

Southern California Edison's Demand Response Emerging Markets & Technology Program: Investment Overview 2017–2019

Executive Summary

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Prepared by



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Produced by Homecourt Partners in collaboration with Mapleton & Sloan and The Bridge Studio.



Executive Summary

Overview

This report provides a detailed account of the advanced research activities of the Southern California Edison (SCE) Emerging Markets and Technology (EM&T) program from 2017 through 2019. This comprehensive overview of the program identifies the value and purposes of the program investments and the EM&T initiatives' roles in demand response (DR) innovation. The report concludes with recommendations about how the EM&T program can continue to build on its accomplishments in DR innovation to serve California's future energy needs.

Methodology

The Homecourt Partners Team synthesized data from many sources to capture EM&T's recent progress and accomplishments. These included regulatory filings outlining EM&T's plans, CPUC decisions about the DR portfolio, project initiation documents, progress reports, final reports, databases, presentations, and interviews with key EM&T team members. Together, this information helped create a comprehensive view of the EM&T program's activities from 2017 through 2019 and provided the basis for the key recommendations in this report.

Key Recommendations

Homecourt Partners developed the following recommendations to position EM&T for further innovative impact in the next three years:










- Continue to build on internal and external progress.
- Further integrate findings into development of SCE's DR offerings.
- Increase staffing to support EM&T.
- Request additional funding for the EM&T program during the 2020 mid-cycle review.

Page ES-8 provides additional information about how EM&T can integrate these changes to continue to advance DR-enabling technologies and markets.

EM&T's Role in DR Innovation

The EM&T Program serves as a platform for innovation. SCE engages with DR market actors to promote the development and adoption of emerging DR-enabling technologies. EM&T funding offers utility resources and expertise to develop emerging DR-enabling technologies, to understand the markets for them, to enable their market deployment, and to provide strategic advocacy for their effective market development. These key activities will identify opportunities to transfer them into effective measures for customers in new models of DR.

EM&T identifies opportunities for effective DR measures for SCE's customers by engaging in increasingly collaborative research activities with more nimble partners and leveraging other funding sources.

PURPOSE OF EM&T	EM&T STRATEGIES	EM&T INVESTMENT CATEGORIES
 <p>To enable CUSTOMERS to participate with the UTILITY to enhance the GRID'S RELIABILITY in support of California's CLEAN ENERGY FUTURE</p>	 Facilitating, creating and assessing a pipeline of DR-enabling behind-the-meter (BTM) technologies  Facilitating market development  Leveraging other research activities throughout the U.S. and California	 Intake & Curate  Technology Assessments  Market Assessments  Technology Transfer  Strategic Advocacy

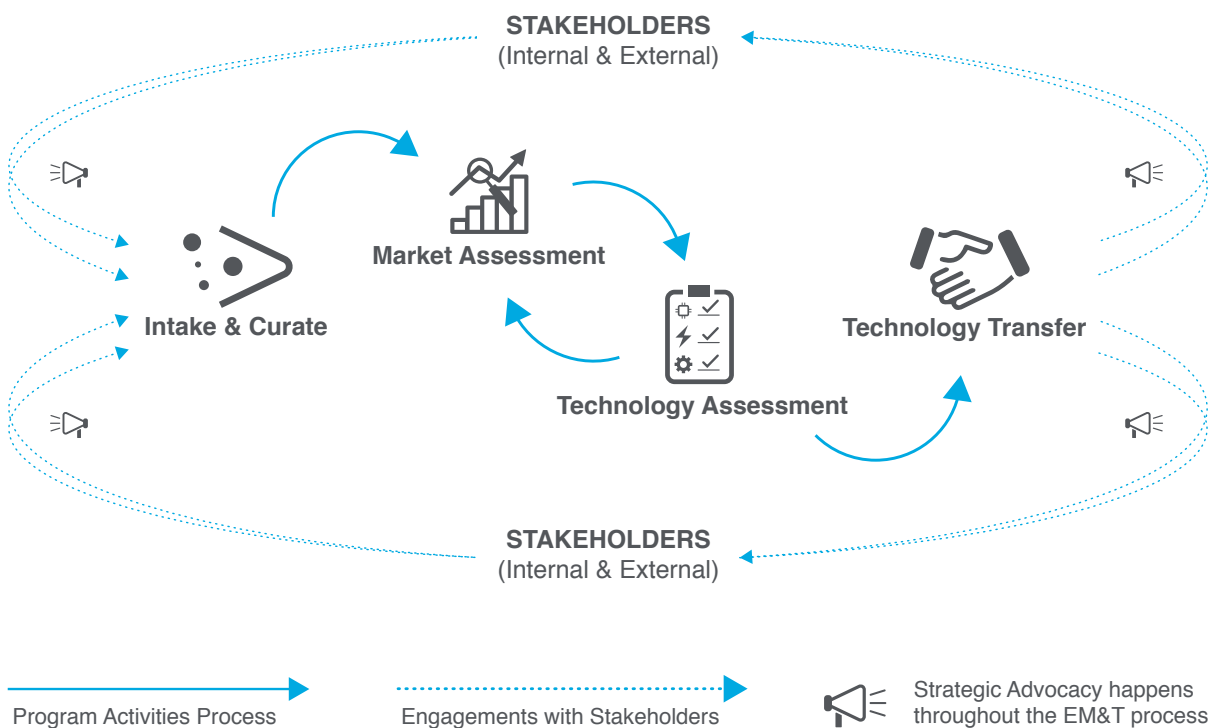
EM&T's Approach Builds on Previous Progress

EM&T takes a dynamic approach to its search for DR emerging technologies and innovative market solutions. SCE staff that support the program engage with internal stakeholders and external ecosystems of clean tech developers in a two-way exchange of ideas, insights, resources, and capabilities to leverage EM&T's ratepayer funds with industry investments.

EM&T's core activities are cyclical in nature rather than linear, driving continuous improvement and advances in technology innovation.

FIGURE 1

EM&T Key Activities



Source: Homecourt Partners Team analysis, 2020

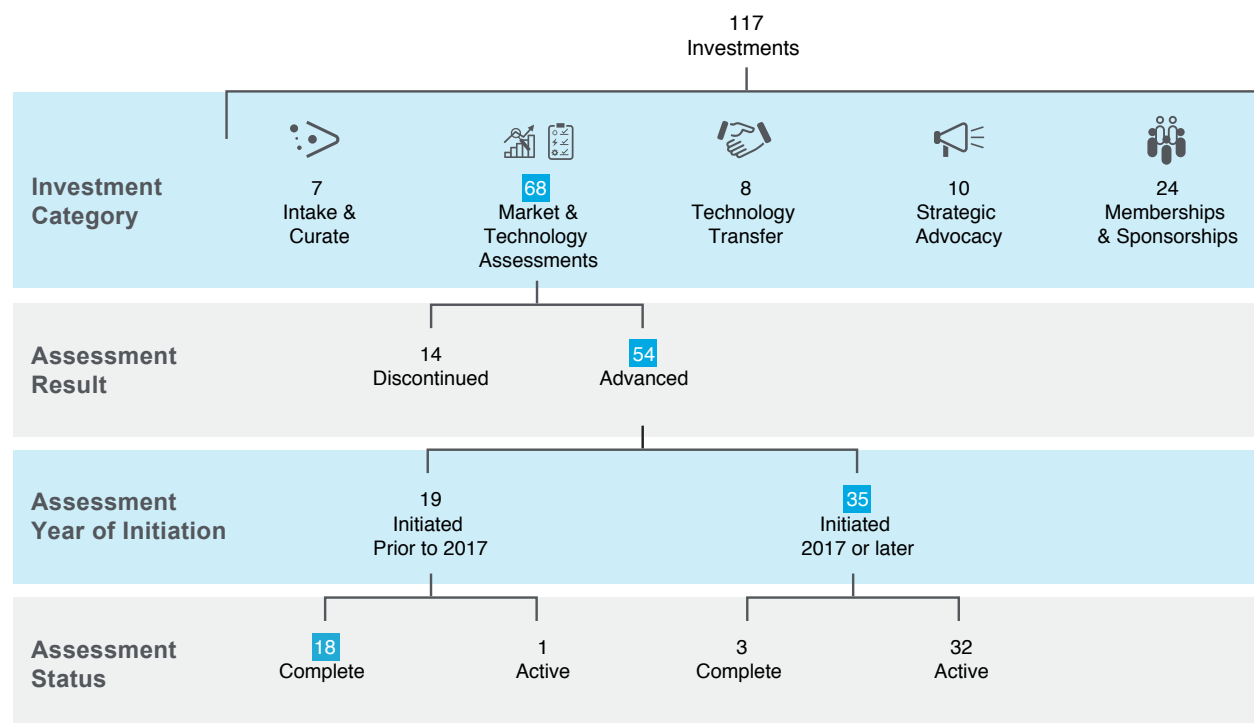
EM&T has Demonstrated Significant Growth

Program activity demonstrated significant growth during the review period for this study. EM&T's portfolio included 117 active investments during 2017 through 2019. Of these, 68 were traditional Technology and Market (T&M) Assessment projects, including 54 projects focused on promising DR opportunities and 18 completed legacy projects.

EM&T initiated 73 new investments from 2017 to 2019, more than twice the number initiated during the previous three years. These spanned all investment categories, including traditional investments and new investment streams.

FIGURE 2

Number and Type of EM&T Program Investments, 2017 through 2019



Source: Homecourt Partners Team analysis, 2020

EM&T's Diverse Investment Portfolio Demonstrated Fiscal Stewardship

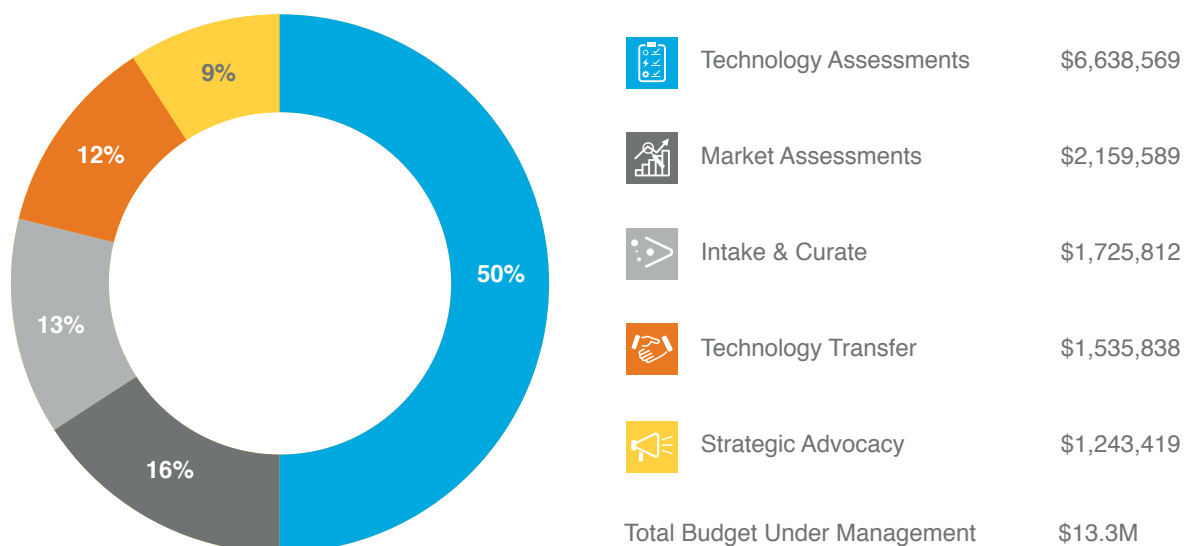
The overall budget allocation for EM&T exemplified diversity in five distinct categories of program investment.

EM&T focused nearly two-thirds of its \$13.3M Budget Under Management on T&M Assessments. Its levels of investment in intaking and curating the portfolio, transferring technologies, and conducting strategic advocacy also demonstrated a reasonable and diverse portfolio strategy.

As an investment strategy, EM&T has leveraged over \$15M of direct external co-investment, \$20M of federal research, and more than \$100M of California DR-related research, a factor of over 10X.

FIGURE 3

EM&T Budget Under Management Allocated by Activity Category, 2017 through 2019



Source: Homecourt Partners Team analysis, 2020

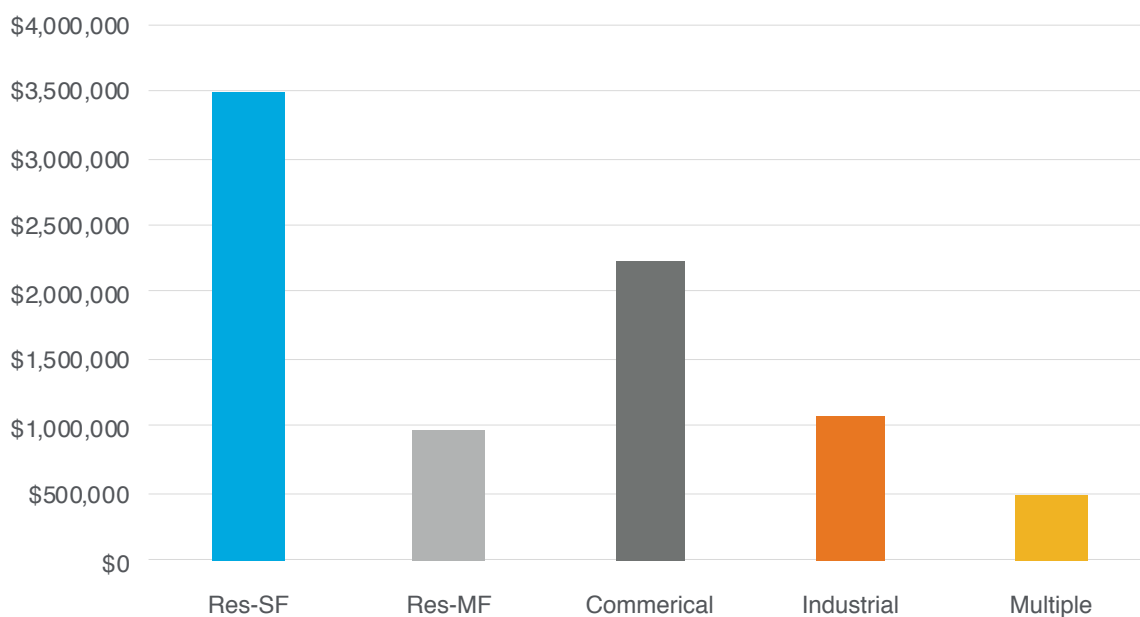
EM&T's Assessments Focus on SCE Customer Sectors

EM&Ts investments are customer focused, as per SCE's A.17.01-018 testimony. Among the items in that filing was an intent to expand residential DR research. EM&T's T&M Assessment budget focused heavily on residential DR, and half of the T&M Assessments initiated during 2017 to 2019 were in the single-family residential sector. EM&T is still considering additional commitments to expand residential energy storage and to focus on low-income and disadvantaged communities.

With the adoption of OpenADR in the California Energy Commission's (CEC) Title 24 new construction code, EM&T DR residential activities are now more relevant than ever.

FIGURE 4

EM&T's Sector Focus for T&M Assessments



Source: Homecourt Partners Team analysis, 2020

EM&T's Key Research Areas of Focus

EM&T has conducted progressive and innovative research in ever-changing innovation arenas. This approach demonstrates EM&T's ability to successively build on its own research and to refine knowledge about uncertainties or needs that emerge through the research.

Collectively, these areas of research demonstrate how EM&T is focusing aspects of the diverse research portfolio on relevant DR innovation opportunities.

Together, they include a myriad of end uses and technologies that integrate across multiple end uses, customer sectors, and an ever-evolving technological landscape.

The Case Studies examine EM&T's curated activities in several of these topical focus areas. They provide a high-level view of 26 highlighted investments, most of which are T&M assessments.

FIGURE 5

EM&T's Case Studies examine topical focus areas.

EM&T's case studies overview 26 investments in the following topical focus areas:

- Residential Electric Storage (Batteries)
- Flexible Communicating Residential Pool Pumps
- Advanced Integrated Whole Buildings
- Advancing OpenADR 2.0b Secure Communications
- Advancements in OpenADR 2.0b HVAC Adoption
- DR For Industrial and Water Processes
- Beneficial Electrification with Flexible DR



EM&T Program Recommendations

The EM&T program is dedicated to continuous improvement to optimize its funding for the benefit of SCE's customers. Below are recommendations from the Homecourt Partners Team about how the

program can continue to demonstrate, innovate, and accelerate the customer adoption of emerging DR technologies.

Continue to build on internal and external progress.

EM&T should continue to integrate the lessons learned from previous program investments, other efforts at SCE, and progress made by many members of the DR Ecosystem. This approach enables EM&T to focus its funds and expertise where they can make the most impact while leveraging the resources offered by its partners.

Further integrate findings into development of SCE's DR offerings.

EM&T's findings can inform and enable SCE's future DR offerings, which may include traditional DR programs as well as refinement of customer engagement with time-based rates. Enabling this internal integration while maintaining the high level of engagement with other ongoing program activities will require additional staff support.

Increase staffing to support EM&T.

EM&T has built a support system that relies heavily on external contractors to supplement SCE staff focused on EM&T. The program could integrate more effectively with internal efforts and advance projects even faster with additional EM&T-focused staff members. EM&T projects offer an opportunity for SCE staff to retrain for professional advancement in DR.

Request additional funding for the EM&T program during the 2020 mid-cycle review.

EM&T is poised to build on its substantial progress during the past three years, and more research opportunities with the CEC's Electric Program Investment Charge (EPIC) III are emerging. Additional funding would support the shared DR policy goals of SCE, the CEC, and the California Public Utilities Commission.



The Emerging Markets and Technology program is supported by an alliance of the California Public Utilities Commission, the California Energy Commission, utilities, state educational institutions, local governments, businesses and nonprofits to assist Southern California Edison (SCE) customers and communities in meeting state and local energy resiliency needs and climate action goals. Our funding comes from SCE's retail customers under the auspices of the California Public Utilities Commission and is authorized through 2022.

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