Appendix J

ETP Accomplishments

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ETP's efforts touch nearly every technological advance that has been incorporated into program offerings over the past decade. ETP staff have served as in-house subject matter experts, giving utilities the ability to do everything from rapidly gauging whether a new technology may be a game-changer and warrants further assessment, to coordinating and funding large-scale strategic collaborations with outside organizations in order to transform the market. Over the last decade, ETP has claimed several notable achievements, including the following:

AutoDR and OpenADR: ETP contributed to the development of AutoDR beginning in 2005, partnering with Lawrence Berkeley National Laboratories. This resulted in the development of customer incentives for OpenADR-compliant technologies across the three electric IOUs, and eventual adoption of OpenADR 2.0 as an international Publicly Available Specification by the International Electrical Committee (IEC) in February of 2014.[1]

LEDs: ETP conducted one of the first US-based assessments of LED-based streetlights in 2007, the results of which were used by manufacturers to develop the next generation product line that was 34% less expensive and 25% more efficient than before. Within PG&E's territory, this has resulted in 27.8 MWh of savings since 2010. ETP projects have also advanced LED use in applications such as retail lighting and refrigerator displays, showing that use of LEDs can achieve 67% overall energy savings.[2]

Workforce, Education, and Training: ETP has provided critical support in developing the California Advanced Lighting Controls Training Program (CALCTP), which in 2013 was incorporated in the Title 24 Building Code as a requirement for State Certified General Electricians. This training inspired the National ALCTP, in which ETP involvement continues to this day.

West Coast Utility Lighting Team (WCULT): In 2007, ETP, together with Sacramento Municipal Utility District, founded a forum for collaborations to accelerate the adoption of advanced lighting technologies. This team has grown to include Bonneville Power Administration, BC Hydro, the California Institute for Energy and the Environment, UC Davis's California Lighting Technology Center, Pacific Northwest National Laboratory, and the Design Lights Consortium (DLC)[3]. This team addresses both program acceleration of market uptake as

[1] The Power of Ten: A Decade of Growth for Emerging Technologies Programs in California, Proceedings of the 2014 ACEEE Summer Study on Energy Efficiency in Buildings.
[2] Ibid.
[3] Ibid.

well as testing of innovations that will drive the next generation of advanced lighting technologies.

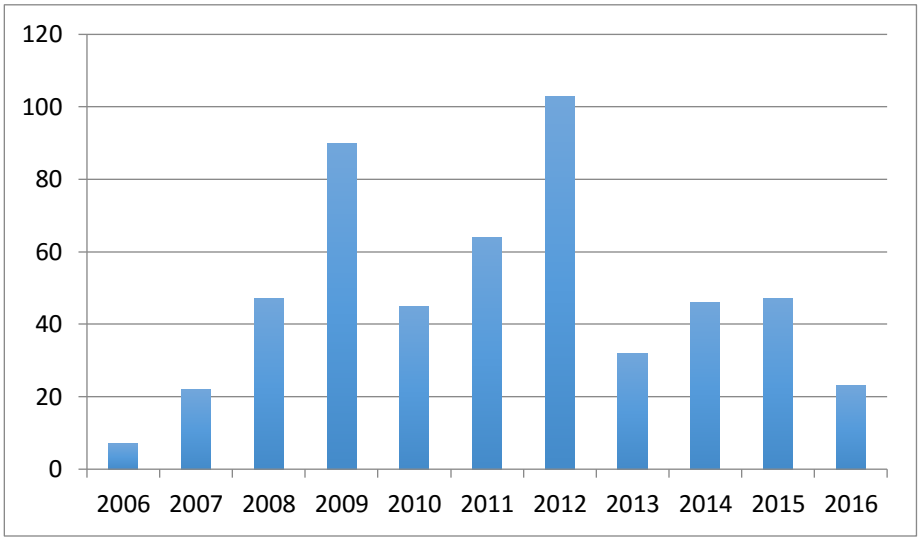
Western HVAC Performance Alliance: ETP helped form a regional advisory group whose objective is to support the goals in the California Energy Efficiency Strategic Plan. In collaboration with the Alliance, ETP developed a new Fault Detection and Diagnostic (FDD) laboratory test method to help quantify savings from residential split systems and commercial packaged units. These efforts have led to ongoing efforts and successes in adoption of the FDD test method within codes at the state and national level[4]. By developing the FDD test method, ETP and the FDD committee have provided the industry with a common methodology by which technological advances in FDD can be quantified.

ETP Published Reports (Gas and Electric)

Since 2006, over 500 ETP project reports have been completed and published[5] for use by program administrators and other EE professionals across California as well as the US.[6] Figure 1 illustrates the uncertain timing of research results: Although ETP can control the rate at which projects are initiated, it cannot control the rate at which projects are completed, particularly for in situ studies that may face challenges from the field. Since 2006, ETP has completed between 7 and 103 projects per year.[7] This large volume of reports actually underrepresents ETP's efforts because they only represent those projects that result in verification of savings. Furthermore, some of the studies have found the tested measures did not have sufficient savings, has practical flaws, or has to be kept confidential for various reasons, and would not be promoted to the next stage gate process.

[4] Ibid.
[5] Reports are available at http://etcc-ca.com
[6] PY2013-2014 Emerging Technologies Program Targeted Effectiveness Study Report, Opinion Dynamics, 2015, Calmac ID # CPU0112.01.
[7] ETP program tracking data.

Figure 1. ETP Project Completions by Year (2006-2016)



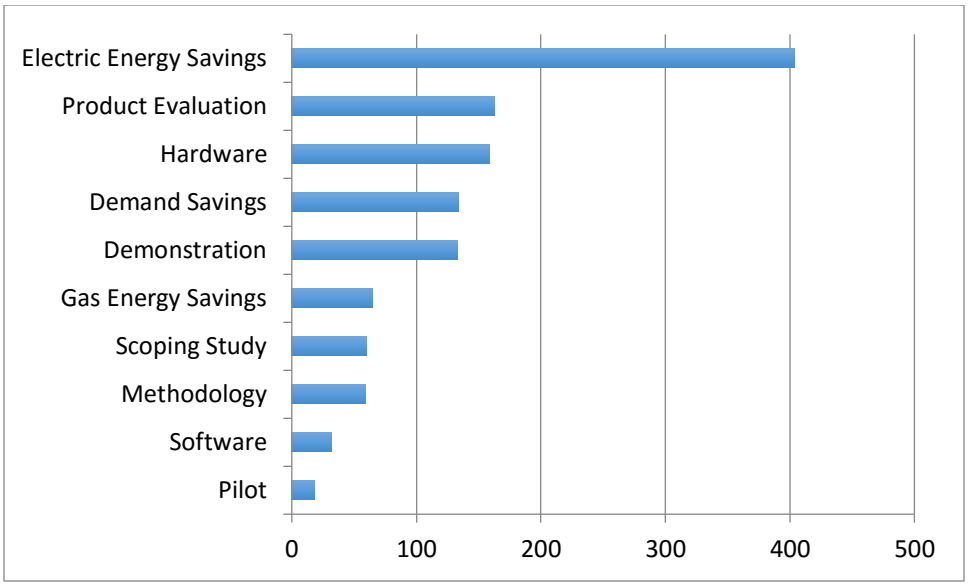
Over the years, ETP has addressed a comprehensive range of EE technologies. Table 1 shows the technology types addressed by ETP reports from 2006-2016, while Figure 2 shows the types of projects ETP has conducted.

Table 1. Types of Emerging Technologies 2006-2016[8]

Lighting-Commercial	119	Design Tools	11
Demand Response	98	Refrigeration-Industrial	11
HVAC-Commercial	81	Distributed Generation	10
Building Controls	67	Heat Recovery	8
Daylighting-Commercial	47	Refrigeration-Commercial	8
Energy Conservation	45	Water Pumping	7
HVAC-Residential	40	Compressed Air Systems	6
Commercial Cooking	31	Swimming Pool Pumps-Residential	6
Building Envelope	29	Drycleaning Technologies	5
Electronics & Process Controls	26	Wastewater Treatment	5
Evaporative Cooling	23	Motors-small	4
Lighting-Residential	23	Dessicant Systems	3
industrial-processes-other	19	Motors-Industrial	3
Hot Water-Commercial	17	Optical Sensors	3
Hot Water-Residential	17	Steam Boilers	3
Integrated Design Process	17	Other	16
Daylighting-Residential	11		

[8] Note that more than one technology may be addressed within an ETP project. Similarly, each ET project report may address more than one project type.

Table 2. ETP Project Types (2006-2016)



Energy Savings from ETs

Although energy savings from ET measures are not under ETP's control, Energy Division has conducted estimates of energy savings from emerging technologies transferred into the EE portfolio for the 2006-2008 cycle and the 2013-2014 cycle.

For the 2006-2008 cycle, only PG&E and SCE electric savings were estimated. PG&E's transferred ETP technologies had generated approximately 59 GWh of ex ante expected first year gross savings[9], constituting 2.08% of PG&E's 2006-2008 savings goals of 2826 GWh[10]. SCE's transferred ETP technologies had generated approximately 196 GWh of ex ante expected first year gross savings, constituting 6.25% of SCE's 2006-2008 savings goals of 3135 GWh.

For the 2013-2014 period, across all electric utilities, emerging technologies transferred into the EE portfolio provided 94 GWh of savings, constituting 1.7% of EE first-year gross savings claims of 5648 GWh. This represents the low end of savings, due to evaluators not being able to successfully match ET measure codes in the savings database. These types of estimates also under-report first-year savings due to the fact that the measure development process takes time,

[9] Evaluation of the California Statewide Emerging Technologies Program, Summit Blue, 2010. Calmac ID# CPU0031.01, p. E-5.
[10] California Energy Efficiency Potential Study, Itron & Kema (May 12, 2008), p. ES-7.

so ETs that were more recently recommended may not have been fully deployed at the time of these estimates.

Achievements and Savings from Gas ETs

Since 2009, SoCalGas' ET has completed or engaged over 100 various technology scans, assessments, laboratory tests, and scaled field demonstrations. Five technologies are currently in the final workpaper stage of the new measure development pipeline, including (but not limited to) a combination service boiler dual-set point controller for multifamily housing, a hot water variable speed circulator controller for multifamily housing and commercial applicants, and advanced thermostats.

SoCalGas ET also identified several technologies/products that were inappropriate for deemed measure consideration due to less than promised performance, inappropriate applications, safety concerns, or insufficient energy savings. Wherever possible, SoCalGas' ET provided feedback to manufacturers to help improve their products, with several technology developers expressing appreciation for the collaboration.

SoCalGas ET has also looked for opportunities to effect market transformation. For example, a scaled field demonstration of a new EnergyStar®) deep fryer product at 17 different restaurants located throughout Southern California revealed that average operational and maintenance savings was approximately three times that of the already notable natural gas savings. SoCalGas' ET provided these results to its Food Service group, who in 2014-15 offered the fryer rebate program and outreach efforts that influenced a threefold increase in fryer adoption compared to 2013. Interest by restaurants in the product has continued to grow.

Finally, SoCalGas ET has successfully leveraged its resources to participate in larger, more complex (and costly) projects to advance ZNE goals. SoCalGas has participated actively in applicable CEC PIER and EPIC solicitations and has partnered with respected lead investigators such as GTI, EPRI, LINC, Dettson, and Energx in near-ZNE demonstrations for multifamily and low-income housing communities. One such example is the commercial, near-ZNE demonstration at the community center at Playa Vista, which showcases an ultra-clean gas CHP integrated with solar PV and other technologies to serve a LEED Platinum building, contributing to a significant reduction in TDV and total air emissions. This project was awarded the ESC TMAF 2015 innovation award.