Technology Resource Innovation Outreach (TRIO)

October 31, 2016

Edwin Hornquist (Your Host and MC)
Emerging Technologies Program Manager

Today's Overview and Opening Remarks

- Safety
- Agenda

Opening Remarks

- Drivers - Policies
- Emerging Technologies Program
- EE Trends and Opportunities

Safety First

- In case of an Emergency
  - CPR Certified
  - 911 Caller
  - Evacuation and Meeting Spot

TRIO - Agenda

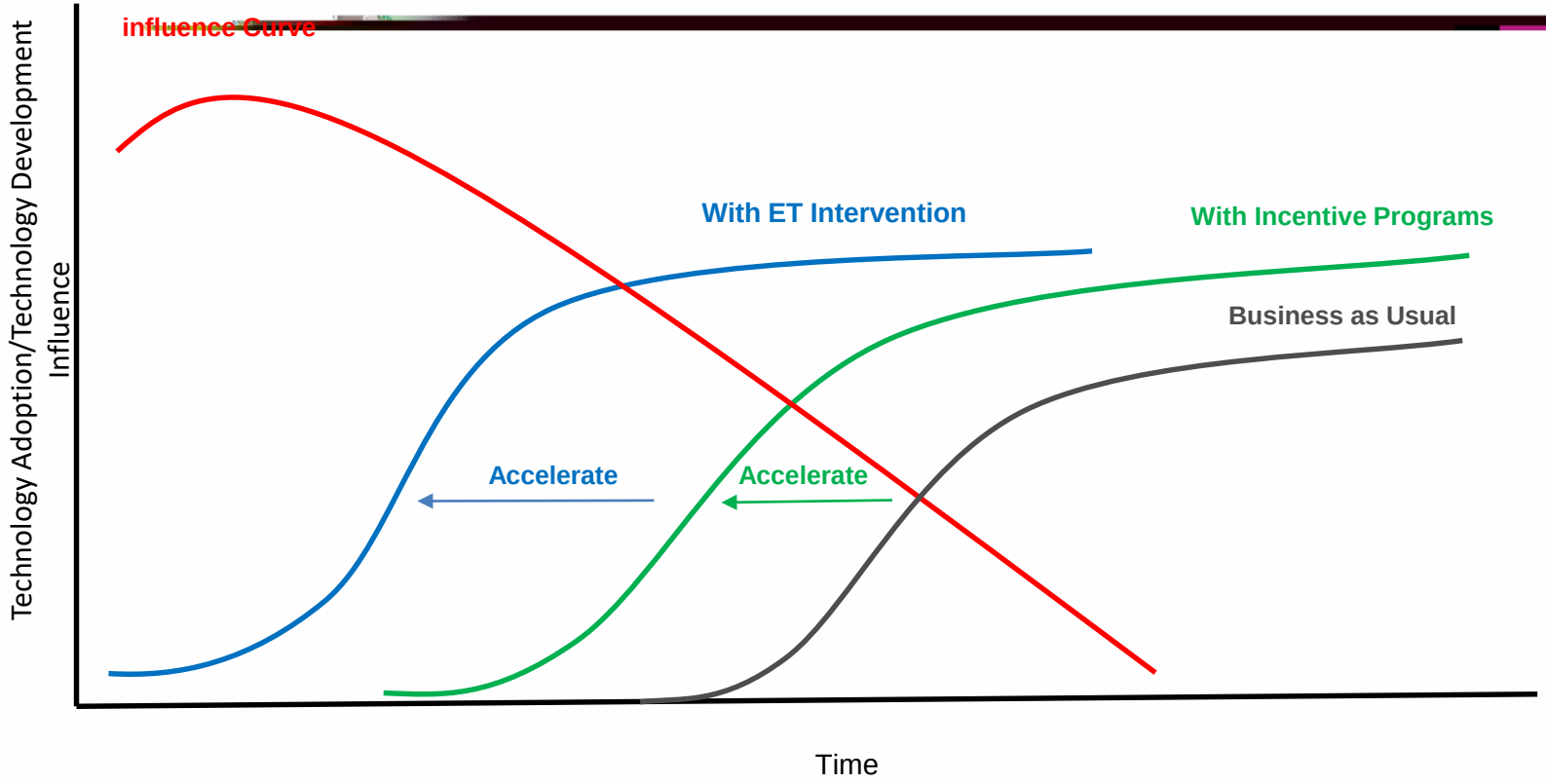
9:30 a.m. – 9:45 a.m.	**Opening Remarks**	**Edwin Hornquist, Emerging Technologies Program Manager, Southern California Edison**
9:45 a.m. – 10:00 a.m.	Idea Intake and SCE Governance	Robyn Zander, Senior Manager, Southern California Edison
10:00 a.m. – 10:45 a.m.	Technology Development Acceleration Panel	Edwin Hornquist (Moderator) Erik Steeb, Chief Programs Officer, LACI Ian Foraker, Executive Director, Cleantech Open Stephanie Yanchinski, Executive Director, Caltech FLoW/Rocket Fund
10:45 a.m. – 11:00 a.m.	Networking Break	
11:00 p.m. – 12:15 p.m.	Entrepreneur/Technologists Panel	Teren Abear, Emerging Products Technical Lead, Southern California Edison Ben Taube, SVP, Evaporcool Solutions Domenico Gelonese, Founder & CEO, Embertech USA LLC Daniel Katz, Market Development Representative, Philips Lighting
12:15 p.m. – 1:30 p.m.	Networking Lunch	
1:30 p.m. – 2:15 p.m.	Engagement Opportunities Outside ET	Janice Wang, Contract Manager, Southern California Edison Adrienne Smith, Manager, Southern California Edison
2:15 p.m.	Closing Remarks	Edwin Hornquist, Southern California Edison
2:30 p.m. – 3:30 p.m.	Topic Focused Mini-Roundtables Process, Innovation Support, ET Strategies, 3rd Party Contracts	Panelists

Drivers and Policy

- AB 32 and SB32 – 2050 GHG reduction targets
- California Long Term Energy Efficiency Strategic Plan
  - ZNE goals, HVAC market transformation, Emerging technologies Integrated Demand Side Management (IDSM)
- AB 758 & the California Energy Commission's (CEC)
  - Existing Buildings EE Action Plan
- SB 350
  - Double the EE savings in electricity and natural gas by 2030
  - Increase the Renewable Portfolio Standard (RPS) to 50% by 2030
- AB 793
  - Promoting Access to Energy Management Technologies
- AB 802
  - Count "to-code" savings for goals and incentives
  - Pay for performance – leverage metered energy consumption
  - Include operational, behavioral, and retrocommissioning savings
  - Increase transportation electrification
- Rolling portfolio and Business Plan Development

Emerging Technologies Program

Technology Influence and Adoption Life Cycle – Conceptual



Emerging Technologies Program

Mission

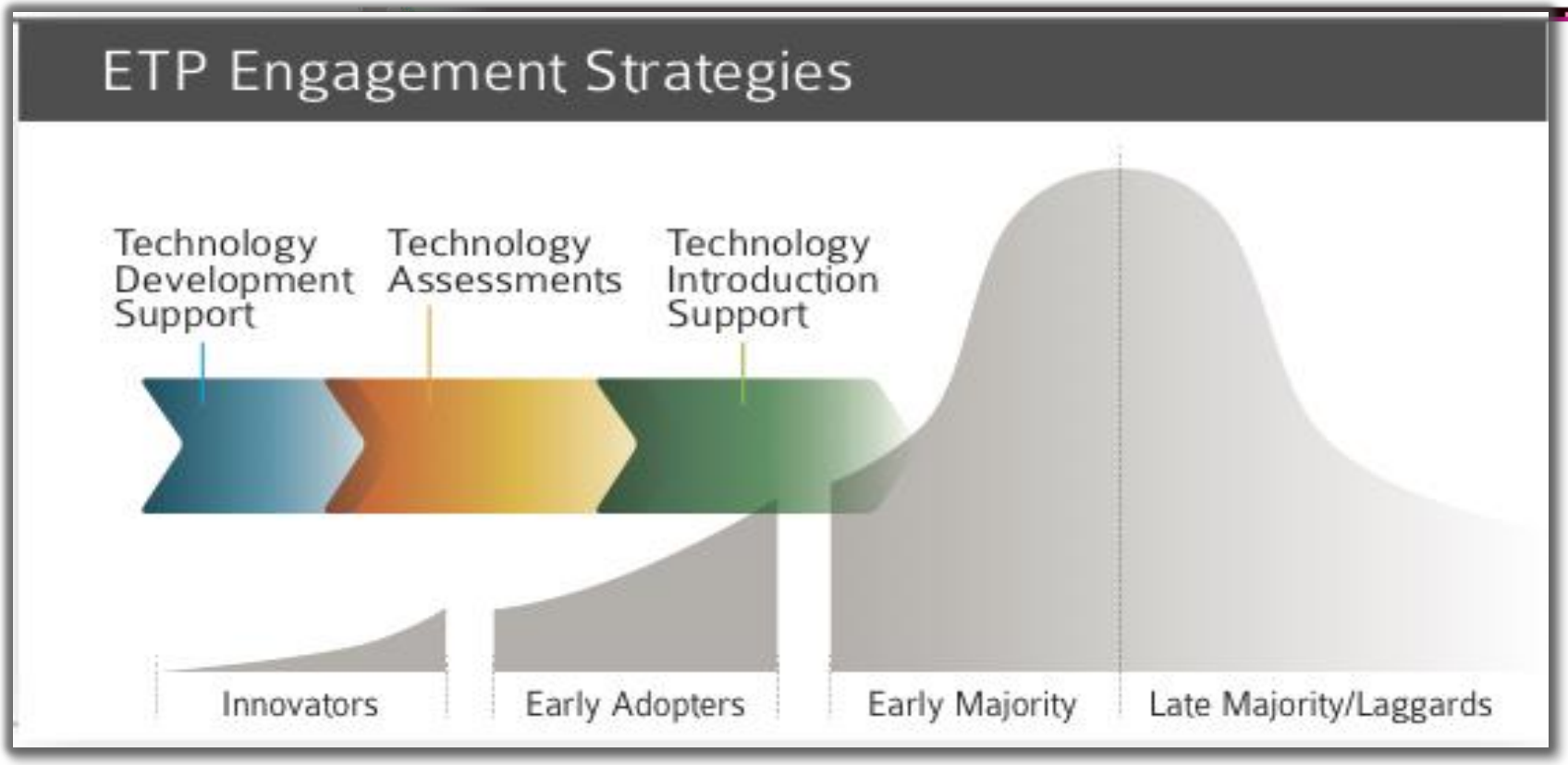
To support increased energy efficiency market demand and technology supply by contributing to development and deployment of new and underutilized energy efficiency (EE) measures (that is, technologies, practices, and tools), and by facilitating their adoption as measures supporting California's aggressive energy and demand savings goals.

What is Emerging Technology?

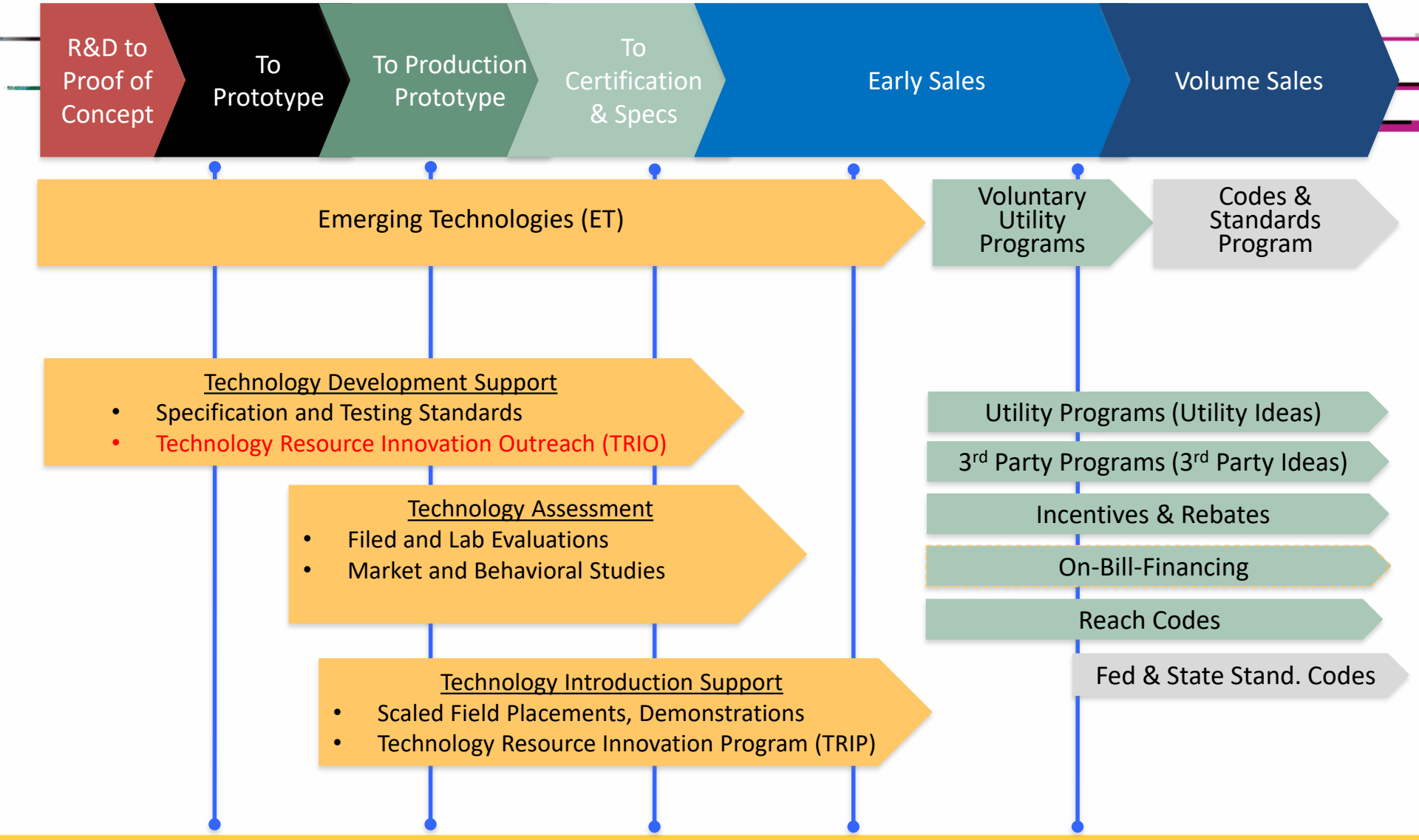
A market-ready or near market-ready technology that needs validation, technical assistance, and/or increased visibility to succeed in the marketplace. ETs include hardware, software, design tools, strategies, and other services.

Emerging Technologies Program

Purpose: ETP supports increased energy efficiency market demand and technology supply by contributing to the development, assessment, and introduction of new and under-utilized EE measures. (i.e., technologies, practices, and tools).



ETP's Place in the Value Chain

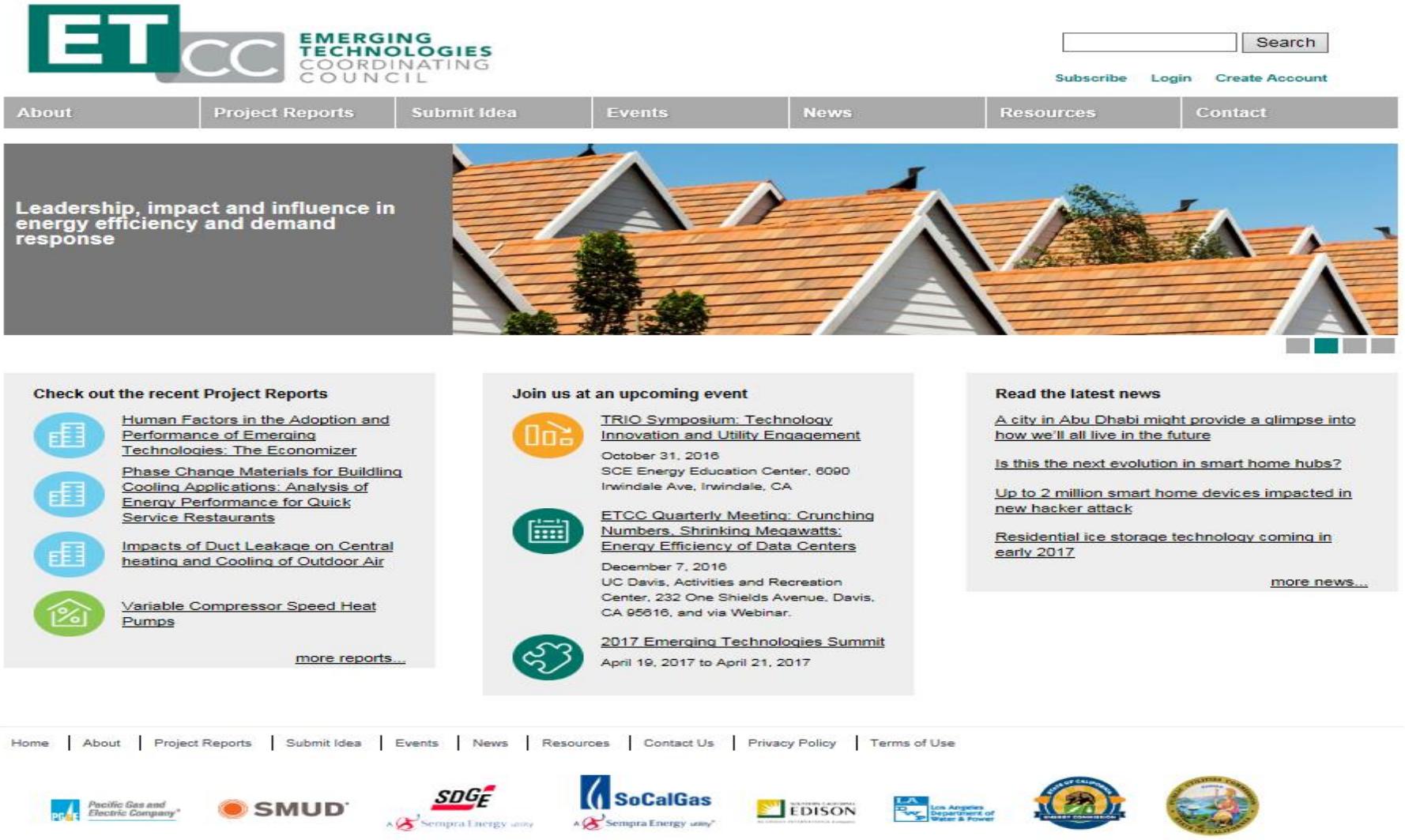


ETP Outreach Forums

- Emerging Technologies Coordinating Council (ETCC) Quarterly Meetings (2 SoCal and 2 NoCal)
  - Customer segment focused public outreach events to highlight innovation
- Annual (Technology Resource Innovation Outreach) TRIO Symposium/Roundtable, and TRIP solicitation
  - Outreach to 3rd parties on how to do business with IOUs
  - Submit new innovation ideas that are ready for self-implemented 3rd Party via TRIP
- ET Open Forums
  - Outreach to early stage companies collaborating with U.S. Department Of Energy's (DOE) First Looks West (FLoW)
  - Early market availability companies pitch session
- ETCC Annual Advisory Council Meeting
  - Council made up of 14 representatives from academia, national labs, Electric Power Research Institute (EPRI), IOUs from across the country, other research entities
- ET Summit (Every two years – Next April 19-21, 2017 Ontario CA)
  - ~500 participant event featuring 30+ panels and roundtables, keynotes, etc.

ET Dissemination Efforts

Emerging Technologies Coordinating Council (ETCC) - WWW.ETCC-CA.COM



EE Trends

Widgets to Systems

- Reduced incremental savings from newer widget technologies
  - Low hanging fruit no longer available
- Value proposition of newer widget harder to make
  - Cost effectiveness and lower avoided cost

Integrated Approach

- Beyond just EE
  - Demand Response (DR), Distributed Generation (DG), etc.
- Provide greater value to the customer but higher capital cost

Data Analytics

- Leverage "Big Data" and meter based performance approaches
- Behavioral & operational improvements
- Non-energy benefits – e.g. locational value, GHG

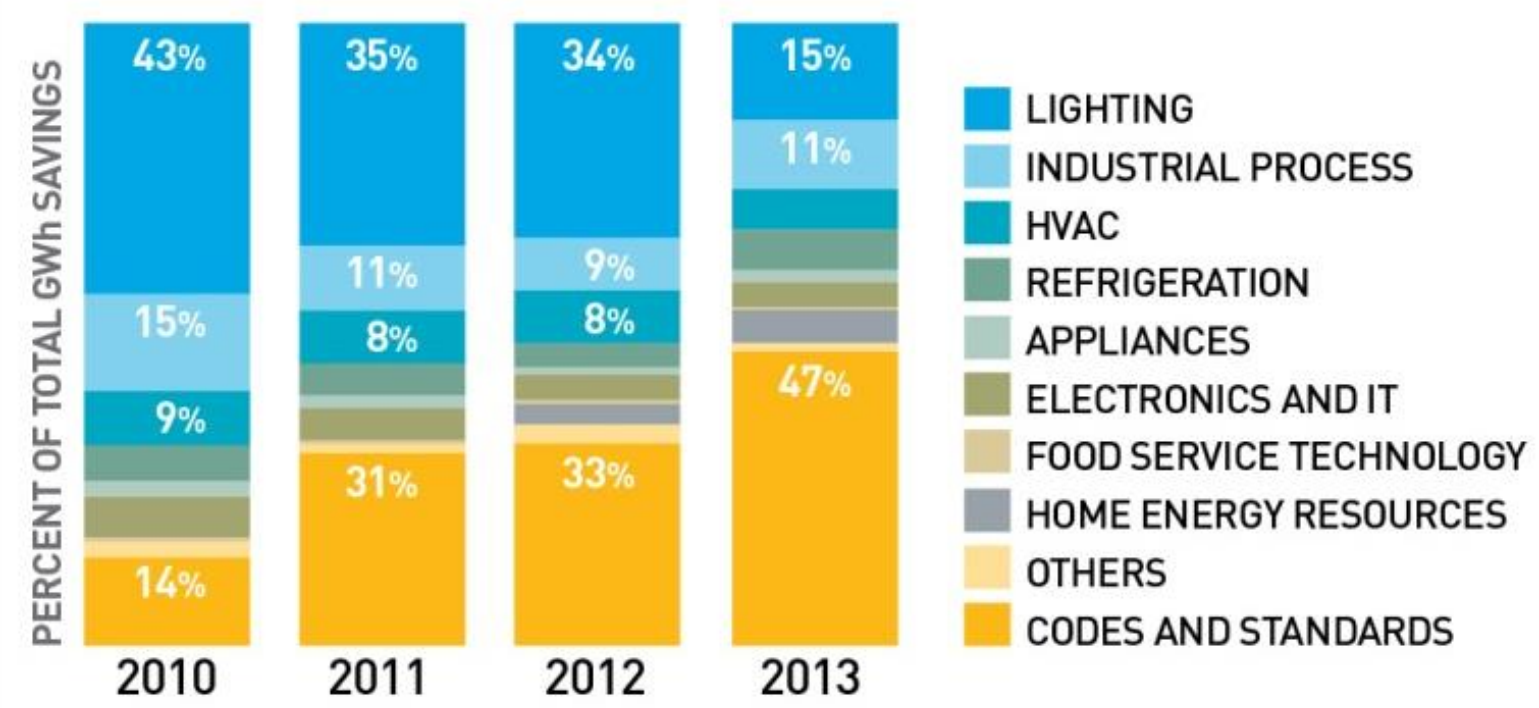
Product Life Cycles

- Shorted Product Development Cycles
  - Advanced manufacturing
  - IoT can enable other value streams and allows remote updates/diagnostics
  - Software driven solutions easier to deploy

Shift in EE Savings

Implementing Newer Codes & Standards Reduces Marginal Savings

EE Savings by Technology End Use Over Time



- New Codes & Standards provide more total savings than previous ones, but also reduce the incremental savings of new potential EE technologies

Source: Utility EE Portfolios

Shift in Avoided Energy Cost ($/kWh)

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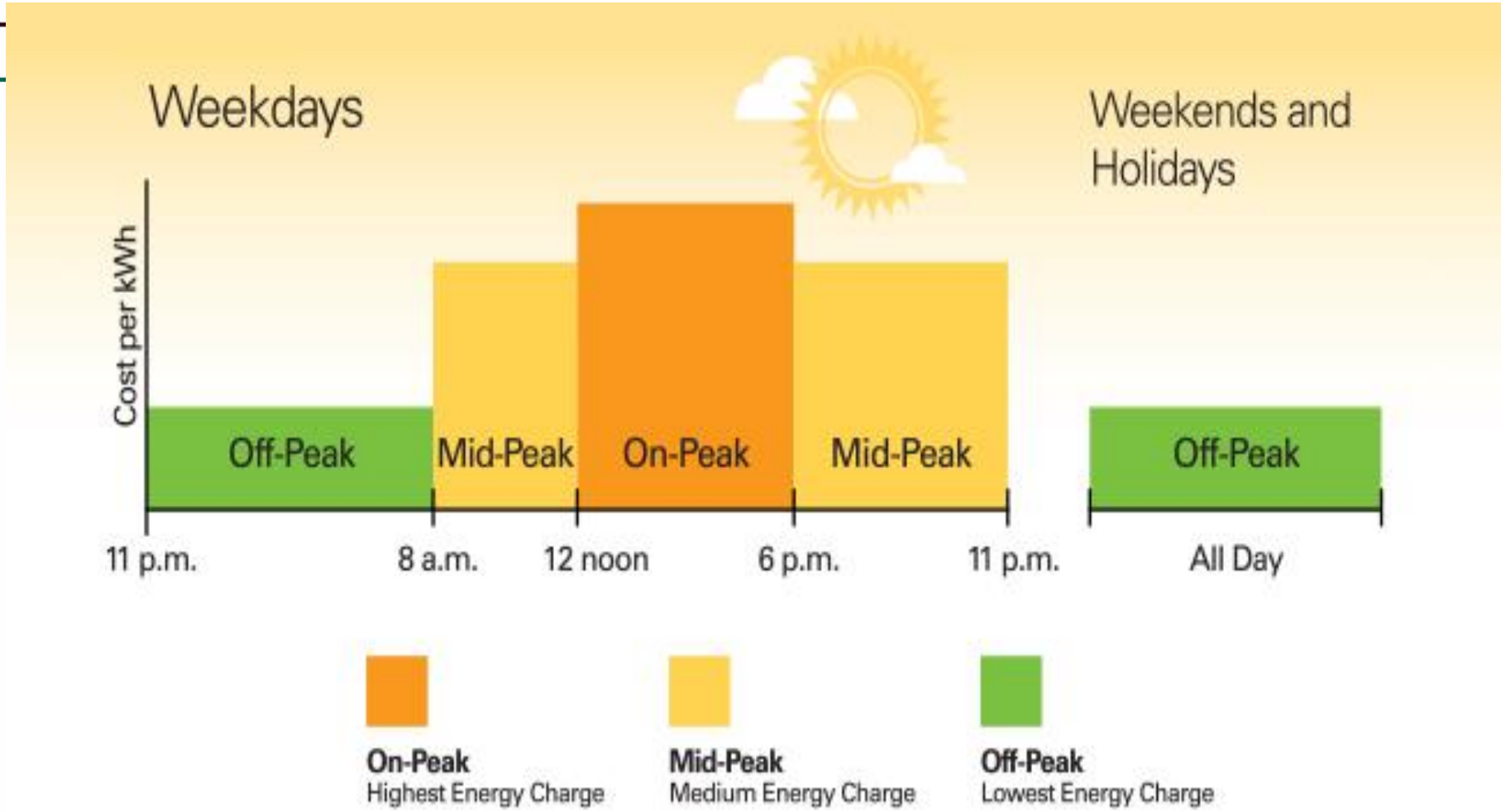
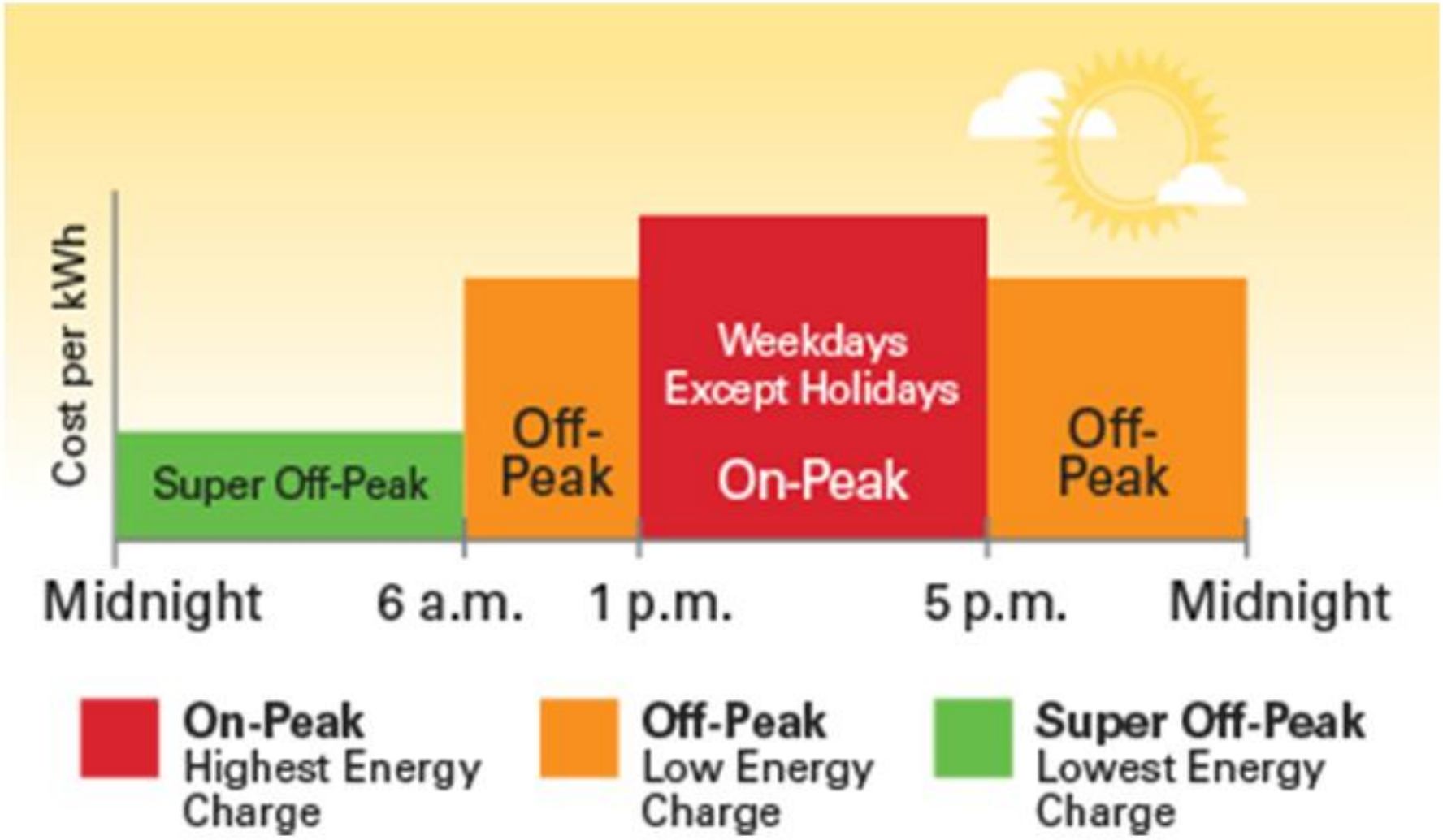
Weekdays

Columns: Hour Ending (PPT) / Rows: Months	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
January	0.049	0.048	0.047	0.047	0.048	0.050	0.058	0.062	0.049	0.046	0.045	0.044	0.041	0.042	0.043	0.046	0.057	0.081	0.077	0.071	0.063	0.060	0.055	0.051	0.053
February	0.048	0.047	0.047	0.047	0.048	0.050	0.059	0.053	0.047	0.044	0.043	0.043	0.042	0.042	0.043	0.044	0.049	0.067	0.076	0.073	0.065	0.060	0.054	0.050	0.052
March	0.047	0.046	0.046	0.046	0.046	0.047	0.052	0.049	0.045	0.040	0.037	0.032	0.027	0.030	0.038	0.040	0.042	0.050	0.062	0.079	0.069	0.061	0.056	0.049	0.047
April	0.046	0.044	0.044	0.044	0.045	0.047	0.051	0.044	0.040	0.035	0.032	0.030	0.028	0.029	0.036	0.038	0.040	0.044	0.050	0.069	0.071	0.058	0.052	0.047	0.044
May	0.046	0.045	0.044	0.044	0.045	0.047	0.047	0.043	0.039	0.037	0.037	0.037	0.036	0.037	0.038	0.040	0.041	0.045	0.047	0.063	0.071	0.062	0.054	0.048	0.046
June	0.047	0.045	0.045	0.045	0.046	0.047	0.046	0.042	0.039	0.038	0.038	0.039	0.038	0.039	0.040	0.042	0.044	0.050	0.048	0.065	0.074	0.070	0.057	0.049	0.047
July	0.049	0.046	0.045	0.045	0.045	0.047	0.046	0.043	0.040	0.041	0.042	0.044	0.046	0.049	0.053	0.056	0.060	0.073	0.059	0.096	0.079	0.070	0.060	0.053	0.054
August	0.049	0.047	0.046	0.046	0.046	0.048	0.050	0.045	0.043	0.042	0.042	0.043	0.044	0.046	0.049	0.053	0.060	0.074	0.065	0.092	0.080	0.067	0.059	0.053	0.054
September	0.049	0.047	0.046	0.046	0.046	0.049	0.055	0.049	0.044	0.042	0.042	0.042	0.043	0.045	0.048	0.050	0.057	0.073	0.090	0.106	0.074	0.062	0.057	0.051	0.055
October	0.048	0.047	0.046	0.046	0.046	0.048	0.054	0.054	0.045	0.042	0.041	0.041	0.042	0.043	0.045	0.046	0.048	0.062	0.073	0.079	0.067	0.060	0.056	0.050	0.051
November	0.049	0.047	0.047	0.047	0.047	0.049	0.055	0.050	0.046	0.044	0.044	0.043	0.043	0.044	0.045	0.048	0.061	0.089	0.076	0.068	0.063	0.059	0.054	0.050	0.053
December	0.050	0.048	0.048	0.048	0.048	0.050	0.057	0.057	0.049	0.047	0.046	0.046	0.045	0.045	0.046	0.048	0.060	0.084	0.077	0.073	0.066	0.062	0.059	0.052	0.055
Hourly Average	0.048	0.046	0.046	0.046	0.046	0.048	0.053	0.049	0.044	0.041	0.041	0.040	0.040	0.041	0.044	0.046	0.052	0.066	0.067	0.078	0.070	0.063	0.056	0.050	

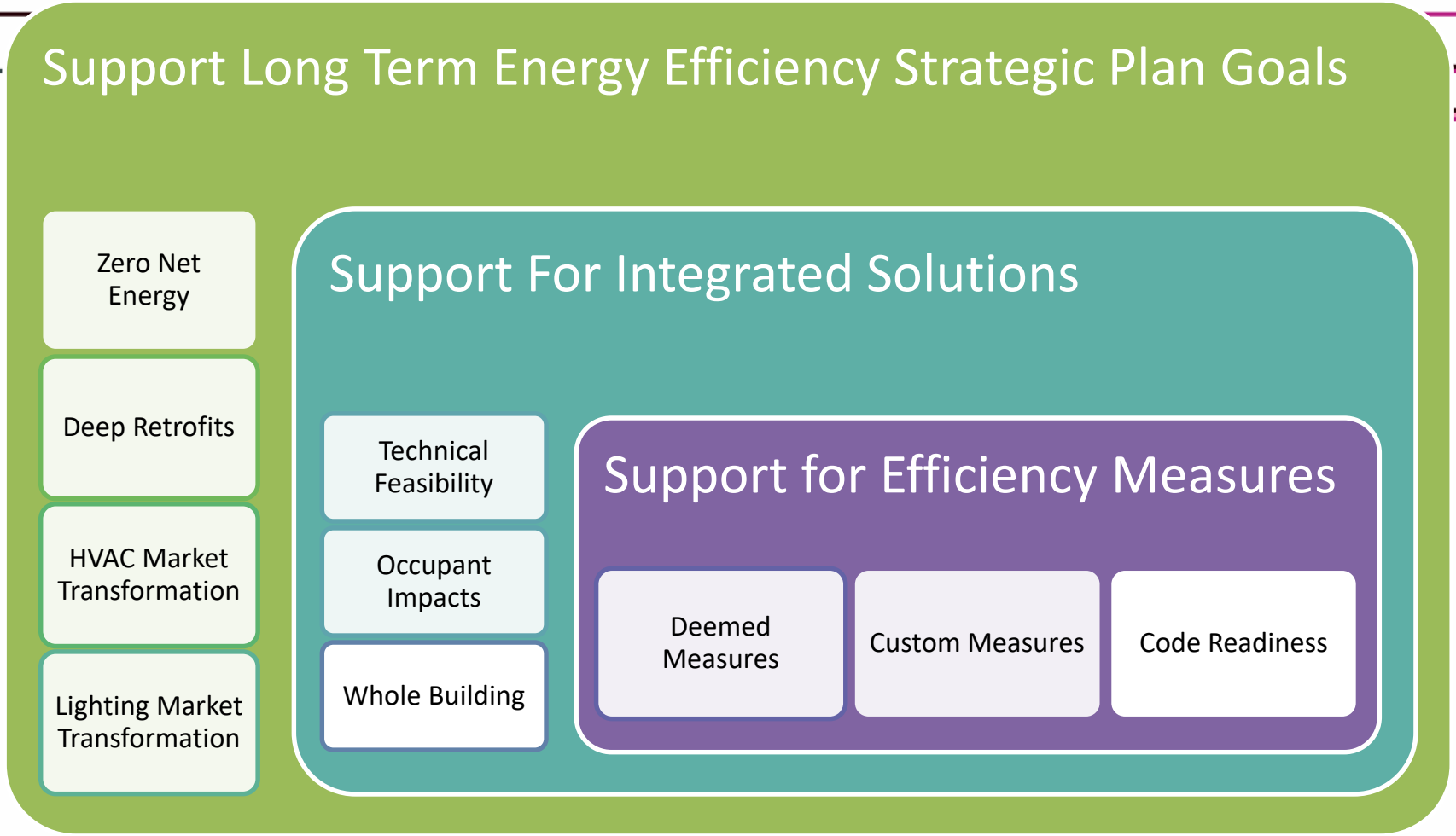
Traditional Time of Use Hours
(2016)



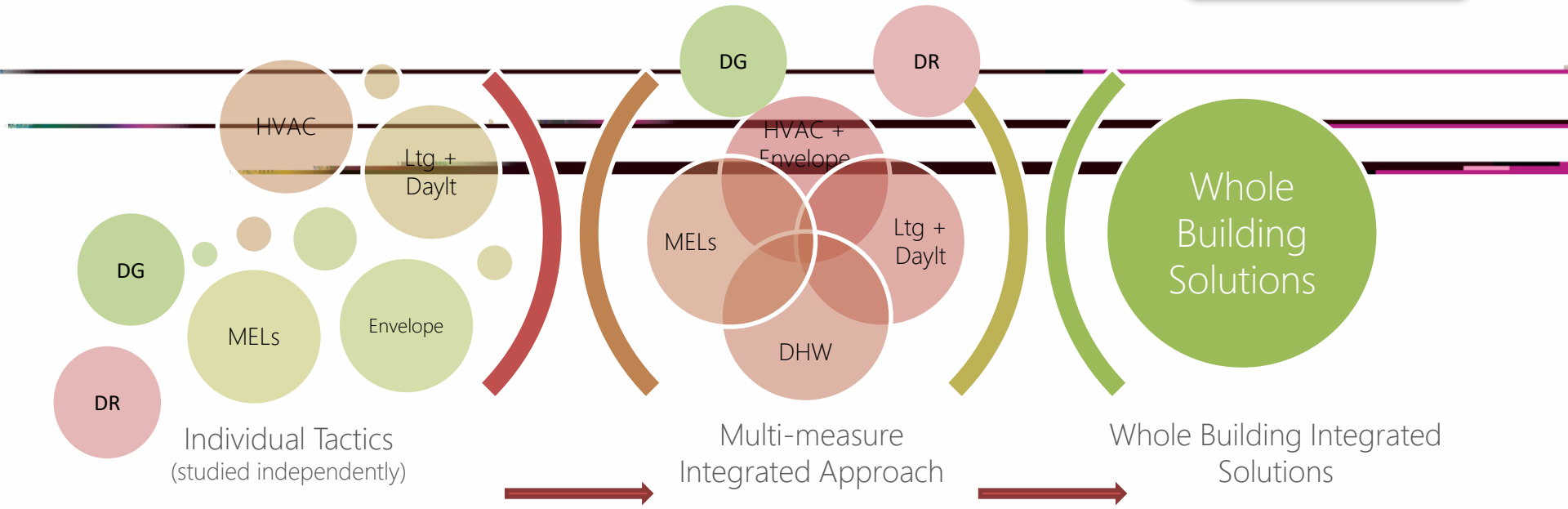
New Time of Use Hours
(October 2018)



ETP Vision for Integrated Priorities



ETP's Vision for Higher Impact



The principle behind integrated solutions is to find an optimal balance of measures that target:

- Optimal reduction of energy use across all energy end uses in the building
- Reduce peak demand impacts
- Simplify building energy management through better integration of systems
- Minimize incremental costs for incorporating EE, DR, DG – heading towards the ZNE Goals
- Incorporate Non-energy benefits – operational, productivity, environmental improvements
  - e.g. Enhanced occupant comfort

Challenges and Opportunities

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Technical

- Evaluate whole building solutions (and integrated measures)
- Drive towards interoperability of systems
- Quantifying non-energy benefits? (i.e. GHG, water, locational value, etc.)
- Integrating behavior and M&V into solutions

Market

- What is the best way to address market gaps without increasing complexity
- Cost effectiveness for integrated measures/solutions to help adoption in light of rapidly changing technology and business models
- Evaluating the potential for integrated solutions with limited market data

Policy

- Evolving policies for performance based measures and behavioral interventions
- Digital and data security challenges
- Cost-effectiveness increasingly a challenge
- Movement towards DSM procurement models and away from traditional programs

Questions ?

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ET Summit – April 2017

Go to www.ETCC-CA.COM or www.ETSummit.com to register

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