SANDAG Roadmap Program
Project Highlight: City of Carlsbad

Energy Working Group Item 5 | March 28, 2019

SANDAG Roadmap Program: Overview

- SDG&E Energy Efficiency Funding: Local Government Partnership (LGP)
- SDG&E LGPs: Cities of Chula Vista and San Diego, County of San Diego, Port of San Diego, SANDAG
- SANDAG LGP:
  - SANDAG Roadmap Program
  - 16 SANDAG member agencies without LGPs
  - Began in 2010 with energy efficiency
  - Integrated climate action planning in 2015
  - Current agreement through 2020
Roadmap Program – Project Highlight: City of Carlsbad

- **2014**
  Carlsbad Energy Roadmap* completed

- **2015**
  Carlsbad Climate Action Plan adopted

- **2018**
  Carlsbad Feasibility Study* completed

* Prepared by the SANDAG Roadmap Program

City of Carlsbad Project Objectives

- Energy cost savings
- Reliability and resiliency
- Climate Action Plan implementation
- Innovation and clean technology
Feasibility Study: A Layered Approach

- **Energy Efficiency:**
  - Interior and exterior lighting retrofits
  - Boiler replacement
  - Controls for air conditioning units for advance scheduling and programming

- **Demand Side Management:**
  - Advanced building management
  - Solar panels
  - Battery energy storage

- **Microgrid**
Feasibility Study: A Layered Approach

➢ Energy Savings and Reduced Environmental & Economical Impact

- Utility Grid Energy 51%
- Peak Load 34%
- N. Gas Usage 31%
- GHG 57%
- SO₂ & NOₓ 50%
- Utility Bills ($) 53%

➢ Improved Energy Resiliency & Reliability

➢ Improved Cybersecurity

➢ Support Clean Energy Market Transformation

➢ Show City’s Commitment to the CEC* 2030 climate and energy goals

➢ Additional Community & Societal Benefits

➢ Project Cost

$6,698,359 15 yr

Many project financing solutions

Many design alternatives to reduce cost

*Sustainable resources for half of the state's electricity. California Energy Commission, 2015

SANDAG Roadmap Program Next Steps

• SANDAG Roadmap Program will continue to offer energy and climate action planning activities primarily funded through the Local Government Partnership with SDG&E through 2020 and will explore additional funding opportunities to support these activities for member agencies in the future.
Port of San Diego
Resiliency in Terminal Operations at Tenth Avenue Marine Terminal
Renée Yarmy, Program Manager – Energy & Sustainability

Port of San Diego Jurisdiction

34 miles of waterfront
2,403 acres of land
3,535 acres of water

Port Tidelands
Submerged Tidelands
The Port Act and Tidelands Trust Doctrine

Details responsibility on behalf of the people of the State of California

Manage San Diego Bay and the Waterfront ‘Tidelands’

Promote commerce, navigation, recreation and fisheries

Climate Action Plan

10% Reduction by 2020
25% Reduction by 2035

CAP 2006 Baseline Emission Sources
(581,750 metric tons CO₂e)

- Electricity
- Natural Gas
- Transportation: On-road
- Transportation: Off-road
- Water Use
- Waste
Climate Action Plan – Status

Tenth Avenue Marine Terminal—An Innovation Hub

- Approved a Redevelopment Plan in 2016
- $10M Transportation Investment Generating Economic Recovery (TIGER) grant
- Quadruple cargo throughput
- Requires emissions reductions
- Enhancements of Shorepower system
- Electric Cargo Handling Equipment
Tenth Avenue Marine Terminal—An Innovation Hub

- Adjacent to the disadvantaged community of Barrio Logan.
- Projects at TAMT aimed at:
  - Reducing criteria air pollutants;
  - Reducing greenhouse gas emissions;
  - Public benefit; and
  - Improving terminal efficiency.
Demonstrate Business Case for Advanced Microgrids in Support of California's Energy and GHG Policies

<table>
<thead>
<tr>
<th>Project Title</th>
<th>Grant Recipient</th>
<th>EPIC Funding (Match)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port of Long Beach Microgrid</td>
<td>Port of Long Beach</td>
<td>$5M ($2.12M)</td>
</tr>
<tr>
<td>Camp Parks Microgrid</td>
<td>Lawrence Berkeley National Laboratory</td>
<td>$5M ($11.41M)</td>
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<tr>
<td>Miramar Marine Air Station Microgrid</td>
<td>University of California, San Diego</td>
<td>$5M ($6M)</td>
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<tr>
<td>Port of San Diego Microgrid</td>
<td>San Diego Unified Port District</td>
<td>$4.98M ($4.63M)</td>
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<td>Port Hueneme Server Farm Building Microgrid</td>
<td>Electric Power Research Institute</td>
<td>$4.99M ($3.5M)</td>
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<td>Chemehuevi Indian Reservation Microgrid</td>
<td>Handbook Holdings, LLC</td>
<td>$4.99M ($8.4M)</td>
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<td>Virtual Wide Area Urban Microgrids</td>
<td>Gridscape</td>
<td>$4.99M ($3.28M)</td>
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<td>Rialto Microgrid</td>
<td>Rialto Bioenergy Facility</td>
<td>$5M ($6.66M)</td>
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<td>Redwood Coast Airport Microgrid</td>
<td>Humboldt State University</td>
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<tr>
<td>Santa Rosa Junior College Microgrid</td>
<td>Sonoma County Junior College District</td>
<td>$4.99M ($8.69M)</td>
</tr>
</tbody>
</table>

**Total Award EPIC - $49.97M**
**Match - $61.02M**

Electric Program
Investment Charge Program
- 17 microgrid projects at 23 sites.
- Total: $75.6 million CEC funds and $71.4 million match funds.
- Projects are located in the CA Investor Owned Utility territories.

Project Overview – Goals of Microgrid Grant

**Electrification**

**Resiliency**

**Technological Advancement**

**Replicability**

Tenth Avenue Marine Terminal
Port of San Diego – Strategic Port

- 1 of 17 U.S. Department of Transportation Strategic Ports
- Supply of Emergency Goods / Services
- Critical Infrastructure:
  - Jet Fuel Storage for San Diego International Airport
  - Security Gates/Facilities
  - Site Lighting

Port of San Diego – Resiliency in Terminal Operations at Tenth Avenue Marine Terminal

Microgrid Project Overview

- **Project Partners**
  - Burns & McDonnell (BMcD) – System Design
  - Electric Power Research Institute (EPRI) – Cyber Security Assessment, Testing/Evaluation, and Knowledge Transfer
  - UC San Diego (UCSD) – Project Evaluation and Knowledge Transfer

- **Application Ask**
  - CEC Funding: $4,985,272
  - District Match: $4,427,973
  - UCSD Match: $201,963

- **Overview**
  - Solar PV power, battery storage, and microgrid controller
  - Energy Efficient Lighting Retrofits
  - Decrease electricity costs 60%

Estimated Project Budget $9.6 M
Microgrid Preliminary Site Plan

- **858,000 kWh Reduction**
  - Solar 700 kW
  - Battery Storage 700 kW / 2,500 kWh

- **280,000 kWh Reduction**
  - Energy Efficient Site Lighting Retrofits

Estimated Reduction 360 MTCO$_2$e

Overview of Value Proposition

- **Emission Reduction Potential**
  - Solar PPA
  - Site Lighting Retrofit
  - Battery Storage / Microgrid Controls

- **Cost Effectiveness**
  - Low Value
  - High Value

Without Grant Funding

With Grant Funding
Microgrid Technical Tasks

1 – General Project Tasks
2 – Microgrid Design
3 – Microgrid Construction
4 – Operation and Maintenance
5 – Testing and Evaluation
6 – Evaluation of Project Benefits
7 – Technology/Knowledge Transfer Activities

60% Design Phase

Technical Advisory Committee
Consultant Role:
UCSD, EPRI, and BMcD
Committee:
San Diego Gas & Electric
City of San Diego
Navy Region Southwest
California Air Resources Board
San Diego International Airport
San Diego Refrigerated Services
(TAMT Tenant)

Anticipated Project Schedule
Grant Funding – Beyond the Microgrid

Port Grants Underway:
- Transportation Investment Generating Economic Recovery (TIGER): Tenth Avenue Marine Terminal Modernization – Phase 1 Underway
- Federal Highway Funds: Harbor Drive Multi-Modal Corridor Study
- Natural Resources Agency: Urban Greening Grant
- California Transportation Commission SB1 Grant: Emissions Capture System

Tenant Grants Underway:
- CEC (PON 14-605): Medium- and Heavy-Duty (MD/HD) Advanced Vehicle Technology Demonstration
- California Air Resources Board: Drayage Truck Grant
- CEC (GFO 15-604): Freight Transportation Projects at California Seaports

Thank you! Questions / Discussion