivery efforts;
- » Coordination with Performance Incentive Mechanism;
- » Coordination with other DSM programs;
- » Safety matters relating to EE programs;
- » Transparent and timely ex ante forecasts of program savings and use thereof to optimize EE portfolios;
- » Regulatory workload refocused on key issues on an ongoing basis.

* From R.13-11-005, page 5. The subsequent Scoping Memo acknowledged the collaborative efforts of stakeholders and encouraged the continuation of discussions between the parties.

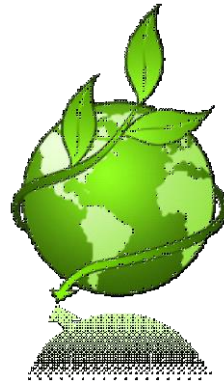
Rolling Cycles Letters Signatories



Challenges & Opportunities

- 1 Cost effective delivery to Residential SF & MF
- 2 Cost effective delivery to SMB & Agricultural Segments
- 3 Integrated program delivery
- 4 Behavior change
- 5 Leverage new technology
- 6 Keep it simple

SoCalGas 2015 EE Program Guidelines



Ganesh Venkat



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Third Party Programs (3PP)

» Why Third Party Programs?

- Addressing portfolio gaps (e.g., underserved markets)
- New perspectives & innovative approaches
- Engagement of broader EE community
- Commission requirement: 20% of portfolio budget for 3PP

Current 3P Programs

- » Total 2013-14 budget: ~\$28.4 million
- » Similar budget for 2015, in approval phase
- » Administered by SCG's Program Advisors
- » Total number of programs:14
 - Resource: 8
 - Non Resource: 6

Current 3P Programs

1. On Demand Efficiency (Benningfield)
2. Manufactured Homes Program (Synergy)
3. Small Industrial Facility Upgrade (GEP /EnerNoc)
4. PREPPS (RSG / Clearesults)
5. PACE (Pacific Association Consortium Employment)
6. CLEO (Global Energy Services)
7. Multifamily Direct Therm Savings (Honeywell)
8. Multifamily Home Tune Up (ECOVA)
9. LivingWise (Resource Actions Programs Group)
10. Save Gas (EDC)
11. HERS Raters Training Advancement (CSG)
12. Portfolio Of The Future (Navigant)
13. California Sustainability Alliance (Navigant)
14. POS Food Service Equipment (Energy Solutions)*

* New program added in 2014

IDEEA365 Process

- » A new approach - in response to the need for year round opportunity for potential participants
- » Started in 2013, likely to continue thru 2015; statewide
- » Purpose – to bring in new and innovative program ideas into EE portfolio
- » Total available: \$5.4 million for the cycle
- » Year-round solicitation of ideas
 - Innovative solicitations (two stage RFA /RFP process)
 - Targeted solicitations (single stage RFP process)

IDEEA365: Progress To Date

- » Completed 3 innovative solicitation rounds:
 - Round 1: 24 RFA 5 RFPs 2 contract stage
 - Round 2: 32 RFA 9 RFP 3 contract stage
 - Round 3: in progress
 - Round 4??

IDEEA 365: Progress To Date

- » 2 Targeted Solicitations
 - CSDP (Commercial Sustainable Development Program) : 6 RFPs received – negotiations are in progress with one vendor
 - Leak Loss Detection: 5 RFPS received, negotiations are in progress with one vendor

Evaluation of Proposals

- » Consistency and fairness
 - Cost effectiveness
 - Innovation
 - Feasibility and comprehensiveness
 - Portfolio fit
 - Deep savings
 - Supplier diversity

Maintaining a “rolling” process

- » Continuous process improvement –with internal teams
 - Reducing cycle time by interviews
 - Simplified evaluation process
 - Evaluation Teams engaged simultaneously
- » Program Advisory Groups meetings and discussions
- » Statewide workshops with ED staff & IOUs
- » Program Review Group inputs

ETP Update



A.Y. Ahmed

Kate Zeng

Edwin Hornquist

Mananya Chansanchai



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Role of Emerging Technologies

Support increased energy efficiency market demand and technology supply by contributing to development and deployment of new and underutilized energy efficiency measures, and by facilitating their adoption as measures supporting California's Long Term Energy Efficiency Strategic Plan.



Big Bold Energy Efficiency Strategies



(1) All new residential construction in California will be zero net energy by 2020

(2) All new commercial construction in California will be zero net energy by 2030



(3) Heating, Ventilation, and Air Conditioning (HVAC) industry will be transformed to ensure that its energy performance is optimal for California's climate



(4) All eligible low-income customers will be given the opportunity to participate in the low income energy efficiency program by 2020



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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...”

Emerging
Technologies

Programs

Codes and
Standards

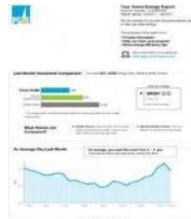
Zero Net Energy



LED Lighting



Home Energy
Report



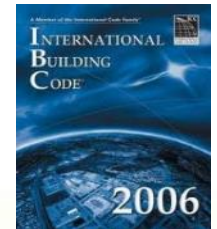
Retail and
Manufacturer
Strategy



Appliance
Standards



Building Codes



HVAC



EE Rebates



Contractor
Training and
outreach



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Emerging Technology Program Funding

2013-2014 Program Cycle

SCE	\$21,185,430
PG&E	\$11,918,595
SDG&E	\$2,700,079 *
SoCalGas	\$2,516,727
Statewide Total	\$38,320,831

» Ratepayer funded thru Public Goods Charge

» Other resources

- Grants
- Solicitations
- Venture capital
- Partnerships
- Customers

* excludes ET-DR

ET Program Funding Support

Technology Development

- 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 new Energy Efficiency measures

Technology Introduction

- 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)



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What are Utilities looking for?

- » NEW technologies that deliver NEW savings and therefore NEW returns to Utilities
 - Saves energy
 - Reduces peak demand
 - Creates behavior change
- » Must show:
 - Verifiable and sustainable savings
 - Commercially available
 - Market barriers addressed
 - Scalable to large market
 - Need for Utility Involvement
 - Aligns with DSM Program Portfolio and California Long Term Strategic Plan
- » Utilities make money on incentives if you succeed!

Technology Resource Innovation Outreach (TRIO)

- » Statewide Emerging Technology outreach program
- » Engage non-traditional methods and greater outreach to generate new innovative program ideas and identify newer technologies for capturing cost-effective gas & electric energy savings
- » Support the commercialization process and create an element of market pull
- » Leverage utility interest in a technology/program to shorten the commercialization process
- » Proactively seeking innovative technologies to meet regulatory & environmental energy efficiency challenges



Today's Goal

Technology companies
gain a better
understanding of the
Utilities' EE/DR
Programs and the
requirements for doing
business with the
Utilities



Utilities gain a better
understanding of
available
technologies and
needs of technology
companies



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October 20 - 22, 2014
Wyndham Parc 55 Hotel
Downtown San Francisco

6th Biennial Emerging Technologies Summit
Hosted by Pacific Gas & Electric



Emerging Technologies Summit

ACCELERATING INNOVATION IN ENERGY EFFICIENCY

TRIO Symposium
Downey, CA
June 10, 2014



What is the ET Summit?

2-day interactive
conference on energy
efficiency and demand
response emerging
technologies



Accelerating Innovation in Energy Efficiency
October 20 -22 | Parc 55 Hotel | San Francisco

The ET Summit is the place to connect, engage and uncover new business opportunities with more than 500 industry leading entrepreneurs, technology developers, investors, implementers, researchers, utilities, regulators and property owners/managers

Hosted by the Emerging Technologies Coordinating Council (ETCC)





ET Summit Highlights

CROSS-CUTTING
BREAKOUT
SESSIONS
ACROSS WIDE
SPECTRUM OF
TOPICS

CENTRALLY
LOCATED
INNOVATION
SHOWCASE

THOUGHT LEADERS
SPANNING
MULTIPLE AREAS
OF EXPERTISE

Local ET Industry Tours



Opening Night @ The Exploratorium





Track Topics



ENERGY SAVINGS THROUGH BEHAVIOR AND DECISION-MAKING STRATEGIES

Identifying how to drive energy savings and technology innovations through data and the use of data analytic tools to enable a deeper understanding of customer behavior and decision-making are key opportunities for stakeholders across the energy efficiency and demand response sectors that will be examined throughout this track.



THE CHANGING ENERGY LANDSCAPE

Stakeholders across the energy landscape must balance technological advances and business model innovations with increased stringency of codes & standards, uncommonly severe weather patterns, non-convergent energy policies, disparate energy sources and regulations that are impacting utilities, their customers, and technology developers. This track will examine next generation technologies, strategies and the collaboration needed to change the market and increase the adoption of emerging technologies amidst this changing landscape.



ENABLING SMARTER ENERGY MANAGEMENT

These sessions will dive into key strategies, program and technology approaches to move beyond the “low-hanging fruit” to capture deeper energy savings with smarter building design, leveraging integrated control and dynamic optimization emerging technologies that span both sides of the meter, and collaboration amongst the entire value chain of stakeholders from technology developers to emerging technology programs to the measurement and verification community.



ACHIEVING DEEPER SAVINGS THROUGH INTEGRATED SOLUTIONS

These sessions will dive into key strategies, program and technology approaches to move beyond the “low-hanging fruit” to capture deeper energy savings with smarter building design, leveraging integrated control and dynamic optimization emerging technologies that span both sides of the meter, and collaboration amongst the entire value chain of stakeholders from technology developers to emerging technology programs to the measurement and verification community.



CUSTOMER ENGAGEMENT STRATEGIES FOR MARKET TRANSFORMATION

Taking a customer-driven approach to technological transformation is proving successful in affecting the market. This track will delve into strategies that incorporate pricing signals and human interaction in technology development, market intelligence and characterization in order to understand what customers respond to and drive adoption.



OVERCOMING MARKET AND TECHNOLOGY BARRIERS

Barriers to entry exist in every industry; a comprehensive understanding of the barriers and strategies deployed to overcome them is critical to short and long term success, implementation and, ultimately, market transformation. Experts will discuss the financial, market and technology barriers that exist in the energy efficiency and demand response sectors and share insights on how companies have overcome these obstacles.



Key ET Summit Information

Website: www.etsummit.com

Early bird registration expires on **Monday, June 16th**!

REGISTER NOW at www.etsummit.com and save \$125!

Book your hotel room at the Parc 55 Hotel via the ET Summit website to receive the discounted group rate!

Sponsorship Opportunities Available:

Please contact sponsor@etsummit.com



Contact Information

Thank you!!

For questions, contact
info@etsummit.com

Mananya Chansanchai

415-973-7383

m7ce@pge.com

TRIO / TRIP Success Stories



Robyn Zander

Technology Resource Innovation Outreach Program - TRIO

Presented by:

**Robyn Zander, Senior Project Manager
Emerging Technologies**

New Program Design & Launch



Background

Technology Resource Innovation Outreach - A statewide program that seeks to engage ***non-traditional methods*** and greater outreach to generate new innovative program ideas and identify newer technologies for capturing cost-effective electric energy savings.

The CPUC directed the utilities to integrate, coordinate and innovate in order to provide more comprehensive solutions to customers.

Commission mandate to pull new and innovative technologies from early stage to commercialization

Examples of innovation

- Deliver increased Customer participation or installation of existing technologies
- Seek out and develop new combinations of existing and new technologies
- Establish untapped relationships and channels
- New wheel – best thing since sliced bread - widget

kWh savings

TRIO accomplishments

- Technology solicitation

- 5 new programs

Generating savings

- Networking opportunity

- Collaboration

Flow

Clean Tech Open

- Technology information

- Marketing

kWh savings

Tool for those Ideas

Technology Resource Innovation Program (TRIP)

TRIP originated with the Technology Resource Innovative Outreach program (TRIO)

Solicitation used to actually do the business with utilities

The intent of this TRIP solicitation is to find, fund, and test the best new EE (energy efficient) or IDSM (integrated demand side management) technologies and delivery approaches available in the marketplace discovered through the TRIO program and/or outreach events

kWh savings

What is the outcome of TRIP

Solicitations	No. of Pos Issued
TRIP I	3
TRIP II	1
TRIP III	1
TRIP IV	TBD
TOTAL	5

Programs Awarded

TRIP

Wireless Energy Management System

Wireless energy management systems; and software and methodology for determining the real performance of energy savings measures using new statistical analytics and SmartConnect interval data.

IDEEA

Water Infrastructure

Tracking individual pumps overall plant efficiency through analytics software and providing solutions on how to make them more efficient; and

Using a holistic approach to evaluate how a citywide pumping system can be optimized.

kWh savings

Successes

- Entrepreneurs partner with existing third parties
- Communicate/Network
- Set realistic expectations
- Submit a proposal
- Take advantage of the TRIO resources
 - Where are the utility people?
 - Where are the consultants?
 - Where are the existing 3P implementers?



kWh savings

Wrap-up Slide

Capture

- Capture cost-effective energy savings

De-mystify

- De-mystify utilities
 - Codes & standards and regulatory requirements
- Increase the diversity of 3rd party implementers

Relationships

- Utilize a network of utility relationships to create innovative solutions by communicating and connecting similar activities

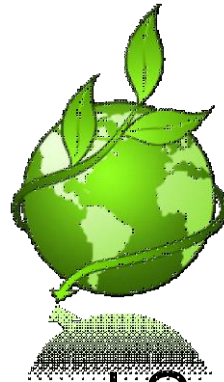
IOU Interest

- Leverage IOU interest for investment funding
- Showcase innovative technologies

Feedback

- Energy industry expertise / utility feedback

Investor Perspective on Utility Program Value



Michael Swords

Bob Zabors

Maurice Gunderson



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LA Cleantech Incubator

Born from the City, run by Entrepreneurs

- City-conceived public/private partnership
- Independent non-profit
- Located in downtown Los Angeles with regional satellites
- Six step, six week vetting process
- Resident and non-resident programs
- International Landing Pad program

31 months of progress

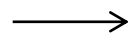
- 30 companies, \$32M invested, 320 jobs, 1st exit
- Operated on or under budget every quarter
- Fundraising traction: JPMorgan Chase, Broad, EDA, The City, SoCalGas, Honda,
- **Boot camps and “C-Level” series**
 - Satellite program
 - WishList and Early Adopter programs
- Established important region-wide partnerships
- Helped raise \$42M funding from 12 sources for permanent campus
- Held our first international cleantech innovation conference

Technology WishList[©]

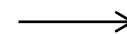
Linking innovation to market makers

- Formal alignment of two organizations' technology paths
- Partner: You tell us the technological problems you're most focused on and define the condition boundaries.
- LACI: We actively search, screen, present and incubate technologies/companies that are strategically important to you.

Define Problem



Recruit Solution



Incubate Company

The Early Adopter Program

A technology acceleration program for start-ups

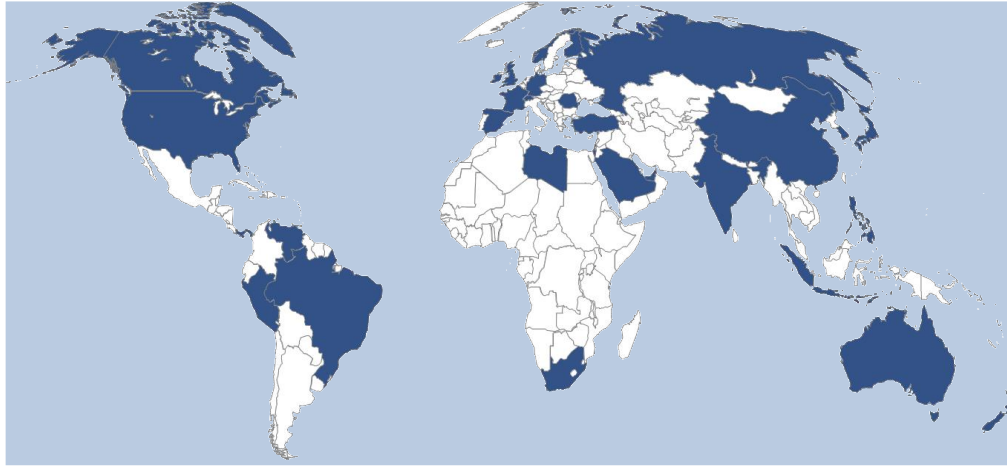
- Program aimed at cleantech startups only
- Program would allow participating city agencies to “test” innovative clean technologies while mitigating risk
- Each participating Early Adopter Company (EAC) would have to be certified by LACI as to:
 - They are an early stage cleantech company
 - Company passes current LACI Portfolio Company vetting criteria
- Once certified, each EAC could apply for a demonstration project (limited scope and budget) with participating agencies
- DWP and SoCalGas will be first movers

TRIO Symposium

Perspectives on Gas and Electric Technology Commercialization and Utility Programs

June 10, 2014

Enovation Partners: a new consulting firm designed to accelerate innovation and deliver results in a rapidly changing energy market



- Experienced professionals from a variety of backgrounds
 - Strategy
 - Operations
 - Project and Technology Development
 - Investment & Finance
 - Regulation and Policy
- Exclusive focus on energy & Infrastructure
- Prior work in all sectors of energy
 - 100+ US electric and gas utilities (IOUs, Munis, Co-ops)
 - Energy retailers, transmission, IPPs, Developers, E&P, midstream, NOCs, traders, OEMs, EPCs, Private Equity, service providers, associations
 - Companies and governments in more than 30 countries
- Partnership with Gas Technology Institute for technical depth
- Affiliation with early/mid stage investment firms and funds

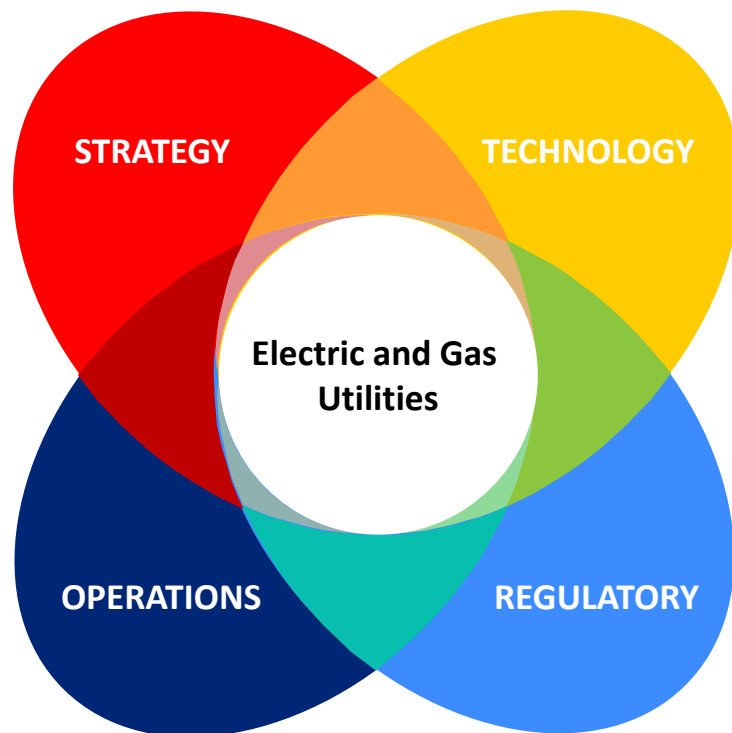


Representative list of former clients served by Firm principals

Utilities are central to innovation, and the success of innovators

The industry requires integrated solutions...

... to deliver across multiple dimensions required by stakeholders



- Safety
- Reliability
- Affordability
- Sustainability
- Security
- Profitability

Innovation is reshaping Natural Gas markets

New Sources and Infrastructure:

New Demand:

Gas Substitution

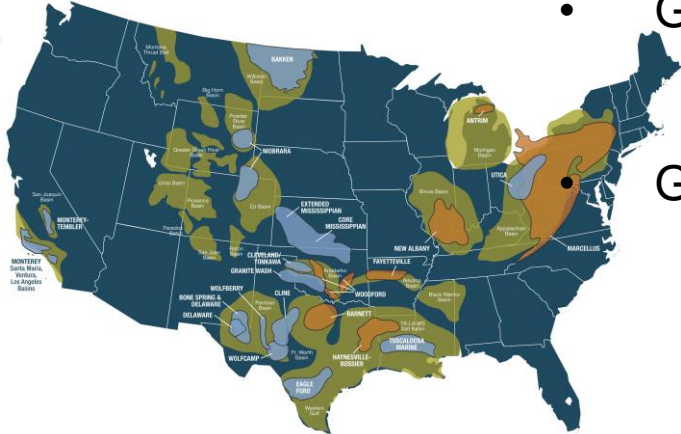
- Gas vs Coal

- Gas vs Oil

Gas Firming
Renewables

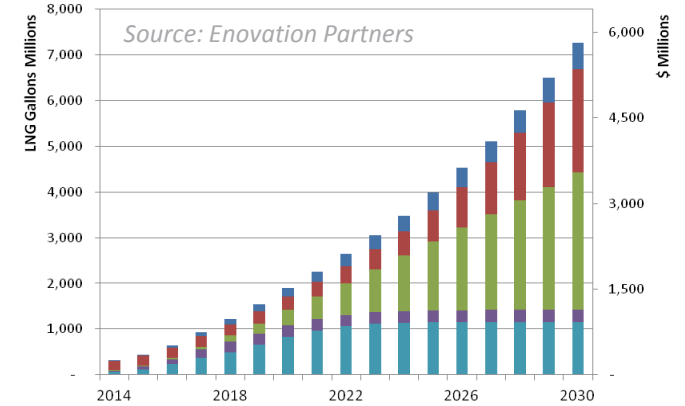
PACWEST
CONSULTING PARTNERS

LEGEND
BASINS
GAS PLAYS
OIL/GAS PLAYS



Energy Provided by LNG - Base Case

Source: Enovation Partners



Transportation
(Vehicle, Marine, Rail)

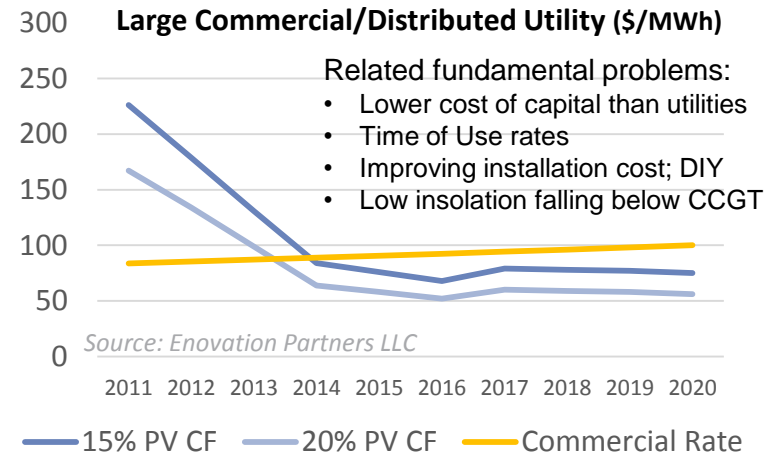
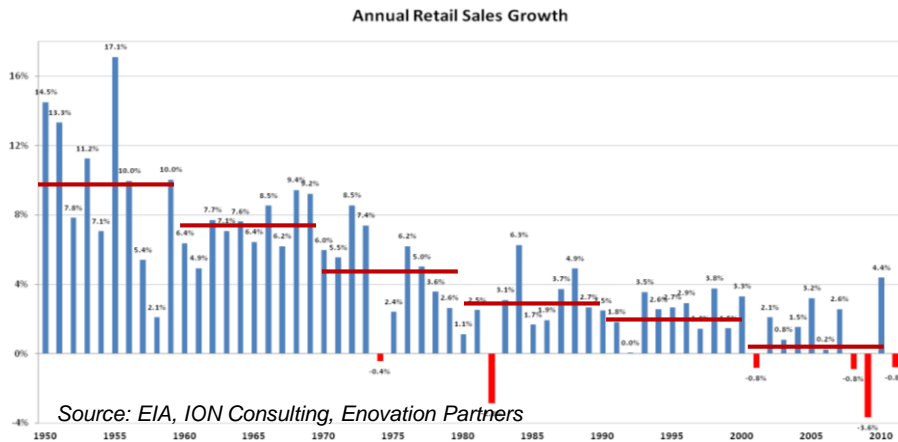
High Horsepower (HHP) Motors

Distributed Generation

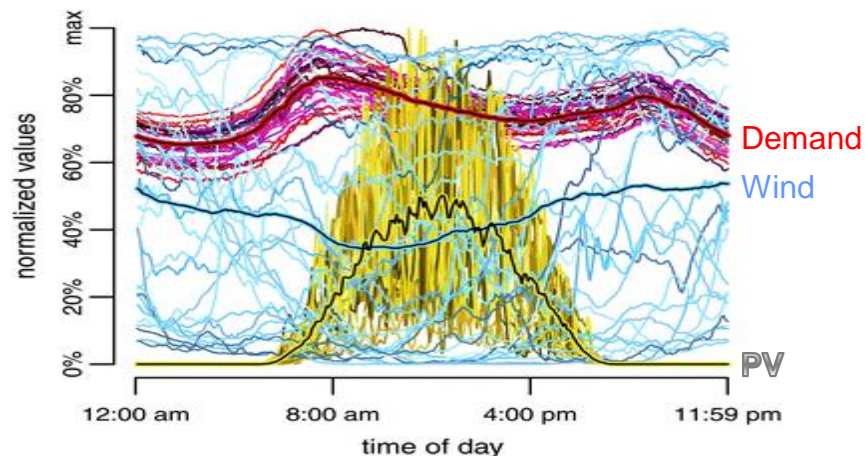
Is natural gas a Bridge Fuel, a Foundation Fuel, or both?

Electric providers face unprecedented complexity

The electric model was predicated on growth... with central generation as the primary source



Investment and innovation were essential to build the centralized, growth model, and will certainly be required in a distributed future of complex and declining demand



The energetic implications of curtailing versus storing solar- and wind-generated electricity
 Global Climate and Energy Project, Stanford University, Stanford, CA, August, 2013
 PRIVILEGED AND CONFIDENTIAL

Some keys to commercialization

1. Clear economic benefit to specific consumers, supported by as much data as possible
2. Understanding customer decision making/ adoption process, timing
3. Recognizing decision influencers and channel partners
4. Integration with overall market trends and policy direction
5. Realistic capital requirements and plans that reflect customer adoption, and other factors such as seasonality
6. Sufficient team experience – employees and extended team
7. Substantial team commitment, ‘real’ advisors where needed
8. Access to data to build and support business model
9. Realistic assessment of current and potential competitors, likely competitive response, and switching cost
10. Having the capital

Utilities can provide substantial support for innovation and investment – with California as one of the most important global markets

- Performance data to develop business models
- Proof of concept – design, testing support
- Funding to close the widening gaps in R&D & development capital
 - Some investors shifting to later stage in many areas as higher returns available with faster
 - Other investors growing more conservative – focus on contracted assets (Utility programs as initial basis for cash flow/ contracts)
- Equity position typically on favorable terms vs. other early stage investors
- Introductions to associations/ groups (AGA, GTI, EEI , EPRI, SEIA/SEPA... and many in-state resources)
- Credibility in discussions with other utilities, customers and channel partners
- Guidance on how, when and where to expand



Energy + Innovation = Results

www.EnovationPartners.com

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Enovation Partners and the new dynamic

- *A time for thoughtful action*

- The foundations of energy and infrastructure markets are changing – supply, demand, regulation, and consumer and investor expectations
- Taken together, the threats and opportunities from shale, renewables, rapidly evolving end use technologies, and shifting regulation offer new strategic paths, as well as everyday operational challenges, including safety, security, customer engagement, and affordability

- *A time for innovation*

Incumbents look to improve performance and find avenues for growth, while change and uncertainty create openings for new business models across increasingly global markets

- *Enovation Partners' founding purpose is to build positive change in this new dynamic*

- More than a dozen highly experienced, creative professionals from top consulting, project development, and research firms joined together to build a new consulting group focused exclusively on energy and infrastructure clients
- With deep experience across all aspects of the industry and global markets and a hands-on working style, Enovation Partners brings quality, insight, speed, flexibility, and value
- And through our partnership with Gas Technology Institute, one of the nation's leading energy research organizations, more than 200 energy scientists are also part of the team

- *We focus on energy, accelerate innovation, and deliver results.* In a word, Enovation.

Our value proposition

- Deep understanding of the full energy complex – from E&P through power generation, delivery, and retail
- Teams consisting entirely of highly experienced energy professionals with proven track records in strategy, operations, new ventures, and regulatory and transaction support
- Practical, collegial, high-intensity working style – focused on value realization, not reports
- Extensive relationships among key strategic players and ability to leverage relationships in utilities, oil and gas, private equity and venture capital to test strategies and accelerate deployment of new technologies
- True technical depth, through partnerships with GTI, as well as information technology, talent management, and regulatory analysis firms, among others
- Full array of relevant modeling capabilities – power, gas, NGLs, petroleum, renewables – with seasoned valuation analysts
- A refreshingly reasonable and flexible fee structure, reflecting our ability to deliver insight and impact faster than traditional firms

Our perspective on utilities and analytics

The relevance of technology is accelerating for utilities. Transformational potential is now apparent. And it is NOT about gathering and storing petabytes of data in expectations of future needs

Technological cost and functionality has matured to the point where it can make a difference...

- Enabling DG, energy efficiency – impacting load growth/shape and role of utilities
- Consumers expectations being reshaped – desire for openness, connectedness, *and* privacy

... if incentives, partners, channels, and regulations are right

- Many new entrants, but utilities, regulators best placed to align disparate resources, standards, etc.

Consumer insight - It has always been about finding the useful data, not about data access per se

- Integrate hyper-detailed usage data into holistic view of customers in order to create value for them and improve efficiency of the enterprise
- Preserve confidentiality while providing value (delivering information, anticipating needs, earning affinity)

Analytics for network operations – Move decision making to where it can be most effective

- Centralized - asset and commodity purchasing; Substation level - outage response, managing intermittency and voltage; Meter level - outage management and interface with energy management, or integration of DER.

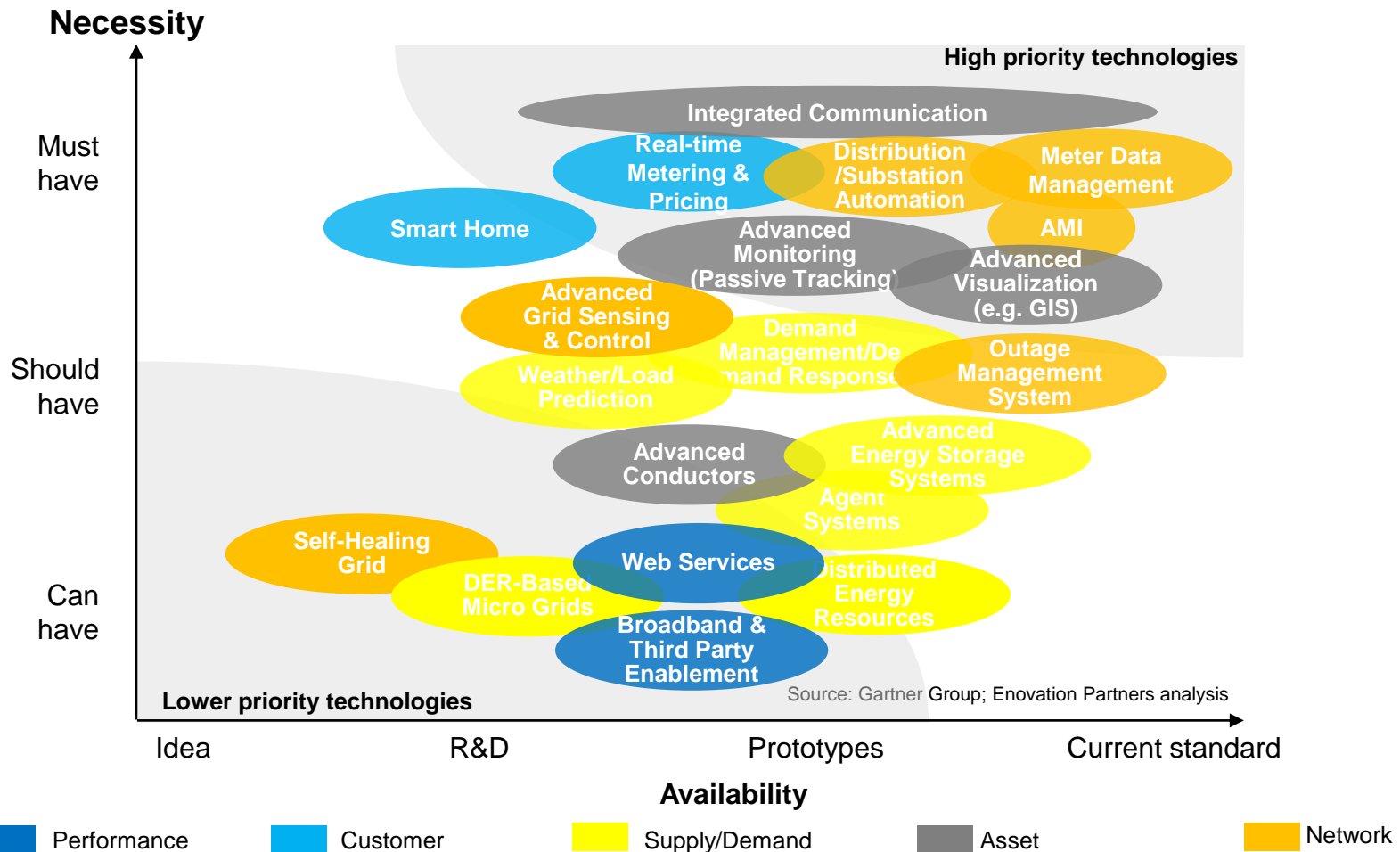
Capability development – One path leads to integration/diffusion of analytics as workforce shifts to millennials, but leading users of analytics are actually moving the opposite direction

- Dedicated, detach groups imagining new applications (e.g. Wall St., consumer, e-commerce, game design)

Diverse array of analytics technologies being explored

Powerful analytics are key components of several clusters of technologies being explored by utilities, including customer insight, smart grid, utility operations, DG integration, etc.

Necessity vs. Availability Analysis



Robert Zabors
Managing Director and Founding Partner

Summary

- 25 years developing corporate, business unit, technology, and market strategies for electric and natural gas utilities, suppliers and investors

Past Experience

- Founder of Bridge Strategy's Energy Practice and consultant with Booz & Co, Renaissance Worldwide and CSC Planmetrics.

Education

- BA Northwestern University; MBA – University of Chicago

**Southern California Gas Company
TRIO Symposium**

**VC Perspective on Emerging Technology:
Utility Programs and the Energy Entrepreneur**

Maurice Gunderson
Energy Resource Center, Downey, June 10, 2014

Introduction.



Maurice E. P. Gunderson, PE

Managing Director, Earth Energy Ventures

- Founder of three Strategic Venture Capital firms:

Runway Capital (Aeronautics and Astronautics) 2012

Radiant Capital (Nuclear Technologies) 2012

Nth Power (Energy) 1992

- Founder and CEO of five companies in aerospace, real estate, and management services
- Member of Board of Directors of Gentherm Inc. (NASDAQ:THRM)
- Investor in over thirty high technology energy companies
- Early engineering career in aerospace and energy sectors
- Registered professional engineer, pilot and aircraft owner since 1975
- MBA, Stanford University
- MS (Thermodynamics), BA (Mechanical Engineering), Oregon State University
- Leadership Fellow, National Association of Corporate Directors
- Fellow, American Society of Mechanical Engineers

Earth Energy Ventures

Agenda.

*Provide a Business Development
and Investor perspective on:*

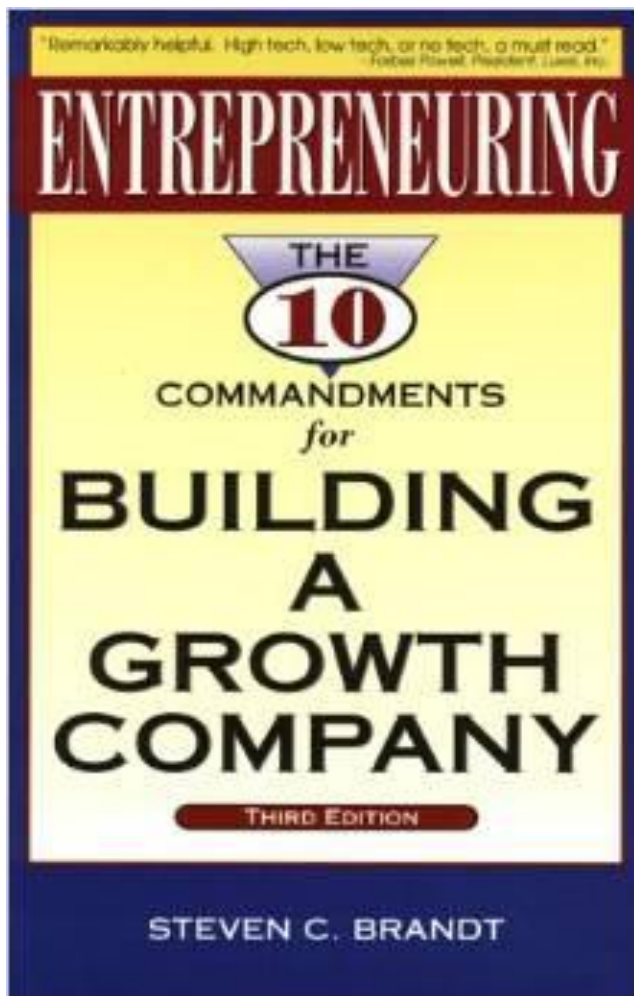
- **The Keys to a Successful Commercialization Plan**
- **The potential benefits that entrepreneurs and start-ups can receive by engaging with utility programs.**

Agenda.

*Provide a Business Development
and Investor perspective on:*

- **The Keys to a Successful Commercialization Plan**
- **The potential benefits that entrepreneurs and start-ups can receive by engaging with utility programs.**

The Keys to a Successful Commercialization Plan



**Earth Energy
Ventures**

The Second Commandment

Define the business of the enterprise in terms of what is to be bought, precisely by whom, and why.

The Fifth Commandment

Employ key people with proven records of success at doing what needs to be done in a manner consistent with the desired value system of the enterprise.

The Pi Theorem of Product Development

$$\$1 : \$\Pi : \$\Pi^2$$

Stage	Cost	Purpose
1	\$1,000,000	Actual cost (not original estimate) of technology development
Π	~ \$3,000,000	Minimum reasonable cost for product development
Π^2	~ \$10,000,000	Minimum reasonable estimate for market development

- Market development is the most expensive, difficult and risky stage.
- Most of us here operate at Stage 1 or Stage Π .
- Profits can come after Stage Π^2 is successfully completed.
 - **Successful Companies Master All Three Stages**

Earth Energy
Ventures

Agenda.

*Provide a Business Development
and Investor perspective on:*

- **The Keys to a Successful Commercialization Plan**
- **The potential benefits that entrepreneurs and start-ups can receive by engaging with utility programs.**

Successful Utility-Entrepreneur Programs



Utility Professional

Risk averse

Concentrates on what's wrong

Plans in months, years, decades

Documents failures

Obligation to serve

Thinks most utility programs succeed

Entrepreneur

Embraces and creates risk

Concentrates on what's possible

Plans in hours, days, weeks

Documents successes

Seeks only most profitable customers

Thinks most utility programs fail

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Ventures

Successful Utility-Entrepreneur Programs



- Take products to utilities only when they are really ready
 - Never forget the Second and Fifth Commandments
 - Maintain control over your pricing and margins
 - Be realistic about timing.
- Embrace the tremendous skills and strengths of the utility, while not allowing them to perform functions to which they are not suited. It's your company and you are the boss.

Thank you.

Maurice Gunderson

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