EnergyWise Plan Energy Section Update including Zero Net Energy Neighborhood Feasibility, Design, and Implementation Study

- Project Overview: The County of San Luis Obispo, funded through a California Energy Commission Local Government Challenge grant, determined the technical, financial, and organizational feasibility of converting an existing, low-income neighborhood to zero net energy (ZNE). This included researching existing conditions; assessing energy efficiency and conservation potential; building distributed energy resource (DER) scenarios; determining physical and operational resource requirements; and conducting extensive community outreach and engagement. A small portion of the grant was also used to prepare a protocol compliant GHG emissions inventory update for the County's EnergyWise Plan.

- Project Start Date and Duration: January 2018 – October 2019

- Goals: The goal of this project was to assess the feasibility of designing and implementing a Zero Net Energy Neighborhood in a disadvantaged community and to create a cost effective and replicable model to do so elsewhere in San Luis Obispo County and across California. There were four objectives supporting this goal including:
    - Energy affordability
    - Decarbonization
    - Resiliency and local control; and
    - Workforce training and economic development

- Relevance to State Policy Goals: Several State policy goals regarding energy efficiency, renewable energy, and GHG emissions were relevant to this project including, but not limited to:
    - SB 32
    - SB 350
    - SB 100

- Disadvantaged Communities: The study area is a neighborhood within the unincorporated community of Oceano. While not considered a disadvantaged community (DAC) according to Cal EnviroScreen (CES) 3.0, Oceano is a low-income community and CES does rank Oceano among the higher percentiles when examining poverty, academic education, exposure to pesticides, and several other disadvantages.

- Integrated Climate Approach: This project employed an integrated climate approach as it included mitigation and adaptation strategies ranging from energy efficiency, electrification, and renewable energy to battery storage and microgrids. It also addressed flooding, infrastructure deficiencies, and the need for a resilient critical facility or crisis mediation center.

- Key Project Deliverables:
    - Community-Wide GHG Inventory Workbook
    - Community-Wide Energy GHG Reduction Measures Summary Report
    - ZNEN Existing Conditions Report
    - ZNEN Energy Profile and Conservation Tool
    - ZNEN Energy Efficiency and Conservation Potential Report
    - ZNEN Distributed Energy Resource Research Findings
    - ZNEN Final Report

Lead Agency and Partnerships

- Lead Agency and Partner Organizations: This was a highly collaborative project led by the County San Luis Obispo and involving several other partner organizations. Key stakeholders included:
    - Local Governments
        - County of San Luis Obispo
            - San Luis Obispo County Energy Watch Partnership
            - Tri-County Regional Energy Network (3C-REN)
        - Oceano Community Services District
    - Community Based Organizations
        - Habitat for Humanity for San Luis Obispo County
        - Promotores Collaborative of San Luis Obispo County
        - Community Action Partnership of San Luis Obispo
        - Boys & Girls Club of San Luis Obispo County
        - Lucia Mar Unified School District
    - Investor Owned Utilities
        - Pacific Gas & Electric
        - Southern California Gas Company

Drivers

- Local and State Legislation/Policy: Policy adopted in the County of San Luis Obispo's Conservation and Open Space Element and in its climate action plan (also referred to as the EnergyWise Plan) mandate the reduction of greenhouse gas emissions through energy efficiency, conservation, and renewable energy; and establish goals for reducing energy consumption and increasing generation of local renewable energy. In addition to local government policy drivers, State legislation also drove the need for this project including SB 32, SB 350, and SB 100. Most of these goals have been unmet.

- Financial and Program Landscape: Other drivers for this project included the availability of funding from the California Energy Commission and the Department of Conservation grants, and the availability of budget and staff resources from existing energy efficiency programs.

Engagement Process

- Stakeholders: Project stakeholders included: local residents and community leaders, community-based organizations, local government agencies, investor-owned utilities, energy consultants, and solar developers. Residents and business owners within the neighborhood face increased vulnerability to climate impacts, particularly related to flooding and levee system failures.

- Engagement Process: Extensive stakeholder engagement was conducted throughout the project to generate awareness, create buy-in and align recommendations with the community's needs and expectations. These activities included:

    - Meeting with individual community residents and leaders
    - Tabling and presenting at community outreach events
    - Facilitating stakeholder meetings
    - Joining monthly community coalition meetings and
    - Convening technical advisory committee meetings

- Engagement Outcomes: The majority of our planned or anticipated outcomes related to engagement were achieved – particularly related to community-based organizations and local government agency staff. The biggest and most important area where our efforts were insufficient was engaging and creating awareness and buy-in amongst local residents.

Climate Impact Area

- Climate Impacts and Resilience: The primary impact that this project responds to is flooding and related levee systems failures and infrastructure deficiencies that are exacerbated by climate driven extreme weather events. The project's scope addressed community resilience against these climate by retrofitting and/or building buildings that are able to remain habitable in the face of an event or crisis resulting in the loss of energy, as well through the creation of one or more resilient critical facilities or crisis mediation centers.

- GHG Reduction: As a ZNE focused project, GHG reduction or mitigation was the primary driver of this project. In addition to preparing a protocol compliant GHG emissions inventory update for the County's EnergyWise Plan, this project determined the feasibility of converting an existing, low-income neighborhood to

ZNE by maximizing energy efficiency and conservation and scaling clean locally owned renewable energy. In addition to many other benefits to a specific low-income neighborhood, this project envisions the deep reduction of GHG emissions.

Funding Source

- $327,142 from California Energy Commission Local Government Challenge grant funding
- $15,000 in match share funding from the County of San Luis Obispo

Research and Data

- Data Tools: Excel-based Energy Profile and Conservation Tool

- Resources: Key resources (see links below) used for this project included:
    - CalEnviroScreen 3.0
    - SoCalGas
    - PG&E
    - Urban Footprint
    - Residential Appliance Saturation Survey (RASS)
    - PVWatts
    - PVRAM
    - USDA NRCS Web Soil Survey
    - CAISO
    - CPUC
    - CEC
    - California Department of General Services
    - US EPA Portfolio Manager
    - CBECC-Res
    - NREL
    - FEMA

Challenges

- Challenges: This project faced major challenges. Some were anticipated and some were either not foreseen or simply underestimated. Key challenges included:
    - Data Access - accessing high-quality data in a timely manner from investor owned utilities
    - Community Engagement – generating awareness and developing trust was challenging due to language barriers, lack of childcare and transportation, and mistrust of local government.
    - Project Support – lack of political and financial support from local government

    - Policy Barriers – key ZNE strategies including community solar and electrification with heat pump technologies face policy barriers

- Overcoming Challenges/Solutions: Some challenges were overcome with persistence and patience. Others were not surmounted. Community engagement challenges were partially overcome by partnering with community-based organizations with deep community ties, experience delivering public services, and trusted public spaces for holding community meetings.

Outcomes

- Outcomes: The primary outcome of this project is that the Oceano community is very well-positioned to implement this project if so desired. In addition to having an accurate and up-to-date understanding of existing conditions, energy efficiency potential, and DER scenarios, there is now a roadmap regarding the physical, financial, and operational challenges facing and resources available to achieving ZNE. This positions the project well for further grant funding, detailed site analysis and environmental review, and financing. A secondary outcome of this project is that 3C-REN is well positioned to serve hard to reach residents and building professionals in the community through its Residential Direct Install and Workforce Education and Training Programs.

- Next Steps: In addition to sharing the project's findings and tools for others to leverage elsewhere, viable next steps for this project are mainly focused on energy efficiency, decarbonization, and 3C-REN's involvement including:
    - Targeting 3C-REN program offerings to the community and neighborhood
    - Coordinating with any potential CCA to explore programmatic offerings that combine beneficial electrification with energy load reduction measures

Replicability

- Replicability to Other Communities/Regions: One of the overarching goals of this project, and its grant funding, was replicability. Specifically, the project sought to develop a framework for the replicable conversion of existing, low-income neighborhoods to ZNE in San Luis Obispo County and across California. The project's overall approach and methodology, as well as its case study research, and deliverables – including its Excel-based Energy Profile and Conservation Tool and DER findings – are all highly replicable. Perhaps most importantly, many of the project's Foundational and Aspirational Strategies, as well as the underlying recommendations, can be applied in other communities and regions.

Additional Resources

- https://www.slocounty.ca.gov/getattachment/8c952367-7655-48ef-a046-8564d7f33b2c/CoSLO-ZNEN-Feasibility-Design-and-Implementation-Study_Final-Report.aspx
- https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-30
- https://urbanfootprint.com/
- https://ww2.energy.ca.gov/appliances/rass/
- https://pvwatts.nrel.gov/
- https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx
- https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/use-portfolio-manager
- http://www.bwilcox.com/BEES/BEES.html

Further Information

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