

SoCal EDGE

Project Summary

Timeline:

Start date: July 2015

Planned end date: July 2018

Key Milestones

1. Marketplace Survey for New Energy Efficient Building Technologies, June 2016
2. Project Development Agreement, June 2016
3. Monitoring and Verification Plans, August 2016

Budget:

Total Project \$ to Date:

- DOE: \$154,074
- Cost Share: \$177,784

Total Project \$:

- DOE: \$558,055
- Cost Share: \$558,055

Key Partners:

LA Cleantech Incubator
LA Better Buildings Challenge
LA Department of Water and Power
Southern California Gas

Project Outcome:

The intended outcome of this project is to accelerate market adoption of best-in-class building technologies, and to create an “on-ramp” for emerging technologies to enter the market.

Purpose and Objectives

Problem Statement: Technology is advancing rapidly, investment brings risk, and property owners and managers are extremely busy – together these factors slow the market’s adoption of best-in-class technologies.

Target Market and Audience: SoCal Edge currently targets Commercial buildings in the City of Los Angeles, which account for 12.8 million megawatt-hours of energy consumption (50%). The audience is property managers and owners with large real estate portfolios, who will be able to scale successful pilots.

Impact of Project:

- **Outputs:**
 - 5 completed pilot projects, with 2 scaling up to multiple sites
 - Emerging Technologies “Onramp” process establish with local utilities
 - Near-term outcomes: Implementation of pilot projects, savings
 - Intermediate-term outcomes: Expansion of technology awareness and adoption, increased energy and water savings
 - Long-term outcomes: Broad scale adoption of energy efficiency measures, exponential savings impacts

Approach

- Identify best-in-class technologies through RFI processes
 - Leverage Green Proving Ground testing and research (9 GPG approved technologies)
 - Leverage DOE performance specifications across 16 approved technologies
 - Engage utility partners
- Negotiate tech demonstration opportunities and define metrics for success that can lead to scaled up portfolio implementation (Currently 45 projects in the pipeline)
- Market technologies to LABBC owner/manager partner base (>90M Square Feet)
- Connect with and Provide technical assistance to real estate portfolio owners.
- In parallel, work with utility partners to develop emerging technology “on-ramp” and utility rebates where available (Memorandum of Understanding in place with Los Angeles Department of Water & Power (LADWP), SoCal Gas, Metropolitan Water District (MWD)).
- Develop M&V process for emerging tech projects and expedited permitting for new efficiency tech

Approach

Key Issues:

Barriers to Market Adoption	Applied SoCal Edge Strategies
Lack of financial resources to implement projects and pilots.	Strong outreach efforts to obtain additional funding through grants, loans and other financial assistance programs.
Difficult regulatory and contracting environment for project pilots.	Working with city agencies and utilities to establish a project task force to streamline the permitting, vetting and rebate process for new tech.
Implementation timelines are much longer than originally projected.	Working with property owners, legal resources, vendors, utilities and city governments to implement structured approach to implementation of projects.

Distinctive Characteristics:

- LACI campus & capabilities (60,000 SF multi-tenant R&D Center), establishment of water and energy clusters to galvanize industry and stakeholders.
- LABBC partnership base (>90M SF)
- Technical Advisory support from industry experts
- Utility engagement with LADWP, SoCal Gas, & MWD
- Partnerships with a various experts, including NREL

Progress and Accomplishments

Accomplishments:

- 4 demonstration projects, including UgMo, Rain Systems, Hive and Ayyeka
- 4 pilot projects, including Dynamic Water, Nalco (2), and HydroGel
- >20 Property Assessments
- Created a strong campaign of outreach, technical assistance, and convening
- Brand recognition for the SoCal Edge program and its capabilities

Market Impact:

Demonstration Projects

	Ugmo Irrigation Installation	Ayyeka Grey Water Installation	Rain Systems Lawn installation
Installation Date	11/25/16	11/2/16	9/24/16
Expected Savings	109,866.24 gallons 1.7MWh	In process	111,649.15 gallons 1.786 MWh

Pilot Projects

Property Assessed	Property Owner	Property SF	Expected Energy Savings through Pilot project	Expected Water Savings through Pilot project	Project Description
California State University, Northridge (CSUN)	California State University	15.5 M SF	40,238 kWh per year	8.3 million gallon per year	Rain Systems' Precision Injection Machine injects a cross-link polymer (CLP) at root level that helps conserve 50% of the water needed to irrigate and maintain healthy, green grass.
Sheraton Grand Hotel	Marriott / Starwood	475,000 SF	6,060 kWh per year	1.25 million gallon per year	Cooling tower
800 Wilshire Blvd	Onni Group	225,000 SF	1,527 kWh per year	315,000 gallon per year	Cooling tower and water softeners
Los Angeles City Hall	City of Los Angeles	435,920 SF	11,635 kWh per year	2.4 million gallons per year	Non-chemical water treatment demonstration to prevent scaling issues in water heating system.

Accomplishments (Contd.) + Project Integration and Collaboration

Portfolio	Buildings	Portfolio Size	Potential Energy Savings	Potential Water Savings
California State University	23 Cal State Campuses 1,207	856 M SF	2,845,776 kWh per year	587 million gallons per year
Marriott / Starwood	Marriott/Starwood properties across 66 commercial	573 M SF	5,817,600 kWh per year	1.2 billion gallons per year
Onni Group	properties across 250 non-residential	6.5 M SF	44,117 kWh per year	9.1 million gallons per year
City of Los Angeles	250 non-residential properties	13.8 M SF	305,424 kWh per year	63 million gallons per year

Awards/Recognition: Portfolio companies featured in Mashable series on clean tech. High publicity for program during incubator launch with city of LA.

Lessons Learned: The largest hurdles have been timing, identifying budgets, building permitting and the overall timelines to get projects sited, negotiated and installed.

Project Integration & Collaboration:

- LABBC conducts outreach, provides project development support
- LACI conducts outreach, refers owners/manager to LABBC, integrates new portfolio companies and emerging tech into program.
- Provides a unique blend of next generation technology with proven implementation methods. Bridges the nexus between utilities, tech vendors, municipalities and portfolio owners.
- LACI has developed a Built Environment Cluster that sources tech and generates project opportunities (165 registrants, key players include USGBC-LA, NREL, LADWP, MWD, LA Metro, City of LA, UCLA, private sector)
- Utility partners help fund outreach efforts, define technologies of interest, with annual or bi-annual commitments to submit their technology challenges to help source new tech

Partners, Subcontractors, and Collaborators:



SoCal Edge First Movers



Partners, Subcontractors, and Collaborators:

SoCal Edge Key Partnership Activities



- **Collaboration with Emerging Tech Team on M&V & Rebates**



- **MOU Draft to accelerate permitting for energy efficiency and water conservation technologies.**



- **Marketing partner for new demonstration projects**



- **Collaboration with engineers on demo projects, M&V, and rebates**

LACI Portfolio Companies



Rethink Remote Monitoring



IoT Hardware Embedded LED Lighting
50-70% energy savings



Built Bright
30% potential savings over traditional lighting methods



Advanced Irrigation Reduction Technologies
50% water cost savings



Zero Waste Water Systems
25% water savings

Highlighted companies implemented pilot projects

GSA Vetted Technologies



Smart Meters

15-20% water savings



Wireless Pneumatic Thermostats

15-20% HVAC energy savings



Wireless Advanced Lighting Controls

30-40% energy savings



Non-Chemical Water Treatment

15-30% water savings

GSA Vetted Technologies



Non-Chemical Water Treatment
up to 30% savings on cooling tower discharge water



Advanced Water Softening Treatment
up to 80% water savings on cooling tower blowdown



Wireless Sensor Networks
20-40% of cooling energy with ROIs of less than 3 years



Water Efficient Fixtures
10-20% water savings



Wireless Moisture Sensors
40-80% water savings

Communications

- Conducted LABBC Tech Showcase with approximately 300 attendees. Consisted of a full day of technology showcases, customer engagement and fast pitch component highlighting specific application options. Incredibly successful event resulted in at least 6 new customer leads and a potential installation.
- Working with 6 technical advisors focused on implementing water efficiency measures during one of the state's longest draught periods.
 - Revamped SoCal Edge Website
 - Created Banners to Market SoCal Edge program
 - GreenBuild 2016 Tours and related events
 - Presentations to LADWP and their top customers with approximately 85 attendees
 - Quarterly technology highlight email blasts (Distribution List of 3,000)
 - Conducted 28 LKIC Campus Tech Tours (450 people)
 - Presentations to students from UCLA, USC, and CalPoly Pomona, UC Riverside, CSUN, LACC
 - Presentations to High School students from all over Los Angeles County

Next Steps and Future Plans

Next Steps and Future Plans: Future project activities include establishing additional pilots with large probability of scaling to portfolio scale adoption. Continued gathering of data and disciplined measurement and verification protocols. Establishment of additional technology onramp sources such as competitions, technology challenges and/or calls to action. Continued focus on marketing and outreach of program benefits to additional segments in the built environment. Engage professional writers, engineers and marketers to further expand scope and reach of pilot case studies.

REFERENCE SLIDES

Project Budget

Project Budget: Total program budget of \$1,116,110 based on 50% cost share.

Variations: A portion of the budget was shifted from LABBC to LACI to support additional staff to further develop the program and assist with project implementation.

Cost to Date: 30% of the budget has been spent

Additional Funding: No additional funding is currently in place, however, the program has been pursuing additional grant opportunities through various City, State and Federal opportunities.

Budget History

July 2015 – FY 2016 (past)		FY 2017 (current)		FY 2018 – July 2018 (planned)	
DOE	Cost-share	DOE	Cost-share	DOE	Cost-share
\$154,074.08	\$177,784	\$269,324	\$253,514	\$134,660	\$126,757

Project Plan and Schedule

Task Name	Quarter:	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
Task 1.0 -- Project Management Plan													
Subtask 1.1: Project Management Plan	1	M											
Task 2.0 -- Identifying Tech and Sites													
Subtask 2.1: TDI RFQ Launch	3	M											
Subtask 2.2: TDI Marketplace Survey for New Technologies	7			M									
Subtask 2.3: Complete 3 of 5 TDI Demonstration Project Descriptions	9				M								
Subtask 2.4: Launch TDI Property Matchmaking Program	7			M									
Subtask 2.5: Development of TDI Recommended Elements of a Project Development Agreement	12					M							
Subtask 2.6: Complete 3 of 20 TDI Property Assessment Reports	11				M								
Subtask 2.7: 1st Property Owner Commits to TDI Demonstration Project Installation	12				M								
1 -- End of Budget Period 1: Go / No Go Decision	12					G / NG							
Task 3.0 -- Implementation and Monitoring													
Subtask 3.1: Establish Analytics Team and Metrics for M&V	14					M							
Subtask 3.2: Finalize Project Development Agreement with TDI Recommended Elements	27									M			
Subtask 3.3: Begin Installation of First TDI Demonstration Project	17						M						
Subtask 3.4: Complete 20 TDI Property Assessment Reports	20							M					
Subtask 3.5: Deliver 1st of 5 Case Studies	29										M		
Subtask 3.6: Deliver 5th of 5 Case Studies	36												M
Task 4.0 -- Graduating to Scale													
Subtask 4.1: Annual Presentation of TDI Project Findings and Progress to Utility	9, 23, 34			M					M				M
Subtask 4.2: Conversion of 1st Demonstration Project to a Scale Project	30										M		
Subtask 4.3: Conversion of 2nd Demonstration Project to a Scale Project	36												M
2 -- End of Budget Period 2: Go / No Go Decision	24									G / NG			

Pilot Program Impacts Post Adoption

Property Assessed	Property Owner	Property SF	Expected Energy Savings through Pilot project	Expected Water Savings through Pilot project	Project Description
California State University, Northridge (CSUN)	California State University	15.5 M SF	40,238 kWh per year	8.3 million gallon per year	Rain Systems' Precision Injection Machine injects a cross-link polymer (CLP) at root level that helps conserve 50% of the water needed to irrigate and maintain healthy, green grass.
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Potential Pilot Program Impacts for the Portfolio

Portfolio	Buildings	Portfolio Size	Potential Energy Savings	Potential Water Savings
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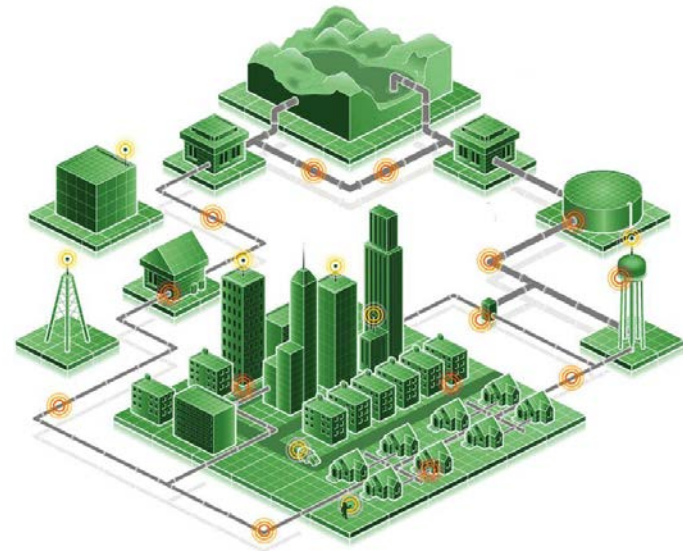
Total **4,763 properties** **1.5 billion SF** **9,012,917 kWh per year** **1.86 billion gallons per year**

Ayyeka



- Low power “Wavelet” accepts any data from any sensor, any manufacturer, data to SCADA control and visualization system.
- First large installation: Cincinnati Wastewater System.

- Monitors flow, pressure, level, pH, turbidity, oxygen, etc.
- Plug-and-play GPS self locating.

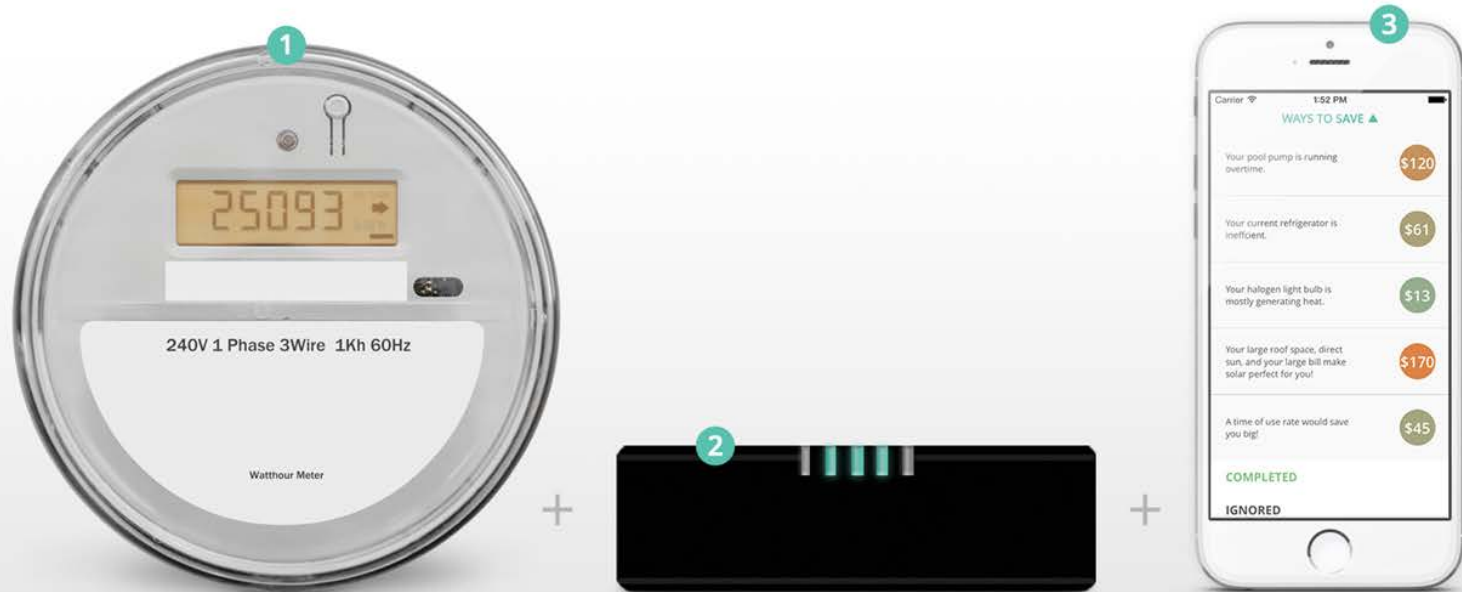


BK Litec



- “HS frame” LED design eliminates a separate heat sink.
- Allows for form factors such as drop-in replacements for metal halide street light bulbs.
- Hollow design allows for IoT hardware integration.

Chai Energy



- The Chai gateway sends 6-second residential smart meter data to Chai servers for analysis. 6,000 users, increasing.
- Individual electrical appliances are identified by profile.
- Users receive push notifications with advice on how to reduce electrical consumption, on average by over 30%.

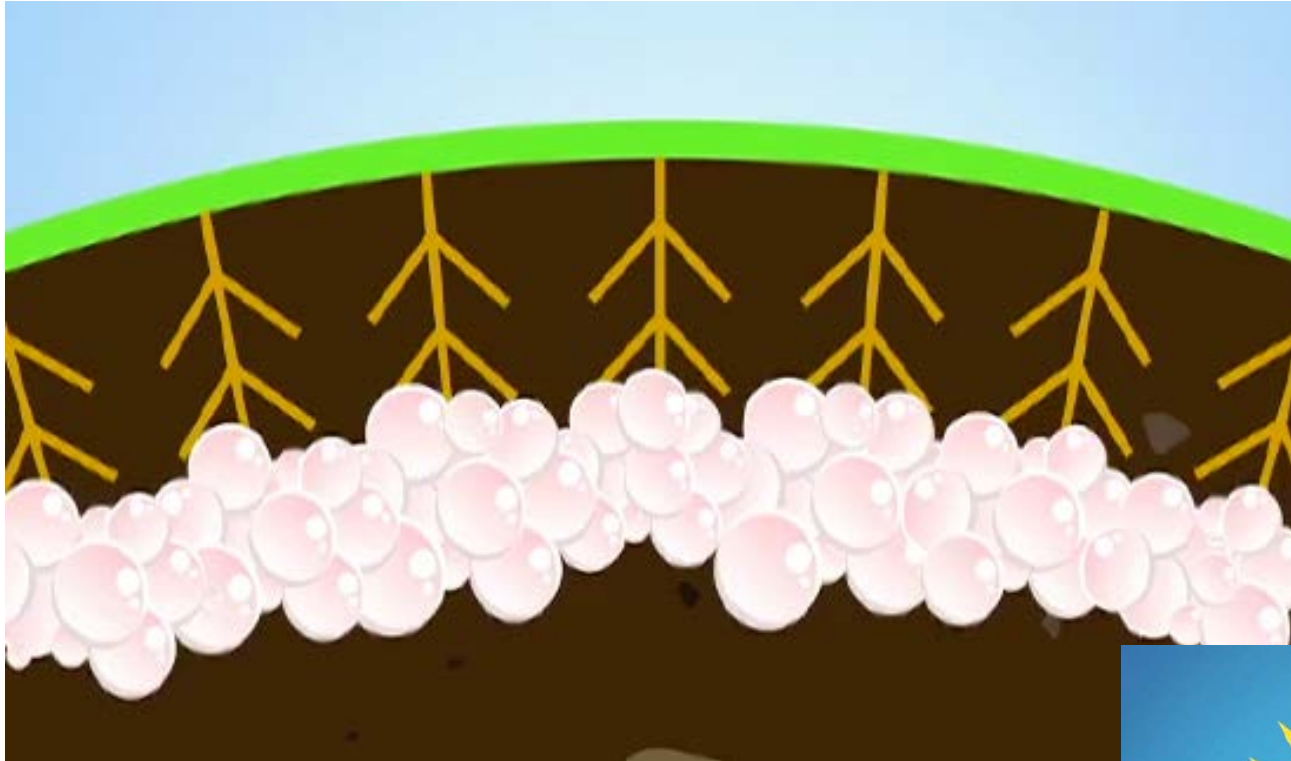
Saya

AQUACERO measures residential water flow, providing data, analytics and control:

- Leak detection and auto shutoff.
- Pipe freeze protection.
- Smart metering for utilities.
- Water consumption monitoring & reporting.
- Partnerships with insurance to reduce claims.
- Analytics data for various verticals.



Rain Systems



Polymers absorb 200 x their weight in water, preventing evaporative loss.

Patented process injects cross-linked polymers under turf for water retention and access by root system.



Hive Lighting



Wasp 1000

Wasp 100-C

5-Chip LED
Color Blending



Energy efficient solutions for high intensity and quality lighting.

- Plasma and advanced LED lighting for film, television and live event.
- Applications in scientific imaging and architectural lighting.

Plasma



50%+ energy savings
Small point source
50,000 hour lifetime
Less heat
Superior color rendering
No flicker at any frame rate

VS

HMI / Metal Halide (current industry standard)



8+ inches
Inefficient
Very Hot
Requires ballast
300 hour lifetime
Flicker