Inland Regional Energy Network
I-REN Executive Committee

AGENDA

Tuesday, February 18, 2025
2:00 PM

WRCOG
3390 University Avenue, Suite 200
Riverside, CA 92501

Remote Meeting Locations

CVAG
74-199 El Paseo
West Building, Suite 100
Palm Desert, CA 92260

Town of Apple Valley
14955 Dale Evans Parkway, Conference Room A
Apple Valley, CA 92307

Committee members are asked to attend this meeting in person unless remote accommodations have previously been requested and noted on the agenda. The below Zoom link is provided for the convenience of members of the public, presenters, and support staff.

Public Zoom Link
Meeting ID: 886 4326 1379
Passcode: 585575
Dial in: 669 444 9171 U.S.

In compliance with the Americans with Disabilities Act and Government Code Section 54954.2, if special assistance is needed to participate in the I-REN Executive Committee meeting, please contact WRCOG at (951) 405-6706. Notification of at least 48 hours prior to meeting time will assist staff in

assuring that reasonable arrangements can be made to provide accessibility at the meeting. In compliance with Government Code Section 54957.5, agenda materials distributed within 72 hours prior to the meeting which are public records relating to an open session agenda item will be available for inspection by members of the public prior to the meeting at 3390 University Avenue, Suite 200, Riverside, CA, 92501.

In addition to commenting at the Committee meeting, members of the public may also submit written comments before or during the meeting, prior to the close of public comment to lfelix@wrcog.us.

Any member of the public requiring a reasonable accommodation to participate in this meeting in light of this announcement shall contact Lucy Felix at least 72 hours prior to the meeting at (951) 405-6706 or lfelix@wrcog.us. Later requests will be accommodated to the extent feasible.

The Committee may take any action on any item listed on the agenda, regardless of the Requested Action.

1. CALL TO ORDER (Oscar Ortiz, Chair)

2. PLEDGE OF ALLEGIANCE

3. ROLL CALL

4. PUBLIC COMMENTS

At this time members of the public can address the Committee regarding any items within the subject matter jurisdiction of the Committee that are not separately listed on this agenda. Members of the public will have an opportunity to speak on agendized items at the time the item is called for discussion. No action may be taken on items not listed on the agenda unless authorized by law. Whenever possible, lengthy testimony should be presented to the Committee in writing and only pertinent points presented orally.

5. CONSENT CALENDAR

All items listed under the Consent Calendar are considered to be routine and may be enacted by one motion. Prior to the motion to consider any action by the Committee, any public comments on any of the Consent Items will be heard. There will be no separate action unless members of the Committee request specific items be removed from the Consent Calendar.

A. Action Minutes from the January 21, 2025, I-REN Executive Committee Meeting

Requested Action(s):

1. Approve the Action Minutes from the January 21, 2025, I-REN Executive Committee meeting.

6. REPORTS / DISCUSSION

Members of the public will have an opportunity to speak on agendized items at the time the item is called for discussion.

A. Energy Resilience and Microgrids

Requested Action(s):

1. Receive and file.

B. California Public Utilities Commission Application Process for Funding for Program Years 2028 - 2035

Requested Action(s):

1. Authorize staff to continue the development of the 2028 Business Plan for the Public, Codes & Standards, and Workforce Education & Training Sectors and direct staff to return at a future meeting for a discussion of possible inclusion of additional sectors.

C. I-REN 2023-2027 Strategic Plan Update

Requested Action(s): 1. Receive and file.

D. Workforce Education & Training Sector I-REN Energy Fellowship Program Activities Update

Requested Action(s): 1. Receive and file.

7. REPORT FROM THE EXECUTIVE COMMITTEE CHAIR
Crystal Ruiz, WRCOG

8. ITEMS FOR FUTURE AGENDAS
Members are invited to suggest additional items to be brought forward for discussion at future Committee meetings.

9. GENERAL ANNOUNCEMENTS
Members are invited to announce items / activities which may be of general interest to the Committee.

10. NEXT MEETING
The next I-REN Executive Committee meeting is scheduled for Tuesday, April 15, 2025, at 2:00 p.m., location to be determined.

11. ADJOURNMENT

12. AGENCY ACRONYMS

Inland Regional Energy Network Acronym Guide

3C-REN – Tri-County Regional Energy Network (Counties of Ventura, Santa Barbara, and San Luis Obispo)
ABAL – Annual Budget Advice Letter
AHJ – Authority Having Jurisdiction
AVCE – Apple Valley Choice Energy
BayREN – Bay Area Regional Energy Network (nine county REN in Northern California)
BUC – Building Upgrade Concierge
C&S – Codes & Standards
CAEECC – California Energy Efficiency Coordinating Committee
CalChoice – California Choice Energy Authority
Cal ISO – California Independent System Operator
CARB – California Air Resources Board
CCA – Community Choice Aggregator
CCEC – California Climate & Energy Collaborative
CEC – California Energy Commission
COG - Council of Government
CPA – Clean Power Alliance
CPUC – California Public Utilities Commission
CVAG – Coachella Valley Association of Governments
DAC – Disadvantaged Communities
DACAG – Disadvantaged Communities Advisory Group
DCE – Desert Community Energy
DER – Distributed Energy Resources
DOE – U.S Department of Energy

EE – Energy Efficiency
EM&V – Evaluation, Measurement, and Verification
EV – Electric Vehicle
GHG – Greenhouse sas
HTR – Hard To Reach communities
IID – Imperial Irrigation District
IOU – Investor-Owned Utility
I-REN – Inland Regional Energy Network
JCM – Joint Cooperation Memorandum
LGSEC – Local Government Sustainable Energy Coalition
LGP – Local Government Partnership
MOA – Memorandum of Agreement
NEBs – Non-energy Benefits
NMEC – Normalized Metered Energy Consumption
NREL – U.S Department of Energy National Renewable Energy Laboratory
PG&E – Pacific Gas & Electric
PA – Program Administrator
POU – Publicly Owned Utility
REN – Regional Energy Network
RMEA – Rancho Mirage Energy Authority
RPU – Riverside Public Utilities
SBCOG – San Bernardino Council of Governments
SCE – Southern California Edison
SCG / SoCalGas – Southern California Gas Company
SDG&E – San Diego Gas & Electric
SJP – San Jacinto Power
SoCalREN – Southern California Regional Energy Network (all of southern California, administered by Los Angeles County)
TA – Technical Assistance
TOU – Time of use
TRC – Total Resources Cost
V2G – Vehicle to Grid
WE&T – Workforce Education & Training
WRCOG – Western Riverside Council of Governments

I-REN Executive Committee

Action Minutes

1. CALL TO ORDER

The meeting of the I-REN Executive Committee was called to order by Chair Oscar Ortiz at 2:00 p.m. on January 21, 2025, at WRCOG's office.

2. PLEDGE OF ALLEGIANCE

Casey Dailey, WRCOG Director of Energy & Environmental Programs, led the Committee members and guests in the Pledge of Allegiance.

3. ROLL CALL

CVAG
- City of Indio - Oscar Ortiz (Chair)

SBCOG
- City of Grand Terrace - Bill Hussey
- County of San Bernardino - Curt Hagman
- Town of Apple Valley - Art Bishop

WRCOG
- City of Jurupa Valley - Chris Barajas

Absent
- City of Corona
- City of San Jacinto - Crystal Ruiz

4. PUBLIC COMMENTS

There were no public comments.

5. CONSENT CALENDAR

RESULT:	**APPROVED AS RECOMMENDED**
MOVER:	Hagman
SECONDER:	Barajas
AYES:	Ortiz, Hussey, Hagman, Barajas
NO RESPONSE:	Bishop

A. Action Minutes from the October 15, 2024, I-REN Executive Committee Meeting

Action:

1. Approved the Action Minutes from the October 15, 2024, I-REN Executive Committee meeting.

6. REPORTS / DISCUSSION

A. I-REN Workforce Education & Training Update - Energy Workforce Gap Assessment

RESULT:	**APPROVED AS RECOMMENDED**
MOVER:	Hagman
SECONDER:	Barajas
AYES:	Ortiz, Hussey, Hagman, Bishop, Barajas

Action:

1. Approved the I-REN Workforce Roundtable's recommendations prioritizing the key recommendations developed in the Energy Workforce Gaps Assessment to inform the development or expansion of Workforce Education & Training programming within the I-REN territory.

B. Memorandum of Understanding with Riverside County and San Bernardino County for further development of I-REN's Workforce Education & Training Program

RESULT:	**APPROVED AS RECOMMENDED**
MOVER:	Hussey
SECONDER:	Bishop
AYES:	Ortiz, Hussey, Hagman, Bishop, Barajas

Action:

1. Recommended that the WRCOG Executive Committee authorize the WRCOG Executive Director to execute Memorandums of Understanding with Riverside County and San Bernardino County separately, and authorize him, or his designee, to enter into discussions with both Counties to develop contracts to implement programs related to these Memorandums of Understanding, for consideration by the I-REN Executive Committee and both Counties.

C. California Public Utilities Commission Application Process for 2028-2035 I-REN Funding

Action:

1. Received and filed.

D. Approval of a Modified Executive Committee 2025 Meeting Schedule

RESULT:	**APPROVED AS RECOMMENDED**
MOVER:	Barajas
SECONDER:	Hussey
AYES:	Ortiz, Hussey, Hagman, Bishop, Barajas

Action:

1. Approved a modified schedule of Executive Committee meetings for 2025, meeting consecutively for 2 months, and dark for 1 month.

7. REPORT FROM THE EXECUTIVE COMMITTEE CHAIR

Chair Ortiz reported that he is happy to see the progress and investments of the past year, and looks forward to the new year.

8. ITEMS FOR FUTURE AGENDAS

Committee member Barajas suggested having an item regarding microgrids.

Casey Dailey, WRCOG Director of Energy & Environment Programs, stated that I-REN is hosting a workshop on Energy Resilience next week at WRCOG, along with the Strategic Growth Council. Invites will be sent out via email.

9. GENERAL ANNOUNCEMENTS

There were no general announcements.

10. NEXT MEETING

The next I-REN Executive Committee meeting is scheduled for Tuesday, February 18, 2025, at 2:00 p.m., in WRCOG's office located at 3390 University Avenue, Suite 200, Riverside.

11. ADJOURNMENT

The meeting was adjourned at 3:02 p.m.

Inland Regional Energy Network
I-REN Executive Committee

Staff Report

Subject: **Energy Resilience and Microgrids**

Contact: **Daniel Soltero, WRCOG Program Manager, dsoltero@wrcog.us, (951) 405-6738**

Date: **February 18, 2025**

Recommended Action(s):

1. Receive and file.

Summary:

Concerns over energy resilience and electric reliability have been raised in recent weeks due to wildfires and high wind events that caused widespread power outages throughout southern California. There are solutions available to enhance infrastructure and assist communities with mitigating the impacts of emergency events and power outages, such as microgrids. WRCOG is taking a regional approach to address energy resilience for its member agencies by exploring the feasibility of implementing microgrids at critical facilities.

Discussion:

Background

Over the past few years, many Californians have lost power due to environmental hazards either directly damaging local infrastructure or necessitating Public Safety Power Shutoffs (PSPS). Extreme heat days, wildfires, and severe weather events are all predicted to increase in frequency and severity in the subregion due to climate change. These challenges will be exacerbated by large population growth in the region, which will increase energy demand and further stress the electric grid.

There are various solutions that have been implemented by public agencies and private companies across the nation to increase resilience to power outages and emergency events. Microgrids are not a new concept in the United States, but in recent years have become a popular and more common tool that customers and utilities can use to solve energy reliability and resiliency issues.

WRCOG has developed an Energy Resilience Plan (ERP) and is currently working on a second iteration, the ERP 2.0, to explore the feasibility of implementing microgrids at key facilities and community resilience centers. Over the last year, staff have worked with member agencies to identify potential sites for feasibility studies and identify the various factors that will help prioritize the sites with the most need for resilience improvements.

Present Situation

During the first two weeks of January 2025, southern California experienced high wind events and wildfires that either directly impacted infrastructure or necessitated PSPS, resulting in widespread power outages. Residents, businesses, and local governments alike experienced the impacts of these power outages, with some communities in Riverside County going without power for up to eight days. WRCOG's member agencies have expressed concerns regarding the impacts of power outages to their communities and to their government facilities and infrastructure.

To address the concerns over energy and community resilience, one must first understand the physical hazards and social vulnerabilities that exist in the region and their nexus to energy and climate resilience. Collectively known as the Inland Empire, Riverside and San Bernardino Counties were ranked in the top 10 for the riskiest geographical areas for natural disasters by the Federal Emergency Management Agency (FEMA). The vast area covered by both Counties encompasses various physical hazards, including extreme heat, drought, wildfire, flooding, wind, and landslides. Many of the physical hazards that exist in the region not only impact the population but can also directly impact energy transmission infrastructure or necessitate PSPS.

The Inland Empire also consists of multiple social vulnerabilities, including age, education, poverty, ethnicity, and disabilities. Some demographic groups tend to be more vulnerable to hazards than others. When considering the physical hazards and social vulnerabilities, the interactions between the variables show that certain populations will be disproportionately impacted by physical hazards in the Inland Empire (i.e., low-income populations are more susceptible to extreme heat impacts due not being able to afford consistent air conditioning or backup generators during an outage, etc.).

In recent years, California utilities have faced increased scrutiny into their handling of power resources and infrastructure during high wind and fire weather events, prompting them to implement PSPS. As a result, the State has seen legislative and regulatory efforts around microgrids such as Senate Bill 1339 (Stern) in 2018 directing the CPUC to “facilitate the commercialization of microgrids for distribution customers of large electrical corporations," and the CPUC's Microgrid Proceeding that followed. While the Microgrid Proceeding was meant to address barriers to microgrid deployment, it concluded without material steps forward to advance microgrid deployment in California.

Energy Resilience

Once it's understood that the Inland Empire experiences a variety of physical hazards and consists of multiple social vulnerabilities, it's easy to see why energy resilience becomes an important topic for our region. Energy resilience is the ability to operate building energy services, such as heating, cooling, ventilation, critical plug loads, and shelter, during and in response to a major disruption, and can be defined by two central functions: passive survivability and grid resilience. This form of resilience consists of a variety of building materials, strategies, and technologies that can include energy efficiency, demand-response, on-site generation, and energy storage systems. In practice, energy resilience can be achieved by combining energy efficiency upgrades, solar panels, and battery energy storage systems along with electric circuit upgrades to form a microgrid.

A local effort undertaken by WRCOG in 2020 saw the development of an Energy Resilience Plan (ERP) (Attachment 1), which created a method to identify and prioritize critical facilities for energy investments, and developed three case studies to explore the feasibility of implementing microgrids at facilities

commonly found throughout its member agencies. In 2023, WRCOG was awarded an Adaptation Planning Grant through the Integrated Climate Adaptation and Resiliency Program administered by the Governor's Office of Land Use and Climate Innovation, formerly Office of Planning & Research, to fund the development of an ERP 2.0. The ERP 2.0 will expand upon the previous work and provide microgrid and community resilience center feasibility studies for WRCOG member agencies. Additionally, the ERP 2.0 will include a memo detailing regulatory climate and barriers around microgrid deployment, identify financing and funding solutions, and outline an implementation plan that interested member agencies can use to further develop the feasibility studies into construction projects.

Microgrids

As defined in the California Public Utilities Code, a microgrid is an interconnected, self-sufficient energy system within a clearly defined electrical boundary that can act as a single, controllable entity. It can connect to, disconnect from, or run in parallel with larger portions of the electrical grid, or can be managed and isolated to withstand larger disturbances and maintain electrical supply to connected critical infrastructure. Microgrids provide energy resilience by disconnecting from the larger electric grid during outages and providing power to customers within the boundary of the microgrid, leveraging energy resources such as solar panels, batteries, generators, etc.

One of the biggest challenges for microgrid projects is the justification of cost. While considerably expensive, the economic case for microgrids is often based on the benefit beyond resiliency that a microgrid can deliver, such as energy savings and peak demand reductions. When the multiple value streams are stacked including the resiliency aspect, energy savings, and peak demand reduction, the economics of implementing a microgrid start to make more sense. Despite costs, microgrids can be used as a tool for energy resilience that can provide the reliable power to a community and its infrastructure that can lead to greater prosperity and greater quality of life for all, especially as a response to the increasingly impactful and widespread power outages.

Role of Energy Efficiency and Regional Energy Networks

In light of the challenges faced by the Investor Owned Utilities related to risk liability and PSPS events, it is more important than ever that local governments are supported by RENs across the state to drive local resilience initiatives in coordination and support of the existing Energy Efficiency (EE) programs offered. There are a number of current and upcoming CPUC proceedings that will examine the ongoing role and importance of EE programs in the overall landscape of supporting California's decarbonization goals. Based on the significant feedback received from active engagement with I-REN public agencies, there is a strong desire for RENs to have expanded ability to integrate solar and storage projects integrated with the existing energy efficiency measures and resources offered by I-REN. Staff will be taking the feedback received from member agencies and will be commenting on the proceeding to advocate for an expanded definition of EE and expand the role of RENs to more fully and holistically support member agencies in their quest for local energy resilience.

Prior Action(s):

None.

Financial Summary:

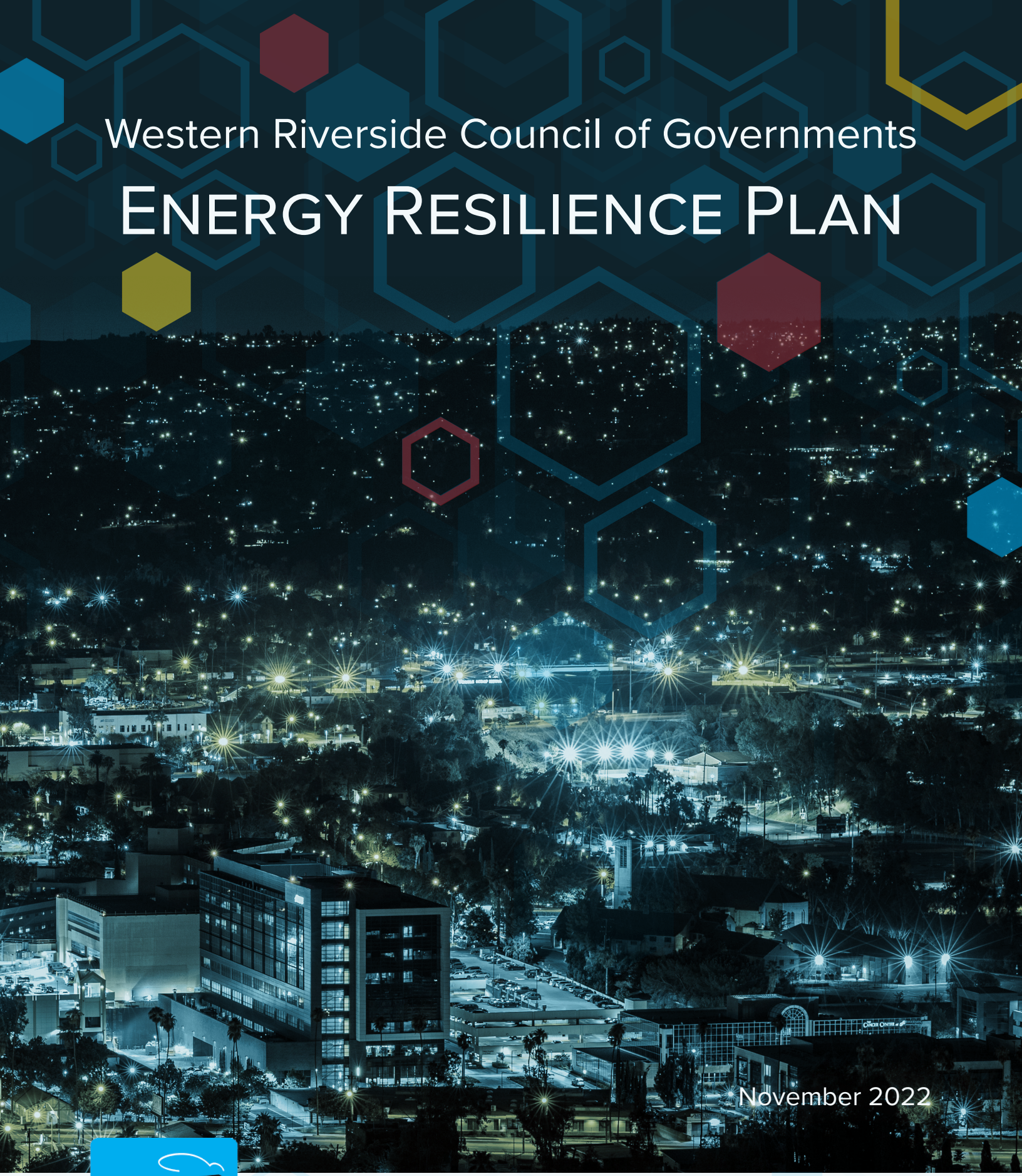
Activities related to the WRCOG Energy Resilience Plan are included in the Fiscal Year 2024/2025 budget under the General Fund (Fund 110) under the ICARP Program (2250).

Attachment(s):

Attachment 1 - WRCOG Energy Resilience Plan

Western Riverside Council of Governments

ENERGY RESILIENCE PLAN



November 2022

WRCOG Western Riverside Council of Governments

CALIFORNIA RESILIENCE CHALLENGE

UCR CE-CERT

AECOM

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Acknowledgments

The AECOM team and the Western Riverside Council of Governments and staff would foremost like to thank all WRCOG member agencies that participated in the Energy Resilience Planning process that led to the creation of this plan. For their technical contribution to the Energy Resilience Plan through stakeholder feedback and analysis peer review, we would like to thank the College of Engineering, Center for Environmental Research and Technology (CE-CERT) at the University of California, Riverside. Finally, this study would not have been possible without the generous support and funding opportunity from the California Resilience Challenge organized by the Bay Area Council. The residents and community members of Western Riverside County are safer and better prepared for an uncertain climate future thanks to the generous support of the California Resilience Challenge 2020 Grant Program.

City of Banning

City of Beaumont

City of Calimesa

City of Canyon Lake

City of Corona

City of Eastvale

City of Hemet

City of Jurupa Valley

City of Lake Elsinore

City of Menifee

City of Moreno Valley

City of Murrieta

City of Norco

City of Perris

City of Riverside

City of San Jacinto

City of Temecula

City of Wildomar

County of Riverside

Eastern Municipal Water District

Western Municipal Water District

Riverside County Superintendent of Schools

Acronyms and Abbreviations

ARPA	American Rescue Plan Act
ATSDR	Agency for Toxic Substances and Disease Registry
BESS	battery energy storage systems
CDC	Centers for Disease Control and Prevention
CDC SVI	Centers for Disease Control and Prevention/Agency for Toxic Substances and Disease Registry Social Vulnerability Index
CVAG	Coachella Valley Association of Governments
FEMA	Federal Emergency Management Agency
GHG	greenhouse gas
IIJA	Infrastructure Investment and Jobs Act
ISRF	Infrastructure State Revolving Fund
I-REN	Inland Regional Energy Network
ISRF	Infrastructure State Revolving Fund
kW	kilowatt
kWh	kilowatt hour
LOCA	localized constructed analogs
NPC	net present cost(s)
P3	public-private partnership
Plan	Energy Resilience Plan
PSPS	Public Safety Power Shutoffs
PV	Photovoltaic
SAIDI	System Average Interruption Duration
SAIFI	System Average Interruption Frequency
SBCOG	San Bernadino Council of Governments
SCE	Southern California Edison
SVI	Social Vulnerability Index
WRCOG	Western Riverside Council of Governments
WWTP	wastewater treatment plant

Executive Summary

Over the past few years, millions of Californians have lost power due to environmental hazards either directly damaging local infrastructure or necessitating public safety power shutoffs. Extreme heat days, wildfires, and flooding are all predicted to increase in the subregion due to climate change. These challenges will be exacerbated by large population growth in the region, which will increase energy demand and further stress the energy grid.

Western Riverside Council of Governments (WRCOG) developed this Energy Resilience Plan (Plan) as a response to these increasing power interruptions. When implemented, the Plan will allow WRCOG and its member agencies to be better prepared to withstand and adapt to the impacts of climate change. The Plan serves as a resource for developing and implementing energy resilience solutions in the subregion. It outlines a process consisting of two core actions: identifying and prioritizing critical facilities and designing for energy resilience (see Figure ES-1).

For future decision-making, the Plan provides information on how to prioritize public facilities for implementation of energy efficiency upgrades, local energy generation, microgrids, and energy storage systems to increase facility and community resilience.

The Plan also serves as a handbook to guide decision-making related to the identification of and investment in critical facilities and other community assets. The Plan outlines four evaluation factors—social vulnerability/community value, operational needs, physical hazard sensitivity, and existing infrastructure—that are used to identify and prioritize facilities in need of resilience upgrades and investment. These four factors, along with possible resilience interventions, are discussed in the Plan through case studies of four facilities located in three WRCOG member cities.

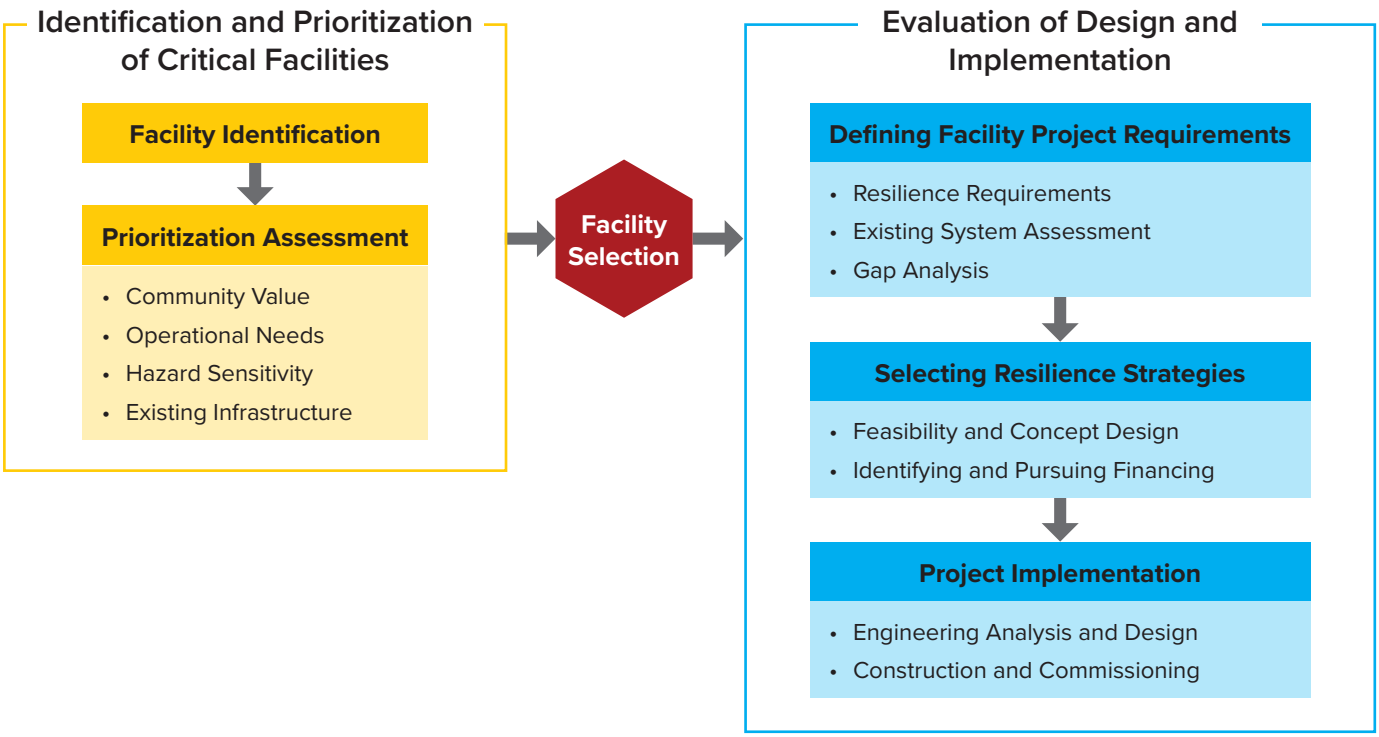


Figure ES.1. Overarching Energy Resilience Assessment and Project Development Framework

A concept-level component sizing and basis of design was applied to four case studies. The facilities that were chosen as case studies were facilities that ranked high according to the prioritization methodology presented in Section 2.4 and that were also representative of other common critical facilities in the WRCOG subregion. These case studies demonstrate specific solutions to enhancing energy resilience at fire stations, water treatment facilities, and community centers across the WRCOG subregion and inform the design approach for other facility types. The scope of potential projects is shown in Figure ES.2.

The combination of the Plan and case studies provided a foundation for a systematic assessment and project development process that considered both the technical and financial solution. The next steps for WRCOG include:

- Apply the technical solution development methodology at the other high-ranking critical facilities to define the applicable resilience projects for implementation.
- For selected facilities, develop concept and/or detailed designs that are suitable for funding, financing, and construction.
- Identify partnership opportunities for planning, funding, and implementing climate actions.
- Determine which strategies will require environmental review, technical analysis, and/or complex partnerships and permitting.
- Track new federal funding opportunities as guidance is released.
- Based upon the developed concept designs, begin preparing application materials for the state grants that have been allocated additional funding in the Governor's 2022-2023 budget.

12 Member Jurisdictions Represented
72 Critical Facilities Identified
178 Energy Loads Identified as Uninterruptible
141 Energy Loads Identified as Essential

27 Emergency Response Facilities
27 Critical Infrastructure Nodes
18 Community Resilience Hubs

Figure ES.2. Scope of Potential Facility Energy Resilience Projects across WRCOG

With this report, WRCOG members are prepared with a decision-making guide regarding implementation of energy resilience projects to increase facility and community resilience against regional power interruptions. This Plan may also serve as a guide and template for governance organizations outside of Western Riverside County to navigate community resilience through energy resilience.


Photo Credit: WRCOG

1. Introduction

WRCOG represents the collective voice of 22 member agencies, including 18 cities, the County of Riverside, Eastern and Western Municipal Water Districts, and the Riverside County Superintendent of Schools. Western Riverside County is known for its warm, dry Mediterranean climate. Eleven of WRCOG's member's jurisdictions are located at the base of mountain areas, including the Santa Ana Mountains in the Cleveland National Forest (home to the "Holy Fire" in 2018). In recent years, millions of California power customers have gone without power due to Public Safety Power Shutoffs (PSPS) events, which have been standard practice for many years but not to the current scale until recently. Extreme heat days, wildfires, and flooding are all predicted to increase in the subregion due to climate change. These climate-related challenges will be exacerbated by large population growth in the region, which will increase energy demand and further stress the energy grid.

WRCOG has developed this Plan as a response to increasing power interruptions resulting from such strains and stressors as wildfires, extreme heat events, and PSPS. As the Plan is implemented, it will allow WRCOG and its member agencies to be better prepared in the coming years for climate change impacts. Building on the previous initiatives, CAPtivate and Resilient IE, the Plan provides a framework for decision-making to develop targeted and prioritized energy resilience projects.

The ability of each agency to respond locally to climate-related disruptions depends heavily on the dependability of the energy and power supply at critical facilities. This Plan contributes to improving resilience in the region by developing a blueprint for facility energy resilience assessment, technologies, projects, and applications for WRCOG's member agencies to be able to respond to environmental events when the need arises.

The Plan was informed by a stakeholder-first approach to identifying the energy resilience needs of the subregion. WRCOG worked with each member agency to identify critical facilities and critical loads, prioritize facilities based on a multiple-criteria methodology, and develop strategies to maintain the power supply during grid interruptions from environmental or PSPS events.

1.1. Why Energy Resilience?

Energy Resilience, like energy supply more generally, is a means to an end. When energy supply for a community is reliable and affordable, it is transformative, leading to greater prosperity and greater quality of life for all. Energy infrastructure has become so ingrained in the daily necessities of life that it has been taken for

granted in many communities. It is only in recent years, through an uptick in energy disruptions caused by unprecedented environmental hazards and natural disasters, that communities have begun recognizing just how fragile this critical infrastructure can be.

This recognition has driven some communities, and WRCOG in particular, to action. As an agency charged with facilitating collective action on important issues that affect its members, WRCOG has developed this Energy Resilience Plan as a means to an end: a means to improve the social and economic resilience of the Western Riverside community through acting on the fragile yet critical infrastructure that the community relies on, energy.

WRCOG and its member agencies established goals for the Plan early on to guide the development process and ensure a Plan that best serves the needs of the community. These goals are:

- **Consistent access** to electricity for all critical public safety community facilities
- Fundamental **health and safety services** at critical public and private facilities for all members of the community
- **Replicable** examples of how energy resilience can be implemented at prototypical locations

1.2. WRCOG Context

WRCOG is a joint powers authority whose purpose is to unify Western Riverside County so that it can speak with a collective voice on important issues that affect its members. Member agencies include 18 cities in Western Riverside County, the County of Riverside, the Eastern and Western Municipal Water Districts, and the Riverside County Superintendent of Schools. WRCOG examines a range of regional matters critical to Western Riverside County's future. In April 2020, the Bay Area Council awarded WRCOG a grant to develop this Plan as part of the California Resilience Challenge Committee.

WRCOG has been a leader in promoting energy efficiency, sustainability, and resilience in Western Riverside County. It has numerous programs to assist its members in enhancing their sustainability efforts including:

- **Inland Regional Energy Network (I-REN):** a collaboration between WRCOG, the Coachella Valley Association of Governments (CVAG) and the San Bernardino Council of Governments (SBCOG) to actively participate in California's Clean Energy initiatives and build a stronger clean energy economy and community. I-REN has a vision to connect residents, businesses, and local governments to a wide range of energy efficiency resources to increase energy savings and equitable access throughout San Bernadino and Riverside Counties. I-REN programs and services include three sectors: a Public sector, a Codes and Standards sector, and a Workforce Education and Training sector.
- **Resilient IE:** A suite of resources to assist with local resilience planning and adaptation to climate hazards. Resilient IE resources include vulnerability assessments and adaptation strategies, hazard and evacuation maps, a Climate Resilient Guidebook, and Resilient IE toolkit/template Resilient Element.
- **Clean Cities Coalition:** A program designed to reduce petroleum use in the transportation sector through the integration of advanced alternative technologies, including zero-emission vehicles, and to improve air quality in Western Riverside County.

1.3. Climate Change

Climate is the long-term behavior of the atmosphere – typically represented as averages – for a given time of year. This includes average annual temperature, snowpack, or rainfall. Human emissions of carbon dioxide and other greenhouse gas (GHG) emissions are important drivers of global climate change, and recent changes across the climate system are unprecedented. Greenhouse gases trap heat in the atmosphere, resulting in warming over time. This atmospheric warming leads to other changes in the earth systems, including changing patterns of rainfall and snow, melting of glaciers and ice, and warming of oceans. Human-induced climate change is already affecting many weather and climate extremes in every region across the globe. Evidence of observed changes include heatwaves, heavy precipitation, droughts, and hurricanes.[1]

While climate projections cannot predict what will happen at a certain date in the future, projections can provide cities with information about what to expect from the climate in the future. For example, climate projections can estimate how much warmer the temperature will be in summer or how many more extreme weather events are likely to occur in the future. Climate projections, however, cannot forecast with precision when those events will occur.

In short, climate change is expected to make many natural hazards more frequent and more severe, which exacerbates the potential hazard sensitivity of critical infrastructure and assets and vulnerable populations.

1.4. Energy Resilience Definition and Context

Resilience can be defined as "**the ability to anticipate, prepare for, and respond to hazardous events, trends, or disturbances.**"[2]

Energy resilience, meanwhile, has been defined as "**the ability of energy systems to prepare for and adapt to changing conditions and withstand and recover rapidly from disruptions.**"[3]

1 Intergovernmental Panel on Climate Change. (2021). Summary for Policymakers. In: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press. In Press.

2 Center for Climate and Energy Solutions

3 Presidential Policy Directive – Critical Infrastructure Security and Resilience

To make an energy system resilient requires an understanding of what can go wrong, what is the likelihood of it going wrong, and how to mitigate the likelihood of a disruptive event from happening or the impact of the event when it does happen. In other words, resilience is about the ability to mitigate risks, as defined[4] in Figure 1.1.

To provide context for this definition of energy resilience and how energy infrastructure changes might be applied in the WRCOG community, a literature review was conducted at the start of the planning process. Key findings from the literature review are discussed below.

Resilience measures (energy efficiency, load management, solar photovoltaics (PVs), battery storage) have been implemented at facilities owned by local governments, school districts, and community-based nonprofits. Most of the examples are of solar plus storage serving individual facilities. Several studies have been completed that address ways to link multiple facilities into a larger microgrid, but regulatory constraints and associated costs have been barriers to implementation. Good candidates for multiple-facility microgrids are locations with large parcels owned by a single entity, such as civic centers, schools, or corporate campuses. **Appendix A** includes references to a few case studies that highlight the applicability of these microgrids.

Electric resilience concerns across California include:

- Localized equipment failure – transformers, switchgear
- Overheating of transmission lines – heat-related impeded electricity flow
- Equipment failure or transmission loss due to wildfire
- Increasing electricity demand – building decarbonization, electric vehicles
- Rolling blackouts due to insufficient capacity (2- to 6-hour disruptions)
- Public Safety Power Shutoffs (up to 48-hour disruptions)
- Seismic, fire, or other extreme events (72 hours or more)

Due to their role serving a community either under normal operations or in an emergency, the types of facilities most often considered for resiliency upgrades include:

- Local Schools and Community Colleges
- Civic Center Public Buildings – City Hall, Police Station
- Other Public Buildings – Library, Community Center, Recreation Center
- Private Community Assets – YMCA/YWCA, Religious Organization Facilities, Boys and Girls Club

Finally, the types of resiliency interventions explored most often by other communities

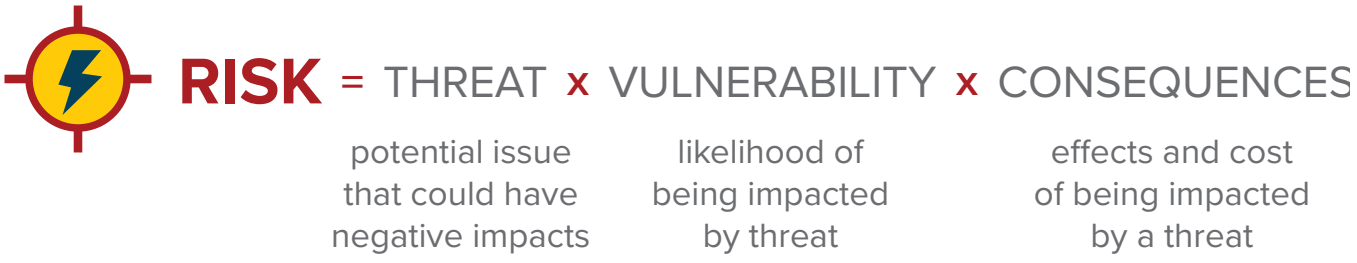


Figure 1.1. Definition of Risk for Energy Systems

4 Department of Homeland Security's Risk Assessment Methodology

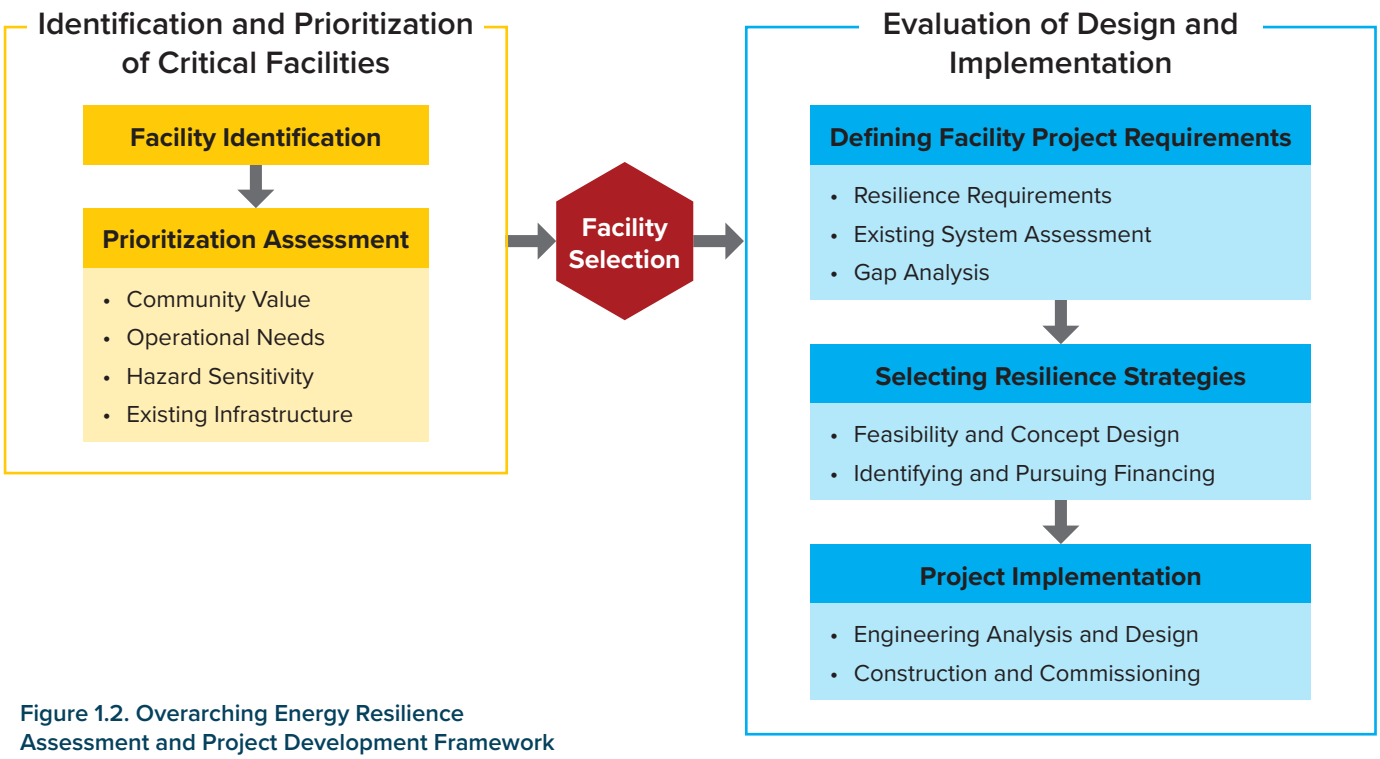


Figure 1.2. Overarching Energy Resilience Assessment and Project Development Framework

throughout California, due to their technological maturity and value brought to the community, include:

- Energy efficiency
- Solar PVs plus battery storage
- Microgrids
- Community resilience hubs

All of these angles for energy resilience helped provide context for and shaped the development of this Plan. In particular, with respect to how this Plan may be useful as a guide outside of WRCOG, these overarching topics provide a frame of reference for how challenges that this Plan attempts to address are being grappled with beyond Western Riverside County.

1.5. What Does This Plan Do?

WRCOG prepared this Plan to support WRCOG members and other agencies in preparing for and responding to power interruptions resulting from events such as wildfires, extreme heat, or PSPS. The Plan provides information for future decision-making regarding the prioritization of public facilities for energy infrastructure upgrades, including efficiency, on-site generation, energy storage systems, and microgrids, to increase facility and community resilience.

This Plan is also intended to serve as a handbook to guide decision-making related to the identification of and investment into critical facilities and other essential community assets. The Plan outlines four evaluation factors—social vulnerability/community value, operational needs, physical hazard sensitivity, and existing infrastructure—that are used to identify and prioritize facilities in need of resilience upgrades. These factors, along with possible resilience interventions, are discussed in case studies of four facilities located in three of the WRCOG member cities. The case studies present the analysis that was performed to identify requirements and arrive at conceptual designs for energy resilience upgrades.

After priority facilities are selected, the Plan describes how to define the requirements for energy resilience at each facility, how to identify and select appropriate energy resilience strategies, and ultimately how to approach energy project implementation. This process is summarized in Figure 1.2.

2. Framework for Identifying and Prioritizing Critical Facilities

The WRCOG Energy Resilience Plan is intended to guide decision-making related to the identification of and investment in critical facilities and other community assets. The Plan achieves this in two stages:

1. Identification and Prioritization of Critical Facilities
2. Evaluation of Design and Implementation Options for Energy Resilience Solutions

The framework for identifying and prioritizing critical facilities outlines four factors that should be evaluated to identify priority facilities and rank their needs for resilience upgrades and investment: social vulnerability/ community value, operational needs, physical hazard sensitivity, and existing infrastructure.

2.1. Identifying Critical Facilities

This Plan focuses on critical facilities because their operations provide everyday utility and benefit to the community and because of their importance for disaster response.

In the development of this Plan, WRCOG member agency Public Works departments and facilities managers were engaged to determine which municipal facilities best fit the Federal Emergency Management Agency (FEMA) description of critical facilities and met the vital needs for communities during hazard events to maintain health and safety.

FEMA defines critical facilities as:

"Facilities or infrastructure that are necessary for the health and welfare of the population and that are especially important following hazard events. Critical facilities include, but are not limited to, shelters, police and fire stations, and hospitals."[5]

Additional "essential facilities" can include:

- Transportation infrastructure
- Water and sewer infrastructure
- Health care facilities
- Substations
- Electric generation and distribution infrastructure
- Telecommunications infrastructure
- Aviation control towers
- Grocery stores
- Government facilities

5 FEMA, 2020, https://www.fema.gov/glossary/critical-facility

WRCOG members identified several types of facilities, including water system infrastructure, fire stations, emergency operations centers, and community centers, as critical facilities deemed eligible for resilience upgrades. Figure 2.1 shows the type of critical facilities identified throughout the WRCOG subregion based on responses from 12 member agencies. **Appendix B** includes a set of questions that were asked to identify the critical facilities and social vulnerability/ community value, operational needs, physical hazard sensitivity, and existing infrastructure.

2.2. Identifying Social Vulnerabilities Facing Western Riverside County

In addition to determining the facilities to focus on for resilience interventions based on typology, this Plan provides a framework for identifying which critical facilities should be prioritized for investment based on four social factors: community value, operational needs, physical hazard sensitivity, and existing infrastructure.

2.2.1. Understanding Community Value (Social Vulnerability)

Understanding how place, demographics, and socioeconomic status contribute to climate change vulnerability helps identify avenues for policy and/or programmatic interventions. Understanding which areas of Western Riverside County have more vulnerable residents helps decision-makers prioritize where and how to allocate resources when wildfires, extreme heat events, and other climate-related hazards occur.

Overall, there are many social, economic, and environmental factors that influence community

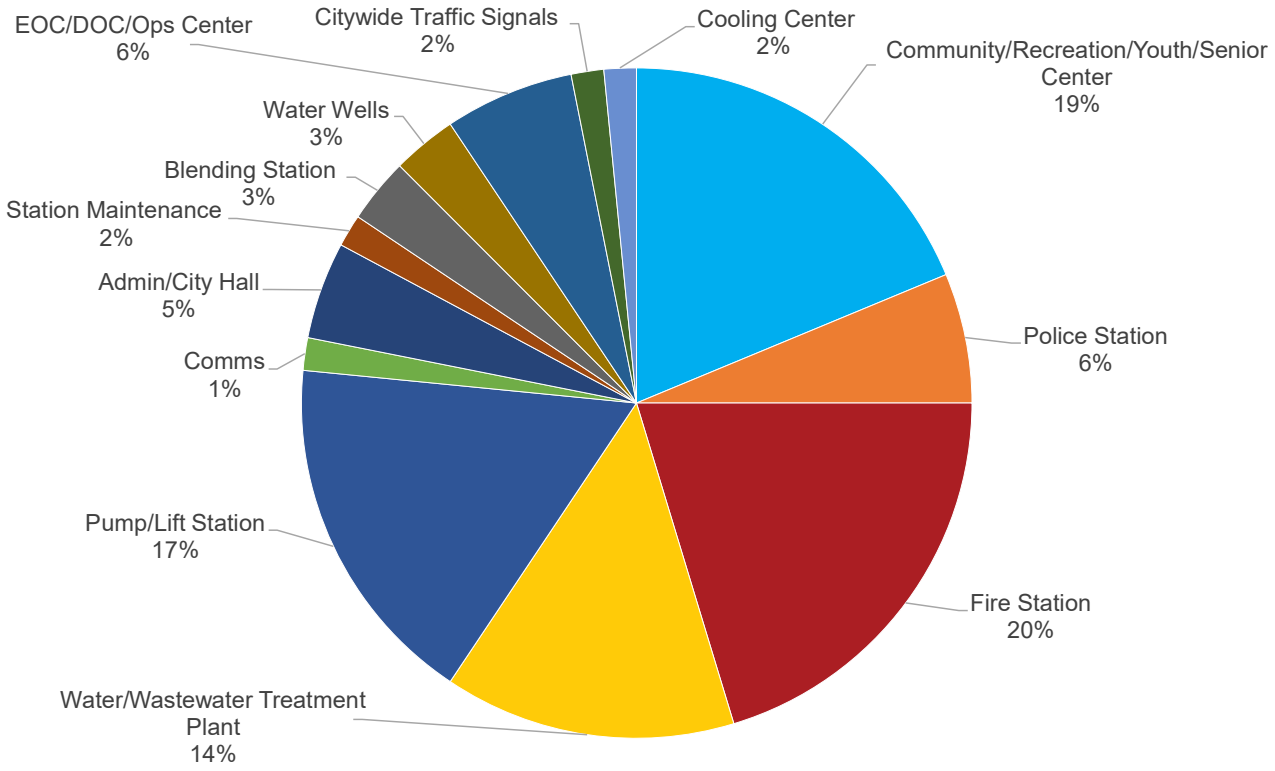


Figure 2.1. Critical Facility Typology Distribution across WRCOG

and individual vulnerability to climate impacts and the ability to adapt to climate change. For example, outdoor workers are at greater risk of heat stroke and related illnesses from extreme heat events; lower income residents have fewer resources to repair flood or fire damage and may live in poor housing conditions; and people with limited English language proficiency are less likely to access programs that could help during or after an extreme weather event. Moreover, individual biological factors, such as age or health status, can amplify a population's sensitivity to climate change.

Communities of color are often burdened with multiple, overlapping factors that cumulatively impact their ability to adapt or respond to climate change. Structural and institutional racism in economic, government, and social systems has resulted and continues to result in the disproportionate distribution of climate burdens and exposures, such as a low concentration of tree canopy coverage and a high concentration of impervious surfaces. In addition, a growing body of social epidemiological research has found that repeated experiences of racism become biologically embedded in the body and result in "weathering" or premature physiological deterioration, which in turn increases a population's sensitivity to climate hazards.

2.2.2. Social Vulnerability Findings in WRCOG

The Social Vulnerability Index (SVI) score and matrix prioritization identified which facilities serve residents with the greatest vulnerability to climate hazards. The social vulnerabilities identified in Western Riverside County include:

Socioeconomic Status: This category measures the proportion of the population that is below the poverty level, unemployed, and has no high school diploma; it also measures income levels. The most straightforward way in which socioeconomic status affects disaster resilience is related to income or assets. Households with lower incomes may not have the funds to prepare their home for climate change hazards, or the ability to recover if their home gets damaged. Lower income and unemployed populations are also less likely to have access to healthcare, leading to a higher incidence of chronic conditions (such as heart and pulmonary conditions) that put them more at risk of health effects from heat and wildfire.

Figure 2.2 depicts the spread of socioeconomic vulnerability within Western Riverside County. The communities of Moreno Valley, Banning, Jurupa Valley, and Lake Elsinore have high scores in this sector.

Household Composition and Disability: This category measures the proportion of households with people aged 65 or older, aged 17 or younger, people older than age 5 with a disability, and single-parent households. Older adults, children, and people with a disability are physiologically and socially more vulnerable to extreme events or climate stressors. For example, older adults and people with a disability may have reduced mobility, communication abilities, and/or mental functioning, which could make it difficult for them to evacuate (e.g., in a wildfire, flood, or landslide) or understand and/or carry out preparedness measures in their homes. Older adults are also more likely to have chronic illnesses (such as heart and pulmonary conditions) that increase the risk of heat illness and medical problems from wildfire smoke.

Children, particularly younger ones, are socially vulnerable because they do not have the resources or knowledge to cope with climate change hazards. They are typically dependent on their parents or other adults to keep them safe and healthy. Physical characteristics (such as the fact that they are still growing, their smaller size, the way they regulate body temperature) also put them more at risk of health effects from heat and wildfire.[6]

6 Kenney WL, Craighead DH, Alexander LM. 2014. Heat waves, aging, and human cardiovascular health. Medical Science Sports Exercise 46(10): 1891-1899.

Figure 2.3 shows that household composition is mixed throughout the subregion, but the communities of Banning, Moreno Valley, Jurupa Valley, Menifee, and Lake Elsinore have high scores in this sector.

Minority Status and Language: This category measures the proportion of the population that is a racial minority and/or speaks English "less than well." Historic and current day social and economic marginalization makes populations of color more

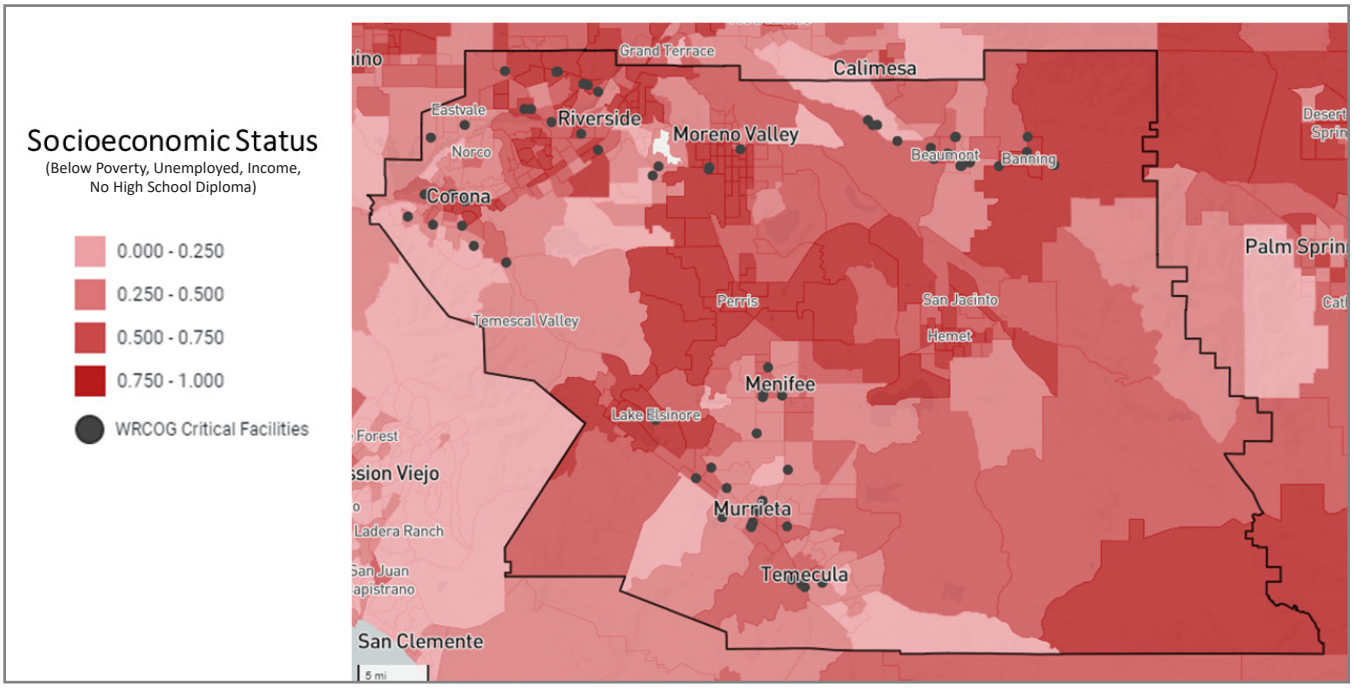


Figure 2.2. Socioeconomic Status Scores

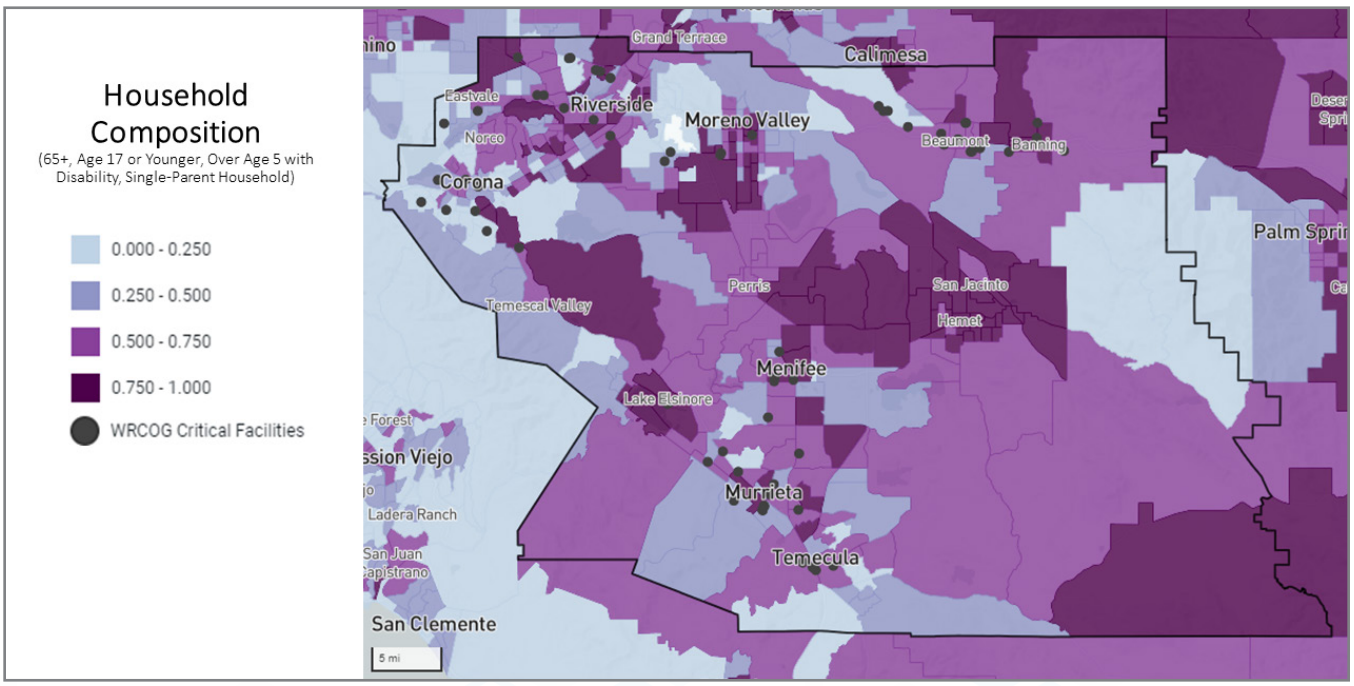


Figure 2.3. Household Composition and Disability Scores

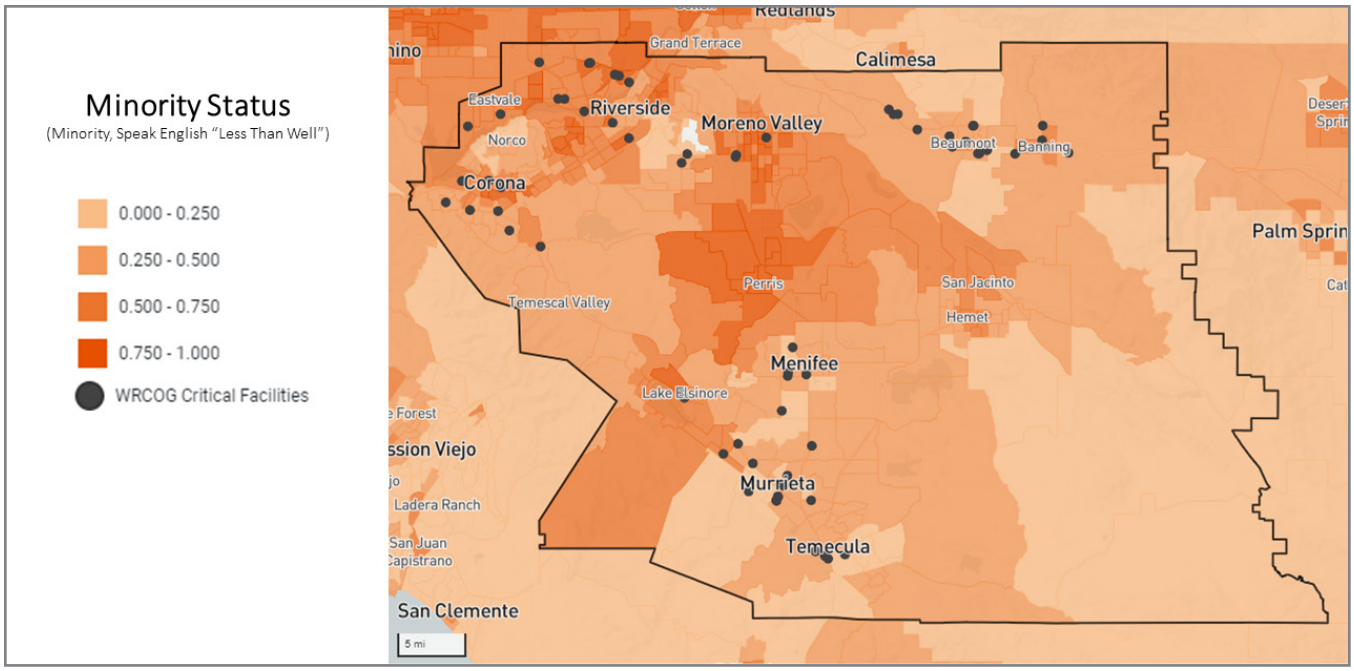


Figure 2.4. Minority Status and Language Scores

vulnerable to the impacts of climate change. Of course, race and ethnicity are connected to all three of the other SVI categories. People who are not proficient in English may have limited access to information and resources. Because of a lack of culturally relevant content, they may not fully understand climate hazards, preparedness actions, or emergency communications. Figure 2.4 shows the distribution of scores throughout the subregion. Jurupa Valley, Riverside, and Lake Elsinore have high scores in this sector.

Housing and Transportation: This category includes housing and transportation factors that lead to higher risk to natural disasters and public health threats for populations. Factors include the number of multi-unit dwellings, mobile homes, group quarters, crowding, and the proportion of households with no vehicle. Homes that are well constructed are better at protecting inhabitants from climate stressors and extreme events. For example, having better insulation and air conditioning reduces the effects of extreme heat. Or a stick-built home is likely to sustain less damage from a flood than a mobile home. Figure 2.5 shows the distribution of scores throughout Western Riverside County. The communities of Banning, Beaumont, Jurupa Valley, Moreno Valley, and Lake Elsinore have high scores in this sector.

The Socioeconomic Status and Household Composition & Disability Centers for Disease Control and Prevention (CDC) SVI themes are the greatest contributors to social vulnerability in the WRCOG region. This indicates the need for facility improvements that support populations of lower-income households, older adults, children, and people with disabilities. Figure 2.6 shows overall SVI scores for Western Riverside County.

The communities with the highest overall social vulnerability scores along with the number of critical facilities identified within them are as follows:

- Jurupa Valley (4 facilities)
- Moreno Valley (3 facilities)
- Lake Elsinore (3 facilities)
- Banning (2 facilities)
- Beaumont (2 facilities)

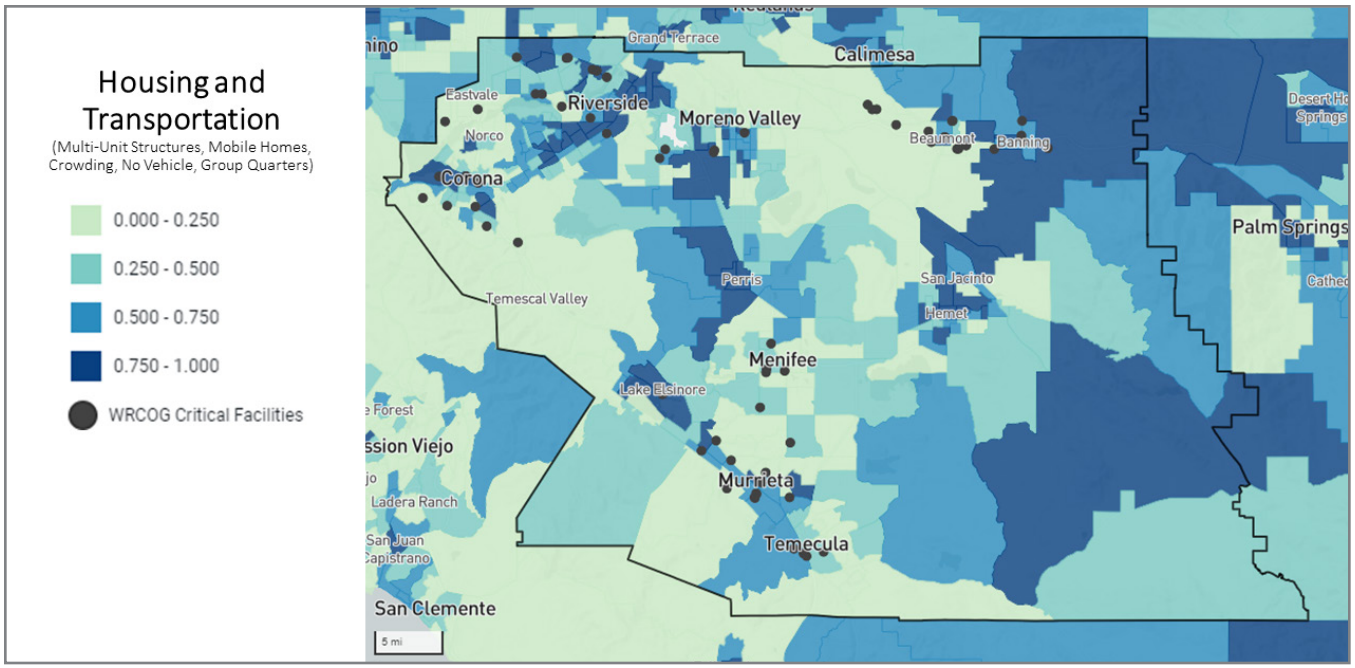


Figure 2.5. Housing and Transportation Scores

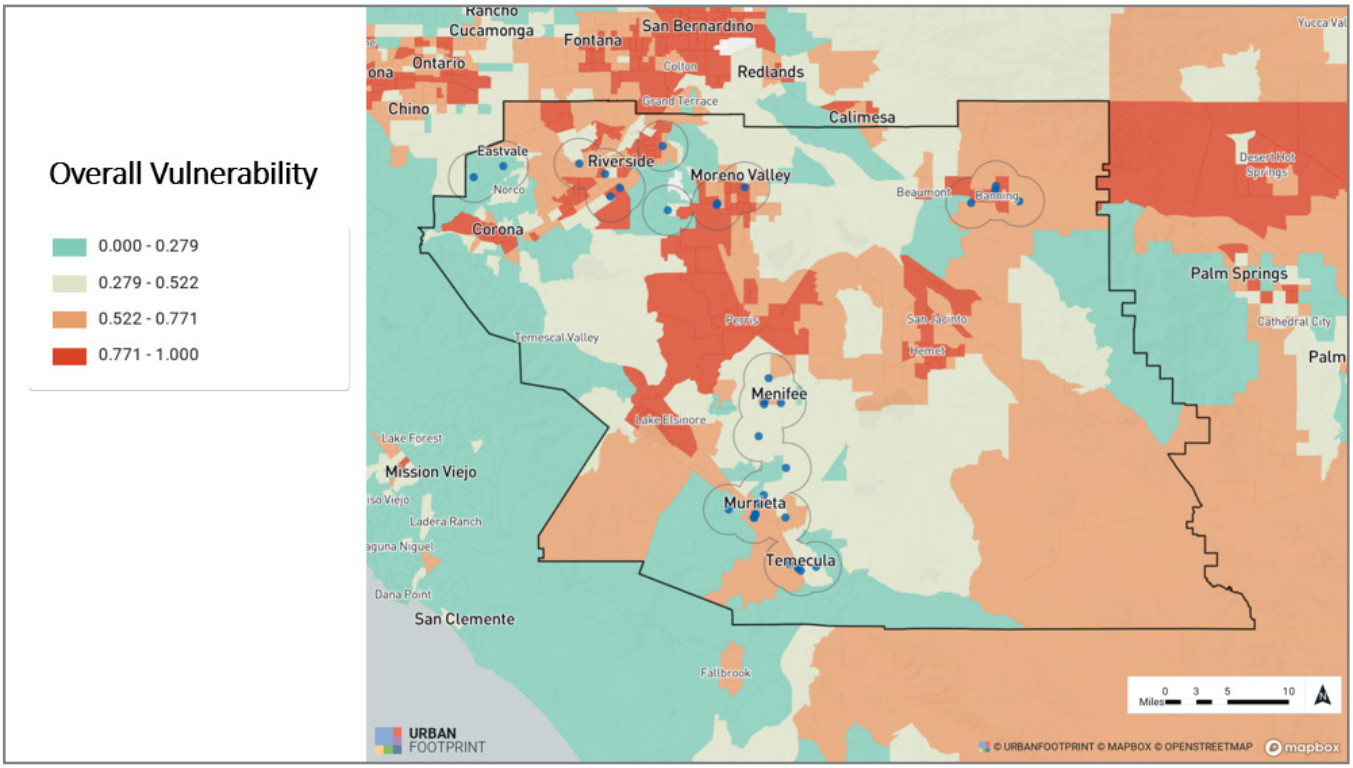


Figure 2.6. Overall Vulnerability Scores

2.3. Identifying Natural Hazards Facing Western Riverside County

The natural and climate hazards for Western Riverside County were identified using three resources: Cal-Adapt, Resilient IE, and member agency staff expertise. Cal-Adapt 2.0 is a collaboration between state agency funding programs, university, and private sector researchers to provide regionally downscaled climate projections and data that are sanctioned by the State of California to be used in climate adaptation resiliency and planning. Cal-Adapt uses California's Fourth Climate Change assessment to model the extent and impact of climate hazards on communities.

Resilient IE is an adaptation and resilience strategy with a focus on transportation infrastructure, community vulnerability assessments, and resilience planning, prepared for the WRCOG subregion of the Inland Empire in collaboration with the San Bernardino County Transportation Authority and the California Department of Transportation (Caltrans).

Several working sessions were held with WRCOG and some member agencies to identify which hazards posed the greatest threat to their communities and assets, based on local experience and institutional knowledge.

Based on these sources, the following subregional climate hazards were identified:

Air Quality: Air quality within the WRCOG subregion is impacted by high levels of ozone and particle pollution that has plagued the region. Rising temperatures can exacerbate the air pollution and trap harmful ground-level ozone in the air due to increased water vapor. Poor air quality can have direct health effects, such as reduced lung function, pneumonia, asthma, cardiovascular diseases, and premature death. Ozone concentrations are projected to increase by five to 10 parts per billion by 2050 in the Los Angeles region, especially in those areas that currently experience high levels of ozone.[7]

Drought: 75% of water supplied to customers in the WRCOG subregion is imported from the Sacramento-San Joaquin Bay Delta via the State Water Project or the Colorado River. Much of the water is from the Sierra Nevada snowpack, which is projected to decrease by 2100 under all climate scenarios, as illustrated in Figure 2.7.[8]

7 Resilient IE (2020).
8 Data derived from 32 LOCA downscaled climate projections generated to support California's Fourth Climate Change Assessment. Details are described in Pierce et al., 2018.

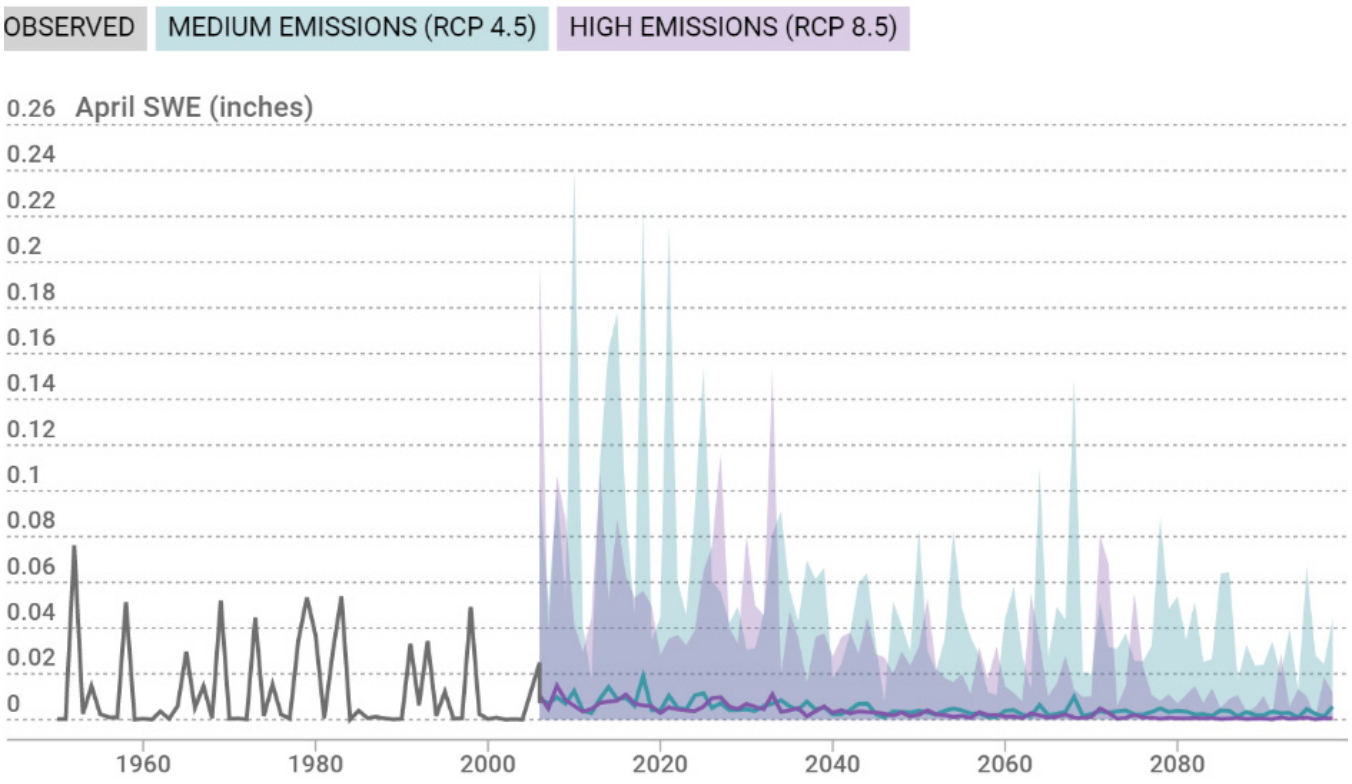


Figure 2.7. April Sierra Nevada Snow Water Equivalent (Source: Cal-Adapt, 2022)

Flooding: Although Southern California is likely to experience a decrease in overall precipitation levels due to climate change, the region is also expected to see an increase in the number of extreme precipitation events. Although flooding may occur in areas not designated as flood zones, the regulatory standard for identifying flood areas is found in the FEMA special hazard flood zone maps, which identify 100-year flood zones. Figure 2.8 identifies FEMA 100-year flood zones for the subregion.

Extreme Temperature: Climate change is expected to increase overall global temperatures (IPCC 2013). The subregion will experience this increase in average annual heat in a variety of ways, including an increased number of extreme heat days [9] and heat waves, warmer summer evenings, and warmer average annual temperatures.

As identified in Figure 2.9, the number of extreme heat days is projected to rise through 2050, where the average year could include 23 to 29 extreme heat days, and 30 to 59 extreme heat days per year by 2099.[10]

Wildfire: Higher temperatures and drought create extremely dry fuel conditions that can increase the likelihood and intensity of wildfire. According to the California Fourth Climate Change Assessment, the WRCOG region may see a 13.4% increase in average annual acres burned above historic levels by mid-century. By the end of the century this increase is projected to decrease to 2.3% above historic levels due to wildfire fuel reductions

9 Threshold temperature for a location is defined as the 98th percentile value of historical daily maximum/minimum temperatures (from 1961–1990, between April and October) observed at that location. In Riverside County, the threshold temperature is 106.0 °F.

10 Data derived from 32 LOCA downscaled climate projections generated to support California's Fourth Climate Change Assessment. Details are described in Pierce et al., 2018.

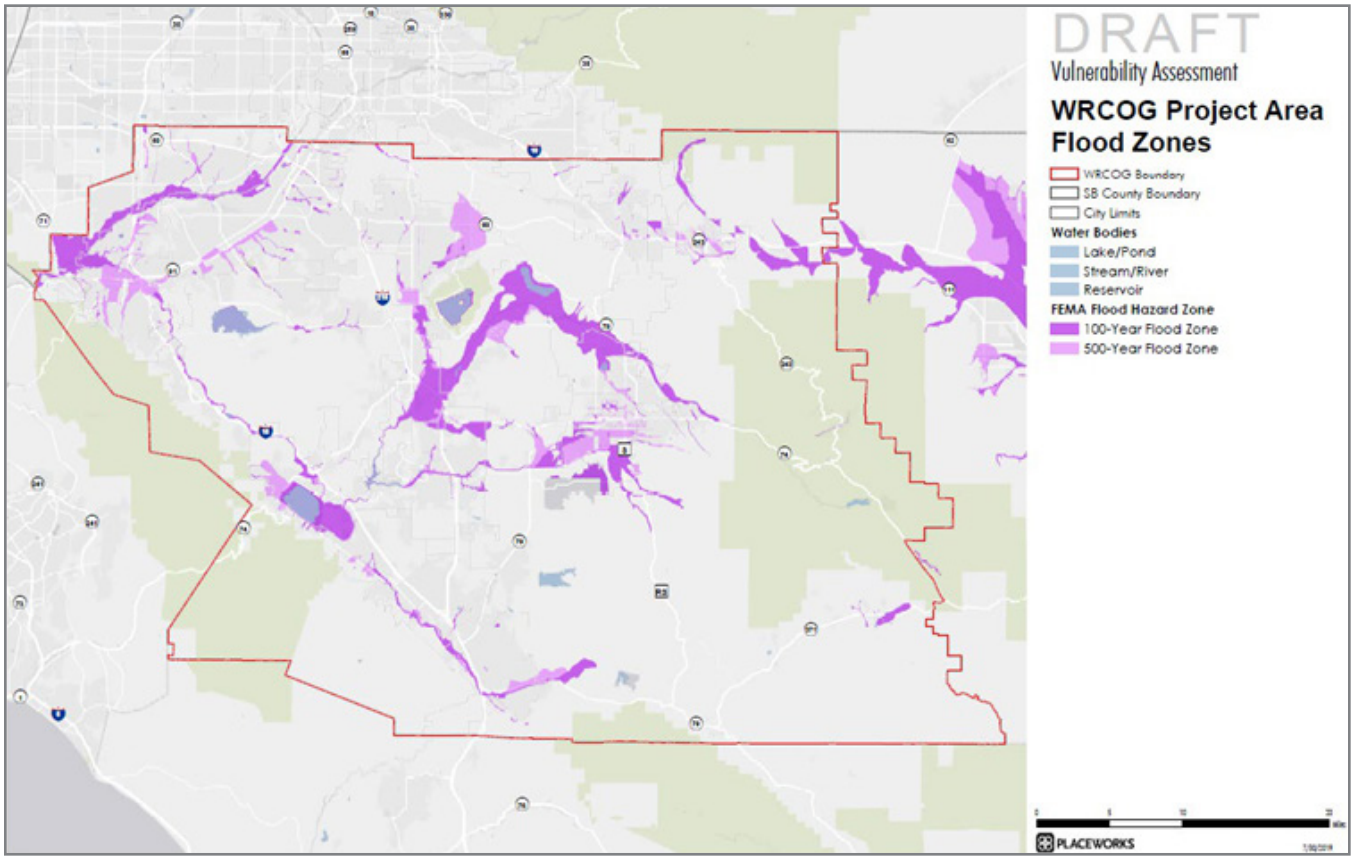


Figure 2.8. FEMA 100-Year Flood Zones (Sources: FEMA, 2018; WRCOG, 2019)

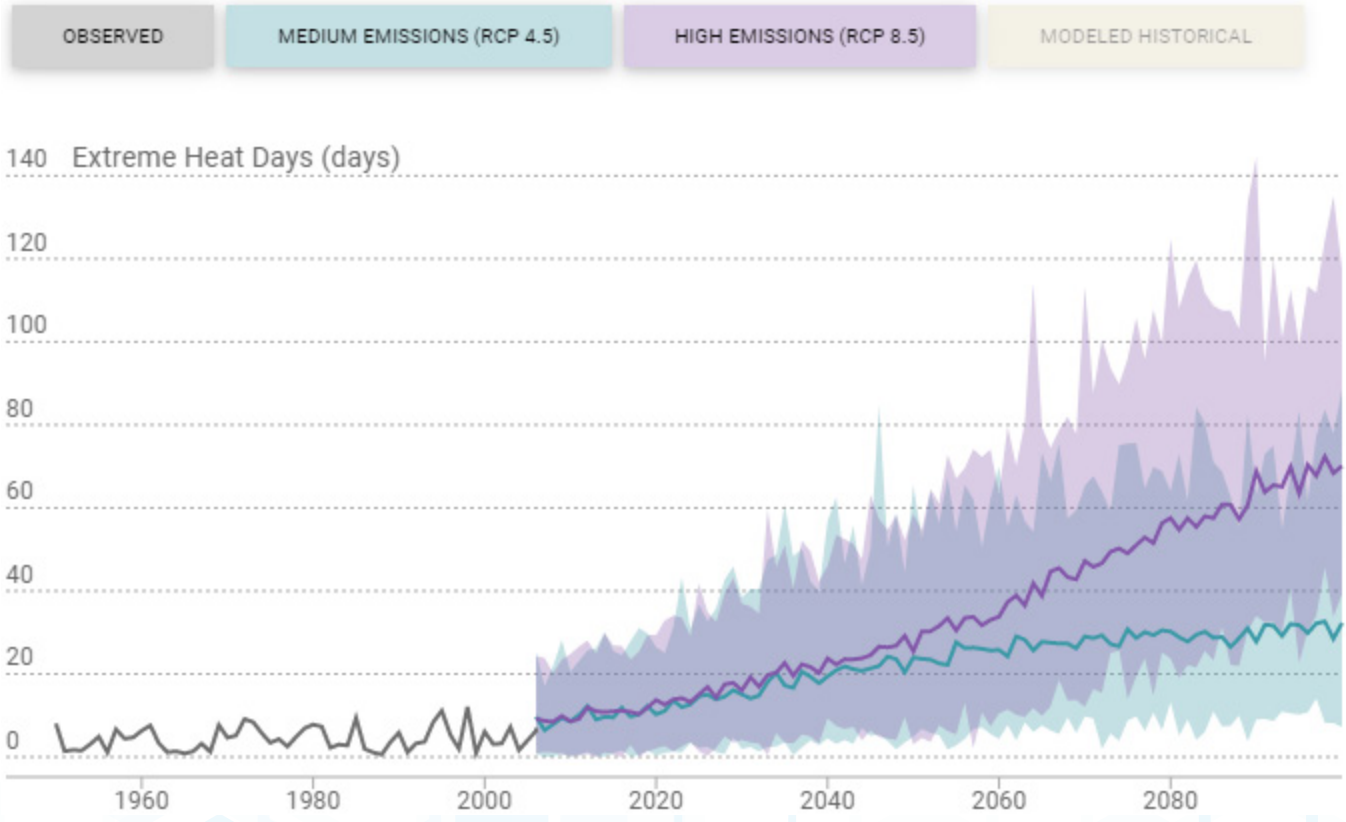


Figure 2.9. Number of Days in a Year When Daily Maximum Temperature is Above a Threshold Temperature of 106.0 °F in Riverside County (Source: Cal-Adapt, 2022)

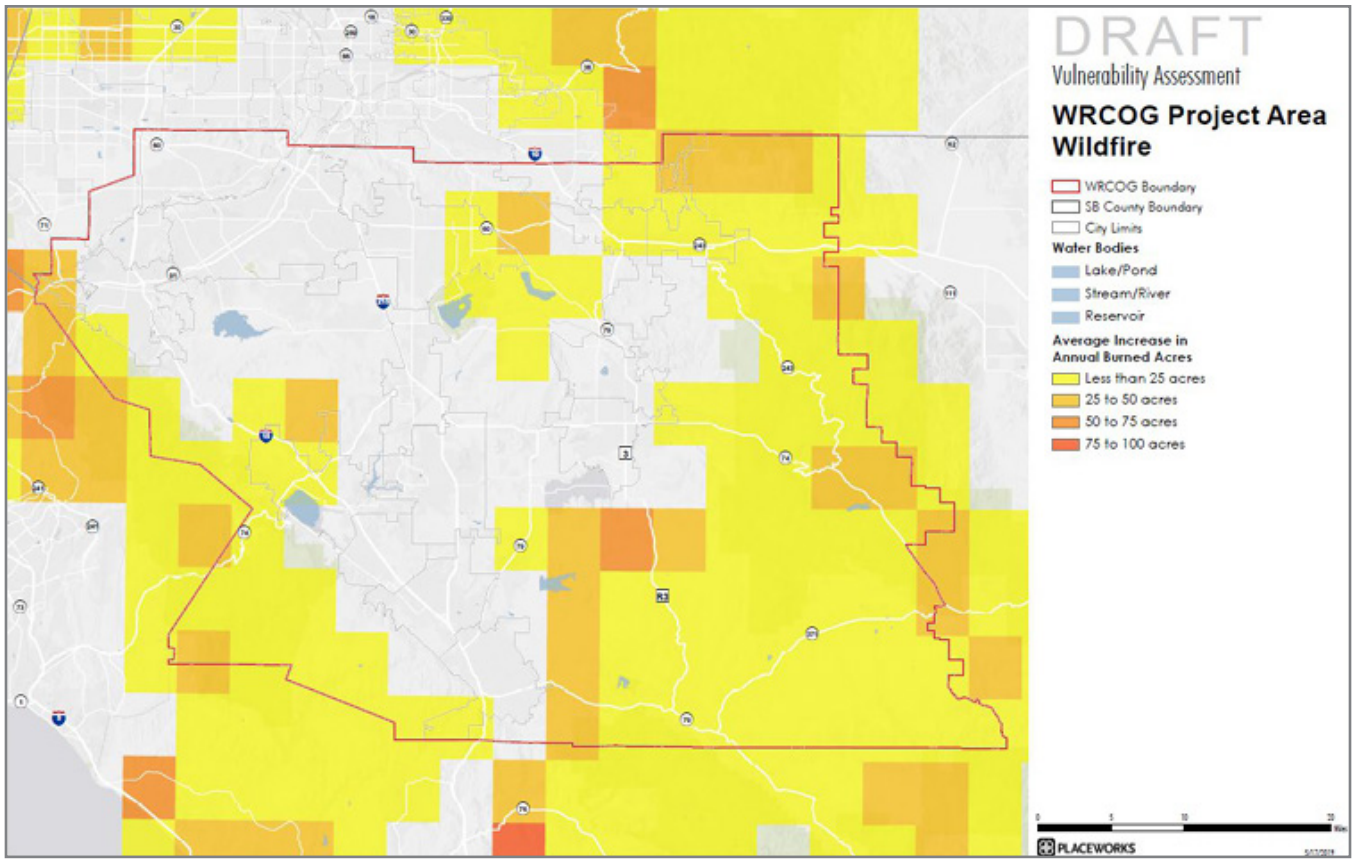


Figure 2.10. Average Increase Between Historic (1962-1990) and Future (2070-2099) Annual Burned Acres (Source: CEC, 2019)

associated with increased drought and extreme heat conditions. In addition to the direct physical threat to life and property, smoke released during an event can have a detrimental effect on the subregion's air quality. Figure 2.10 shows the average increase between historic and future annual acres burned within the Western Riverside subregion.

Human Health Hazards: Climate hazards can have detrimental health impacts on communities, especially vulnerable populations, as discussed in the Social Vulnerability section. Californians face a variety of increasing health problems, such as more heat-related illnesses, breathing and heart troubles, food and water contamination, traumatic injuries, mental health challenges, and exposure to infectious diseases.[11] Extreme heat can exacerbate the air pollution and trap harmful ground-level ozone in the air due to increased water vapor.[12] Flooding can threaten food and water safety and result in more contaminated runoff and failure of wastewater treatment facilities, which can lead to outbreaks of gastrointestinal infections.[13] Wildfire smoke produces particle pollution, which is the principal public health threat from short- and long-term exposure to wildfire smoke. The health effects of particle pollution exposure can range from relatively minor (e.g., eye and respiratory tract irritation) to more serious health effects (e.g., exacerbation of asthma and heart failure, and premature death).[14]

11 Louise Bedsworth et al. (2018). Statewide Summary Report. California's Fourth Climate Change Assessment, California Governor's Office of Planning and Research, Scripps Institution of Oceanography, California Energy Commission, and California Public Utilities Commission.
12 Resilient IE (2020).
13 Juli Trtanj et al. (2016) "Climate Impacts on Water-Related Illnesses," chapter 6 in The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment, USGCRP health2016.globalchange.gov/downloads.
14 US EPA (2021)

2.4. Prioritizing Critical Facilities

2.4.1. Overview of Prioritization Framework

An evaluation matrix was developed to review the characteristics of the various critical facilities identified by WRCOG member agencies **(Appendix C)**. The purpose of the matrix is to provide an objective method to integrate a broad range of important facility factors and characteristics that impact the overall resilience of the facility as well as the broader community. A scoring system was developed to place each facility on 100-point scale, with higher scoring facilities seen as having the greatest need for intervention to enhance their resilience. For example, a facility with a score of 80 is less resilient than a facility scoring 60 and is less able to meet its needs in order to sustain its operations during a disaster event. Different weighting factors were attributed to each aspect of the facility that was evaluated. The factors ranged from the facility's impact on community value; its operational characteristics, such as providing shelter or a place of assembly; its potential sensitivity to nearby hazards; and the services or resources provided relative to the anticipated community needs during a disruption in the energy system (Figure 2.11).

Based on discussion with WRCOG member agencies, several factors were weighted more highly, such as security, ability to maintain medical care, and the ability to meet the needs of the most vulnerable populations and community. The weighting used to reflect the conditions in West Riverside County could be adjusted if the matrix were to be used in another location with different threats, risks, vulnerabilities, and community composition.

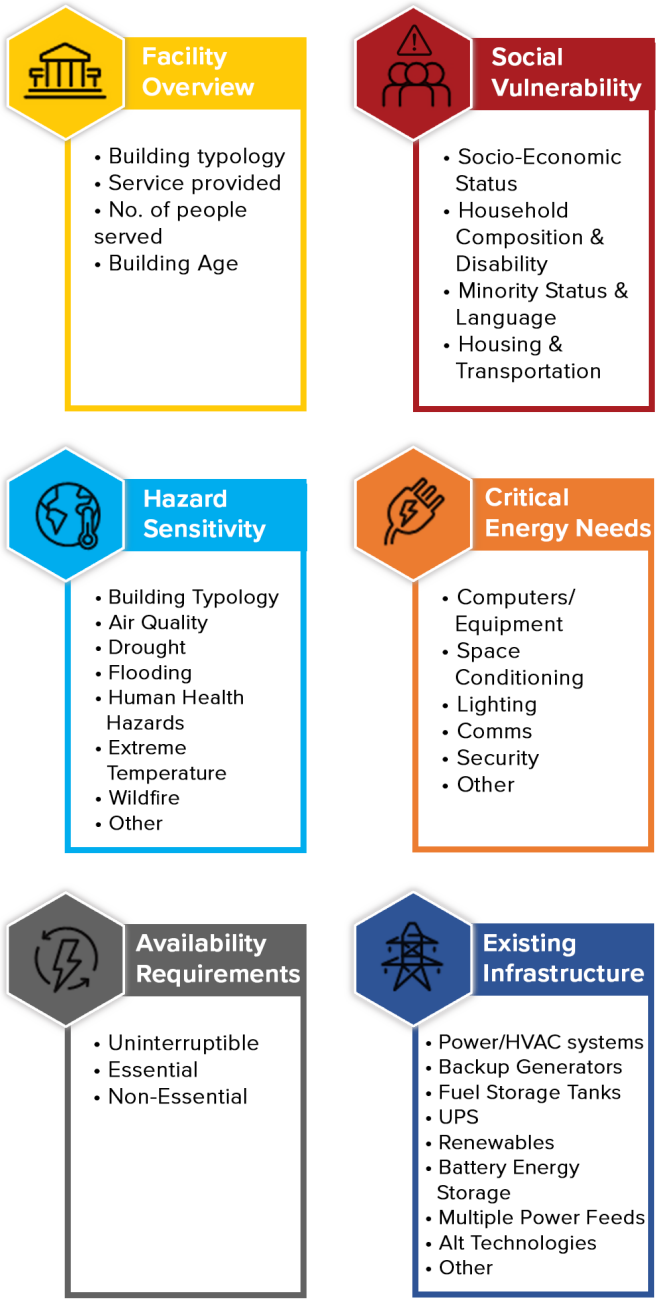


Figure 2.11. Facility Prioritization Factors

2.4.2. Community Value (Social Vulnerability)

This assessment uses the CDC/Agency for Toxic Substances and Disease Registry (ATSDR) Social Vulnerability Index (CDC SVI) [15] to identify census tracts in the member agency's jurisdiction that have greater vulnerability to climate-related hazards such as wildfire and extreme

15 https://www.atsdr.cdc.gov/placeandhealth/svi/index.html

heat. The index uses data from American Community Survey 2014-2018 5-year estimates for 15 variables grouped into four themes: Socioeconomic Status, Household Composition and Disability, Minority Status and Language, and Housing Type and Transportation (see Figure 2.12).

The 2018 SVI dataset for California was used to analyze the CDC SVI data for the WRCOG member agency's jurisdiction.[16] This dataset shows the relative vulnerability, as a percentile ranking, of all census tracts within California (rather than all US census tracts). The WRCOG facilities were then mapped so they could be matched up with the SVI data for the census tract they belong to, using UrbanFootprint software.

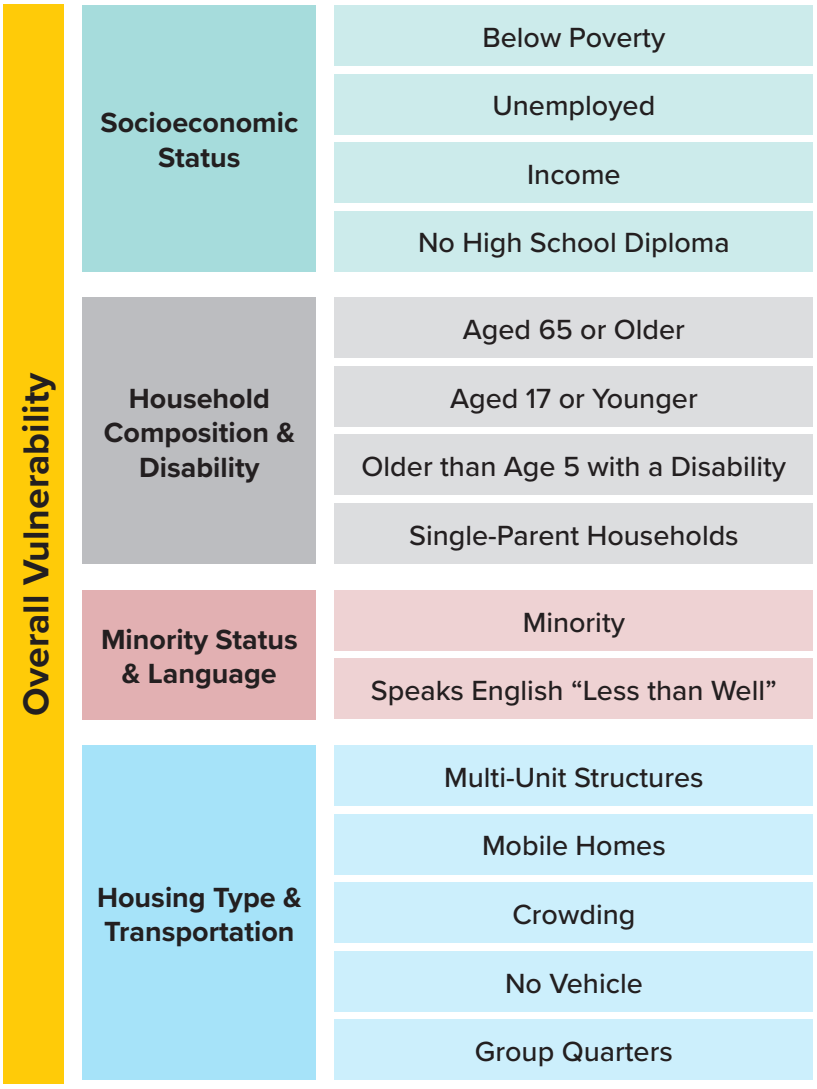


Figure 2.12. CDC/ATSDR SVI Variables Used (Source: CDC, 2022)

To translate the CDC SVI percentile results into the WRCOG Facility Prioritization Matrix Community Value (Social Vulnerability) sector, each facility received points for its tract's overall SVI score. The following methodology is used to convert the percentile score to points in the matrix:

- Over 75th percentile = 4 points
- > 50-75th percentile = 3 points
- > 25-50th percentile = 2 points
- 0-25th percentile = 1 point

To determine the community value of a facility, several criteria should be evaluated, including number of people served, socioeconomic status, household composition and disability, minority status and language, access to housing and transportation, and overall social vulnerability of the population served by the facility. This analysis determines the scale and vulnerability of the community served by the asset/facility. The higher the vulnerability of the population served, the higher the priority of the facility for resilience interventions.

16 Centers for Disease Control and Prevention/ Agency for Toxic Substances and Disease Registry/ Geospatial Research, Analysis, and Services Program. CDC/ATSDR Social Vulnerability Index 2018 Database California. https://www.atsdr.cdc.gov/placeandhealth/svi/data_documentation_download.html. Accessed August 2021.

Key stakeholders to engage on this topic to validate the analysis and learn more about specific community needs include:

- **Representatives from populations identified as socially vulnerable**
- **Community-based organizations**

During the development of this Plan, the SVI analysis was validated by speaking with WRCOG staff and representatives from the cities identified as most at risk.

2.4.3. Operational Needs (Energy Needs and Availability Requirements)

This category addresses the various functions and services that the facilities are currently providing or services that are provided to community members. The analysis of this component of facility prioritization is used to determine the feasibility of continuing to provide these services in a time of electrical grid disruption or other emergency situation.

Each facility feature is ranked on three-point scale. Three points are assigned to services that cannot be interrupted, such as refrigeration of medication; two points to services that are essential, such as heating and cooling; and one point to services than are non-essential. Figure 2.13 shows the type of critical energy needs at various facilities and how important it is to preserve these functions during power disruptions.

The evaluation starts with a determination of whether the function of the services of the facility can be relocated. Having location flexibility enables the services to be brought to the specific community that is being impacted, rather than requiring community members to travel to the facility.

The next factor is the presence of computers and other operations or communications equipment. Given their sensitivity, preservation of electronic resources is seen as a high priority. Facilities with computers are allocated a higher score to reflect the importance of protecting these resources and ideally being able to maintain operations of data and communications.

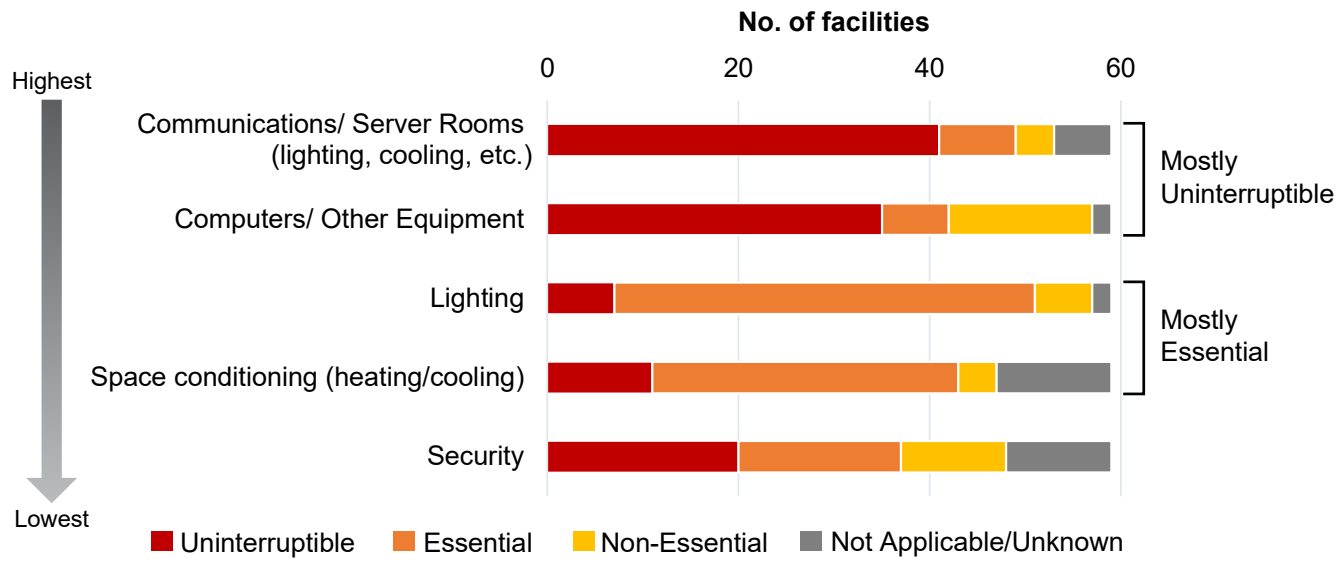
Space conditioning, either heating or cooling, can be vital to protecting people who have health-related concerns that can be exacerbated by extreme heat or cold. These concerns can include persistent cardiovascular or respiratory illnesses. Over time, exposure to extreme heat or cold can be life-threatening.

Lighting is important to maintain for the security and safety of people occupying the building. Facilities with the ability to provide lighting in an area where people can congregate and access other resources are considered to be significant resilience assets.

Maintaining communications during disruption or emergency, through the cell phone or internet networks, is critical. This can be as simple as providing phone charging and as significant as having a secure server or server room that is connected to a long-term backup power source.

Location in a secure area is considered to be a positive attribute. This could be a facility located in a secure city building or maintenance yard or a secure school site in the community. The ability to monitor who comes in and out the facility, provide lighting, provide separation between people or families, and generally protect those using the facility from harm are critical concerns in facility selection.

During the development of this Plan, a request for information was sent to facility managers to collect



Note: Additional requirements pertain to pumps, process equipment, etc.

Figure 2.13. Facility Critical Energy Needs and Availability Requirements

data about the operations of critical facilities. Responses were followed up with stakeholder interviews to provide more details and confirm information.

Key stakeholders to engage at this step in the process to provide insight into the details of facility operations and systems include:

- **Municipal and/or regional emergency management personnel**
- **Public safety departments including Fire, Police**
- **Public and critical facilities managers**
- **Public works and/or utility departments**

2.4.4. Physical Hazard Sensitivity

The third prioritization factor is physical hazard sensitivity, which results from assessing the scale and nature of the physical threats to the asset/facility. Physical threats are measured on a three-point scale, where three points are assigned for high sensitivity, two points are assigned for medium sensitivity, and one point is assigned to low sensitivity for each hazard. Zero points are assigned if the hazard does not apply.

Physical threats to critical facilities include:

- PSPS
- Extreme heat
- Wildfire
- Flood
- Earthquake

Physical threats can interrupt the power supply to critical facilities as a result of physical damage to infrastructure and or preemptive shutoff of the energy supply to minimize possible damage to infrastructure and/or the community. Many critical facilities across the WRCOG subregion are susceptible to physical threats from climate hazards.

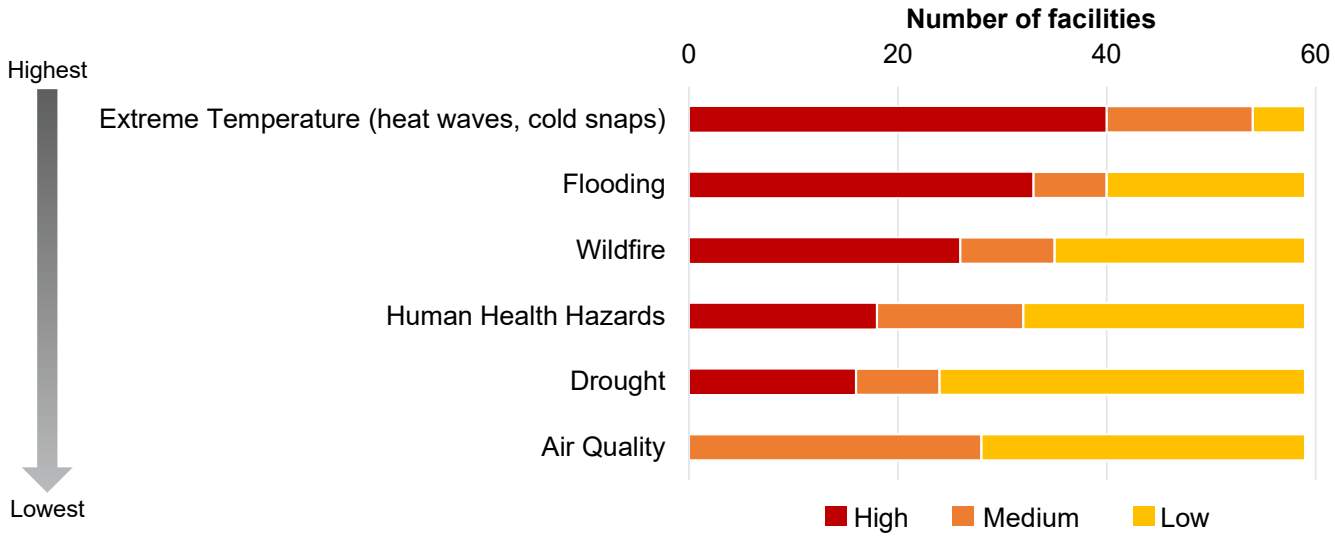
Figure 2.14 shows the hazard sensitivity of critical facilities in Western Riverside County to various climate hazards.

The hazard sensitivity evaluation takes into consideration the location of the facility and that location's sensitivity to a particular hazard (e.g., Is the facility located in a high wildfire severity zone?) as well as the likelihood of a hazard to disrupt energy supply to the facility.

During the development of this Plan, a workshop was held with WRCOG member agencies' emergency management personnel and public works departments to discuss which climate hazards were affecting their cities and how facilities and communities were being impacted.

Key stakeholders to engage at this step in the process include:

- **Municipal and/or regional emergency management personnel**
- **Public safety departments including Fire and Police**
- **Public and critical facilities managers**



Note: Additional threats include PSPS and earthquakes. The latter is specifically applicable to Riverside.

Figure 2.14. Physical Threats to Critical Facilities

2.4.5. Existing Infrastructure

The criteria in this component of the prioritization analysis address the physical attributes of the facility that are related to providing continuous energy supply or supporting the needs that are reliant on electricity, such as lighting, heating and cooling, refrigeration of medicines, or telecommunications.

The criteria include fundamental attributes such as the age of the building, the age and condition of the energy equipment, and the overall capacity of the electricity system. Older buildings are more likely to have less efficient systems or need energy upgrades and may have capacity constraints on electrical service or the addition of new systems. Older buildings may also present opportunities to integrate energy resilience measures into planned facility upgrades. Other infrastructure factors include the age and condition of the energy equipment and the presence and capacity of heating and cooling systems. Capacity is a critical concern if the facility is to be place of refuge or assembly.

The next cluster of criteria address methods of maintaining power to provide basic services. These include backup generation, fuel storage tanks, battery storage, and on-site energy generation. Photovoltaic systems designed to operate autonomously from the power grid can serve this need during daylight hours but need to be combined with other methods to provide energy for longer periods.

Typical backup generations systems are designed to maintain building energy services for relatively short periods. If the facilities are considered for a longer period of use to provide resilience services, which is likely, the existing backup systems may need to be increased to provide energy for 12 to 24 hours or be augmented by on-site generation to extend the time period. Other factors include whether there are multiple ways to feed energy to the property or if the property is able to switch from one source, such as a diesel generator, to another energy source, such as PV or batteries, without major disruption to services.

The energy infrastructure components and services at a given facility are compared to an ideal list of systems and services to determine the score in each category. The analysis is then used to determine the gap between a specific facility and an ideal situation. Facilities with a greater diversity of services and existing capacity, and thus a smaller gap, receive a higher score in this section of the prioritization analysis.

Similar to the operational needs factor, a request for information was sent to facility managers to collect data about critical facilities and was followed up with stakeholder interviews to provide more detail and confirm information.

Key stakeholders to engage at this step in the process to provide insight into the details of facilities include:

- **Municipal and/or regional emergency management personnel**
- **Public and critical facilities managers**
- **Public works departments**

3. Framework for Designing for Energy Resilience

The WRCOG Energy Resilience Plan serves as a guide for decision-making related to the identification of and investment in critical facilities and other community assets, which occurs in two stages:

1. Identification and Prioritization of Critical Facilities
2. Evaluation of Design and Implementation Options for Energy Resilience Solutions

Once the critical facilities are identified and prioritized, the framework for designing for energy resilience focuses on developing a technical solution. This includes determining what hazards to mitigate or protect against, what level of reliability and resilience to design to, what technologies and design elements could be part of the solution, and what resources can be mapped to the selected technologies to help with implementation.

3.1. Evaluating Energy Resilience

This section describes the process for defining the design objectives of a resilient energy system for critical WRCOG facilities. It is an attempt to answer the question:

"How resilient is resilient enough?"

There are many levels of resilience and many layers of backups and redundancies that could be applied to a given situation. The challenge for any prudent engineer or emergency planner is how to put boundaries on that decision-making process. One approach is summarized below:

$$Resilience = \frac{[Capabilities]}{[Requirements]}$$

In other words, designing a facility to be "resilient enough" means designing it to have resilience capabilities that are appropriately aligned with the resilience requirements. Designing capabilities that far exceed the requirements appropriate for that facility, i.e., achieving ">100%" (conceptually) would constitute overinvestment in infrastructure.

3.1.1. Defining the Energy Resilience Requirements

When the resilience requirements are successfully identified for a given facility, the result is a "desired end-state" to aim for when selecting design solutions. This desired end-state should be built up from a holistic understanding of the **mission needs** of a facility, i.e., what is/are the function(s) and purpose of the facility being evaluated and what systems must be operational in order for the mission to be successful. Missions

for a facility can include emergency response, water treatment and water distribution, critical life safety, and community cooling hubs. Mission needs can include lighting, computers and network connectivity for communications; heating, ventilation, and air conditioning (HVAC) systems; and specialized equipment such as garage bay doors, medical equipment, and pumps. This top-down approach for defining resilience requirements is summarized in Figure 3.1.

A resilience evaluation informs the **resources** required to support successful operation, as shown in Figure 3.1. Most critical missions require some degree of **power** supply to assure mission success, either for the whole facility or for critical circuits. Depending on the mission, **heating** and **cooling** may be critical to maintain sensitive climate control requirements. Reliable **water** supply may also be a requirement for mission success, although in some cases reliable water supply is the outcome of mission success (such as for water/wastewater treatment and distribution systems).[17]

Resource requirements for describing all possible scenarios for mission needs can be defined in three tiers of availability, as shown in Table 3.1.

To determine the availability requirements for each resource at a given facility, starting with an understanding of the facility by engaging the following stakeholders who know the facility well is recommended:

- The **facility manager** can speak to what systems are in place, what they are used for, and where are the chronic issues that have historically caused mission disruptions.
- The **site director** can speak to the broader functions of the facility, the implications to community resilience if utilities are disrupted, and what kind of contingency plans are in place (or lacking) to mitigate mission interruption due to facility degradation (such as whether the mission can be relocated).

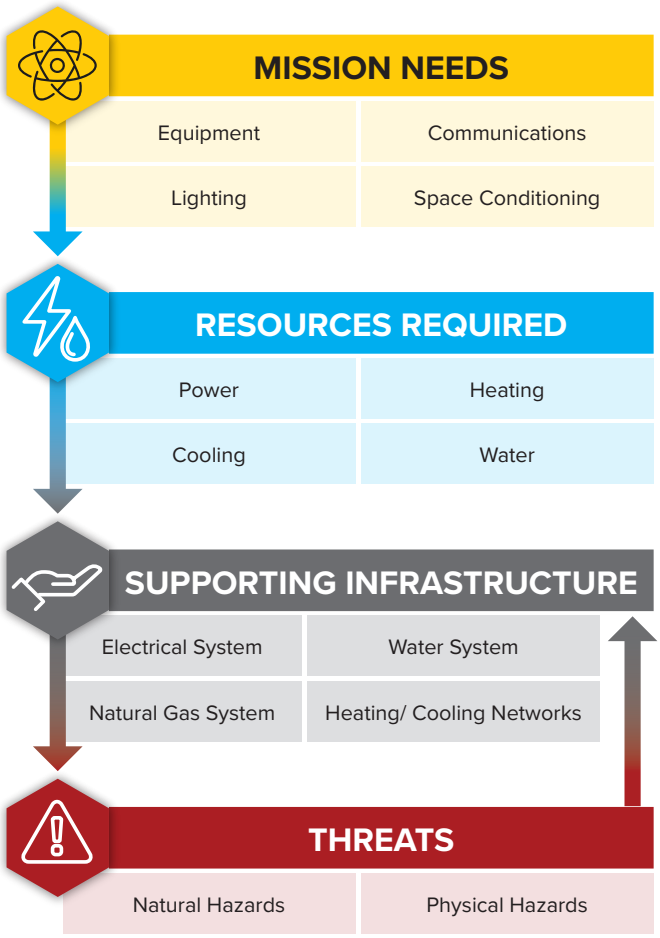


Figure 3.1. Top-down Approach to Defining Energy Resilience Requirements

Through interviewing the facility manager and site director of the critical facility being assessed, each end-use for each resource can be categorized as uninterruptible, essential, or non-essential. For the case studies, this was achieved by sending a facility questionnaire to the key stakeholders to gain an initial understanding and then following up with a phone interview. The result is a complete knowledge base for the resource requirements of the facility. For most facilities, such as the **Menifee Senior Center** and **Jurupa Valley Fire Station**, the resource end-uses that are categorized as uninterruptible or essential will be a focused

17 Water and wastewater systems at a facility are important elements of resilient infrastructure but have not been the focus of this effort.

Table 3.1. Tiers of Resource Availability Requirements

Tier	Description
Uninterruptible	Resource must be continuously available and cannot experience even momentary disruptions in supply or quality.
Essential	Resource must be available during a specific activity for a given duration. Minor variations in resource quality can be tolerated without significant disruption.
Non-Essential	Resource can be lost or quality can be degraded for extended periods without severe consequence.

subset of the total resource use at the facility. This can be a very helpful discovery because it means that the facility's resilience strategy can hone in on that subset of more critical end-uses instead of building a strategy for the entirety of all resources used. When resources are scarce in an austere environment, such as the aftermath of a natural disaster, having a clear understanding of which end-uses are most critical will help ensure that those scarce resources are allocated appropriately.

Once the resource requirements have been identified, an understanding of the supporting infrastructure is a natural next step. The supporting infrastructure represents not just the physical, engineered systems in a facility but also the management systems applied to a facility, such as maintenance plans and emergency protocol exercises. When a mission needs resources to ensure success, it is the **supporting infrastructure** that provides those resources. This includes the power distribution system (transformers, panels, circuits), the HVAC system (mechanical equipment, pipes, ducts, natural gas supply), the water and wastewater systems (pipes, pumps, valves), and management systems.

Similarly, it is the supporting infrastructure that must survive the **threats** present in a given community or geographic location. Threats include the natural hazards in the area (heat waves, earthquakes, heavy rains and flooding, strong winds) as well as the social vulnerabilities and physical threats that a community may face (socioeconomic factors, social unrest, public health challenges). Revisit Chapter 2 for information on how to assess the threats in a given location.

To summarize, when designing a facility for energy resilience, it is the supporting infrastructure that provides the resources required for the mission, and it is the supporting infrastructure that must survive the threats facing the community. The level of risk mitigation pursued (the resilience requirement) is informed both by the degree to which the critical resources are required for mission success and the magnitude of the threats that may cause resource disruption. The supporting infrastructure, therefore, is the entry point into making changes at a facility that will enhance its ability to achieve mission success amid a range of threats. Supporting infrastructure is the focus of the rest of this chapter. See Figure 3.2 for a conceptual summary.

3.1.2. Defining the Energy Resilience Capabilities

An effective energy resilience strategy involves more than simply installing a backup diesel generator with some fuel storage and calling it a day. Resilience includes **preventing** utility service disruptions from ever occurring, **mitigating** the impact of utility service disruptions when they do occur, and **recovering** to full operations in the aftermath of a disruption event.

The capability of a facility to prevent, mitigate, and recover from a disruption event is informed by the

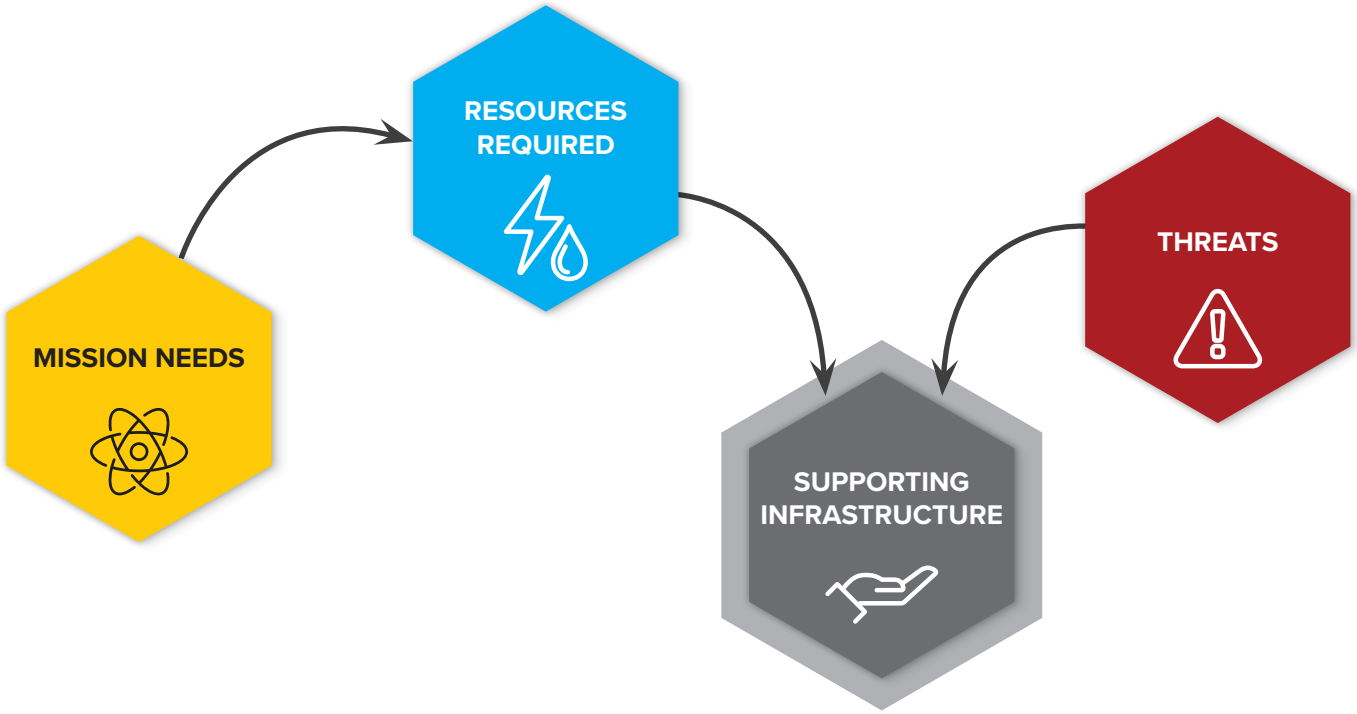


Figure 3.2. Supporting Infrastructure Is the Entry Point for Addressing Threats and Providing Resources for Mission Success at a Facility

supporting infrastructure defined in the previous section. To assess the energy resilience capability of the supporting infrastructure, the three qualities of resilient infrastructure (prevention, mitigation, recovery) can be subdivided into 10 energy resilience attributes (see Table 3.2). When evaluating the resilience capability of a facility, taking into account each of these attributes helps make sure that energy resilience is being addressed from all angles.

3.1.3. Defining the Energy Resilience Gaps

When compared against the energy resilience *requirements*, the existing energy resilience *capabilities* provide insight into how well the facility can meet the needs of the mission that the facility is charged to perform. If the capabilities fall short of the requirements, then a **resilience gap** is identified. The essential goal of an energy resilience plan is to fill these gaps by selecting and implementing energy resilience strategies.

For guidance on how to assess the existing infrastructure serving a critical facility, see Section 2.4.5.

As the gaps are identified, the areas that need more attention may become clearer. The resilience attributes can help provide a more focused direction for that attention. Once that direction is clear, resilience strategies come into play.

For example, the **Menifee Senior Center** was identified as a critical facility with an essential power requirement to serve as a cooling and heating emergency shelter and food distribution location for residents of the community. The existing infrastructure assessment found that this essential power supply requirement was not

Table 3.2. Energy Resilience Attributes

Resilience Attributes	Attribute Qualities
Cybersecurity of Energy Systems	Protection in place for energy systems (e.g., HVAC controls, centralized monitoring) to resist a cyber attack
Physical Hardening	Protection of energy infrastructure (e.g., electrical supply lines and switch stations, district heating plants and pipes) from threats, such as flooding, fire, and strong winds
Redundant Supply Paths	Separated supply paths to minimize the system infrastructure's vulnerability to the same local threat. (e.g., having multiple electrical supply lines from same source routed through the north and south of the campus, respectively)
Energy Source Diversity	Alternative sources of energy available to supply critical loads (e.g., utility connection, on-site renewable energy, and emergency backup diesel generator)
Energy Demand Reduction	Conservation and management of energy use to reduce the requirement for critical backup capacity and increase outage sustainment time
Load Sustainment Capacity	Ability to maintain energy supply to critical demand from on-site sources; includes generation, fuel storage, controls, and infrastructure
Emergency Management Protocols	Level of emergency response plan and personnel training
Islanding Capabilities, Analytics, & Controls	Automation of backup systems, threat prediction, and performance indicators to support response efforts
Personnel Availability for Assessment & Repair	Ability to access staff (be it university, contractor, or local specialists) of appropriate expertise for damage assessment and repair
Equipment, Parts & Procurement	Ensuring replacement critical equipment and parts are available; also includes standardization of components and secured procurement practices

being met. The utility power supply capacity was sufficient when the grid was operational, but in response to a threat such as a wildfire-caused PSPS event, no alternative power source would be available. In other words, the resilience gap of insufficient energy source diversity was identified. When a gap is thus identified, strategies can be considered that are designed to close that gap.

3.2. Selecting Energy Resilience Strategies

To close a resilience gap, start thinking about the nature of the gap and the different strategies that are available. Is the resource supply susceptible to physical damage? Does the facility consume excessive energy relative to its needs? Is the ability to phase down non-critical loads lacking? Based on the kind of gap, the next step is to look at the relevant menu of strategies and narrow it down to the strategy that best fits the need.

A list of the energy resilience strategies considered in this Energy Resilience Plan is provided in **Appendix D**. Although the list is not exhaustive and does not cover all possible design approaches to energy resilience, it does capture the majority of desired end-states or capabilities that would apply to the WRCOG community. The more agnostic take which is to focus on desired end-states and capabilities instead of focusing on specific technical solutions, allows the project engineer to identify the best solution for a specific

site in the context of rapidly evolving energy technology. However, a selection of specific technical solutions that are more commonly deployed are also included in this list.

Besides addressing resilience gaps, the strategy selection takes into account the site **constraints** and **opportunities**, and these considerations inform the kinds of strategies that make sense for the facility. The strategy selection period is an appropriate time to re-engage the facility manager and site director because their knowledge of the site may exceed any information that can be gleaned from utility bills or as-built drawings. That said, data from utility bills (including interval data) and as-built drawings can be used to verify and support information provided by the facility manager and site director, and will be needed when forming the basis of design for a technical solution.

Appendix D provides a complete list of strategies considered in this Energy Resilience Plan. To help with identifying resilience strategies that can be applied to fill a resilience gap, each strategy is tagged with a category, the resource(s) the strategy supports, and the resilience attribute(s) the strategy addresses. Also included are some key considerations that help in determining whether the strategy is worth further evaluation. Table 3.3 provides a sample of what is included in **Appendix D**.

Categories that each energy resilience strategy will fall under are as follows:

- Backup Power
- Energy Supply
- Energy Storage
- Energy Conservation
- Energy Management and Controls
- Power Distribution
- Mechanical Systems
- Maintenance

Table 3.3. Sample of Energy Resilience Strategies

Strategy	Category	Resource	Resilience Attribute	Key Considerations
On-site Solar	Energy Supply	Power	Energy Source Diversity	• Rooftop/parking area • Circuit capacity • Structural support • Shading/glare
Battery Energy Storage System	Energy Storage	Power	Energy Source Diversity; Energy Demand Reduction	• Outdoor space with clearances • Circuit capacity • Advanced controls
Dispatchable Power (Backup Generator)*	Backup Power	Power	Load Sustainment Capacity	• Outdoor space with clearances • Ventilation requirements • Air quality requirements • Noise requirements • Fuel storage capacity • Dedicated emergency circuits

* The energy industry is currently developing alternatives to using diesel generators to support air quality improvements and reduce greenhouse gas emissions associated with backup power supplies.

Resource(s) that each energy resilience strategy may support are as follows:

- Power
- Heating
- Cooling

For resilience attribute(s) that each energy resilience strategy may address, see Table 3.2.

To arrive at a short-list of strategies to pursue, make use of this dataset of energy resilience strategies and keep in mind the resilience gaps and key considerations.

3.3. Implementing Selected Strategies

When the engineers and facility stakeholders have worked out which energy resilience strategies are appropriate to move forward with, it is time to develop the technical designs and financing plans for implementation.

Note that some of the strategies that may be selected for implementation are programmatic. Other strategies are more technological in nature and can be generally described as "strategies that require projects to implement." This section focuses on those strategies that require projects to implement (see Figure 3.3).

For the **technical design**, the case studies in **Appendix A** provide insight into the design process for arriving at an energy resilience solution. After the appropriate energy resilience strategies have been identified by working with the facility manager and site director to define the resilience requirements and opportunities or constraints of the existing conditions, the design team leverages a multi-variable optimization model to arrive at a recommended preliminary design architecture.

Inputs to the optimization model include the energy load profile, utility tariff structure (e.g., consumption rate, demand charges, time-of-use rates, ratchet charges), on-site energy generation profiles, PV overproduction net metering tariffs, new equipment capital costs, equipment maintenance costs, and equipment replacement costs or end-of-life demolition costs and equipment values (depending on project life cycle). Utility outage trends are also considered, namely, historical average outage frequency and duration in the site's utility service area.

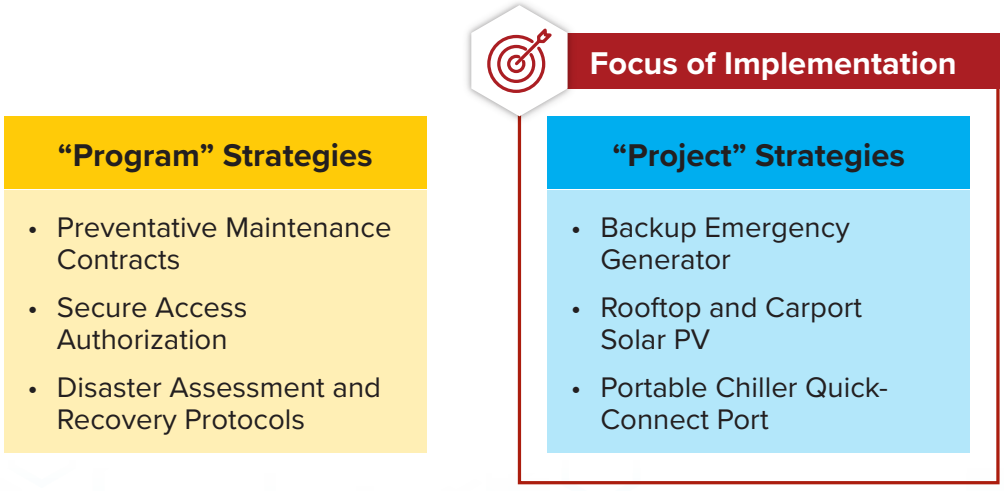


Figure 3.3. Program-oriented vs Project-oriented Energy Resilience Strategies

To arrive at a recommended preliminary design architecture, the optimization model essentially minimizes the net present cost of design scenarios. This begins with defining multiple design scenarios (i.e., design alternatives with different equipment capacities) for comparison. The model simulates how each scenario may operate in a manner that minimizes the operational costs (e.g., minimize purchased electricity or diesel consumption) and then ranks each scenario based on its overarching net present cost. Net present cost combines the upfront capital costs, ongoing operations and maintenance costs, and end-of-life costs and values into a single cost variable by applying a discount factor to future savings and expenses. For an energy resilience focus, the design team can rank each scenario by additional factors, such as reduction in annual diesel generator runtime. Multiple simulations were modeled per design scenario to capture typical and atypical utility outage conditions at varying times of day and year.

To choose a preferred alternative among the different design scenarios, a system that provides the right balance of minimum net present cost and minimum diesel generator runtime was selected for each case study. Once the recommended balance of equipment capacities has been selected, a preliminary architecture for the proposed solution can be drafted. To move forward from conceptual to detailed design and implementation, choosing a funding and financing strategy for the site is the next step.

A range of **funding and financing strategies** were identified to support project implementation, particularly to support the electrification and resilience planning of critical facilities in the WRCOG region, with an emphasis on including energy storage for emergency response. Funding strategies include federal and state grants, demand-side rebates and incentive programs, local revenue-generating mechanisms like new measures, and financing tools like public-private partnerships, state loan programs, and climate resilience-focused bonds. These strategies were also identified to inform and prepare the WRCOG for the development of new partnerships, the potential environmental review and technical analysis, and the tracking of federal and state funding opportunities as guidance is released. Refer to **Appendix E** for more details on the full list of funding and financing strategies identified as a part of this review.

4. Conclusion

The WRCOG Energy Resilience Plan serves two primary functions. First, the Plan is a decision-making guide for WRCOG members regarding implementation of energy resilience projects to increase facility and community resilience against regional power interruptions. Second, the Plan is a more general guide for governance organizations outside of Western Riverside County to begin to untangle the complex topic of community resilience through energy resilience. This conclusion addresses both elements.

4.1. Impact for WRCOG and Its Members

This Energy Resilience Plan will have a lasting impact on WRCOG and its member agencies by enhancing the day-to-day health and well-being of communities through reducing the negative impacts of natural disasters and power interruptions. The Plan achieves this by outlining a pathway for equitable and reliable access to electricity at all critical facilities across WRCOG member agencies, ensuring fundamental access to health and public safety services for all members of the Western Riverside community. Figure 4.1 shows the scope of the critical services covered in the Plan.

Through the Plan's framework, WRCOG will realize its goal of ensuring that its member communities can withstand and adapt to current and future climate-related threats. Because it is modeled around a replicable framework, the Plan can benefit other communities and jurisdictions beyond Western Riverside County.

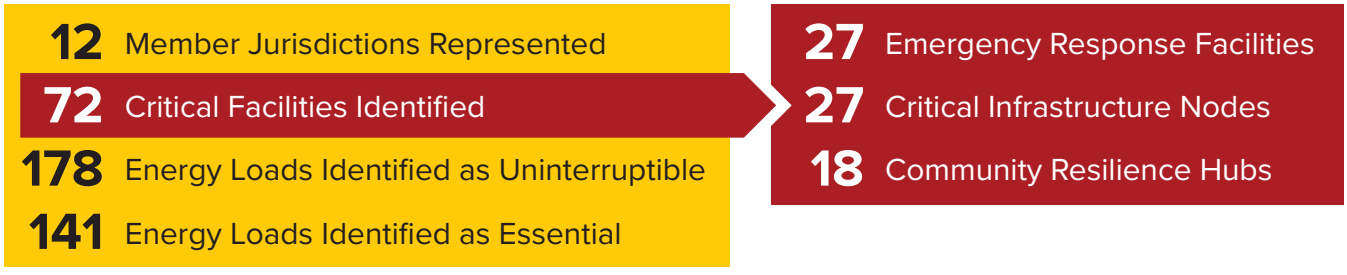


Figure 4.1. Energy Resilience Scale of Impact

4.2. Next Steps

The main priority for achieving the full potential of this Energy Resilience Plan is to scale the findings from the case studies and apply them to the remaining critical facilities across WRCOG member agencies.

4.2.1. Technical Implementation Next Steps

The Plan describes an approach for identifying critical facilities and potential energy resilience strategies to be considered. At the subregional level, the next step is to apply the strategies outlined in this Plan across the critical facilities, developing bespoke concept designs for each. These designs will provide the basis for project financing, detailed design, and subsequent installation. This workflow is shown in Figure 4.2.

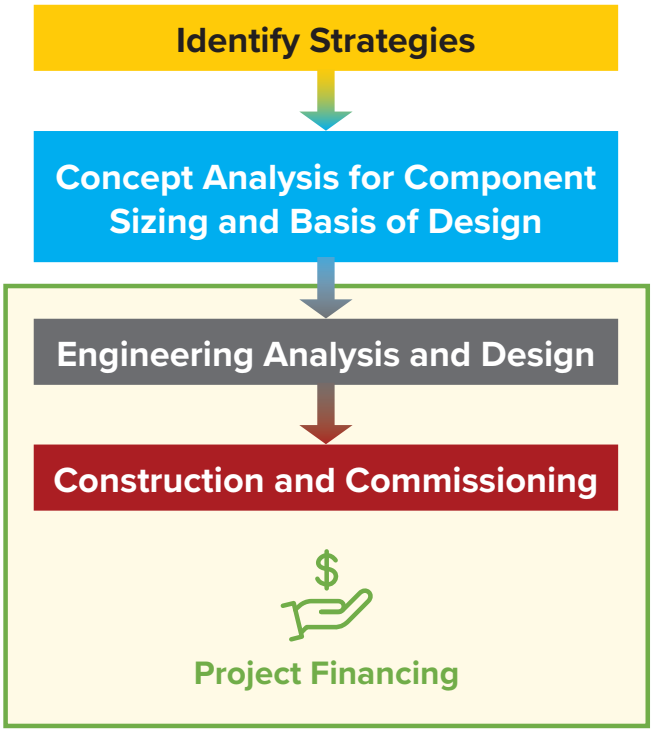


Figure 4.2. Project Implementation Life Cycle

In the development of this Plan, four facilities were selected as case studies for strategy analysis and subsequent preliminary concept design (provided in **Appendix A**). The facilities were chosen based both upon their score from using the prioritization methodology and how representative they are of other common critical facilities in the WRCOG subregion. The concept designs for the four facilities have informed the approach to energy resilience projects at the remaining critical facilities.

The following are general recommendations for the concept design process at any critical facility:

- **Confirm with stakeholders the age, condition, and future plans for a building to make sure that energy investments make sense for the site.** This information supports the relevance and urgency of seeking energy resilience improvements to the site; if a site is scheduled for demolition then energy projects may not be appropriate but if the site is due for major renovation then it may be perfect timing for energy upgrades.

- **Confirm with stakeholders all the critical loads at the site, and use this information as the basis for estimating the percentage of interval data to be carried by the alternative power system.** In rare cases, critical-load interval data may be available, but in general critical load information allows approximations of real-world outage scenarios to be modeled for energy supply optimization (compared, for example, with designing a microgrid at full load capacity that may require greater reliance on diesel generation).
- **Plan to install as much solar PV as can fit on the site, up to the capacity that would yield annual net zero energy.** Solar PV is typically the most cost-effective alternative energy resource. Thus, identifying as much area on-site for solar PV as possible (i.e., roofs and parking areas that are flat, unobstructed, unshaded, and generally southward facing) is likely to yield the greatest energy resilience benefits.
- **Unless limited by space availability at the site, optimize the on-site battery energy storage capacity for minimum net present cost and minimum generator runtime during grid outages.** When paired with enough solar PV, battery energy storage will unlock the ability to operate the site in islanding mode without a backup generator, which can significantly improve energy resilience even if just for a few hours during peak daylight.
- **Size the backup power source (i.e., diesel generator unless alternative technologies are identified) to cover all critical loads.** This is not only required where building codes dictate a backup power source but also guarantees the reliability requirements for a site will be met even if the solar PV array fails or if weather conditions yield a significantly less than average PV power output.
- **For community resilience hubs that serve a critical response function for heat waves and wildfires, evaluate the facility HVAC system and identify opportunities for greater redundancy in the cooling supply and intake air filtration.** For sites that serve this function, reliable and resilient power is only part of the energy resilience solution; reliable and resilient mechanical systems are equally important to ensure cooling and indoor air quality services are provided when they are most critical for the community.

4.2.2. Financial Implementation Next Steps

The Plan details a regional transition to renewable energy in critical infrastructure, including the ability to quickly adapt to drought, extreme heat, and other climate changes. Implementation will be most effective and efficient if multiple actions are pursued simultaneously, which may include using funding and financing sources to support multiple or bundled projects. Near-term next steps (within 1 to 2 years) for beginning implementation of priority actions may include the following:

- **Identify partnership opportunities to plan, fund, and implement climate actions.** WRCOG convened agencies from across Western Riverside County to participate in the development of this Plan, which has opened up opportunities to continue these partnerships as agencies begin to pursue funding. Partnerships between public agencies can increase the competitive edge of grant applications. Other civic institutions, notably UC Riverside, may also offer partnership opportunities.
- **Determine which strategies will require environmental review, technical analysis, and/or complex partnerships and permitting.** Some of the priority actions will have longer implementation timelines due to environmental review or financing coordination requirements (e.g., new sales tax, bond issuance). To meet WRCOG electrification goals in a timely manner, WRCOG member agencies will need to start the first phase of work on these longer-term projects.

- **Track new federal funding opportunities as guidance is released.** The Infrastructure Investment and Jobs Act (IIJA) and Inflation Reduction Act present enormous opportunities. While the available details on known programs are summarized in this chapter, the federal government regularly releases new program announcements related to funding eligibility and availability.
- **Begin preparing application materials for the state grants that have been allocated additional funding in the Governor's 2022-2023 budget.** Some funding for these grants may already be or will soon be available and will have short application deadlines. An early start on application materials will give WRCOG member agencies more time to match actions to grant opportunities, define strong proposal narratives, and identify potential partnerships Through this Energy Resilience Plan, WRCOG has advanced its mission to "facilitate, plan, and identify funding opportunities for critical infrastructure projects and programs that benefit its member agencies and the communities they serve" by providing a decision-making framework for identifying and prioritizing energy resilience projects for critical facilities and essential community assets.[18] The general next steps particularly benefit WRCOG member agencies by delivering an action plan that can be applied to all the critical facilities that were not analyzed in case studies. The benefits of the Plan extend beyond WRCOG by providing a replicable framework for energy resilience planning that may be used by other jurisdictions across California.

18 Western Riverside Council of Governments Strategic Plan 2022-2027. Available: https://wrcog.us/DocumentCenter/View/9317/Strategic-Plan-2022- . Accessed November 2022.

Appendix A.
Case Studies

A1. Case Study 1 - Banning Wastewater Treatment Plant

Facility Overview

The Banning Wastewater Treatment Plant (WWTP) plant located at 2242 Charles Street, Banning, CA 92220 treats wastewater from approximately 30,000 people, including 12,800 dwellings and the surrounding community.

The Banning WWTP is currently connected to the Southern California Edison (SCE) utility on the TOU-GS-2-D-CPP tariff. As a critical infrastructure system, the WWTP has an existing backup power system consisting of two diesel generators, each dedicated to half of the plant, with a total capacity of 900 gallons of diesel storage.

Figure A.1. City of Banning Wastewater Treatment Plant Site Location

Past Disruptions

The WWTP has experienced seven SCE grid outages over the past several months, and the longest one lasted 5 hours. However, such outages have not yet led to any operational disruptions or degradations, as the backup generators have been able to cover the full plant electrical loads. However, given the importance of the WWTP to the community and the fact that no redundant diesel generator exists, additional backup power systems may be warranted for these reasons:

- If either of the existing diesel generators fails, no other alternative exists to power that section of the plant.
- In case of major disasters that may cause prolonged outages, the diesel storage may not be sufficient and fuel re-supply may be compromised.
- Air quality regulations limit the run hours of fossil-based generators, and alternatives are being promoted at the regional and state level for environmental benefits.

Therefore, to prevent such cascading effects of power outage to other utility functions, it is proposed that multiple on-site power sources be incorporated into the plant infrastructure to provide enough flexibility and redundancy to enhance system resilience against power outages.

Resilience enhancement against grid outages requires technical and financial analyses to develop a viable solution that includes a recommended size and combination of power generation and energy storage assets. These analyses, along with detailed simulations of the microgrid system, are further discussed in the section below.

Analysis and Simulations

To assess how the current and proposed system would response to prolonged utility power outages, a comprehensive microgrid modeling and analysis were carried out. For this purpose, the HOMER Grid software tool was used. HOMER Grid is a microgrid modeling software that is being widely used in the research and utility industry communities to design and optimize microgrids, to size different components of the system, and to perform a technical and financial feasibility assessment. This tool can also help with resilience and reliability assessments of various microgrid combinations, which are the main focus of the current study.

To develop the baseline model (i.e., the business-as-usual case), the annual load of the WWTP was collected and input to the model. AECOM received a partial load profile for August 22, 2021 to March 2, 2022. Estimates were then used to fill in missing data based on known load profiles in order to have a complete year for analysis. The existing diesel generators were also modeled to reflect the current status as the baseline of the model.

Based on utility bill analysis, the utility charges were $74,447 for the period from June 2020 to May 2021. The tariff is not Time of Use and energy costs were determined by a flat rate of $0.0923 per kWh used.

During the period from June 2020 to May 2021, the total energy consumption was 784,000 kWh. Peak demand of 120 kW was measured on November 14 and December 24, 2020, and on February 23, 2021.

Figure A.2 shows the monthly variations in monthly energy consumption and the breakdown of billing charges. Figure A.3 is the electrical load heatmap for the Banning WWTP.

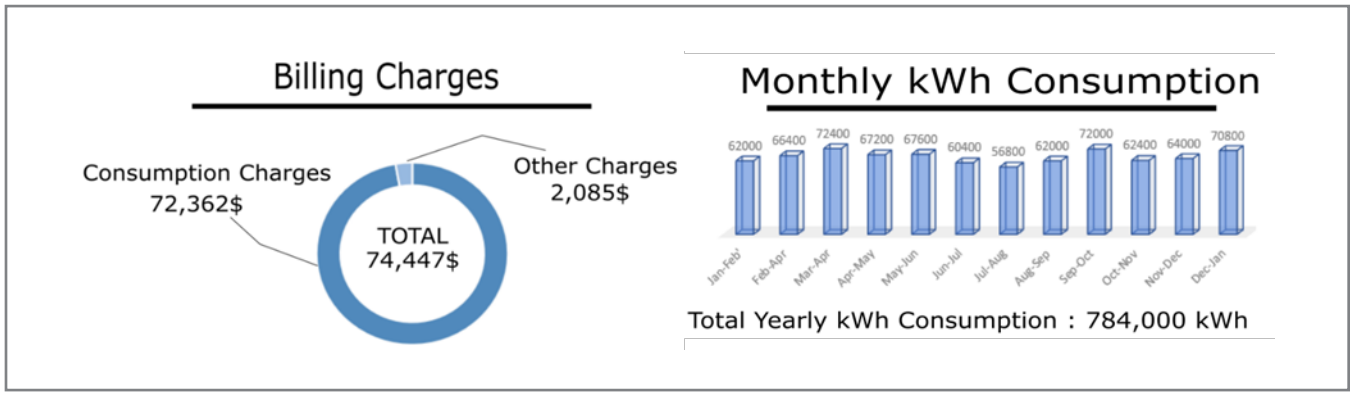


Figure A.2. System Annual Electricity Consumption and Billing Charges

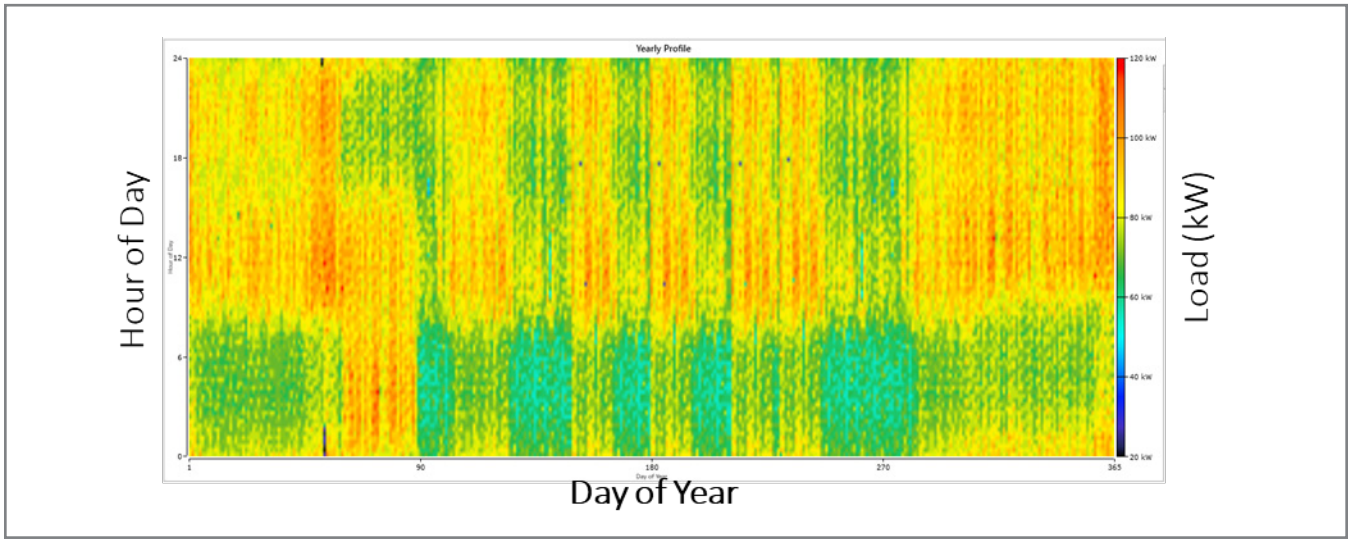


Figure A.3. Heat Map of the Banning WWTP Electrical Load

Improving the WWTP's resilience to utility power outages can be enhanced through implementation of diverse power sources. To achieve this goal, it is proposed that on-site solar photovoltaics (PVs be used as an additional source of power along with battery energy storage systems (BESS) and that various combinations and sizes be evaluated. The capacity of the existing diesel generators totals 130 kW; PV array size was dictated by the available space on land at the southwest corner of the site, resulting in a 123 kW system.

For the purpose of this analysis, it is assumed that 100% of the plant load is critical and that no downtime is acceptable. The schematic in Figure A.4 shows the main components and connections of the developed microgrid for the Banning WWTP.

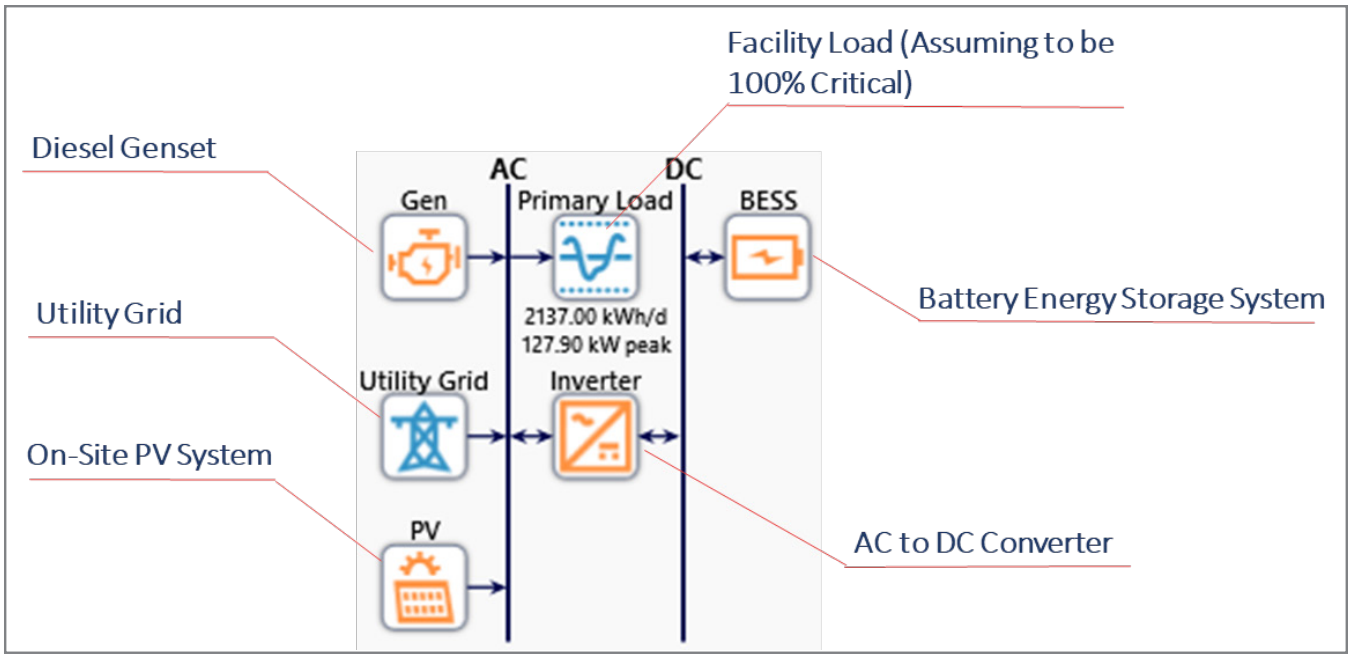


Figure A.4. Microgrid Architecture and Components

The analysis considered the numbers and duration of historical power outages sourced from SCE reliability reports.[1] System Average Interruption Frequency (SAIFI) and System Average Interruption Duration (SAIDI) numbers, which represent the average frequency of sustained interruptions and average duration of sustained interruptions respectively, were used in this study. According to the historical reliability of SCE circuits serving the City of Banning for 2021, the SAIDI has been 772 minutes and the SAIFI has been 2.9 outages per year. Therefore, it was assumed that the system would have to endure three outages per year, each of which would be 4.5 hours long.

$$SAIDI = \frac{\text{sum of all sustained customer interruption durations}}{\text{total number of customers served}}$$

$$SAIFI = \frac{\text{sum of total quantity of “sustained” customer interruptions}}{\text{total number of customers served}}$$

The distribution of these outages will be randomly selected by the software, depending on the reliability requirements set for the facility; one example is shown in Figure A.5. In this case study, we assumed that 100% of the plant load is critical and should be covered throughout the year; that is, no downtime or degradation of performance is allowed.

1 Circuit Reliability Review- Banning, 2022, SOUTHERN CALIFORNIA EDISON

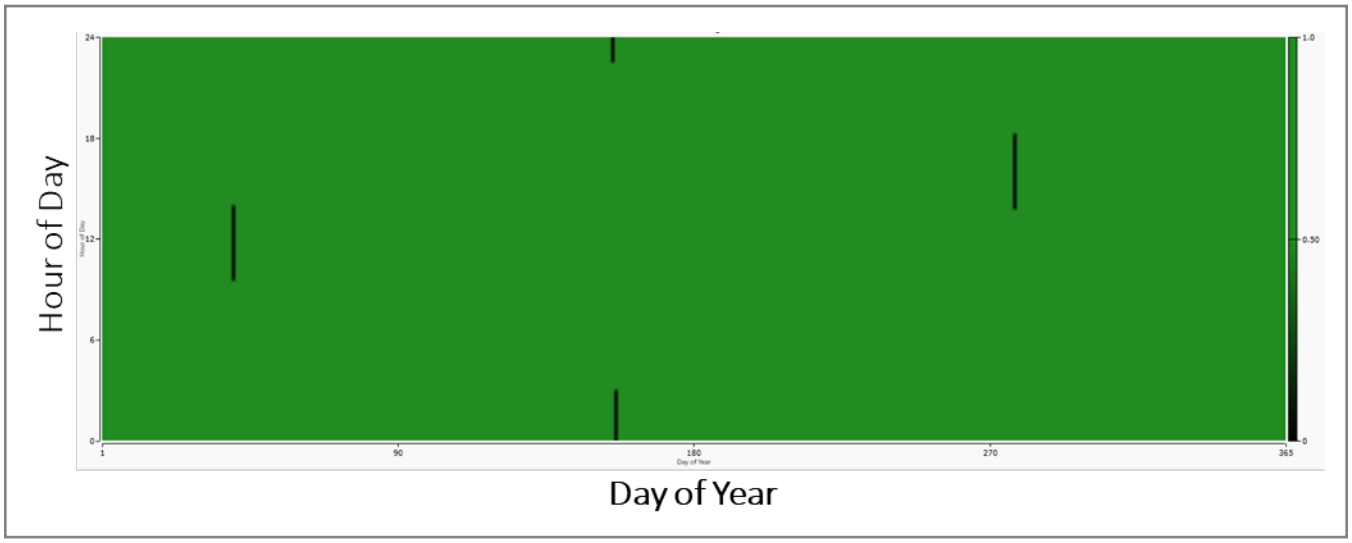


Figure A.5. Random Distribution of Outages Throughout the Year

Results and Recommendations

Feasible solutions for the Banning WWTP are summarized in Table A.1. These solutions essentially include those system sizes and combinations, referred to as system architecture, that are capable of meeting the loads during the defined outage scenarios. Each battery pack has the rated capacity of 85 kWh/185 kW, and the software will come up with the optimum number of packs for each system architecture. Also considered are scenarios without diesel generators (i.e., Scenarios 5 and 6) to see if there will be any benefits to replacing the existing ones if they are nearing their end of life.

Table A.1. Banning WWTP Microgrid Modeling Results

Architecture				Cost				System		
Scn.	PV (kW)	Generator (kW)	BESS (kWh/kW)	NPC ($)	LCOE ($/kWh)	Capital Expense ($)	Simple Payback (year)	Renewable Fraction (%)	Generator Hours	BESS Autonomy (hour)
1	123	130	-	$920 k	0.091	$194 K	11.2	27.5	10	-
2	-	130	-	$950 k	0.094	$0.0 K	-	0	14	-
3	**123**	**130**	**85/185**	**$1.00 M**	**0.099**	**$243 K**	**17.3**	**27.5**	**4**	**0.95**
4	-	130	85/185	$1.03 M	0.102	$48 K	-	0	10	0.95
5	123	-	425/925	$1.33 M	0.131	$435 K	-	27.5	-	4.77
6	-	-	510/1110	$1.43 M	0.142	$289 K	-	0	-	5.73

These scenarios are ranked based on their net present cost (NPC).[2] Scenario 2, which is the baseline scenario, has the second-best NPC; however, the renewable fraction (defined as annual renewable energy generation divided by annual energy consumption) is zero and the generator runtime is 14 hours per year. Scenario 3 consists of solar PVs, BESS, and diesel generators; this combination provides

2 Analysis was undertaken based upon equipment cost only. To take into consideration the total project cost, a premium of 30%-40% should be added.

multiple benefits in terms of resilience performance and integration of renewable energy. Availability of multiple power sources improves the system flexibility and thereby enhance resilience against power outages. If future outages become longer and more frequent, the system would be able to sustain the plant operations for longer periods compared to other scenarios investigated here; see the reduced generator runtime for Scenario 3 compared to other scenarios, which means less reliance on diesel fuel, less maintenance, and longer lifetime for the diesel generators. For these reasons and taking into account the only slightly higher NPC compared with the baseline case, Scenario 3 is the proposed option for improving the system's resilience posture while also reducing greenhouse gas (GHG) emissions and maintaining an economic performance close to that of the existing situation. Figure A.6 is a single-line diagram of the proposed system.

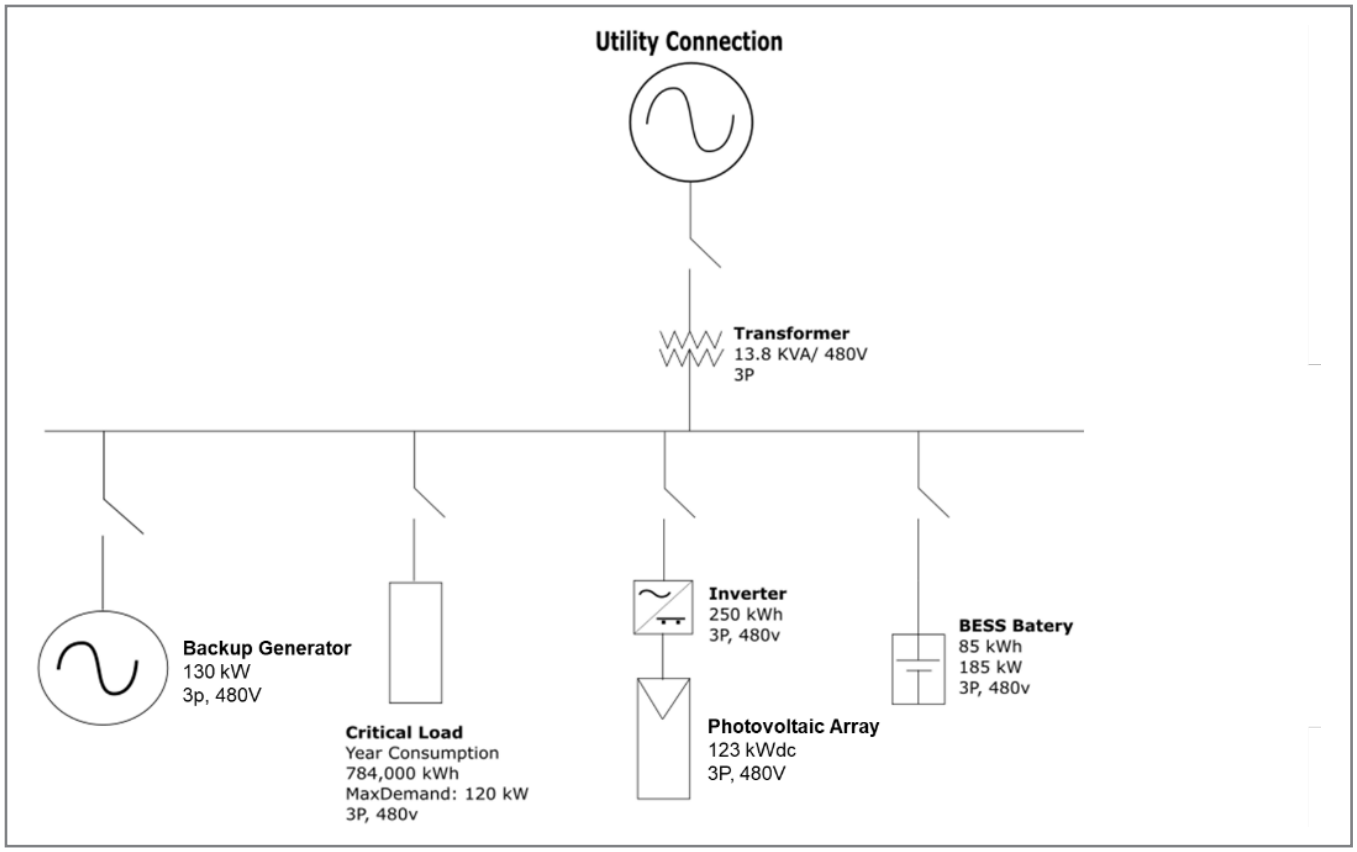


Figure A.6. Single-line Diagram of the Proposed System for Banning WWTP

A2. Case Study 2 - Menifee Senior Center

Facility Overview

The Menifee Senior Center is located at 29844 Haun Road, Menifee, CA 92586, and serves more than 100 seniors. The Menifee Senior Center is also being used as a cooling and heating emergency shelter and food distribution location for residents of the community.

The facility is currently connected to the Southern California Edison (SCE) utility on the TOU-GS-2-D-CPP tariff. The backup system includes a 36 kW diesel generator. The site location is shown in Figure A.7 below.

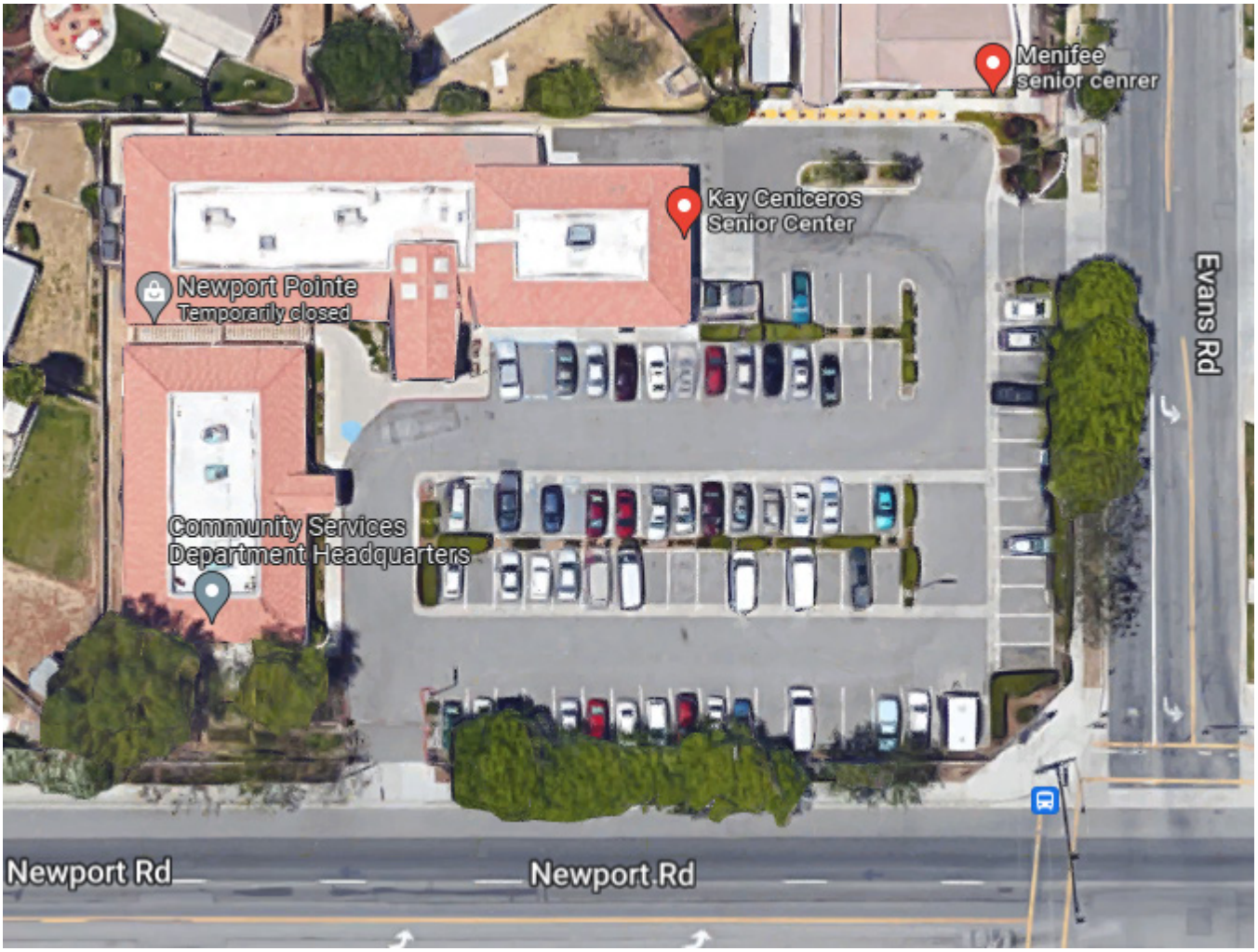


Figure A.7. Menifee Senior Center Site Location

Past Disruptions

The hazard sensitivity assessment revealed that flooding and human health risks caused by extreme temperatures are among the highest threats. The latter threat can be alleviated by enhancing the reliability of the senior center's heating and cooling systems. In addition to regular scheduled

maintenance to ensure reliable operation of the heating and cooling systems, reliable power sources are required. As grid outages are becoming more frequent, improving the resilience of the energy systems against them is critical and has been the focus of this study. Analyses along with detailed simulation of the plant system are further discussed below.

Analysis and Simulations

To assess how the current and proposed system would response to prolonged utility power outages, a comprehensive microgrid modeling and analysis was carried out. For this purpose, the HOMER Grid software tool was used. HOMER Grid is a microgrid modeling software that is being widely used in the research and utility industry communities to design and optimize microgrids, to size different components of the system, and to perform a technical and financial feasibility assessment. This tool can also help with resilience and reliability assessment of various microgrid combinations, which are the main focus of this study.

In 2021, the total cost of electricity charges was $31,110, which includes energy charges, demand charges, and fixed charges. The annual electricity consumption during 2021 was 133,590 kWh, with peak demand of 58 kW occurring on August 1, 2021. Figure A.8 depicts the monthly variations in monthly energy consumption and the breakdown of billing charges. Figure A.9 is an electrical load heatmap for the Menifee Senior Center.

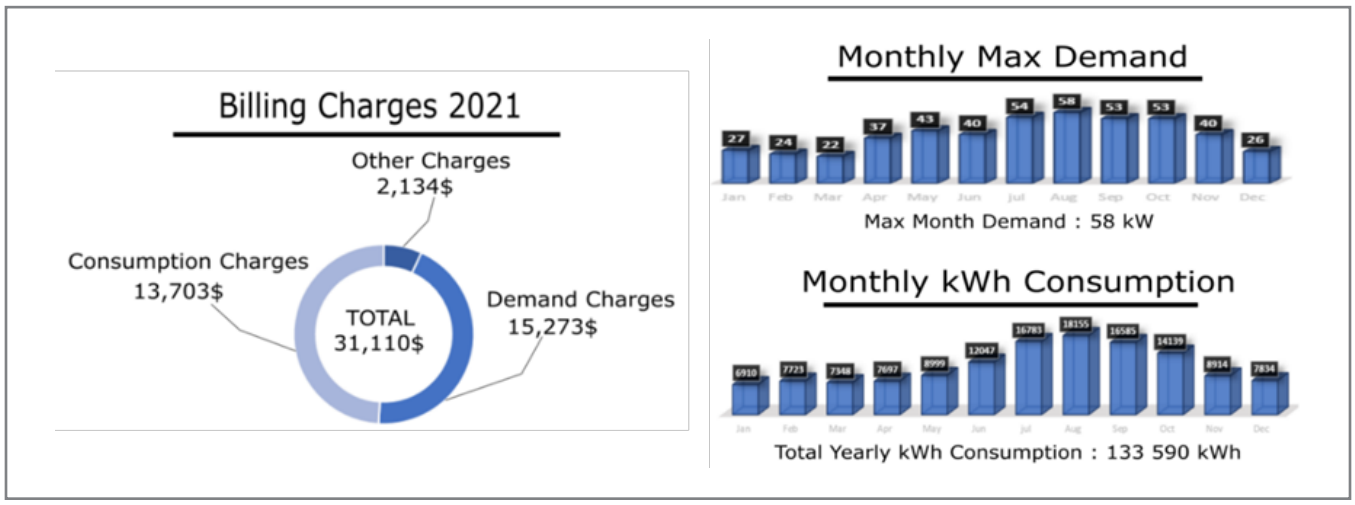


Figure A.8. System Annual Electricity Consumption and Billing Charges

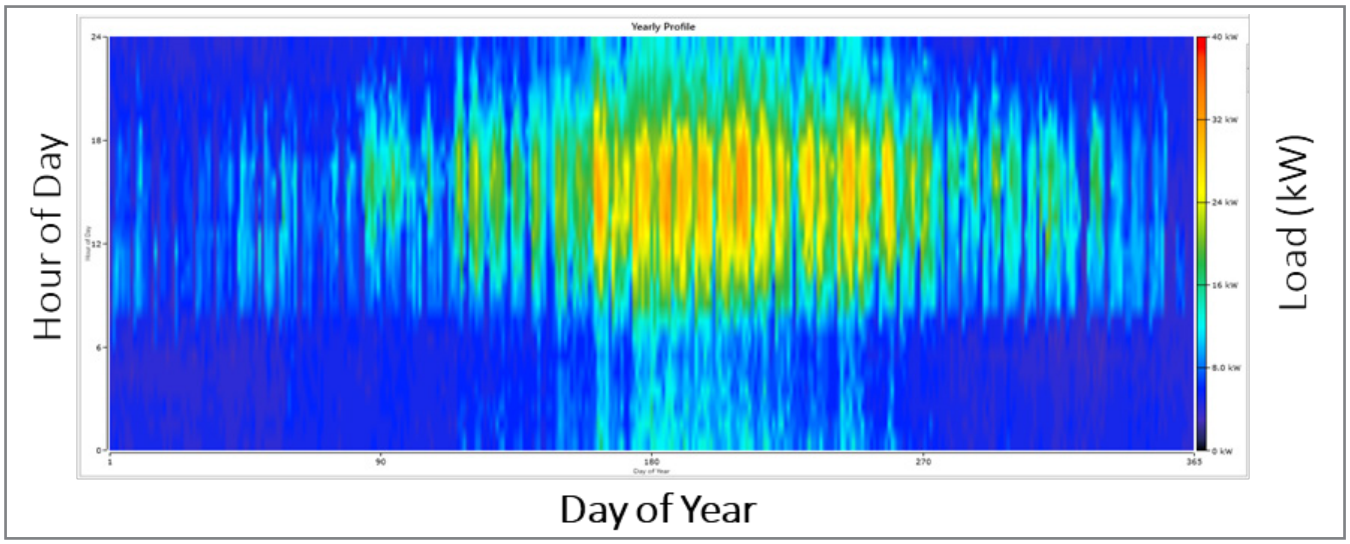


Figure A.9. Heat Map of the Menifee Senior Center Electrical Load

As mentioned earlier, the resilience performance of the Menifee Senior Center against utility power outages can be enhanced through implementation of diverse power sources. To achieve this goal, it is proposed that on-site solar photovoltaics (PVs) be used as an additional source of power along with battery energy storage systems (BESS) and that various combinations and sizes be evaluated. The capacity of the planned diesel generator is 36 kW.

Figure A.10 shows the proposed location for the solar PV arrays, which can accommodate a 62 kW PV system and also provide a shaded parking area for staff and customers.

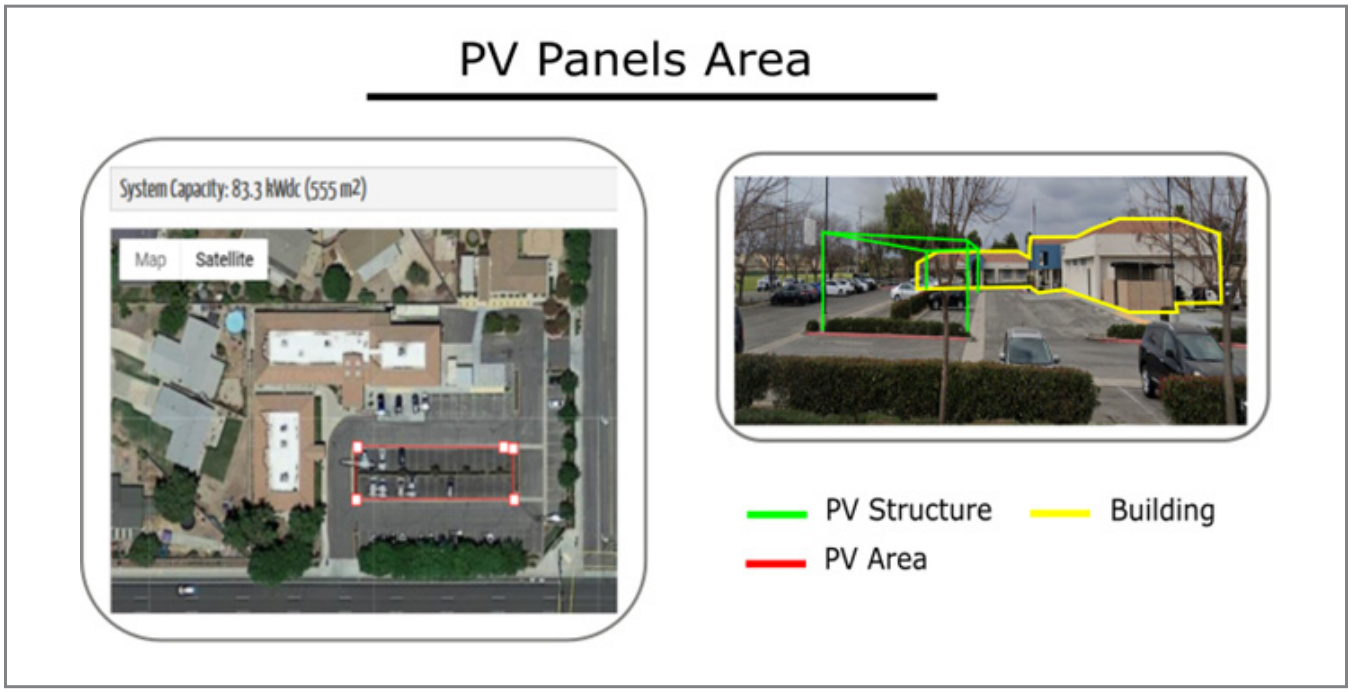


Figure A.10. Menifee Senior Center - PV System Location

For this analysis, it is assumed that 70% of the facility load associated with the non-office building is critical. That is particularly important in how the HOMER tools will treat the load in terms of resilience requirements, which would directly impact how the microgrid components are sized and operated. In this case study, no downtime is allowed, and the tool will develop the system such that all the loads are met all the time throughout the year, even in the case of prolonged grid outages. The schematic in Figure A.11 shows the main components and connections of the developed microgrid for the Menifee Senior Center.

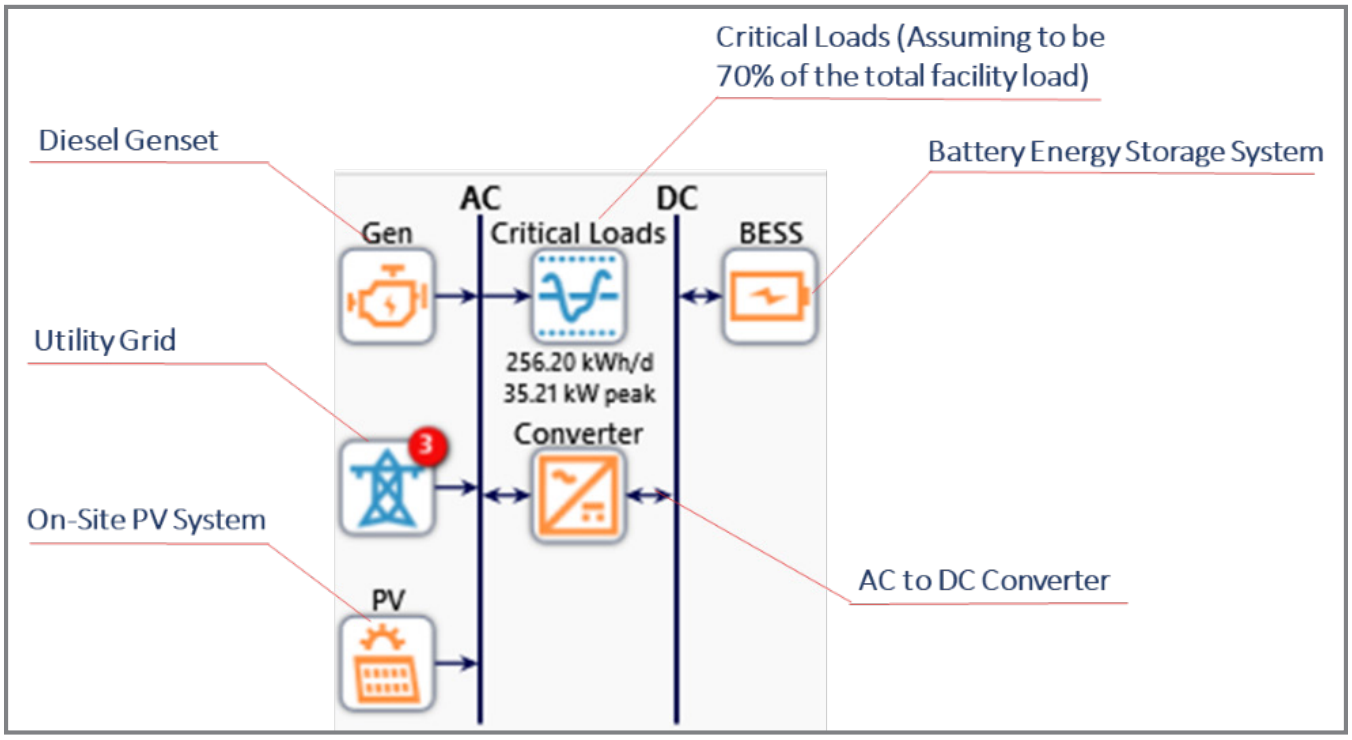


Figure A.11. Menifee Senior Center - Microgrid Architecture and Components

To evaluate the reliability and resilience of the facility, grid outages should be modeled, and the system's response to such outages should be evaluated. Therefore, data on the frequency and duration of power outages are needed as inputs to the software model. Statistics of the past grid outages are available at the city level through SCE reliability reports.[3] System Average Interruption Frequency (SAIFI) and System Average Interruption Duration (SAIDI) numbers, which represent the average frequency of sustained interruptions and average duration of sustained interruptions respectively, were used in this study. According to the historical reliability of SCE circuits serving the city of Menifee for 2021, the SAIDI has been 175 minutes and the SAIFI has been 1.2 outages. Therefore, it was assumed that the system would have to endure 1.2 outages per year, each of which would be 2.5 hours long.

The distribution of these outages will be randomly selected by the software; one example is shown in Figure A.12. Depending on the reliability requirements set for the facility, the software will size the solar and battery system such that those requirements are met at all times. In this case study, 70% of the facility load was assumed to be critical and should be covered throughout the year; that is, no downtime or degradation of performance is allowed for that portion of the load.

3 Circuit Reliability Review- Menifee, 2022, Southern California Edison

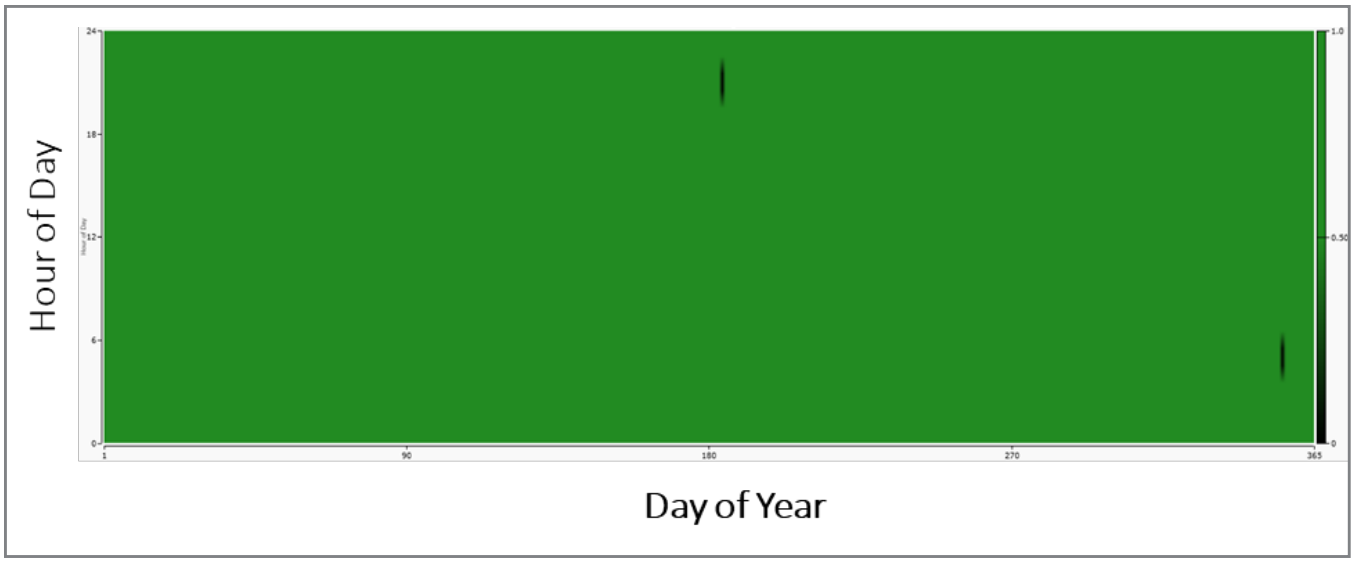


Figure A.12. Menifee Senior Center - Random Distribution of Outages Throughout the Year

Results and Recommendations

Feasible solutions for the Menifee Senior Center are summarized in Table A.2. These solutions include those system sizes and combinations, referred to as system architectures, that are capable of meeting the critical loads during the defined outage scenarios. Each battery pack has the rated capacity of 85 kWh/185 kW, and the software will come up with the optimum number of packs for each system architecture.

Table A.2. Menifee Senior Center- Microgrid Modeling Results

Architecture				Cost				System		
Scn.	PV (kW)	Generator (kW)	BESS (kWh/kW)	NPC ($)	LCOE ($/kWh)	Capital Expense ($)	Simple Payback (year)	Renewable Fraction (%)	Generator Hours	BESS Autonomy (hour)
1	62	36	-	$124 k	0.082	$149,450	9.5	75.8	4	-
2	-	36	-	$131.5 k	0.172	$27,000	-	0.0	4	-
3	**62**	**36**	**85/185**	**$146.4 k**	**0.108**	**$190,950**	**9.7**	**82.9**	**3**	**8**
4	-	36	85/185	$161.6 k	0.201	$68,500	-	0.0	4	8

These feasible scenarios are ranked based on their net present cost (NPC).[4] Scenario 2 represents the baseline scenario and has the second-best NPC; however, the renewable fraction for this scenario is zero. Additionally, the generator runtime is 4 hours per year, which is the highest time among all feasible scenarios. Scenario 3 consists of solar PVs, BESS, and diesel generators; this combination provides multiple benefits in terms of resilience performance and integration of renewable energy. Availability of multiple power sources improves the system flexibility and thereby enhances resilience against power outages. If future outages become longer and more frequent, the system would be able to sustain

4 Analysis was undertaken based upon equipment cost only. To take into consideration the total project cost, a premium of 30%-40% should be added.

critical operations for longer periods compared to other scenarios investigated here; in other words, the reduced generator runtime for Scenario 3 compared with other scenarios can be translated to less reliance on diesel fuel, less maintenance, and longer lifetime for the diesel generators. For these reasons and because the NPC of this scenario is only slightly higher than that of the other scenarios, Scenario 3 is the proposed option for improving the resilience posture of the system while also reducing greenhouse gas (GHG) emissions and maintaining an economic performance close to that of the existing situation. Implementation of BESS would provide more flexibility in demand management and could reduce demand charges on utility bills. Figure A.13 is a single-line diagram of the proposed system.

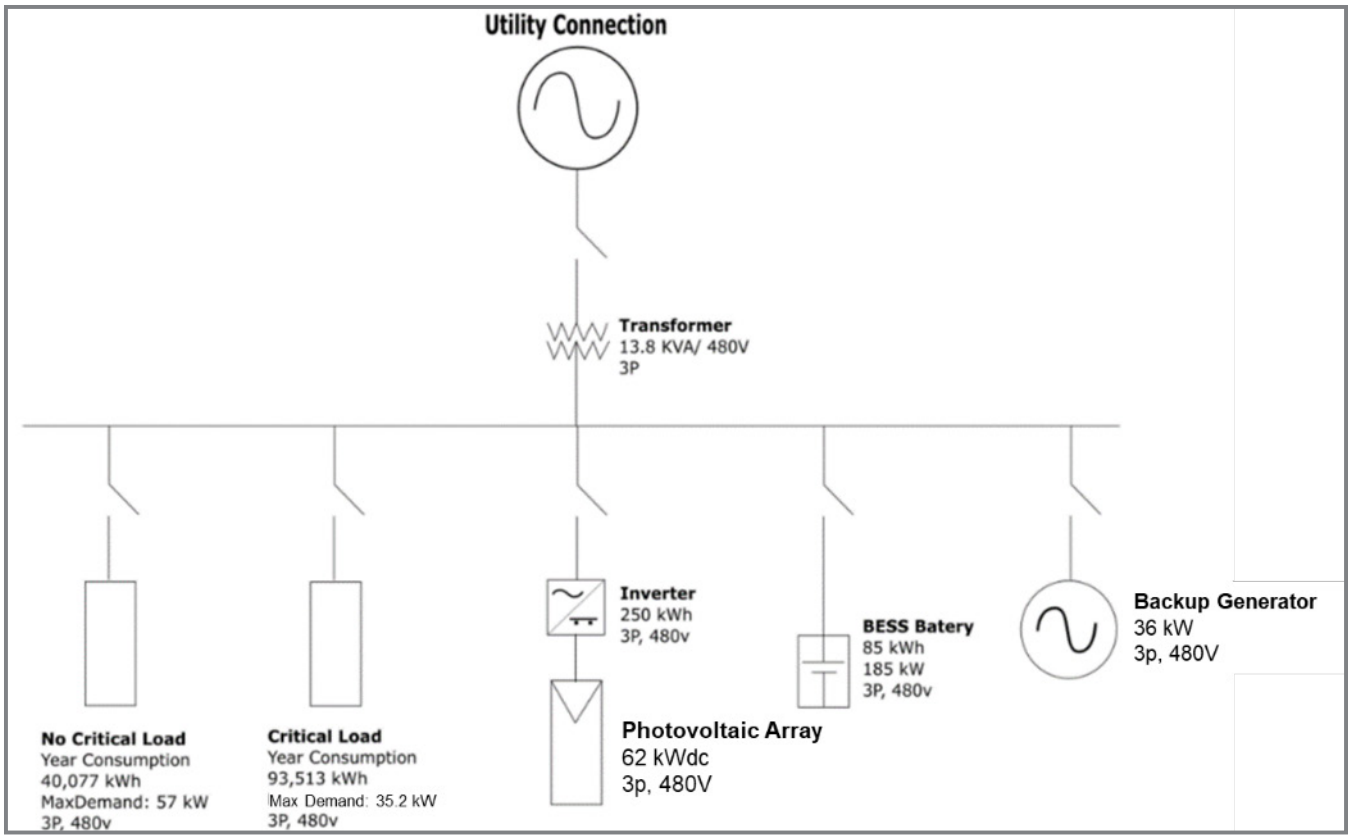


Figure A.13. Single-line Diagram of the Proposed System for the Menifee Senior Center

A3. Case Study 3 - Jurupa Valley Fire Station 16

Facility Overview

The Jurupa Valley Fire Station 16 is located at 9270 Limonite Avenue, Jurupa Valley, CA. The facility is more than 40 years old and serves around 10,000 people. The facility team has recently acquired a 12 kW backup generator.

The facility is currently connected to the Southern California Edison (SCE) utility on the TOU-GS-1-B tariff. The site location is shown in Figure A.14 below.

Figure A.14. Jurupa Valley Fire Station 16 Site Location

Analysis and Simulations

To assess how the current and proposed system would response to prolonged utility power outages, a comprehensive microgrid modeling and analysis was carried out. For this purpose, the HOMER Grid software tool was used. HOMER Grid is a microgrid modeling software that is being widely used in the research and utility industry communities to design and optimize microgrids, to size different components of the system, and to perform a technical and financial feasibility assessment. This tool can also help with resilience and reliability assessment of various microgrid combinations, which are the main focus of this study.

In 2021, the total utility charges were $5,256, which includes energy charges, demand charges, and fixed charges. The total energy consumption during 2021 was 26,923 kWh, with the peak demand reaching 11.28 kW on July 11, 2021. Figure A.15 shows the monthly variations in monthly energy consumption and peak demand. The electrical load heatmap for this facility is shown in Figure A.16.

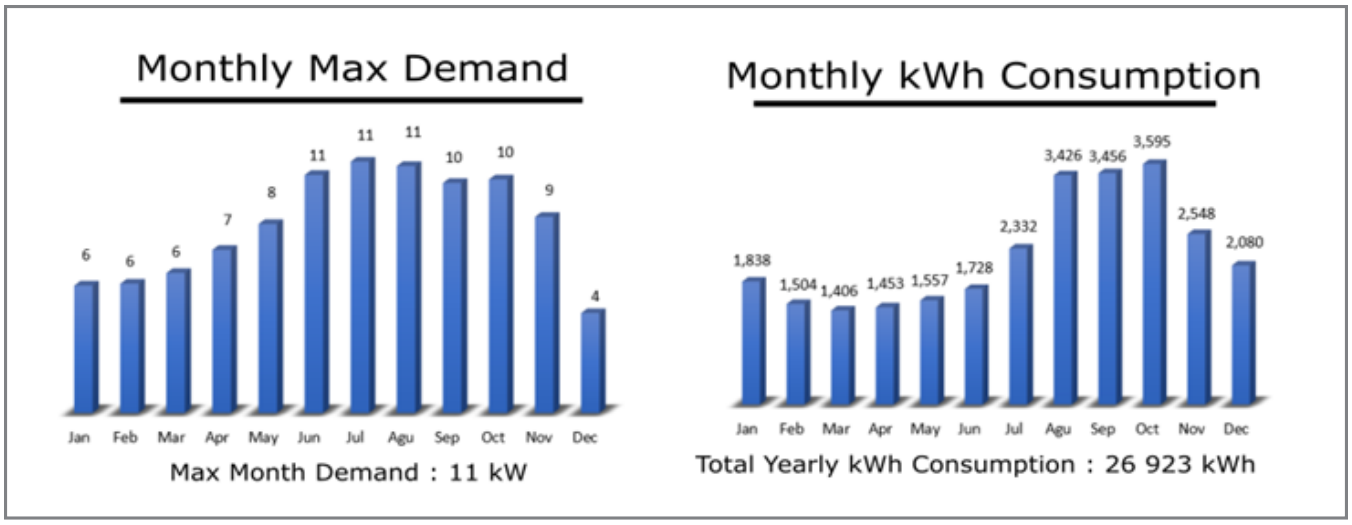


Figure A.15. Monthly Electricity Consumption and Peak Demand

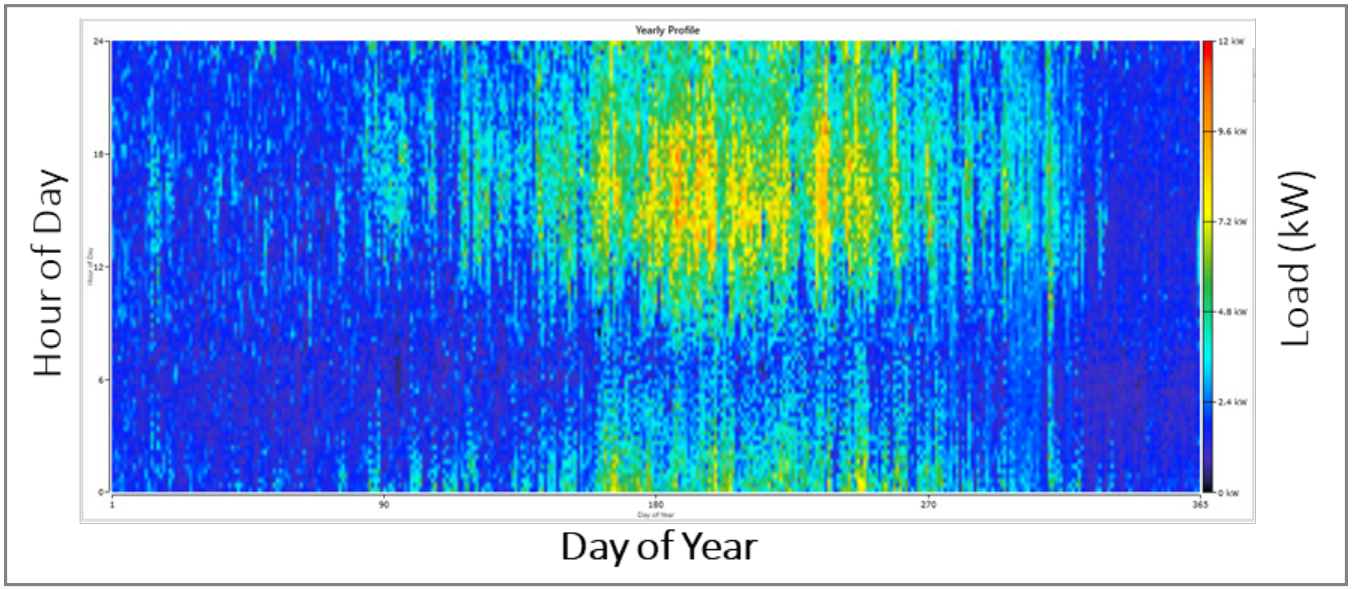


Figure A.16. Heat Map of the Jurupa Valley Fire Station 16 Electrical Load

To improve the resilience performance of the facility, it is proposed that on-site solar photovoltaics (PVs) be used as an additional source of power along with battery energy storage systems (BESS) and that various combinations and sizes be evaluated. The capacity of the existing (or planned) diesel generator is 12 kW. Figure A.17 shows the proposed location for the solar PV arrays, which can accommodate a 14 kW PV system and also provides a shaded parking area for the staff.

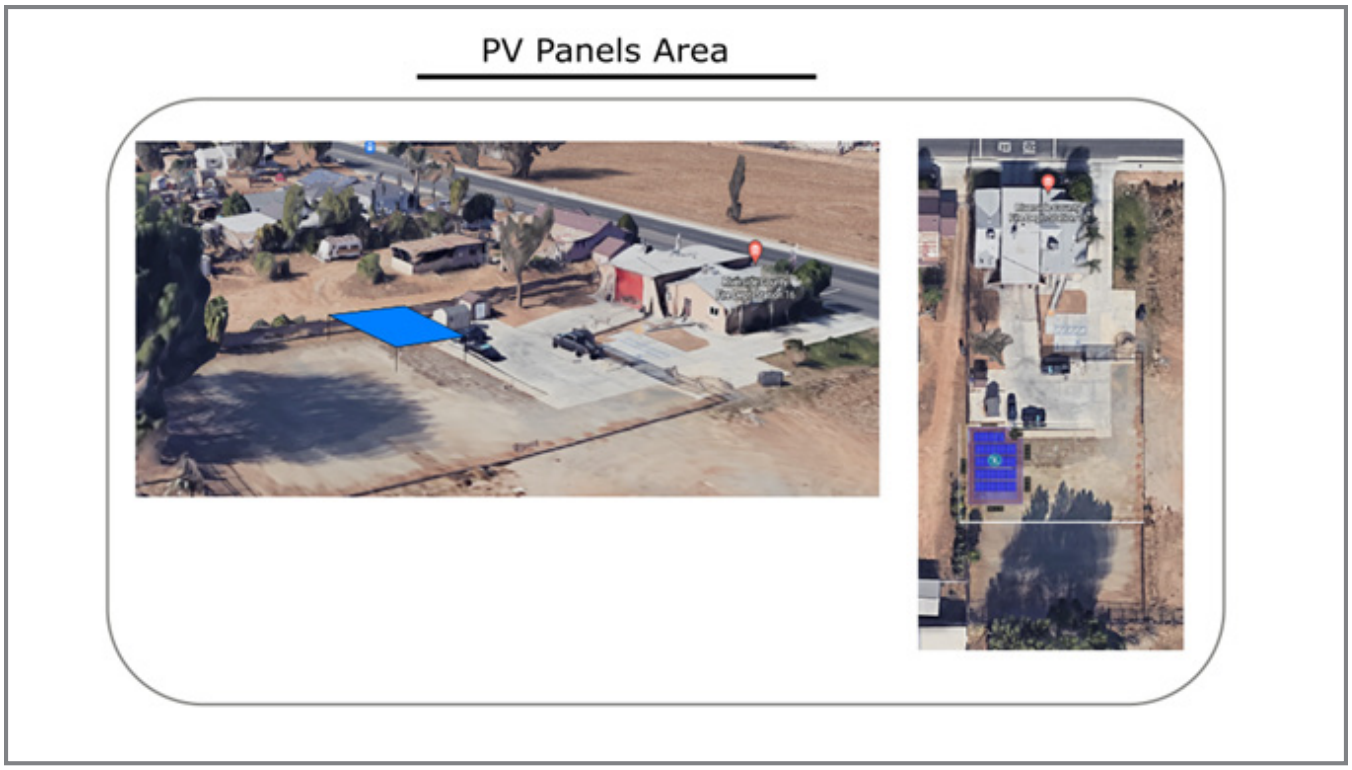


Figure A.17. Jurupa Valley Fire Station 16 - PV System Location

For the purpose of this analysis, 100% of the facility load is assumed to be critical. That is particularly important with respect to how the HOMER tools will treat the load in terms of resilience requirements, which would directly impact how the microgrid components are sized and operated. In this case study, no downtime is allowed, and the tool will develop the system such that all the loads are met all the time throughout the year, even in the case of prolonged grid outages. The schematic in Figure A.18 shows the main components and connections of the developed microgrid for Jurupa Valley Fire Station 16.

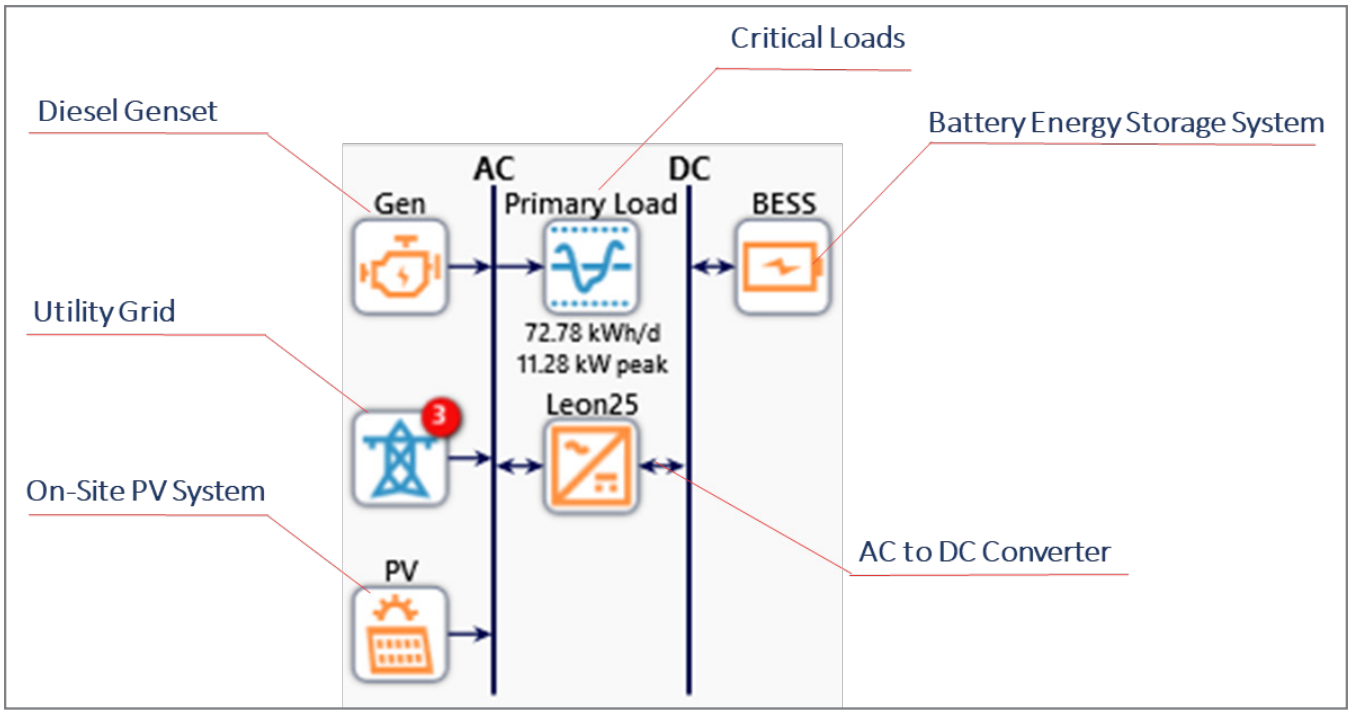


Figure A.18. Jurupa Valley Fire Station 16 - Microgrid Architecture and Components

To evaluate the reliability and resilience of the facility, grid outages should be modeled and the system's response to such outages should be evaluated. Towards that end, frequency and duration of power outages are needed as input to the software model. Statistics of the past grid outages is available at city level through SCE reliability reports.[5] SAIFI and SAIDI numbers, representing average frequency of sustained interruptions and average duration of sustained interruptions respectively, were used in this study.

According to the historical reliability of SCE circuits serving the city of Jurupa Valley for 2021, the SAIDI has been 891 minutes and the SAIFI has been 2.7 outages. Therefore, it was assumed that the system would have to endure 2.7 outages per year, each of which would be 5.5 hours long.

The distribution of these outages will be randomly selected by the software; one example is shown in Figure A.19. Depending on the reliability requirements set for the facility, the software will size the solar and battery system such that those requirements are met at all times. In this case study, we assumed that 100% of the plant load is critical and should be covered throughout the year, i.e., no down time or degradation of performance is allowed.

5 Circuit Reliability Review- Jurupa Valley, 2022, Southern California Edison

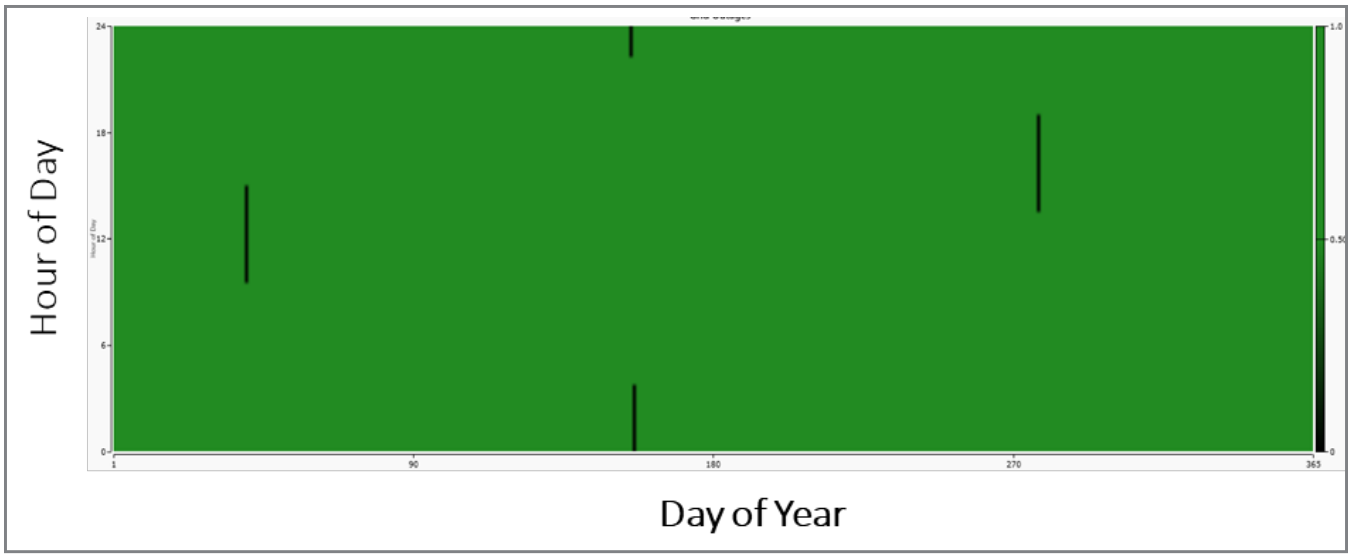


Figure A.19. Jurupa Valley Fire Station 16 - Random Distribution of Outages Throughout the Year

Results and Recommendations

Feasible solutions for the Jurupa Valley Fire Station 16 are summarized in Table A 3. These solutions essentially include those system sizes and combinations, referred to as system Architectures, that are capable of meeting the critical loads during the defined outage scenarios. Each battery pack has the rated capacity of 10.5 kWh/10.5 kW, and the software will come up with the optimum number of packs for each system architecture.

Table A.3. Jurupa Valley Fire Station 16 - Microgrid Modeling Results

Architecture				Cost				System		
Scn.	PV (kW)	Generator (kW)	BESS (kWh/kW)	NPC ($)	LCOE ($/kWh)	Capital Expense ($)	Simple Payback (year)	Renewable Fraction (%)	Generator Hours	BESS Autonomy (hour)
1	14	12	-	$27.8 k	0.066	$27.6 k	7.7	66.2	8	-
2	**14**	**12**	**10.5/10.5**	**$37.2 k**	**0.089**	**$33.6 k**	**10**	**67.1**	**3**	**2.8**
3	-	12	-	$41.4 k	0.159	$0	-	0	7	-
4	-	12	10.5/10.5	$50.1 k	0.193	$5.9 k	-	0	19	2.8

These feasible scenarios are ranked based on the net present costs (NPC).[6] Scenario 3 represents the baseline scenario and has the third-best NPC. Scenario 2 consists of solar PVs, BESS, and diesel generators; this combination provides multiple benefits in terms of resilience performance and integration of renewable energy. Availability of multiple power sources improves the system flexibility and thereby enhance resilience against power outages. In case of future outages become longer and more frequent, the system would be able to sustain critical operations for longer periods compared to other scenarios investigated here; in other words, reduced generators runtime for scenario 2 compared

6 Analysis was undertaken based upon equipment cost only. To take into consideration the total project cost, a premium of 30%-40% should be added.

with other scenarios can be translated to less reliance on diesel fuel, less maintenance, and longer lifetime for the diesel generators. Scenario 2 will also result in a better economic performance compared to the baseline case; for those reasons, and considering that it has lower GHG emissions, Scenario 2 is the proposed option for improving resilience posture of the system. Implementation of BESS would provide more flexibility in demand management and could reduce demand charges on utility bills. The single-line diagram of the proposed system is shown in Figure A.20.

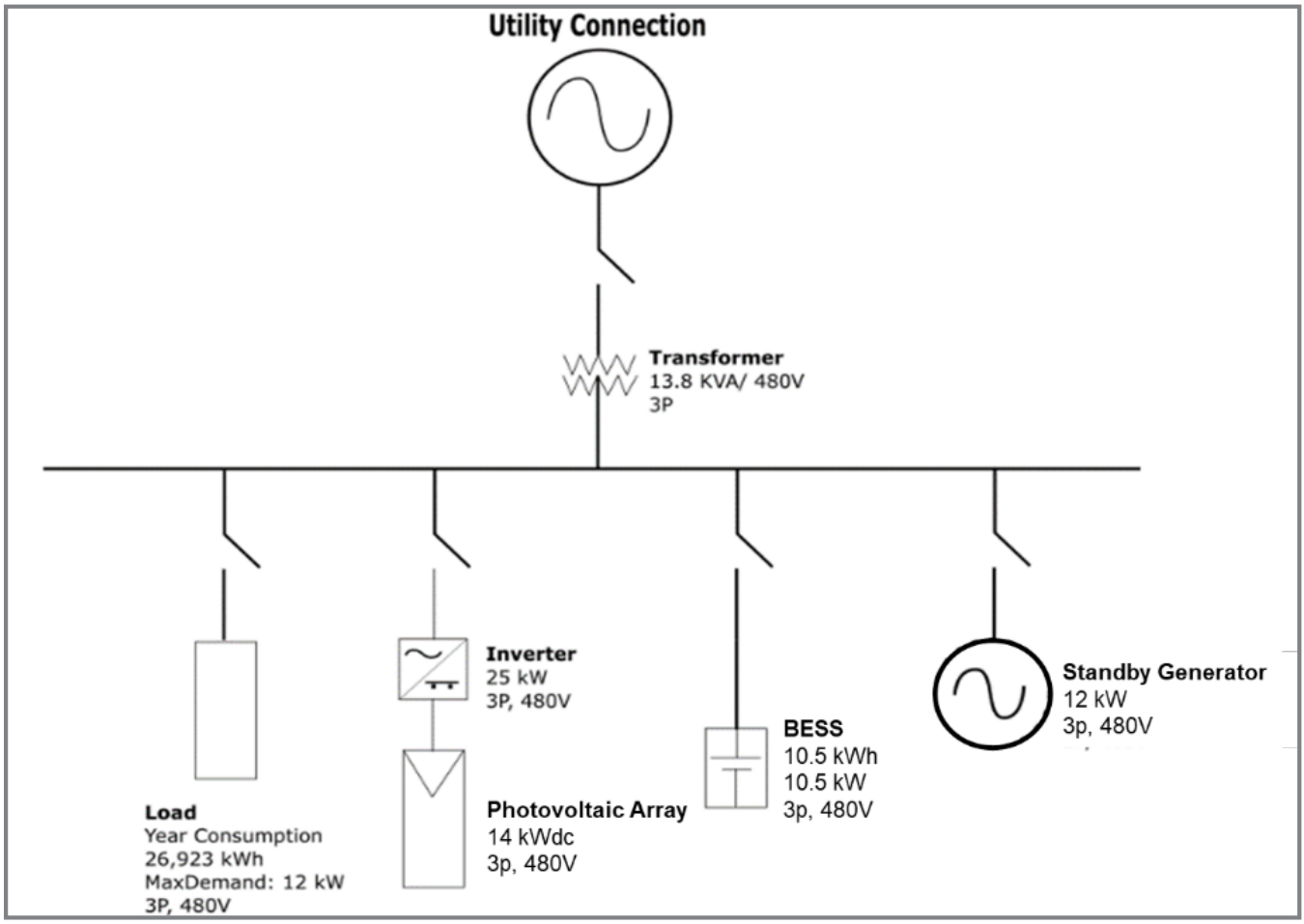


Figure A.20. Single-line Diagram of the Proposed System for Jurupa Valley Fire Station 16

A4. Case Study 4 - Jurupa Valley Fire Station 17

Facility Overview

Similar analysis was carried out on Jurupa Valley Fire Station 17 as was completed for the Jurupa Valley Fire Station 16. Jurupa Valley Fire Station 17 is a larger and newer facility located at 10400 San Sevaine Way, Mira Loma, CA 91752.

The facility is currently connected to the Southern California Edison (SCE) utility on the TOU-GS-1-B tariff. The site location is shown in Figure A.21.

Figure A.21. Jurupa Valley Fire Station 17 Site Location

Analysis and Simulations

To assess how the current and proposed system would response to prolonged utility power outages, a comprehensive microgrid modeling and analysis was carried out. For this purpose, HOMER Grid software tool was used. HOMER Grid is a microgrid modeling software that is being widely used in the research and industry communities to design and optimization of microgrids, size different components of the system, and also to perform a technical and financial feasibility assessment. This tool can also help with resilience and reliability assessment of various microgrid combinations, which has been the main focus of this study.

In 2021, the total energy consumption of the facility was 73,600 kWh, with the peak demand reaching 24 kW multiple times throughout the year in June, July, and August. Figure A.22 depicts the monthly variations in monthly energy consumption and peak demand. The electrical load heatmap for this facility is shown in Figure A.23.

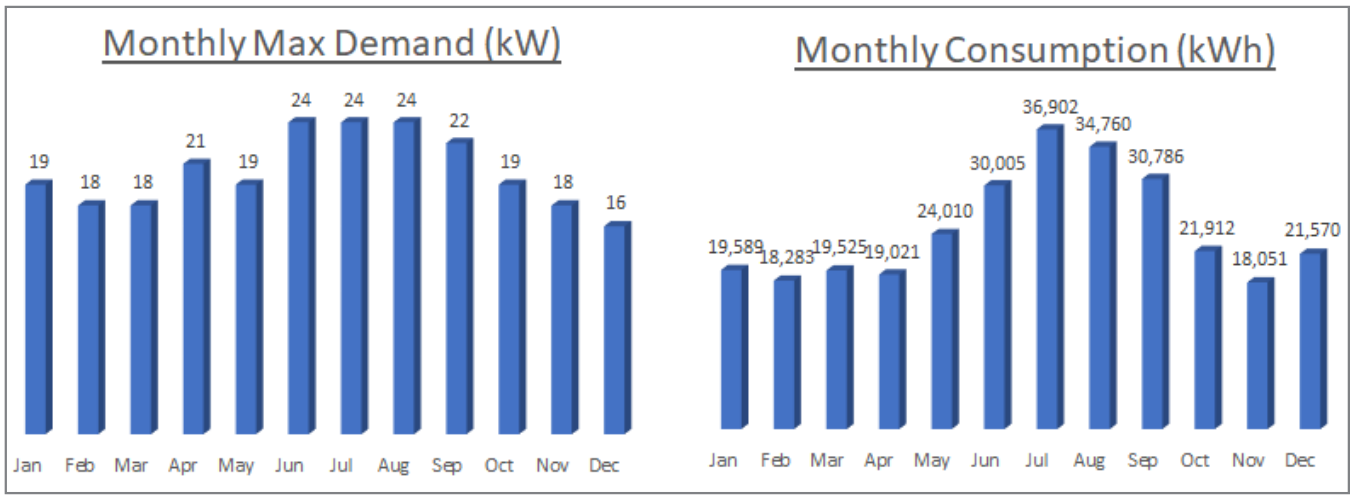


Figure A.22. Monthly Electricity Consumption and Peak Demands

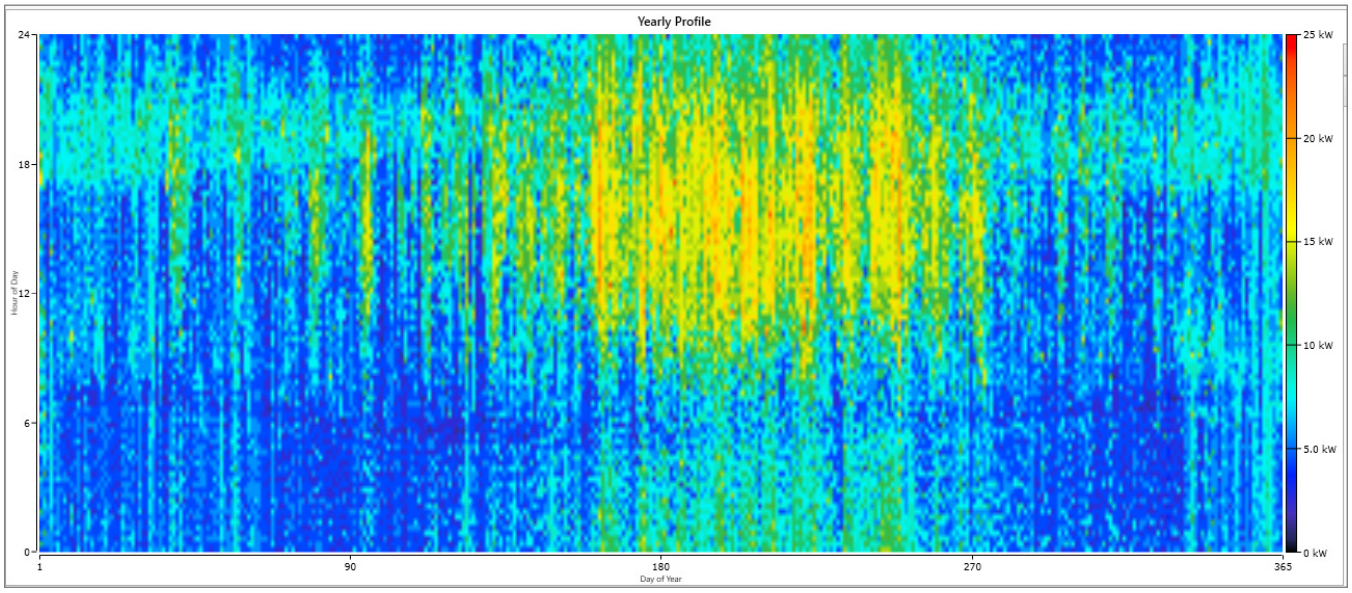


Figure A.23. Heat Map of the Jurupa Valley Fire Station 17 Electrical Load

To improve the resilience performance of the facility, it is proposed that on-site solar photovoltaics (PVs) be used as an additional source of power along with battery energy storage systems (BESS) and that various combinations and sizes be evaluated. The capacity of the existing (or planned) diesel generator is 24 kW. Figure A.24 shows the proposed locations for the solar PV arrays, which can accommodate a 55 kW PV system combined and also provide shaded parking areas for the staff.

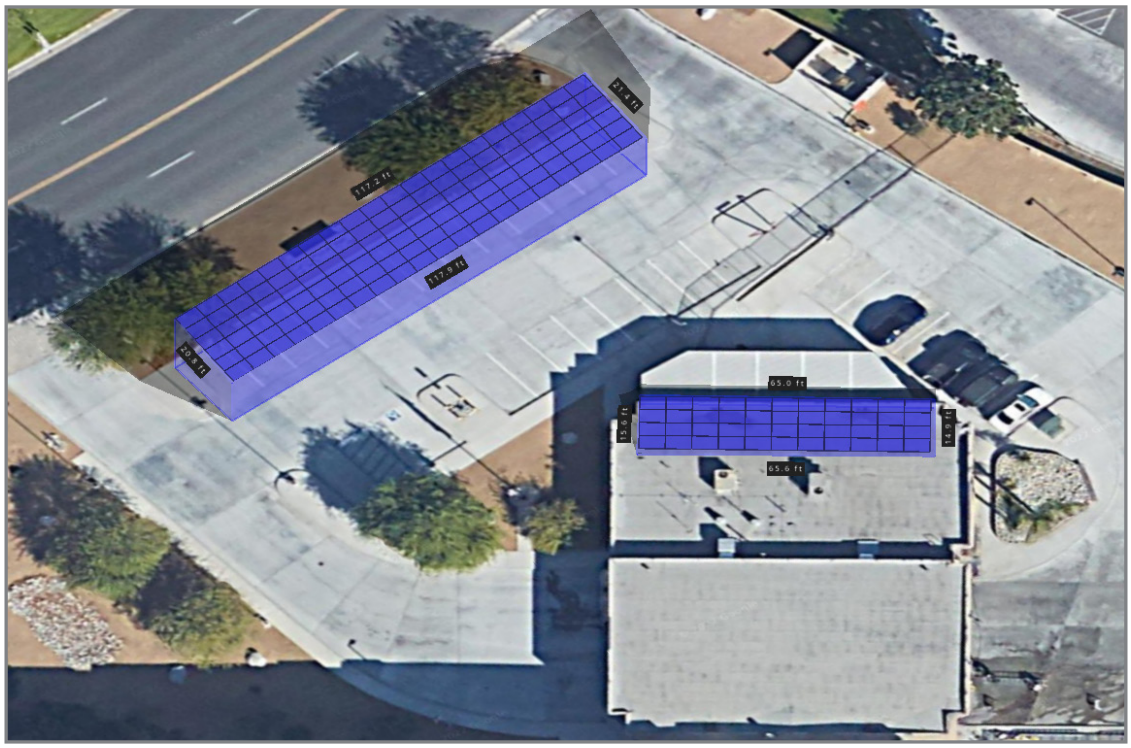


Figure A.24. Jurupa Valley Fire Station 17 - PV System Location

For the purpose of this analysis, 100% of the facility load is assumed to be critical. That is particularly important in how the HOMER tools will treat the load in terms of resilience requirements, which would directly impact how the microgrid components are sized and operated. In this case study, no down time is allowed, and the tool will develop the system such that all the loads are met at all the time throughout the year even in case of prolonged grid outages. Figure A.25 schematically shows the main components and connections of the developed microgrid for Jurupa Valley Fire Station 17.

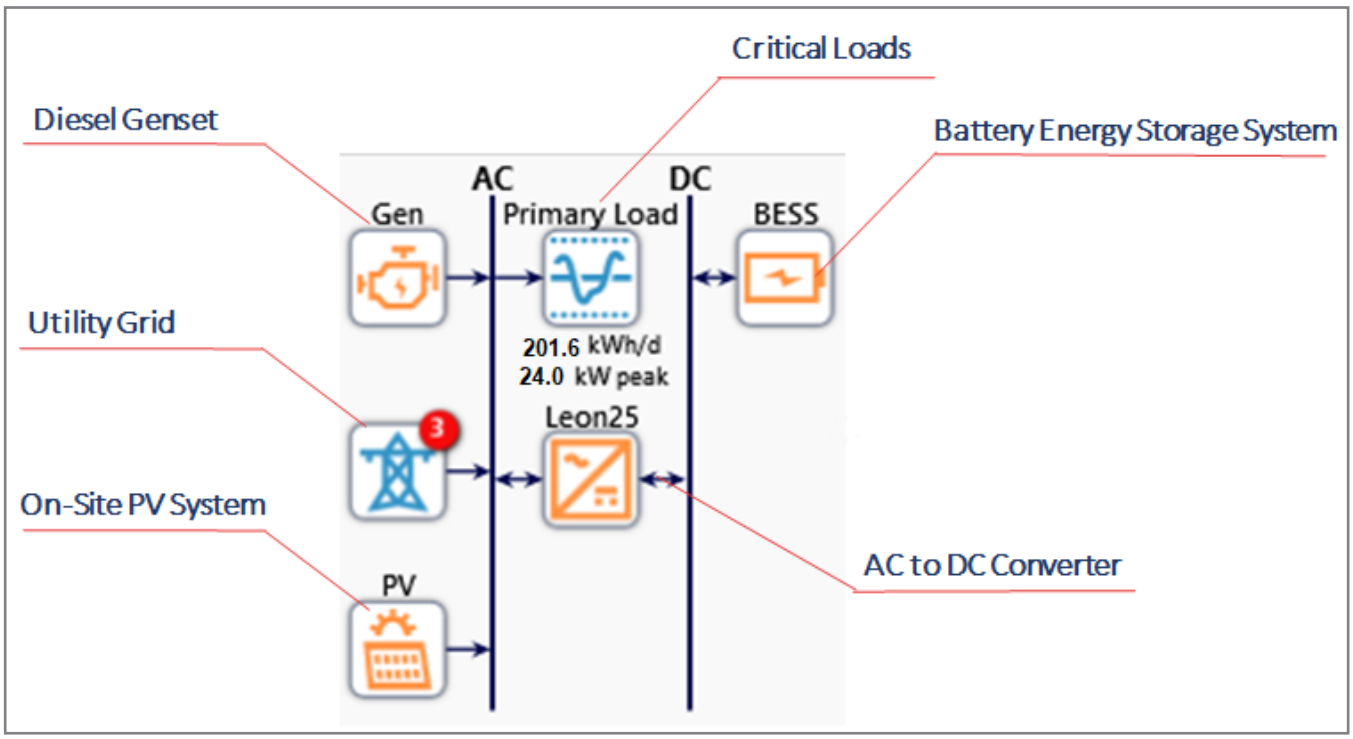


Figure A.25. Jurupa Valley Fire Station 17 - Microgrid Architecture and Components

To evaluate reliability and resilience of the facility, grid outages should be modeled, and the system respond to such outages to be evaluated. Towards that end, frequency and duration of power outages are needed as input to the software model. Statistics of the past grid outages is available at city level through SEC reliability reports.[7] SAIFI and SAIDI numbers, representing average frequency of sustained interruptions and average duration of sustained interruptions respectively, were used in this study According to the historical reliability of SEC circuits serving the Jurupa Valley for 2021, the SAIDI has been 891 minutes and the SAIFI has been 2.7 outages. Therefore, it was assumed that the system would have to endure 2.7 outages per year, each of which would be 5.5 hours long.

The distribution of these outages will be randomly selected by the software; one example is shown in Figure A.26. Depending on the reliability requirements set for the facility, the software will size the solar and battery system such that those requirements are met at all times. In this case study, we assumed that 100% of the plant load is critical and should be covered throughout the year, i.e., no down time or degradation of performance is allowed.

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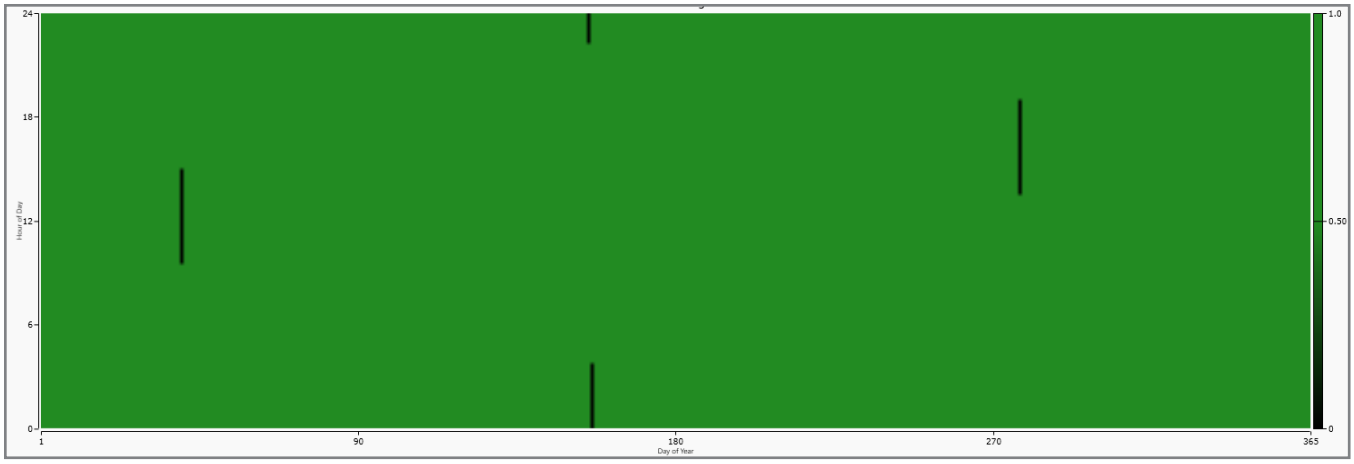

Figure A.26. Jurupa Valley Fire Station 17 - Random Distribution of Outages Throughout the Year

Results and Recommendations

Feasible solutions for the Jurupa Valley Fire Station 17 are summarized in Table A 4. These solutions essentially include those system sizes and combinations, referred to as system Architectures, that are capable of meeting the critical loads during the defined outage scenarios. Each battery pack has the rated capacity of 10.5 kWh/10.5 kW, and the software will come up with the optimum number of packs for each system architecture.

Table A.4. Jurupa Valley Fire Station 17 - Microgrid Modeling Results

Architecture				Cost				System		
Scn.	PV (kW)	Generator (kW)	BESS (kWh/kW)	NPC ($)	LCOE ($/kWh)	Capital Expense ($)	Simple Payback (year)	Renewable Fraction (%)	Generator Hours	BESS Autonomy (hour)
1	55	24	-	$62.5 k	0.042	$108.6 k	8.1	74.5	17	-
2	**55**	**24**	**10.5/10.5**	**$98.6 k**	**0.067**	**$131.4 k**	**10.9**	**74.9**	**16**	**1**
3	-	24	-	$107.7 k	0.150	$0	-	0	31	-
4	-	24	10.5/10.5	$143.6 k	0.199	$22.8 k	-	0	33	1

These feasible scenarios are ranked based on the net present costs (NPC).[8] Scenario 3 represents the baseline scenario and has the third-best NPC. Scenario 2 consists of solar PVs, BESS, and diesel generators; this combination provides multiple benefits in terms of resilience performance and integration of renewable energy. Availability of multiple power sources improves the system flexibility and thereby enhance resilience against power outages. In case of future outages become longer and more frequent, the system would be able to sustain critical operations for longer periods compared to other scenarios investigated here; in other words, reduced generators runtime for scenario 2 compared with other scenarios can be translated to less reliance on diesel fuel, less maintenance, and longer lifetime for the diesel generators. Scenario 2 will also result in a better economic performance compared to the baseline case; for those reasons, and considering that it has lower GHG emissions, Scenario 2

8 Analysis was undertaken based upon equipment cost only. To take into consideration the total project cost, a premium of 30%-40% should be added

is the proposed option for improving resilience posture of the system. Implementation of BESS would provide more flexibility in demand management and could reduce demand charges on utility bills. The single-line diagram of the proposed system is shown in Figure A.27.

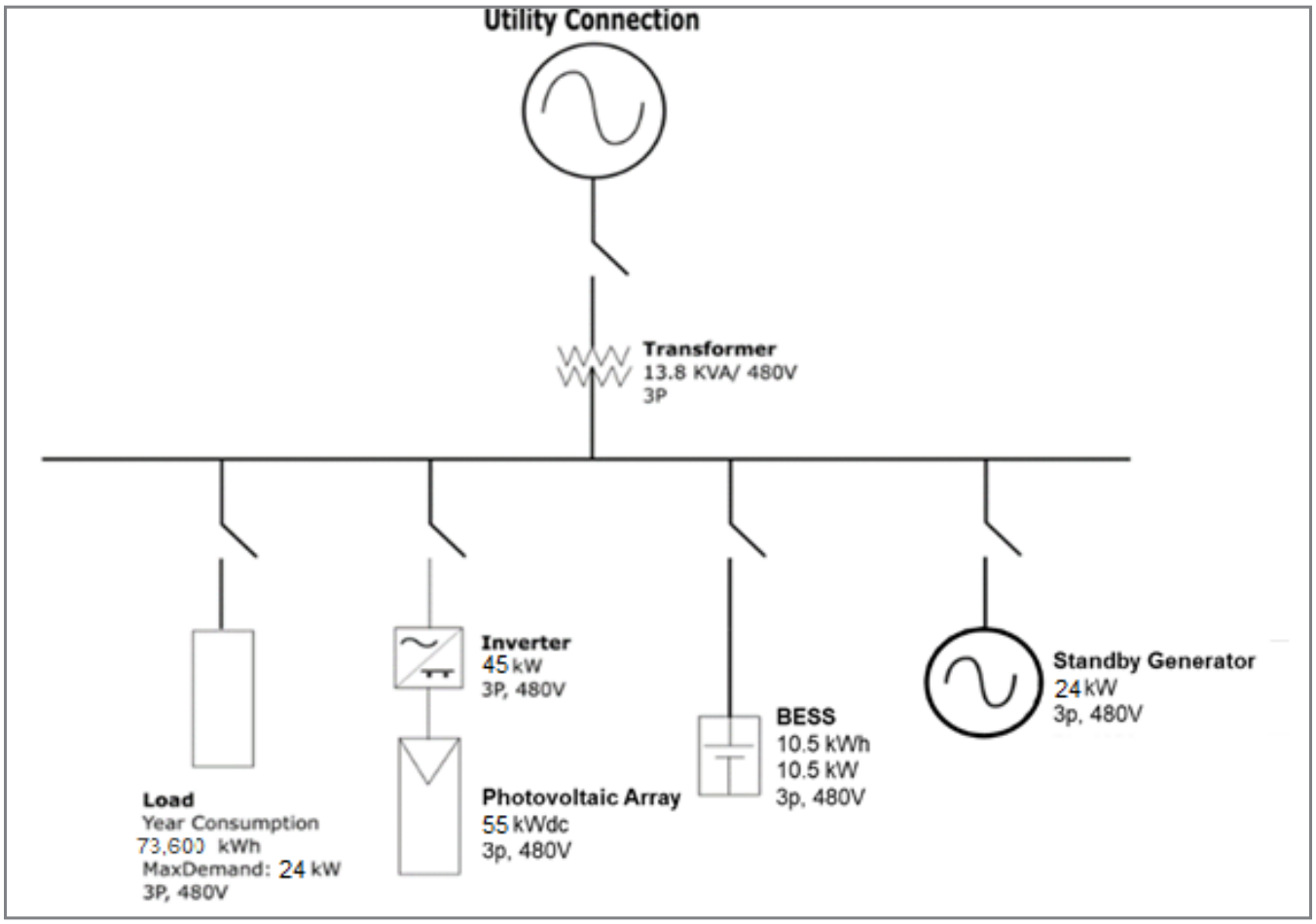

Figure A.27. Single-line Diagram of the Proposed System for Jurupa Valley Fire Station 17

Appendix B. Critical Facility Questionnaire

WRCOG Critical Assets- Questionnaire

[NAME OF JURISDICTION]

	Guidance	*Facility 1*	*Facility 2*	*Facility 3*	*Facility 4*
Facility Name	*As extracted from the WRCOG Regional Facility List spreadsheet circulated earlier; add/modify list as needed.*	**[FACILITY NAME]**	**[FACILITY NAME]**	**[FACILITY NAME]**	**[FACILITY NAME]**
FACILITY OVERVIEW					
Facility Type	*As extracted from the WRCOG Regional Facility List spreadsheet circulated earlier; add/modify list as needed.*				
Services Provided	*As extracted from the WRCOG Regional Facility List spreadsheet circulated earlier; add/modify list as needed.*				
No. of people served	*On average, how many people does this facility serve under normal operations? Select range from dropdown menu.*				
Facility Age	*Select from dropdown menu.*				
HAZARD SENSITIVITY					
Air Quality	*Identify degree of sensitivity against each threat, by selecting one of the following options from the dropdown menu:* ***Low*** ***Medium*** ***High***				
Drought					
Flooding					
Human Health Hazards					
Extreme Temperature (heat waves, cold snaps)					
Wildfire					
Other?	*Note any additional remarks on threat probability and consequence*				

	Guidance	*Facility 1*	*Facility 2*	*Facility 3*	*Facility 4*
Facility Name	*As extracted from the WRCOG Regional Facility List spreadsheet circulated earlier; add/modify list as needed.*	**[FACILITY NAME]**	**[FACILITY NAME]**	**[FACILITY NAME]**	**[FACILITY NAME]**
MOST CRITICAL ENERGY NEEDS					
Computers/ Other Equipment	*Identify most prioritized energy needs for the facility by selecting "X" where applicable. Leave other fields blank.*				
Space conditioning (heating/cooling)					
Lighting					
Communications/ Server Rooms (including ltg, clg etc)					
Security					
Other?	*Note any additional remarks on critical energy needs here*				
AVAILABILITY REQUIREMENTS					
Computers/ Other Equipment	*Identify availability requirements to meet the most critical energy needs by selecting one of the following options from the dropdown menu:* ***Uninterruptible*** *: Eg-24x7, no downtime at all; Eg- 911 call center comms* ***Essential*** *: Eg- can afford minor downtime, Eg- fire station* ***Non-Essential*** *: Eg: can afford downtime, can stay offline for a few hours without major impact, Eg- Contracting office* ***Not Applicable***				
Space conditioning (heating/cooling)					
Lighting					
Communications/ Server Rooms (including ltg, clg etc)					
Security					
Additional remarks	*Note any additional remarks on availability requirements can be entered here*				

	Guidance	*Facility 1*	*Facility 2*	*Facility 3*	*Facility 4*
Facility Name	*As extracted from the WRCOG Regional Facility List spreadsheet circulated earlier; add/modify list as needed.*	**[FACILITY NAME]**	**[FACILITY NAME]**	**[FACILITY NAME]**	**[FACILITY NAME]**
EXISTING INFRASTRUCTURE					
Electrical/Power System Condition	*Select from dropdown menu*				
HVAC System Condition	*Select from dropdown menu*				
Backup Generators	*Identify if facility has backup generators that support facility load, in part or in full, from dropdown selection*				
Fuel storage tanks	*Identify if facility has fuel storage tank, from dropdown selection*				
Power conditioning systems (UPS)	*Identify if facility has UPS supporting critical loads of the concerned facility, from dropdown selection*				
Renewable energy supply	*Identify if facility has solar PV or other forms of renewable energy, from dropdown selection*				
Battery energy storage	*Identify if facility has battery energy storage systems, from dropdown selection*				
Multiple power feeds	*Identify if facility has multiple power feeds, from dropdown selection*				
Opportunity for alternative technologies	*Identify if alternate energy on site can be an option, or if there is room to expand current alternative systems. Enter response in words.*				
Additional remarks	*Any additional remarks on current infrastructure or on any of the above can be entered here. Note any issues related to backup power, power outages, or power quality*				
What are the key challenges you anticipate in implementing resilience measures on this site ?	*Enter response in words. Mention any key pain points, if they exist, specific to the facility or region.*				

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Appendix C.
Asset Prioritization Matrix

WRCOG Facility Prioritization Matrix

	Facility Overview			Community Value (Social Vulnerability)						Operational Needs (Energy Needs & Availability Requirements)						Physical Hazard Sensitivity						Existing Infrastructure										
				The scale and vulnerability of the community served by the asset/facility.						*The requirements for energy at the at the facility to maintain function.*						*The scale and nature of the physical threats to the asset/facility.*						*The asset's/facility's existing systems which influence its ability to operate*										
Agency	Facility name	Building Type	Services Provided	People served	Socioeconomic Status	Household Composition & Disability	Minority Status & Language	Housing & Transportation	Overall Social Vulnerability	Relocatability	Computers/ Other Equipment	Space conditioning (heating/cooling)	Lighting	Communications/ Server Rooms (including	Security	Air Quality	Drought	Human Health Hazards	Flooding	Extreme Temperature (heat waves, cold	Wildfire	Facility age- Old /Avg/New	Electrical/Power system condition	HVAC systems	Backup Generators	Fuel storage tanks	Power conditioning systems (UPS)	Renewable energy supply	Battery energy storage	Multiple power feeds	Opportunity for alternative technologies	TOTAL SCORE
All responses translated from questionnaire and coded per category as highlighted in this row (Low – High)				<100=1 100-1k=2 1k-10k=3 >10k=4	4 percentiles [highest (4) to lowest (1)]					Y=1 N=3	Uninterruptible=3 Essential=2 Non-essential=1 N/A= 0					High=3 Medium=2 Low=1 N/A=0						<10 yrs=1 10-40yrs	Poor=3 Avg/Fair=2 Good=1		No=3 Yes-P=2 Yes-	Yes=1 Yes w/gap=2 No=3 Not needed= blank/0							Max=100
			Attribute weights listed in this row	1.25					1.25	1.4	1.4	1.4	1.4	1.4	1.4	2.0	2.0	2.0	2.0	3	2.3	0.5	1	1	1	0.81	0.81	0.81	0.81	0.81	0.81	
CORONA	Wells 7, 8, 9A, 11, 12, 13, 14, 15, 17, 1	Water Wells	Groundwater pumped for treatment used as potable wat																												86
BEAUMONT	Beaumont Fire Station	Fire Station	Emergency ops																												83
CORONA	Desalter	Potable WTP	Potable water treatment for distribution																												82
CORONA	Sierra del Oro Treatment Plant	Potable WTP	Potable water treatment for distribution																												81
CORONA	Garretson Blending Station	Blending station	Blend multiple sources of potable water for distribution																												81
CORONA	Water Reclamation Facility 1	Water Reclamation	WWT to be used as reclaimed water																												81
CORONA	Lester Water Treatment Plant	Potable WTP	Potable water treatment for distribution																												80
CORONA	15 Wastewater Lift Stations	Lift station	Lift station																												80
CORONA	Water Reclamation Facility 2	Water Reclamation	WWT to be used as reclaimed water																												80
BEAUMONT	Beaumont Police Station	Police Station	Emergency ops																												80
JURUPA VALLEY	County Sheriff's Station	Police Station	Emergency ops																												79
CORONA	Mangular Blending Station	Blending station	Blend multiple sources of potable water for distribution																												79
CORONA	Water Reclamation Facility 3	Water Reclamation	WWT to be used as reclaimed water																												79
BEAUMONT	City of Beaumont WWTP	WWTP	24/7 WWT																												78
JURUPA VALLEY	County Fire Station 18	Fire Station	Emergency ops																												77
JURUPA VALLEY	County Fire Station 16	Fire Station	Emergency ops																												77
JURUPA VALLEY	County Fire Station 38	Fire Station	Emergency ops																												75
BANNING	Water Canyon Production Wells	Water production well	Wells in water canyon to provide city water																												74
BEAUMONT	Four Seasons Lift Station	WW Pump Station	Lift station																												73
JURUPA VALLEY	County Fire Station 17	Fire Station	Emergency ops																												73
BEAUMONT	Beaumont Mesa Lift Station	WW Pump Station	Lift station																												73
RIVERSIDE	Riverside Water Quality Control Plant	Sewer treatment plant	Sewer treatment plant for potable use																												72
BEAUMONT	Noble Creek Lift Station	WW Pump Station	Lift station																												71
BEAUMONT	Marshall Creek Lift Station	WW Pump Station	Lift station																												71
MURRIETA	Murrieta Fire Station 5	Fire Station	Emergency ops																												70
MENIFEE	Fire Station #68	Fire Station	Emergency response																												70
MENIFEE	Kay Ceniceros Senior Center	Senior Center	Senior center and shelter																												69
MURRIETA	Murrieta Fire Station 2	Fire Station	Emergency ops																												69
MENIFEE	City Hall	City Hall	City service hall																												69
RIVERSIDE	Wood Rd Swer Lift Station	Lift station	Lift station																												69
BEAUMONT	Upper Oak Valley Lift Station	WW Pump Station	Lift station																												69
BEAUMONT	San Timoteo Repeater	Comms	Control/Comm for sewer conveyance																												68
RIVERSIDE	Emergency Operation Center (EOC)	EOC	Emergency ops																												68
BANNING	Wastewater Treatment Plant	WWTP	WWT for percolation ponds																												68
TEMECULA	CalFIRE Station 12	Fire Station	Emergency ops																												68
MURRIETA	Murrieta Fire Station 1/Admin	Fire Station	Back-up EOC																												68
MENIFEE	Maintenance and Operations Center (	Department ops center (D	DOC location during rainstrom/flooding																												68
BEAUMONT	Fairway Canyon Lift Station	WW Pump Station	Lift station																												68
MURRIETA	Murrieta Fire Station 3	Fire Station	Emergency ops																												68
BEAUMONT	Albert A. Chatigny, Sr. Community Re	Community Center	Emergency center, heat/cool center, children/senior serv																												67
MURRIETA	Murrieta Fire Station 4	Fire Station	Emergency ops																												67
BEAUMONT	Seneca Springs Lift Station	WW Pump Station	Lift station																												67
MURRIETA	Murrieta Senior Center	Senior Center	Senior center and cool/heat center																												67
MURRIETA	Murrieta Community Center	Community Center	Services for children/adults																												66

WRCOG Facility Prioritization Matrix

	Facility Overview			Community Value (Social Vulnerability)						Operational Needs (Energy Needs & Availability Requirements)						Physical Hazard Sensitivity						Existing Infrastructure										TOTAL SCORE
				The scale and vulnerability of the community served by the asset/facility.						*The requirements for energy at the at the facility to maintain function.*						*The scale and nature of the physical threats to the asset/facility.*						*The asset's/facility's existing systems which influence its ability to operate*										
Agency	Facility name	Building Type	Services Provided	People served	Socioeconomic Status	Household Composition & Disability	Minority Status & Language	Housing & Transportation	Overall Social Vulnerability	Relocatability	Computers/ Other Equipment	Space conditioning (heating/cooling)	Lighting	Communications/ Server Rooms (including	Security	Air Quality	Drought	Human Health Hazards	Flooding	Extreme Temperature (heat waves, cold	Wildfire	Facility age- Old /Avg/New	Electrical/Power system condition	HVAC systems	Backup Generators	Fuel storage tanks	Power conditioning systems (UPS)	Renewable energy supply	Battery energy storage	Multiple power feeds	Opportunity for alternative technologies	
All responses translated from questionnaire and coded per category as highlighted in this row (Low – High)				<100=1 100-1k=2 1k-10k=3 >10k=4	4 percentiles [highest (4) to lowest (1)]					Y=1 N=3	Uninterruptible=3 Essential=2 Non-essential=1 N/A= 0					High=3 Medium=2 Low=1 N/A=0						<10 yrs=1 10-40yrs	Poor=3 Avg/Fair=2 Good=1		No=3 Yes-P=2 Yes-	Yes=1 Yes w/gap=2 No=3 Not needed= blank/0						Max=100
			Attribute weights listed in this row	1.25					1.25	1.4	1.4	1.4	1.4	1.4	1.4	2.0	2.0	2.0	2.0	3	2.3	0.5	1	1	1	0.81	0.81	0.81	0.81	0.81	0.81	
BEAUMONT	Lower Oak Valley Lift Station	WW Pump Station	Lift station																													66
JURUPA VALLEY	Jurupa Valley City Hall	Admin	City service hall																													66
RIVERSIDE	Janet Goeske Senior Center	Senior Center	Senior center																													65
RIVERSIDE	Ysmael Villegas Community Center	Community Center	Service for children/adults																													65
MURRIETA	Murrieta Police Department	Police Station	Emergency ops																													65
WILDOMAR	Fire Station #61	Fire Station	Emergency ops																													64
MURRIETA	Murrieta Youth Center	Youth Center	Services for children																													63
TEMECULA	Temecula Field Operations Center	Field ops	Response ops, response equipment location																													63
TEMECULA	Mary Phillips Senior Center	Senior Center	Cool/heat center																													62
TEMECULA	Temecula City Hall	EOC	Emergency ops																													62
BANNING	Westward Lift Station	Lift station	Lift station																													61
WILDOMAR	City Hall	City Hall	EOC																													61
JURUPA VALLEY	City of Jurupa Valley, Fleet Maintenar	Maintenance	Field/Maintenance/Facilities Maintenance staff use																													61
EASTVALE	Fire Station 27	Fire Station	Fire Service																													61
EASTVALE	Fire Station 31	Fire Station	Fire Service																													60
JURUPA VALLEY	City of Jurupa Valley, Eddie D. Smith S	Senior Center	Senior center and shelter																													60
BANNING	Community Center	Community and senior cer	Cool center, services for seniors																													59
MENIFEE	Lazy Creek Recreational Center	Rec Center	Service for children																													58
WILDOMAR	Facility #4	Cooling center	Cool center																													57
BANNING	Banning Police Station	Police Station	Emergency ops																													57
TEMECULA	Temecula Community Recreation Cen	Community Center	Services for children/adults and emergency shelter																													57
MORENO	City of Moreno Valley Senior Center	Senior center	daily access and services for seniors, cooling center																													53
MORENO	City of Moreno Valley EOC	Emergency Operations Cer	emergency response central command																													51
MORENO	City of Moreno Valley CRC	Community center /emerg	emergency shelter for disasters, COOL center																													50
LAKE ELSINORE	Senior Center	cooling center	lunch service, cooling center																													45
LAKE ELSINORE	Planet Youth/ Tiny Tots	child care, school	child care, school																													44
LAKE ELSINORE	Neighborhood Center	child care, cooling center	child care, activities for kids																													44
WILDOMAR	Facility #3	Traffic Signals-citywide																														37

Appendix D.
Energy Resilience Strategies

Table D.1. Energy Resilience Strategies

Strategy	Category	Resource	Resilience Attribute	Considerations
Dispatchable Power (Backup Generator)	Backup Power	• Power	• Energy Source Diversity • Load Sustainment Capacity	• Outdoor space with clearances • Ventilation requirements • Air quality requirements • Noise requirements • Fuel storage capacity (runtime requirement) • Critical loads (for generation capacity) • Dedicated emergency circuits • Weatherproofing requirements • Generator testing
Critical Load Uninterruptible Power Supply (UPS) System	Backup Power	• Power	• Load Sustainment Capacity • Islanding Capabilities, Analytics, and Controls	• Space availability • Runtime requirement • Dedicated emergency circuits • Maintenance
Portable Generator Quick-Connect	Backup Power	• Power	• Energy Source Diversity • Load Sustainment Capacity	• Dedicated emergency circuits • Space availability • Electrical panel capacity
On-site Solar Photovoltaics (PVs)	Energy Supply	• Power	• Energy Source Diversity	• Rooftop/Parking Area • Circuit capacity • Structural support • Shading/glare • Solar rate riders and net-metering tariffs • Ability to operate in island-mode
Other Alternative Energy Generation	Energy Supply	• Power	• Energy Source Diversity	• Alternative energy opportunity assessment required
Battery Energy Storage System	Energy Storage	• Power	• Energy Demand Reduction • Load Sustainment Capacity • Energy Source Diversity • Islanding Capabilities, Analytics, and Controls	• Space availability • Circuit capacity • Advanced controls • Utility tariff structure • Battery storage sizing • Ability to operate in island-mode
Fuel Storage for Dispatchable Power	Energy Storage	• Power	• Load Sustainment Capacity	• Space availability • Secondary containment • Surface or subsurface storage requirements • Fire/explosives safety requirements (for alternative fuels)

Strategy	Category	Resource	Resilience Attribute	Considerations
Thermal Energy Storage	Energy Storage	• Heating • Cooling	• Energy Demand Reduction • Thermal Load Sustainment Capacity	• Space availability • Heating or cooling demand profiles • Utility tariff structure • Critical thermal loads • Thermal storage sizing
Building Envelope Sealing	Energy Conservation	• Heating • Cooling	• Energy Demand Reduction	• Energy savings payback • Expected useful life (EUL) remaining for envelope
Heating, Ventilation, and Air Conditioning (HVAC Performance Upgrades	Energy Conservation	• Heating • Cooling	• Energy Demand Reduction	• Energy savings payback • Expected useful life (EUL) remaining of mechanical system • Building system controls capability
Lighting Performance Upgrades	Energy Conservation	• Power	• Energy Demand Reduction	• Type of existing lighting fixtures • Energy savings payback • Building system controls capability
System Recommissioning and Rebalancing	Energy Conservation	• Heating • Cooling	• Energy Demand Reduction	• Energy savings payback • Age of existing mechanical system • Building system controls capability
Energy Demand Forecasting	Energy Conservation	• Power • Heating • Cooling	• Energy Demand Reduction • Islanding Capabilities, Analytics, and Controls	• Building system monitoring capability • Building system controls capability
Building System Monitoring and Controls	Energy Management and Controls	• Power • Heating • Cooling	• Cybersecurity of Energy Systems • Islanding Capabilities, Analytics, and Controls	• Age of existing mechanical system • Existing communications network
Energy Management Personnel	Energy Management and Controls	• Power • Heating • Cooling	• Energy Demand Reduction • Personnel Availability for Assessment and Repair	• Complexity of building energy systems • Energy savings potential • Difference in critical and non-critical loads
Microgrid Controls System	Energy Management and Controls	• Power	• Islanding Capabilities, Analytics, and Controls	• On-site energy generation opportunity • On-site energy storage opportunity • On-site dispatchable power capacity • Building system controls capability • Difference in critical and non-critical loads

Strategy	Category	Resource	Resilience Attribute	Considerations
Priority Load-Shedding Protocol	Energy Management and Controls	• Power • Heating • Cooling	• Emergency Management Protocols	• Building system controls capability • Difference in critical and non-critical loads
Graceful Shutdown Procedures	Energy Management and Controls	• Power	• Emergency Management Protocols	• Difference in critical and non-critical loads • Uninterruptible power requirement • Ability to relocate critical functions to another location
Energy Communications Network Encryption	Energy Management and Controls	• Power • Heating • Cooling	• Cybersecurity of Energy Systems	• Existing communications network • Desired building monitoring and controls capability
Isolated Energy Communication Strands	Energy Management and Controls	• Power • Heating • Cooling	• Cybersecurity of Energy Systems	• Existing communications network • Desired building monitoring and controls capability
Cybersecurity Authorization Protocol	Energy Management and Controls	• Power • Heating • Cooling	• Cybersecurity of Energy Systems	• Existing communications network • Typology of new equipment to be installed on site
Remote Alerts for Building Systems	Energy Management and Controls	• Power • Heating • Cooling	• Cybersecurity of Energy Systems • Personnel Availability for Assessment and Repair	• Existing communications network • Desired building monitoring and controls capability • Maintenance personnel location (on- or off-site)
Dedicated Emergency Circuits	Power Distribution	• Power	• Load Sustainment Capacity	• Difference in critical and non-critical loads • On-site energy generation opportunity • On-site dispatchable power capacity
Sufficient Power Circuit Capacity	Power Distribution	• Power	• Load Sustainment Capacity	• Facility age and condition • History of change in facility use
Adequate Power Circuit Condition	Power Distribution	• Power	• Equipment, Parts and Procurement	• Facility age and condition • Preventative maintenance on power systems
Redundant Power Supply Paths	Power Distribution	• Power	• Redundant Supply Paths	• Uninterruptible power requirement • Power utility relationship
Hardened Power Supply Paths	Power Distribution	• Power	• Physical Hardening	• Power utility relationship • Hazard threat profile
Critical Cooling Capacity	Mechanical Systems	• Cooling	• Thermal Load Sustainment Capacity	• Criticality of cooling loads • Facility age and condition • History of change in facility use

Strategy	Category	Resource	Resilience Attribute	Considerations
Critical Heating Capacity	Mechanical Systems	• Heating	• Thermal Load Sustainment Capacity	• Criticality of heating loads • Facility age and condition • History of change in facility use
Adequate HVAC System Condition	Mechanical Systems	• Heating • Cooling	• Equipment, Parts and Procurement	• Facility age and condition • Preventative maintenance on HVAC systems
Simplified HVAC Systems	Mechanical Systems	• Heating • Cooling	• Equipment, Parts and Procurement	• Facility age and condition • History of change in facility use • Expected useful life (EUL) remaining of mechanical system
HVAC System Redundancies	Mechanical Systems	• Heating • Cooling	• Redundant Supply Paths • Equipment, Parts and Procurement	• Criticality of heating and cooling loads • Existing mechanical system layout (e.g., ducting)
Portable HVAC System Tie-in Connection	Mechanical Systems	• Heating • Cooling	• Energy Source Diversity • Equipment, Parts and Procurement	• Mechanical system type (e.g., hydronic) • Mechanical room location
Regular Generator Testing	Maintenance	• Power	• Energy Management Protocols • Equipment, Parts and Procurement	• Availability of maintenance personnel
Regular UPS Maintenance and Testing	Maintenance	• Power	• Emergency Management Protocols • Equipment, Parts and Procurement	• Availability of maintenance personnel • Existing contracts with vendor
Preventative Maintenance on Power Systems	Maintenance	• Power	• Personnel Availability for Assessment and Repair • Equipment, Parts and Procurement	• Availability of maintenance personnel • Power system ownership demarcation point
Preventative Maintenance on HVAC Systems	Maintenance	• Heating • Cooling	• Personnel Availability for Assessment and Repair • Equipment, Parts and Procurement	• Availability of maintenance personnel
Critical Spare Parts Supply	Maintenance	• Power • Heating • Cooling	• Equipment, Parts and Procurement	• Space availability • Price and lead time of replacement parts
Contractor Emergency Availability Protocol	Maintenance	• Power • Heating • Cooling	• Personnel Availability for Assessment and Repair	• Ownership structure of electrical and mechanical systems
Defined Repair and Recovery Response Protocols	Maintenance	• Power • Heating • Cooling	• Personnel Availability for Assessment and Repair	• Disaster recovery exercises • Coordinated response team personnel
Defined Generator Refueling Protocols	Maintenance	• Power • Heating • Cooling	• Personnel Availability for Assessment and Repair	• Ownership structure of backup power system • Off-site fuel resupply source • Refueling assets

Appendix E. Funding and Financing Strategies

The available funding and financing strategies identified in this chapter support the electrification of and resilience planning for critical facilities in the WRCOG region, with an emphasis on inclusion of energy storage for emergency response. This chapter summarizes key considerations for developing funding strategies for resiliency efforts, as well as grants and other funding and financing tools that are currently available to fund capital-intensive energy resiliency projects and ongoing policies and programs.

E1. Key Considerations for Developing Funding and Financing Strategies

The following section will contain high-level descriptions of the difference between funding and financing types, revenue-generating tools, and the potential role of local and regional stakeholders in the implementation process.

Funding versus Financing

Energy resiliency projects often require a combination of funding and financing strategies. Funding includes revenue generated by a project (e.g., from electricity generated by a renewable energy project), taxes, and grants or incentives that do not need to be paid back. While many grants are very competitive and require a multiple-stage application process, some are allocated through state or federal formulas that consider factors such as population size, demographics, and various other forms of census data.

Financing, often accessed in the form of loans or bonds, is the incurrence of indebtedness to cover the initial costs of a project. Financing must be paid back with revenue, for example, from the sale of electricity back to the grid, incentives, or tax credits. A common example of financing for a renewable energy project is a solar power purchase agreement (PPA). Solar PPAs are a type of public-private partnership in which a developer covers most, if not all, of the cost associated with design, permitting, financing, and installation of a solar energy system on a customer's property. The developer will then provide the energy generated on-site to the customer at a cost lower than the typical utility's rate. The developer of the solar energy system will benefit from the income associated with the sale of electricity as well as any related tax credits and other incentives generated from the system. In addition to public-private partnerships, other financing opportunities may include revolving loan funds operated by the state and/or bond issuances.

Implementation and Governance

The facilities evaluated in this planning process are operated by a wide range of city and county agencies, including local Police (or County Sheriff), Fire, Wastewater, and Community Services Departments. Some of the fire stations evaluated are operated by the state (CalFIRE). In general, the agencies that own and operate facilities are likely to be the primary implementers of energy measures. Local governments are eligible to apply for most of the grants and incentives described below, to enter into PPAs or other public-private partnerships, and to access the other funding and financing tools described below.

However, the process for applying for competitive grants in particular is onerous. Larger cities and local governments that operate their municipal utilities are most likely to have the capacity to pursue state and federal grants independently. By partnering together, cities may help share the administrative burden and increase the competitiveness of grant applications. WRCOG can continue to play a valuable role in convening cross-agency partnerships, providing information about upcoming grant opportunities, and even serving as a co-applicant for specific grants that have a regional focus. Other important local partners include Southern California Edison (SCE), which (as discussed below) offers some incentive and financing programs for energy efficiency improvements.

E2. Funding and Financing Tools

Common funding and financing sources for energy resiliency projects and programs can be broadly categorized as (1) grants from local, state, and federal agencies, (2) financing tools and 3) local revenue sources. This section summarizes key funding and financing sources that are currently available to support implementation of WRCOG's regional resilience plan.

Grants and Incentives

In response to the COVID-19 pandemic and the increasing impacts of climate change, an unprecedented amount of federal and state funding is being made available to local governments for energy and resilience related projects, creating a once-in-a-generation opportunity to implement projects and programs that mitigate and adapt to climate change. At the same time, local agencies across the country are largely underfunded, which creates substantial competition for grant funding. The increasing frequency and intensity of extreme weather events have also increased local agency demand for grant dollars to mitigate climate change, prepare for future events, and support recovery from these events.

The grants summarized below are those that have the potential to fund WRCOG and member agencies' resiliency efforts. These efforts include improving resiliency to regional vulnerabilities, such as wildfire, drought, flooding, and extreme heat, and supporting the goal of long-term decarbonization.

State and Regional Grants

The State of California offers an array of mitigation and resilience-related grants for which WRCOG's Energy Resiliency Plan may be well-suited. In May 2022, Governor Newsom announced a record-breaking $32 billion increase in state funding over the next four years to address climate change, including emissions reduction, drought resilience and response, extreme heat, natural carbon sequestration, renewable energy, and energy resilience (Office of Governor Gavin Newsom, 2022). State grant programs that are earmarked to receive increased funding allocations because of this increased budget allocation are indicated with an asterisk.

Table E.1. State and Regional Grants Most Applicable to WRCOG Energy Resiliency Plan

Administering Organization	Program/Grant Name	Eligible Receiving Entities	Description	Eligible Uses	Funding Range	Type of Funding
California Governor's Office of Planning and Research (Cal OPR)	Adaptation Planning Grant Program*	Local, Regional, and Tribal Governments	Adaptation Planning Grant Program provides funding to help fill planning needs, provides communities the resources to identify climate resilience priorities, and support the development of a pipeline of climate resilient infrastructure projects across the state.	• Build community planning and capacity by supporting peer to peer learning/info sharing. • Multisector/issue planning. • Support communities faced with cascading and compound impacts of climate change.	$25 million (M) released in total through multiple rounds of funding.	Competitive
California Governor's Office of Planning and Research (Cal OPR)	Regional Resilience Planning and Implementation Grant Program*	Local, Regional, and Tribal Governments	This Program will support regions in advancing resilience through capacity-building, planning, and project implementation.	• Support regional projects that improve climate resilience and reduce risk from climate impacts. Including: wildfire, sea level rise, drought, flood, increasing temperatures, and extreme heat events.	$255M in federal funding (federal cost share) 25% local cost share ($85M set aside by FEMA to cover).	Reimbursement based; advanced funding on a case-by-case basis.
California Energy Commission (CEC)	Energy Partnership Program	Cities, Counties, County offices of Education, Special Districts, Public Hospitals, Public Care Facilities, Public Colleges or Universities	This Program offers services to help identify the most cost-effective, energy-saving opportunities for existing buildings and new construction. These funds may be used to conduct energy audits, prepare feasibility studies, and develop equipment performance specifications, among other construction related plans.	• Assist with contractor selection • Review commissioning plans. • Review equipment bid specifications. • Develop equipment performance specifications. • Review existing proposals and designs.	Up to $20,000 available per grantee.	Available, continuously open with final filing date. Closed once funding is expended.
California Governor's Office of Emergency Services (Cal OES)	PrepareCA Jumpstart	Local, Regional, and Tribal Governments	Provides technical assistance to develop local initiatives that primarily benefit eligible socially vulnerable and high hazard risk communities; and create resiliency through capacity building, mitigation, preparedness activities, education, response and recovery planning, and/or future project scoping.	• Evacuation planning – community education on mitigation. • Strengthening building codes. • Implementing a Community Emergency Response Team. • Establishing a data/fiscal management system.	$15M in state funding. Applications may not receive more than $1m in state funds.	Reimbursement based; advanced funding on a case-by-case basis.
California Resilience Challenge	California Resilience Challenge 2022 Grant Program	State communities	A statewide effort inviting local communities across CA to apply for funding for a project that addresses a unique climate threat: drought, fire, flood, or extreme heat.	• Differs case-by-case. • Santa Barbara County received an award to design two pilot climate resilience hubs that will provide safe refuge and critical services during emergencies.	$2M released in 2021, 2022 TBD.	Competitive
California Governor's Office of Emergency Services (Cal OES)	PrepareCA Match	Local, Regional, and Tribal Governments	Provides scoping/sub-application technical assistance to develop FEMA HMGP projects and activities that directly and primarily benefit socially vulnerable and high hazard risk communities.	• Address effects of future conditions such as climate change, demographics changes, population changes, and land-use changes. • Advance whole community risk reduction, including protecting access and functional needs.	$255M in federal funding (federal cost share) 25% local cost share ($85M set aside by FEMA to cover).	Reimbursement based; advanced funding on a case-by-case basis.
California Governor's Office of Planning and Research (Cal OPR)	Extreme Heat and Community Resilience Grant Program*	TBD. More information coming soon.	TBD. More information coming soon.	• TBD. More information coming soon.	TBD. More information coming soon.	TBD. More information coming soon.
Coachella Valley Mountains Conservancy	Climate Resilience and Community Access Grant Program	Nonprofit, Public Agency, Tribal Government	Seeks to invest in local conservation community by creating new programs or developing organizational or agency capacity to enhance desert resilience to climate change and foster conservation of the desert as a carbon sink.	• Enhance desert resilience to climate change. • Improve natural resources management.	Grants requests may range from $100-400,000 per grantee.	No minimum match, but applicants leveraging other funds will be preferred.
State Energy Resource Conservation and Development Commission	Community Energy Resilience Act of 2022 (Senate Bill 833)	TBD. More information coming soon.	Seeks to support local governments in developing community energy resilience plans that help achieve energy resilience objectives and state clean energy and air quality goals.	• TBD. More information coming soon.	TBD. More information coming soon.	TBD. More information coming soon.
California Department of Food and Agriculture (CDFA)	Fairground and Community Resilience Centers Program	Tribes, Community-based organizations, Nonprofits, Foundations, Public agencies, Financial institutions, small businesses, Private sector	The Fairground and Community Resilience Centers Program focuses on improving both local fairground and other community facilities to enhance the state's emergency preparedness capabilities, particularly in response to climate change.	• Infrastructure for emergency evacuation, shelter, base camps during emergency events, and critical deferred maintenance. (I.e., cooling and heating centers, clean air centers, and extended emergency evacuation response centers with kitchens, shower facilities, broadband, back-up power, etc.)	$38M of available funding.	TBD. Draft guidelines and details are currently being developed.

*These grants have been allocated funding through the 2022 California State Budget.

Administering Organization	Program/Grant Name	Eligible Receiving Entities	Description	Eligible Uses	Funding Range	Type of Funding
California Strategic Growth Council	Community Resilience Centers (CRC) Program	California Native American Tribes, Community-based organizations, Community development financial institutions, Faith-based organizations, Foundations, Joint powers authorities, Nonprofits, Libraries, Local government agencies, Schools, Small businesses	The CRC program funds new construction and upgrades of neighborhood-level resilience centers across the state that will support communities during climate and other disasters, as well as build long-term resilience, preparedness, and recovery operations for local communities.	• Comprehensive retrofits that support the resilience center's ability to provide shelter during an emergency (I.e., solar installation, energy and water efficiency appliances, etc.). • Upgrades to surrounding area that support accessibility and function of the center (I.e., community gardens, shade trees, low-carbon transportation, etc.) • Distribution of community services and resources such as food, clean water, and personal protective equipment. • Local workforce development and job force training programming.	$25M will be available in 2022-2023 fiscal year and $75M will be available in 2023-2024 fiscal year.	TBD. Draft guidelines and details are currently being developed.

Federal Grants

Federal grants tend to offer larger dollar amounts per grantee than state and local grants but often have more requirements and lengthier application processes, which can be resource-intensive for the applicant. Given this, federal grants are generally better suited for projects with a higher price tag, including regional projects, for which the grant can cover a significant portion. The federal grants that are most relevant to WRCOG's Energy Resiliency Plan are summarized in Table E.2. Many new and legacy federal grants have received an injection of funding through President Biden's Infrastructure Investment and Jobs Act (IIJA). These funding opportunities must be used in accordance with IIJA rules, such as domestically sourced construction materials and Justice 40 Initiative requirements.

In addition to pursuing competitive funding, WRCOG member agencies may also consider allocating federal formula funding to improve energy resilience. For example, funds already allocated to cities and counties from the American Rescue Plan Act (ARPA) through the Coronavirus State and Local Fiscal Recovery Fund could potentially be used to fund portions of energy resiliency projects, particularly projects related to water infrastructure or replacement of lost public sector revenue streams.[1] Other potential formula funding sources include the Energy Efficiency and Conservation Block Grant Program, which specifically calls out as an eligible use the development, implementation, and installation of renewable energy technologies on government buildings.

1 For example, the City of Riverside received $73,535,189 in ARPA funding, which the City had already allocated to various uses at the time of this publication. Any remaining funding, however, could be considered for this purpose.

Table E.2. Federal Grants Most Applicable to WRCOG Energy Resiliency Plan

Administering Organization	Program/Grant Name	Eligible Receiving Entities	Description	Eligible Uses	Funding Range	Type of Funding
Federal Emergency Management Agency (FEMA)	Building Resilient Infrastructure and Communities (BRIC)*	State, Tribal Government/ Organization, Local Government, For-Profit Entity, Public Agency/ Authority, Other, Utilities, Cooperative Organization	The BRIC program makes federal funds available to states, US territories, federally recognized Tribal governments, and local communities for hazard mitigation activities.	• Capability and capacity-building. (knowledge sharing, etc.) • Mitigation projects. (projects to increases resilience and public safety) • Management costs (indirect, direct, administrative expenses.)	State allocations - $56M. National competition for mitigation projects - $919M.	Competitive
United States Department of Energy (US DOE)	Program Updating our Electric Grid and Ensuring Reliability and Resiliency*	State, Tribal Government/ Organization, Local Government, US Territory	Provides federal financial assistance to demonstrate innovative approaches to transmission, storage, and distribution infrastructure to harden and enhance resilience and reliability.	• Innovative approaches for hardening efforts that enhance resilience and reliability. • Promotion of grid resilience by region.	$5B available in total with $1B appropriated annually for FY 2022-2026. Opens 3rd QTR, 2022.	Competitive, Cooperative Agreement, Other
Federal Emergency Management Agency (FEMA)	Hazard Mitigation Grant Program (HMGP)*	State, Tribal Government/ Organization	Hazard mitigation includes long-term efforts to reduce risk and the potential impact of future disasters. HMGP assists communities in rebuilding in a better, stronger, and safer way to become more resilient overall.	• Development and adoption of hazard mitigation plans (required to receive federal funding). • Structural resilience retrofits for buildings and utilities for resistance against hazards.	$3.46B available until expended.	Competitive. 75% federal and 25% local/state match requirement.
Energy Efficiency and Renewable Energy (EERE)	Energy Efficiency and Conservation Block Grant Program*	State, Tribal Government/ Organization, Local Government, County	This program assists states, local governments, and Tribes to reduce energy use, reduce fossil fuel emissions, and improve energy efficiency.	• Energy distribution technologies; distributed resource, district heating and cooling systems. • On-site renewables; solar energy, wind energy, fuel cells.	$550M available until expended. Applications 4th QTR, 2022.	Mix of competitive and formula grants.
Department of Agriculture, Forest Service	Community Wildfire Defense Grant Program for At-Risk Communities*	State, Tribal Government/ Organization, Local Government, Public Agency/Authority, Non-Profit	Provides grants to communities at risk from wildfire to develop or revise their community wildfire protection plans and carry out projects described within those plans.	• Under development. • Eligible to plan and implement fuels reduction strategies and drought mitigation.	Not to exceed $250,000 for planning or $10M for implementation per grantee.	Mix of competitive and formula grants.
Federal Grant, disbursed through State	Building Codes Implementation for Efficiency and Resilience*	States and State Partnerships	Enables sustained, cost-effective implementation of updated building energy codes to save customers money on their energy bills.	• Meeting updated building energy codes in a cost-effective manner. • Address implementation needs in both urban and suburban areas. • See sources for all eligible uses.	$225M available until expended.	Competitive
US Department of Housing and Urban Development (HUD)	Community Development Block Grant (CDBG)	Metropolitan Statistical Areas (MSAs), Cities with a Minimum Population of 50,000, Urban Counties with a Minimum Population of 200,000	To develop viable urban communities by providing decent housing and a suitable living environment, and by expanding economic opportunities, principally for low- and moderate-income persons.	• Flexible funding to meet multi-sector/issue planning needs that intersect with climate risks. • Planning and responding to cascading and compound impacts of climate change.	$8.7B allocated for FY 2022. Minimum request of $100,000 and has no ceiling limit.	Mix of competitive and formula grants. 70% of funds must be used to benefit low- and moderate-income persons.

*These grants have been allocated additional funding through IIJA.

Utility and Tax Incentives

The state and federal government currently have programs in place to incentivize an equitable transition to clean energy. Incentive programs and rebates are funding sources open to all applicable projects until the program budget is expended. To reap the benefits of incentives and rebates, the costs of planning and implementation must first be covered to establish a functioning renewable energy system.

Note that the federal Inflation Reduction Act, which was passed in August 2022, extended the solar investment tax credit and advanced energy project credit, and created new tax credits and deductions to incentivize investments in energy efficient commercial buildings, clean vehicles, alternative fuels, and clean electricity production and storage. Guidance on the details of these new programs can be expected over the coming months and years.

Table E.3 summarizes the existing utility and tax incentives that are most applicable to the WRCOG Plan.

Table E.3. Existing Utility and Tax Incentives Most Applicable to WRCOG Energy Resiliency Plan

Administering Organization	Program Name	Description	Eligible Uses
California Public Utilities Commission (CPUC)	**Microgrid Incentive Program (MIP)**	The MIP, with $200M budget, will fund clean energy microgrids to support the critical needs of vulnerable communities impacted by grid outages and to test new technologies or regulatory approaches to inform future action.	• Increased electricity and resiliency in communities at risk of electrical outages. • Increased reliability for critical infrastructure such as fire stations, schools, nursing homes, etc. • Reduced impacts of power outages and minimized disruptions for low-income households.
Southern California Edison (SCE)	Self-Generation Incentive Program (SGIP)	The SGIP is a CPUC program administered by California's Investor-Owned Utilities (IOUs) that offers rebates for installing energy storage technology at an IOU facility. These storage technologies include battery storage systems that can function in the event of a power outage.	• Self-generated energy in a storage system (i.e., a battery).
United States Department of Energy (US DOE)	**Solar Investment Tax Credit (ITC)**	The solar ITC is a federal tax credit for those who purchase solar energy systems for commercial-scale properties. The credit is equal to a percentage of the cost of eligible equipment. Tax exempt entities may not collect the credit themselves, but the benefits may be useful in securing a power purchase agreement (PPA).	• Solar photovoltaic (PV) system that is placed in service during the tax year.

Financing Tools

Projects that generate their own revenue or cost savings create private investment opportunities. Public-private partnership (P3) agreements are cooperative agreements between one or more public and private entities that can take different forms, such as private entity financing or management of a project in return for a promised stream of payments from a government agency. In the context of limited public funding opportunities, P3 agreements may provide capital that allows a project to be delivered faster, since private operators may have more immediate access to capital and debt financing and fewer competing resource demands. Table E.4 summarizes some of the most common P3 opportunities to implement energy projects.

Table E.4. Public-Private Partnership Opportunities

Strategy	Description
Power Purchase Agreement (PPA)	A power purchase agreement (PPA), a type of P3, is a financial agreement in which a developer arranges for the design, permitting, financing, and installation of an energy system on a customer's property at little to no cost. The developer sells the power generated to the host customer at a fixed rate that is typically lower than the local utility's retail rate. The lower electricity price serves to offset the customer's purchase of electricity from the grid, while the developer receives the income from the sales of electricity as well as any tax credits and other incentives generated from the system. These may take the form of corporate PPAs, which involve corporate or industrial buyers purchasing renewable energy directly or virtually from developers. PPAs typically last 10 to 25 years, and the developer is responsible for the operation and maintenance of the system for the duration of the agreement. The Morris Model of a PPA is when a public entity issues a government bond at a low interest rate and transfers low-cost capital to a developer in exchange for a lower PPA price.
Energy Savings Performance Contracting (ESPC)	Budget-neutral approach to building improvements that provide renewable energy, reduce energy, and increase operational efficiency. In ESPC, a facility owner partners with an energy service company (ESPC) that provides design and installation of the energy improvements, arranges the financing, and in some cases provides ongoing operations and maintenance services. Similar to a PPA, a facility owner can use an ESPC to pay for today's facility upgrades with tomorrow's energy savings without tapping into capital budgets. State and local governments can implement ESPC projects in their own facilities as well as promote and support ESPC projects through ESPC programs. Ideal candidates for ESPC projects include any large building or group of buildings such as city, county, and state buildings; schools; hospitals; commercial office buildings; and multiple-family buildings.
Leasing Arrangements	Tax-exempt lease-purchase agreements provide state and local governments with the opportunity to finance upgrades and use energy savings to pay for financing costs. While leasing arrangements have higher rates compared to bond financing, they are often faster and more flexible revenue-generating mechanisms.
On-Bill Tariff Financing (SCE Program)	The On-Bill Financing Program provided by Southern California Edison (SCE) offers commercial and institutional customers with a monthly usage of 100 kW or less the opportunity to reduce operating expenses and finance retrofitting projects by covering the initial costs of installing the energy-saving measures. Commercial property owners pay back these costs on their monthly utility bills interest free for up to 60 months. The program includes energy assessment and includes a specific list of measures to reduce the cost of refrigeration, cooling, and lighting.

Table E-5 summarizes current loan opportunities that are relevant to WRCOG's resiliency framework. Notably, the California Infrastructure and Economic Development Bank's Infrastructure State Revolving Fund (ISRF) can be used as a source of matching funds for grants or other financing needs. Table E-6 summarizes the types of bonds that may be suitable for funding WRCOG's climate actions.

Table E.5. Relevant Loan Programs Offered by the California Infrastructure and Economic Development Bank

Program	Description
CLEEN (Green Loan) Program	The CLEEN Program provides public financing to help meet state goals for greenhouse gas reduction, water conservation, and environmental preservation. This program consists of two subprograms: (1) the Statewide Energy Efficiency Program (SWEEP), which helps local governments and nonprofit organizations make small-, medium-, and large-scale energy efficiency upgrades and projects, and (2) the Light Emitting Diode Street Lighting Program, which finances the installation of LED (Light Emitting Diode) streetlights for local governments.
Infrastructure State Revolving Fund (ISRF)	The ISRF Program (through IBank) is authorized to directly provide low-cost public financing to state and local government entities, including municipalities, universities, schools, and hospitals (MUSH borrowers) and to nonprofit organizations sponsored by public agencies for a wide variety of public infrastructure and economic expansion projects. In the past, WRCOG member agencies have received state revolving fund loans for the development of bike path and pedestrian path lights and investments in drinking water sources.

Table E.6. Bonds Relevant to WRCOG Energy Resiliency Plan

Strategy	Description
Environmental Impact Bond (EIB)	An EIB is an innovative financing tool that uses a pay-for-success approach to provide up-front capital from private investors for environmental projects, either to pilot an innovative approach whose performance is viewed as uncertain or to scale up a solution that has been tested in a pilot program.
Revenue or General Obligation Bonds	Revenue bonds are used to pay for projects, such as major improvements to an airport, water system, garage, or other large facilities, that generate revenue that is then used to repay the debt. General obligation (GO) bonds are issued to pay for projects that may not have a revenue stream. Debt is repaid through an increase in the ad valorem property tax. In California, GO bonds (and in some cases revenue bonds) are subject to voter approval.
Green or Climate Bonds	Green or climate bonds specifically finance climate change adaptation or mitigation projects. Eligible projects include those related to renewable energy and energy efficiency, sustainable waste management projects, sustainable land use and biodiversity conservation, clean transportation, and clean drinking water.
Utility Revenue Bonds	A utility revenue bond is a type of municipal bond issued to finance a public utility project that repays investors directly from project revenues. Utility revenue bonds are used to fund capital projects in areas considered essential to public services, including hospitals, fire services, water and waste treatment facilities, and improvements to the electrical grid.

Local Revenue Sources

Another key strategy for funding and financing the region's climate actions is to develop fiscal policies that support and reinforce the region's climate goals. Climate change creates a long-term financial obligation, and an obligation in terms of mitigating, adapting, and responding to a climate crisis, therefore requires long-term fiscal planning. WRCOG's member agencies may consider developing a Climate Action Fund that allocates a portion of the local General Fund to specifically fund climate mitigation and adaptation efforts.

WRCOG member agencies may also identify climate action and adaptation as priority criteria when determining how to allocate funding and prioritize programs and projects across all funds. For example, the City of Los Angeles Financial Policies identifies "resilience and sustainability" as a primary criterion for allocating funding and prioritizing capital projects (City Administrative Officer of Los Angeles, 2020). If WRCOG member agencies were to develop a similar criteria policy, it could have the effect of facilitating implementation of fund-specific or department-specific climate actions, such as prioritizing facility improvements that include energy resiliency improvements.

In some cases, government agencies in California have implemented local climate and resource specific taxes to offset the cost of natural hazard mitigation. The City of Santa Clara renewed the Safe, Clean Water and Natural Flood Protection Program in November of 2020, along with a parcel tax of $.006 per square foot, which protects drinking water supplies and dams from earthquakes and climate change; reduces pollution, toxins, and contaminants in waterways; and provides flood protection. Marin County also passed the Marin Wildfire Prevention Measure in 2020; this parcel tax of 10 cents per building square foot supports wildfire prevention, including early detection and improvements to critical infrastructure. WRCOG member agencies may consider a similar program or measure to fund regionally specific resilience efforts, which could include funds set aside for resilience improvements for critical facilities.

Next Steps

The Energy Resiliency Plan details a regional transition to renewable energy in critical infrastructure, including the ability to quickly adapt to drought, extreme heat, and other climate changes. Implementation will be most effective and efficient if multiple actions are pursued in tandem, which may include using funding and financing sources to support multiple or bundled projects. Near-term next steps (within 1 to 2 years) for beginning the implementation of priority actions may include the following:

- **Identify partnership opportunities to plan, fund, and implement climate actions.** WRCOG made efforts in this planning process to include representatives from member agencies across Western Riverside County, and now there are opportunities to continue these partnerships as agencies begin to pursue funding. Partnerships between public agencies can increase the competitive edge of grant applications. Other civic institutions, notably the University of California, Riverside, may also offer partnership opportunities.
- **Determine which strategies will require environmental review, technical analysis, and/or complex partnerships and permitting.** Some of the priority actions will have longer implementation timelines due to environmental review requirements or financing coordination (e.g., on a new sales tax or bond issuance). To meet its electrification goals in a timely manner, WRCOG and its member agencies will need to start the first phase of work on these longer-term projects.
- **Track new federal funding opportunities as guidance is released.** The IIJA and Inflation Reduction Act present enormous opportunities. While the available details on known programs are summarized in this chapter, the federal government is regularly releasing new program announcements related to funding eligibility and availability.
- **Begin preparing application materials for the state grants that have been allocated additional funding in the Governor's 2022-2023 budget.** Some funding for these grants may already be or will soon be available and the grants will have short application deadlines. An early start on application materials will give WRCOG member agencies more time to match actions to grant opportunities, define strong proposal narratives, and identify potential partnerships.

Appendix F. Resilient Design Resources and Guidelines (References)

References

Centers for Disease Control and Prevention/ Agency for Toxic Substances and Disease Registry/ Geospatial Research, Analysis, and Services Program. (2021). *CDC/ATSDR Social Vulnerability Index 2018 Database California*. https://www.atsdr.cdc.gov/placeandhealth/svi/data_ documentation_download.html.

Center for Climate and Energy Solutions. (2022). https://www.c2es.org/

Department of Homeland Security's Risk Assessment Methodology. (Undated). https://www.fema.gov/pdf/plan/prevent/rms/155/e155_unit_v.pdf

FEMA. (2020). https://www.fema.gov/glossary/critical-facility

Intergovernmental Panel on Climate Change. (2021). *Summary for Policymakers. In: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press. In Press.

Juli Trtanj et al. (2016). "*Climate Impacts on Water-Related Illnesses*," chapter 6 in The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment, USGCRP health2016. globalchange.gov/downloads.

Kenney WL, Craighead DH, Alexander LM. 2014. Heat waves, aging, and human cardiovascular health. *Medical Science Sports Exercise.* 46(10): 1891-1899.

Louise Bedsworth et al. (2018). *Statewide Summary Report. California's Fourth Climate Change Assessment.* California Governor's Office of Planning and Research, Scripps Institution of Oceanography, California Energy Commission, and California Public Utilities Commission.

Pierce et al. (2018). *California 4th Climate Change Assessment*. https://climateadapt.ucsd.edu/california-releases-4th-climate-change-assessment-with-contributions-from-center-affiliates/

Presidential Policy Directive. (2013). *Critical Infrastructure Security and Resilience.* https://obamawhitehouse.archives.gov/the-press-office/2013/02/12/presidential-policy-directive-critical-infrastructure-security-and-resil

Resilient IE. (2020). https://wrcog.us/285/Resilient-IE

US EPA. (2022). *Health Effects Attributed to Wildfire Smoke*. https://www.epa.gov/
Western Riverside Council of Governments Strategic Plan 2022-2027. https://wrcog.us/DocumentCenter/View/9317/Strategic-Plan-2022- through-2027

Resources

Anderson, K. (2017). Increasing Resiliency Through Renewable Energy Microgrids. *Journal of Energy Management, 2(2),23-38.* https://www.nrel.gov/docs/fy17osti/69034.pdf

Better Buildings. (2022). *Distributed Generation (DG) for Resilience Planning Guide.* U.S. Department of Energy. https://dg.resilienceguide.ornl.gov//

California Energy Commission. (2018). *Microgrid Analysis and Case Studies Report*. California Energy Commission. https://www.districtenergy.org/viewdocument/microgrids-analysis-and-case-studie

California Governor's Office of Emergency Services. (2020). *California Adaptation Planning Guide*. *Resilient California.* https://www.caloes.ca.gov/wp-content/uploads/Hazard-Mitigation/Documents/CA-Adaptation-Planning-Guide-FINAL-June-2020-Accessible.pdf#search=adaptation%20planning%20 guide

California Natural Resources Agency. (2018). *Paying it Forward: The Path Toward Climate-Safe Infrastructure in California.* State of California. https://files.resources.ca.gov/climate/climate-safe-infrastructure-working-group/

City of Los Angeles. (Undated). Resilience by Design: Los Angeles Earthquake Plan. Mayor's Office of Resilience. https://www.eeri.org/images/archived/wp-content/uploads/Garcetti-Los-Angeles- Earthquake-Plan.pdf

City of Los Angeles. (2018). Resilient Los Angeles. Mayor's Office of Resilience. https://resilientcitiesnetwork.org/downloadable_resources/Network/Los-Angeles-Resilience-Strategy-English.pdf

City of Phoenix. (2021). Climate Action Plan. City of Phoenix. https://www.phoenix.gov/oepsite/Documents/2021ClimateActionPlanEnglish.pdf

Elsworth, J., and O. Van Geet. (2020). Solar Photovoltaics in Severe Weather: Cost Considerations for Storm Hardening PV Systems for Resilience. National Renewable Energy Laboratory. https://betterbuildingssolutioncenter.energy.gov/sites/default/files/75804.pdf

New York City Mayor's Office of Resiliency. (2020). Climate Resiliency Design Guidelines (Version 4.0). City of New York. https://www1.nyc.gov/assets/orr/pdf/NYC_Climate_Resiliency_Design_ Guidelines_v4-0.pdf

Moslehi, S. (2018). Sustainability of integrated energy systems: A performance-based resilience assessment methodology. Applied Energy, 228 (15),487-498. https://doi.org/10.1016/j.apenergy.2018.06.075

NIST. (2016). Community Resilience Planning Guide for Buildings and Infrastructure Systems, Volume

NREL. (2017). Microgrid-Ready Solar PV – Planning for Resiliency. National Renewable Energy Laboratory. https://www.nrel.gov/docs/fy18osti/70122.pdf

NREL. (2018). Valuing the Resilience Provided by Solar and Battery Energy Storage Systems. National Renewable Energy Laboratory. https://www.nrel.gov/docs/fy18osti/70679.pdf

Placeworks, Atlas Planning Solutions and ICF. (2020). Resilient IE Toolkit. Western Riverside Council of Governments. https://wrcog.us/DocumentCenter/View/8019/Resilient-IE-Toolkit

Resilient by Design. (2017). Resilient by Design Bay Area Challenge. The Rockefeller Foundation. http://www.resilientbayarea.org/book

Laouadi, A. et. al. (2022). Climate Resilience Buildings: Guideline for management of overheating risk in residential buildings. National Research Council Canada Construction research Centre. https://nrc-publications.canada.ca/eng/view/ft/?id=9c60dc19-ca18-4f4c-871f-2633f002b95c&dp=2&dsl=en

Lawrence, A. (2021). The gathering storm: Climate change and data center resiliency. Uptime Institute. https://uptimeinstitute.com/the-gathering-storm-climate-change-and-data-center-resiliency

SOM. (2021). Designing Communities for Wildfire Resilience. https://www.som.com/wp-content/uploads/2021/09/Designing-Communities-for-Wildfire-Resilience_reduced_FINAL-1632896152.pdf

Serdar, M.Z., and S. G. Al-Ghamdi. (2021). Preparing for the Unpredicted: A Resiliency Approach in Energy System Assessment. Green Energy and Technology. DOI: 10.1007/978-3-030-67529-5_9

Urban Land Institute. (2022). Enhancing Resilience through Neighborhood-Scale Strategies. https://knowledge.uli.org/en/reports/research-reports/2022/enhancing-resilience- through-neighborhood-scale-strategies?_gl=1*1p1h7b6*_ga*OTE5MDc0OTgyLjE2NjgxMjkxODM.*_ ga_HB94BQ21DS*MTY2ODE5MDU2NS4yLjEuMTY2ODE5MTI1My4wLjAuMA.

Urban Land Institute. (2022). Resilient Retrofits: Climate Upgrades for Existing Buildings. Urban Land Institute. https://knowledge.uli.org/en/reports/research-reports/2022/resilient-retrofits

Zhivov, A., et. al. (2021). Defining, Measuring and Assigning Resilience Requirements to Electric and Thermal Energy Systems. IEA-EBC, preprint, VC-21-004. https://annex73.iea-ebc.org/Data/Sites/4/ media/papers/VC-21-004_Preprint.pdf

Zhivov, A., et. al. (2022). Energy Master Planning toward Net Zero Energy Resilient Public Communities Guide. Springer Cham. https://link.springer.com/content/pdf/bfm:978-3-030-95833-6/1

Relevant Websites and Organizations:

- AIA (The American Institute of Architects) Community Resilience Design Resources
- Better Buildings U.S. Department of Energy
- Building Forward LA
- California Association of Councils of Governments Planning for Resiliency
- HUD (US Department of Housing and Urban Development) Community Resilience Planning Resources
- Microgrid Resources Coalition
- National Renewable Energy Laboratory (NREL) – Resilient Energy Systems
- Resilient California
- Resilient Cities Catalyst
- Resilient Cities Network (formerly 100 Resilient Cities)
- Southern California Association of Governments (SCAG)
- Southern California Resilience Initiative (SCRI)
- Uptime Institute
- U.S. Green Building Council (USGBC)
- Urban Land Institute (ULI) Urban Resilience Program
- Whole Building Design Guide

Inland Regional Energy Network
I-REN Executive Committee

Staff Report

Subject: **California Public Utilities Commission Application Process for Funding for Program Years 2028 - 2035**

Contact: **Casey Dailey, WRCOG Director of Energy & Environmental Programs, cdailey@wrcog.us, (951) 405-6720**

Date: **February 18, 2025**

Recommended Action(s):

1. Authorize staff to continue the development of the 2028 Business Plan for the Public, Codes & Standards, and Workforce Education & Training Sectors and direct staff to return at a future meeting for a discussion of possible inclusion of additional sectors.

Summary:

The draft 2028 I-REN Business Plan is currently in progress, preparing for submission to the California Public Utilities Commission to secure funding for program years 2028 – 2035. At a minimum, I-REN staff propose to retain the same sectors outlined in the current business plan: Public, Codes & Standards, and Workforce Education & Training. This item is to continue the discussion around the next Business Plan and explore other market sectors for consideration.

Discussion:

Background

At the January 21, 2025, Executive Committee meeting, staff presented an overview of the California Public Utilities Commission (CPUC) application process for I-REN Energy Efficiency (EE) Program funding for 2028 – 2035. The application, or "Business Plan," is due to the CPUC in February 2026 and will consist of an eight-year strategic business plan and four-year portfolio plan. In addition to outlining detailed plans for program years 2028 - 2031, the 2028 I-REN Application will also include high-level strategies, future plans and goals for program years 2032 – 2035.

Preparing the 2028 Application will involve assessing the energy efficiency needs of stakeholder communities within the CPUC-defined market sectors I-REN wishes to serve, determining capabilities to address those needs, and developing a compelling set of strategies and a justifiable budget request to serve those sectors.

Factors the CPUC is likely to consider in evaluating the reasonableness of I-REN and other Portfolio Administrators' (PAs) applications include but are not necessarily limited to the following:

- Results from PA's initial round of funding, e.g.:
    - Performance on goals and metrics
    - Utilization of budget
    - Lessons learned
- PA communities' unmet needs for energy efficiency, reflected in quantitative and qualitative data from primary and/or secondary research
- Overlapping programs offered by other PAs that may already be able to serve I-REN communities
- PA's capability to plan and deliver forward-thinking and effective approaches to address demonstrated needs
- Overarching policy trends and issues, e.g.:
    - Energy bill affordability concerns
    - State goals for decarbonization

Statutory requirements for REN programs will also be considered, alongside the factors mentioned above. In accordance with CPUC Decision (D.) 19-12-021, in order to obtain CPUC approval, RENs must propose activities that meet at least one of the criteria below (D.19-12-021, Ordering Paragraph 4):

1. Activities that utility or Community Choice Aggregator (CCA) PAs cannot or do not intend to undertake.
2. Pilot activities where there is no current utility or CCA Program offering, and where there is potential for scalability to a broader geographic reach, if successful.
3. Activities serving hard-to-reach markets, whether or not there is another utility or CCA Program that may overlap.

Present Situation

PAs such as I-REN are expected to be good stewards of ratepayer dollars that fund EE Programs, and in 2024, PAs saw a marked increase in scrutiny from regulatory bodies and lawmakers due to the increasing energy bill affordability crisis in the state. The California Public Advocates Office (Cal Advocates) worked throughout the year to convince lawmakers that EE Programs, especially REN programs, were not a good use of ratepayer dollars. Relatedly, in October 2024, Governor Gavin Newsom issued Executive Order N-5-24, calling for the CPUC to "modify or sunset any underperforming or underutilized programs or orders whose costs exceed the value and benefits to electric ratepayers." This level of scrutiny is expected to continue and increase in 2025. It is within this context that I-REN staff are examining whether to expand into new market sectors and/or continue existing programs in the next Business Plan.

The question of exploring new market sectors was mentioned at the January 21, 2025, Executive Committee meeting, specifically with regard to commercial and industrial new construction program opportunities and California Assembly Bill (AB) 98, signed into law on September 29, 2024. AB 98 becomes effective January 1, 2026, and relates to warehousing and trucking activity, and is relevant for the I-REN region as it is home to numerous existing and planned warehouse facilities and trucking routes. Additionally, it was also brought to staff's attention that the Coachella Valley Association of Governments would like to discuss the potential of adding the residential and small and medium commercial sectors in the next Business Plan submission.

Staff and consultants have begun research to identify whether any gaps exist in existing EE program

offerings for commercial, industrial new construction, and residential, and whether staff have the capacity to propose a REN program for any of these market sectors. In doing so, staff have identified a large-scale existing statewide program for non-residential new construction serving commercial, public, high-rise multifamily, industrial, and agricultural projects in Pacific Gas & Electric, Southern California Edison, SoCalGas, and San Diego Gas & Electric service areas. The California Energy Design Assistance (CEDA) Program is a comprehensive statewide program that promotes electrification and decarbonization to reduce energy demand, consumption, and carbon emissions related to new building construction and major renovation projects. An attachment is provided in this staff report discussing the CEDA program.

Staff have also identified approximately 58 residential EE programs, and 66 commercial EE programs currently offered in the I-REN region. Staff are working on identifying the active EE programs supporting Commercial, Industrial, and Residential Sectors that are offered in the I-REN territory to identify what, if any, gaps exist in the market that I-REN could support. If it is determined that there are no gaps in the existing EE programs offered in the region, but rather a lack of awareness and utilization of those programs, staff can work to build up the external EE program engagement efforts as part of the ongoing work.

While it is too early to know if I-REN is ready and able to expand into additional sectors beyond Public, Workforce, Education & Training, and Codes & Standards, staff is prepared to request direction from the Executive Committee that, at minimum, it pursues the existing sectors in the next Business Plan. This direction will give staff and its implementers sufficient direction to begin the process of incorporating the three additional Sectors in the next Business Plan. I-REN is effectively halfway through the initial funding period (2022-2027) and the programs across the three current Sectors are only now starting to function as designed and beginning to yield the outcomes desired as described in the initial Business Plan. Staff will return in April with a more comprehensive review of the existing regional and statewide programs offered to discuss and determine what gaps may currently exist in the suite of EE Programs.

Prior Action(s):

January 21, 2025: The I-REN Executive Committee received and filed.

Financial Summary:

The I-REN has an existing, six-year, $65M budget approved by the CPUC from 2022 through 2027. The amount for the next funding period will be determined at a later time, prior to filing the new Business Plan in 2026.

Attachment(s):

Attachment 1 - California Energy Design Assistance (CEDA) Program Guide

Attachment

California Energy Design Assistance (CEDA) Program Guide

2023 v2

Program Guide

California Energy Design Assistance

We provide intelligent decarbonization analysis;
you make informed energy decisions

CEDA

WHAT IS CEDA?

The California Energy Design Assistance (CEDA) program promotes the electrification and decarbonization of new building construction or major renovation. CEDA works in collaboration with project teams to reduce energy demand, consumption, and carbon emissions.

CEDA serves commercial, public, high-rise multifamily, industrial, and agricultural projects in Pacific Gas & Electric (PG&E), Southern California Edison (SCE), SoCalGas (SCG), and San Diego Gas & Electric (SDG&E) service areas.

PROGRAM OBJECTIVES

- Advance the market to achieve California's aggressive decarbonization goals
- Promote electrification and all-electric buildings
- Reduce long term energy costs and emissions
- Drive adoption of high-performance measures
- Make buildings true grid resources
- Educate the market

Overall Goals

Increase supply and demand for all-electric and high-performance measures

Build relationships with the A/E/C community

Drive Innovation

WHY PARTICIPATE IN CEDA?

- Receive complimentary custom **decarbonization** analysis to identify and evaluate opportunities
- Gain analysis of **energy costs and paybacks**
- Receive **financial incentives** to help offset the costs of decarbonization measures for qualified projects
- Demonstrate commitment to high performance building practices and design

CEDA PROGRAM ELIGIBILITY

- New construction projects and/or major alterations
- Projects in design phase
- Owner pays/will pay the Public Purpose Program surcharge on the account where the Energy Efficiency (EE) measures are installed
- No double-dipping incentives with other utility sponsored ratepayer energy efficiency programs for the same measures
- Allow access to project site at project completion for verification of installed measures

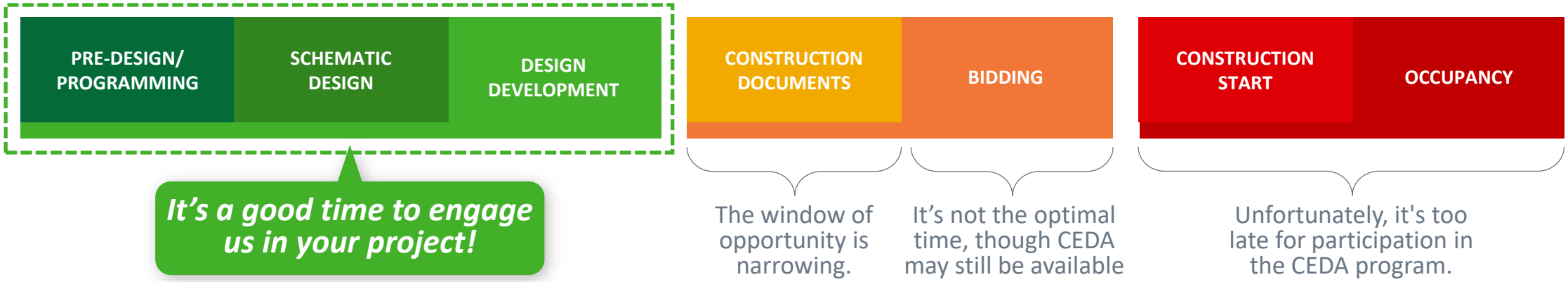
ELIGIBILITY – MAJOR ALTERATIONS

Major alterations must meet the following criteria:

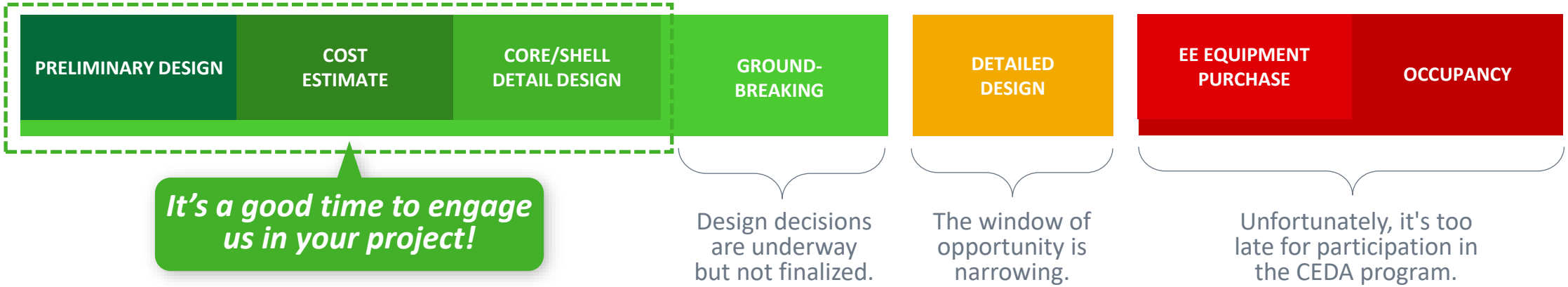
- Changes in space function (building or space occupancy type change) OR
- Substantial changes (≥30%) in design occupancy (square feet per person) OR
- Increase (≥10%) in conditioned floor area OR
- Any expansion or addition of substantial process or conditioning load to an existing facility

ENROLLMENT TIMING

TRADITIONAL DESIGN/BID/BUILD PROCESS



FAST-TRACK OR DESIGN/BUILD PROCESS



PROCESS

1

Enrollment

You provide schematic information about your building through our Energy Design Assistance application or directly to one of our outreach specialist

2

Discovery

Willdan performs a real-time evaluation of decarbonization measures and bundle potential whole-building strategies for further analysis

3

Results

You determine the measures that best align with your project goals, from which estimated savings, and incentives are calculated

4

Verification

We confirm your project was constructed to plan and issue a final report confirming savings, incentives as applicable

5

Savings

Enjoy continual energy savings, helping to actualize decarbonization goals and being a grid partner

PARTICIPATION INCENTIVES

Design teams are stretched thin on time and budget, but that doesn't mean decarbonization needs to be put on the back burner.

CEDA is now offering participation incentives on top of the incentives your project will get for implementing decarbonization measures.

It’s a win-win!

MEASURE INCENTIVES

CEDA offers incentives to reward buildings of the future that implement high performance measures and electrification.

Incentives are also available for the installation of traditional above code minimum energy efficiency measures

Amount calculated during free analysis

Inducements Process:

COMMIT TO IMPLEMENTATION → SHARE DESIGN INFORMATION → INSTALL EQUIPMENT → VERIFICATION/DATA SHARING → RECEIVE INCENTIVE

HIGH-PERFORMANCE MEASURES

Examples of high-performance measure types to help your teams evaluate decarbonization opportunities and available incentives

Space heating system

Heat pumps, controls, heat pump chillers and heat pumps for VAV reheat systems

Service water heating

Central heat pump water heaters, distributed heat pump water heaters, water heater and distribution systems

Plug Loads

Heat pump clothes dryers, induction cook tops, electric commercial kitchens

Process Loads

Heat pump pool heaters, high temp heat pumps for industrial processes, microwave or other electric drying processes

Refrigerant Systems

Low GWP refrigerants for heat pumps, VRF, chillers, water heaters, reduced refrigerant leakage

CEDA LITE

If there is a decarbonization consultant on your design team already, there is still an opportunity to participate in CEDA Lite and be eligible for measure incentives and a design team stipend.

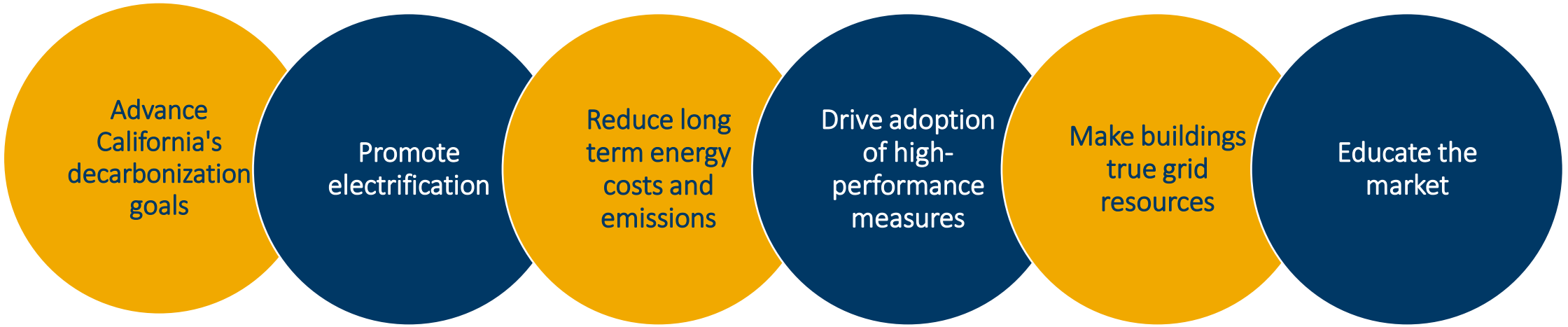
For CEDA Lite, project teams must

- Complete all program documentation requirements
- Adhere to program modeling protocol
- Calculate energy savings using Approved Baseline (this is not CEC Title 24 modeling)
- Receive approval for modeling approach and software tool

Design team stipend paid at savings claim submission acceptance and measure incentive paid at Verification

START YOUR DECARBONIZATION JOURNEY

Together we can achieve our goals to:



Enroll your project today to determine,
which decarbonization methods will benefit your project.

HAVE A PROJECT TO DISCUSS?

For more information, please contact one of our program outreach specialists:

Jeff Glover
Program Outreach Lead
JGlover@Willdan.com
952.938.1588

Tina Hendrix
Program Outreach Specialist
THendrix@Willdan.com
760.585.7577

GET STARTED TODAY!

CEDA

WILLDAN

CaliforniaEDA.com

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Pacific Gas and Electric Company®

The California Energy Design Assistance (CEDA) program is funded by California utility customers and administered by Pacific Gas and Electric Company (PG&E) *and supported by the state's other investor-owned utilities, (IOUs) under the auspices of the California Public Utilities Commission. Customers who choose to participate in this program are not obligated to purchase any additional goods or services offered by Willdan or any other third party.*

Inland Regional Energy Network
I-REN Executive Committee

Staff Report

Subject: I-REN 2023-2027 Strategic Plan Update

Contact: Benjamin Druyon, WRCOG Program Manager, bdruyon@wrcog.us, (951) 405-6727

Date: February 18, 2025

Recommended Action(s):

1. Receive and file.

Summary:

The purpose of this item is to provide an update regarding I-REN's 2023 - 2027 Strategic Plan.

Discussion:

Background

In 2023, the Inland Regional Energy Network (I-REN) developed a five-year Organizational Strategic Plan (Strategic Plan) to proceed with the launch and rollout of its programs, to ensure effective and efficient use of California Public Utilities Commission funding, identify clear priorities and actions, and align activities and engagement across REN member agencies.

The process to develop the Strategic Plan included analysis of I-REN best practices and engagement with all the agencies, staff, and I-REN Executive Committee members. These relationships are central to the organization's path to success. To that end, the Strategic Planning effort reached out to every member agency, as well as other partners, to share information and gather input.

The resulting Strategic Plan was designed for use by the internal team and Executive Committee, and will serve as a public-facing document to share the direction and focus of I-REN with cities, tribes, and other government partners in the local region.

The goals established in the Strategic Plan are shown below:

1. **Cohesive Region:** I-REN operates as a cohesive regional program and will make available and distribute benefits equally throughout the region with a fair allocation of resources and services to the COGs and member agencies.
2. **First Two Years:** I-REN will focus on the delivery of positive tangible impacts to the region through a successful rollout and launch of programs.
3. **Awareness and Relationships:** I-REN will actively engage with all member agencies, special

districts, and partners and strive to establish them as active participants.
4. **Internal Organization:** I-REN will be an effective and efficient organization, characterized by agility, responsiveness, and accountability.

Based on these goals, I-REN identified the following priorities and key activities.

- **Equal Benefits Region-wide:** Establish tools and approaches to offer equal benefits for COGs and member agencies.
- **Program Development and Launch:** Ensure successful launch of programs in the first two years to help build I-REN's momentum.
- **Regional Engagement:** Ensure that the diverse voices of the region are engaged and part of the development of the programs.
- **Strong and Successful Organization:** Create the foundation for an effective and responsive organization.

In conjunction with the Strategic Plan, the internal team worked with the consultant team to create an actionable Implementation Plan that identifies timelines for each action and details the roles and responsibilities of staff members in completing these actions. The Implementation Plan will stand as an internal guide for the coming years to keep I-REN on track and complete the goals outlined in the Strategic Plan. Staff and the Executive Committee are dedicated to implementing this plan over the coming years and tapping the innovation and dynamic character of the region to become a well-established, effective, and impactful organization.

The Strategic Plan was officially approved by the Executive Committee in January 2024.

Present Situation

Over the past year, I-REN has made substantial progress toward the Strategic Plan goals by implementing the strategies identified in the Implementation Plan. Examples of this progress include but are not limited to the following:

- **Goal 1:** Orientations, forums, and one-on-one discussions have been conducted to gather information on member agencies' needs throughout the region. Marketing and branding guidelines have been developed to ensure a cohesive regional identity for I-REN.

- **Goal 2:** Unique value metrics have been developed to track performance. I-REN has established consistent communication with program implementers and the CPUC. Positive, tangible impacts have been delivered to the region through energy assessments and roadmaps, energy code trainings and continuing education credits, and fellowship opportunities for job seekers to support local agencies with energy projects.

- **Goal 3:** Program-focused surveys have been conducted for each sector to assess awareness and needs in the region. I-REN is an active member and participant of organizations such as the California Climate and Energy Collaborative (CCEC), Local Government Sustainable Energy Coalition (LGSEC), and the California Energy Efficiency Coordination Committee (CAEECC). I-REN works closely with other RENs to share best practices, coordinate regulatory responses, and overall increase the impact and influence of the local government program administrators.

- **Goal 4:** I-REN has provided access to training resources to staff to increase staff knowledge about program topics, and has identified leads / co-leads for programs to help establish leadership and implementation structure.

Next Steps

As noted in the Implementation Plan, one of the strategic objectives is to annually review organizational performance and provide a routine means to make changes and updates to systems, processes, and overall operations as needed. Strategies to accomplish this objective include maintaining and updating the strategic plan annually and engaging with internal stakeholders to understand areas for improvements.

In support of that objective, I-REN plans to conduct a 2025 Goals and Planning Retreat to help refine the organization's goals and priorities for the years ahead and help to inform the upcoming Business Plan submittal. The retreat is envisioned to be a half-day, in-person workshop that will coincide with the April 2025 Executive Committee meeting.

Prior Action(s):

January 16, 2024: The I-REN Executive Committee approved the 2023 - 2027 I-REN Strategic Plan.

Financial Summary:

Activities related to this item are included in the approved WRCOG Fiscal Year 2024/2025 budget under the I-REN Fund (180).

Attachment(s):

Attachment 1 - I-REN 2023-2027 Strategic Plan
Attachment 2 - I-REN 2023-2027 Implementation Plan

Attachment

I-REN 2023-2027 Strategic Plan

INLAND REGIONAL ENERGY NETWORK

Strategic Plan

2023-2027

January 2024

WRCOG Western Riverside Council of Governments

sbcog San Bernardino Council of Governments

CVAG

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INLAND REGIONAL ENERGY NETWORK

iren.gov

Letter from Casey Dailey

Inland Regional Energy Network, Administrative Lead

To Community Members and Local Governments,

The Inland Empire is home to over 4.6 million people and covers over 27,000 square miles, the 3rd largest region in California. With the approval of the Inland Regional Energy Network (I-REN) in 2022, the region joins California's transition to clean, affordable energy, **bringing $65 million dollars in ratepayer funding**, and a new organization operated and managed by local leaders.

This 3-year Strategic Plan supports I-REN by focusing and aligning priorities, needs, and resources to effectively guide the launch of I-REN's energy efficiency programs - public buildings, workforce, education and training, and codes and standards - in 2024 and beyond. The Plan is the culmination of a 10-month process and discussions with internal and external stakeholders, including representatives of the region's three Councils of Government, and potential partners.

The Strategic Plan's four goals and strategies are designed to build success for I-REN's initial program offerings and advance the organization so it can expand programs to residential and commercial buildings and continue funding in future years. A cornerstone of this plan is articulating the role and importance of the community in informing and guiding program development, including member cities of the three Council of Governments, special districts, tribes, and other communities. Finally, this Plan is designed to ensure that the benefits and resources provided by ratepayers are equally shared throughout the region, supporting growth and resilience in a changing climate.

The I-REN staff and Executive Committee are dedicated to implementing this plan over the coming years and tapping the innovation and dynamic character of the region to become a well-established, effective, and impactful organization.

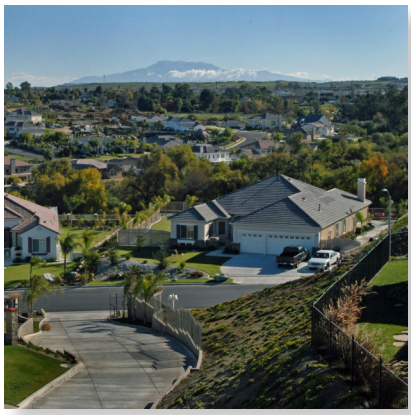
Sincerely,

Casey Dailey

Casey Dailey
Director of Energy and Environmental Programs
Western Riverside Council of Governments

The Coachella Valley Association of Governments and San Bernardino Council of Governments have partnered with the Western Riverside Council of Governments to develop I-REN to serve the cities and communities of our region.

Introduction



About I–REN

I-REN, the Inland Regional Energy Network is a coalition of three councils of governments, the Western Riverside Council of Governments (WRCOG), the Coachella Valley Association of Governments (CVAG), and the San Bernardino Council of Governments (SBCOG), that encompasses San Bernardino County, Riverside County, and all of the jurisdictions within the region. These organizations have joined together to establish locally administered, designed, and delivered energy efficiency (EE) programs.

I-REN sees a critical need to accelerate action in the region, catalyzing current local government activities related to climate change through targeted and tailored energy efficiency programs and layering other efforts to increase impact.

I–REN Business Plan

In 2021, I-REN submitted it's first Business Plan to the California Public Utilities Commission (CPUC) to become an authorized program administrator for energy efficiency services in the Inland Empire, covering all of San Bernardino and Riverside Counties. The Business Plan outlines anticipated activities and the development of three main program areas for the REN for the initial round of ratepayer funding from the CPUC for $65 million for 2021 to 2027.

Historically, the Inland Empire has faced challenges in participating fully in energy efficiency and advanced energy programs, training, and funding due to its geography and more dispersed population. I-REN's approval by the CPUC to be a locally administered regional energy network will enable a transformation for the region. The $65 million dollars in ratepayer funding will help to provide the region with robust programs to ensure ratepayers in this region can become active participants in meeting California's energy efficiency goals.

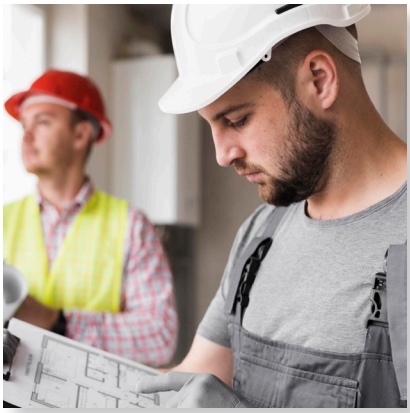
The Business Plan provides a vision and goals for services in Workforce Education and Training, Codes and Standards, and Public Sector programs. The Business Plan is the foundation for the programs and funding, but is separate from the organizational goals and vision that is expanded upon in this Strategic Plan.

Introduction

I–REN Program Areas

Public Sector

The I-REN Public Sector offering strives to establish robust and comprehensive wrap-around services for the local jurisdictions in the I-REN territory. Briefly, this includes Strategic Energy Planning to help identify opportunities, strategic investments in municipal and community buildings, establishing a Building Upgrade Concierge (BUC) service with digital and person-to-person technical assistance, and building upgrade incentives. I-REN member agencies have developed extensive networks and expertise with key partners in the public sector across the region, and plan to leverage this history to continue facilitating energy efficiency upgrades. With 52 cities, 78 unincorporated county areas, and 17 tribal areas, there are significant needs. Further, the local governments tend to be under-resourced and lack the capacity, knowledge, and ability to effectively update their buildings or to enforce codes and standards. This will fill a gap in energy efficiency services.



Codes & Standards

I-REN will implement a well-rounded set of activities related to support improved codes and standards compliance and enforcement. This effort will support local government as well as industry professionals. I-REN includes many smaller jurisdictions that face significant challenges with codes and standards enforcement and compliance. I-REN sees an opportunity to leverage its strong network with public sector staff to offer resources and support to further code compliance and enforcement. This effort will target both local governments and industry actors to create better communications, protocols, and systems for increased efficiency.

Workforce Education & Training

The I-REN team will work closely with local providers, as well as coordinating with other industry leaders statewide to bring more comprehensive and targeted training opportunities to the region. In addition, I-REN will work to improve workforce development and help enhance the availability of skilled workers and connections with businesses. Due in part to its geographic distance from major Metropolitan areas, the Inland Empire has historically had limited engagement in necessary workforce development opportunities. There is substantial demand but not a strong enough pool of skilled workers to meet that demand. The majority of IOU EE workforce training has typically taken place in the Los Angeles area or in border cities distant

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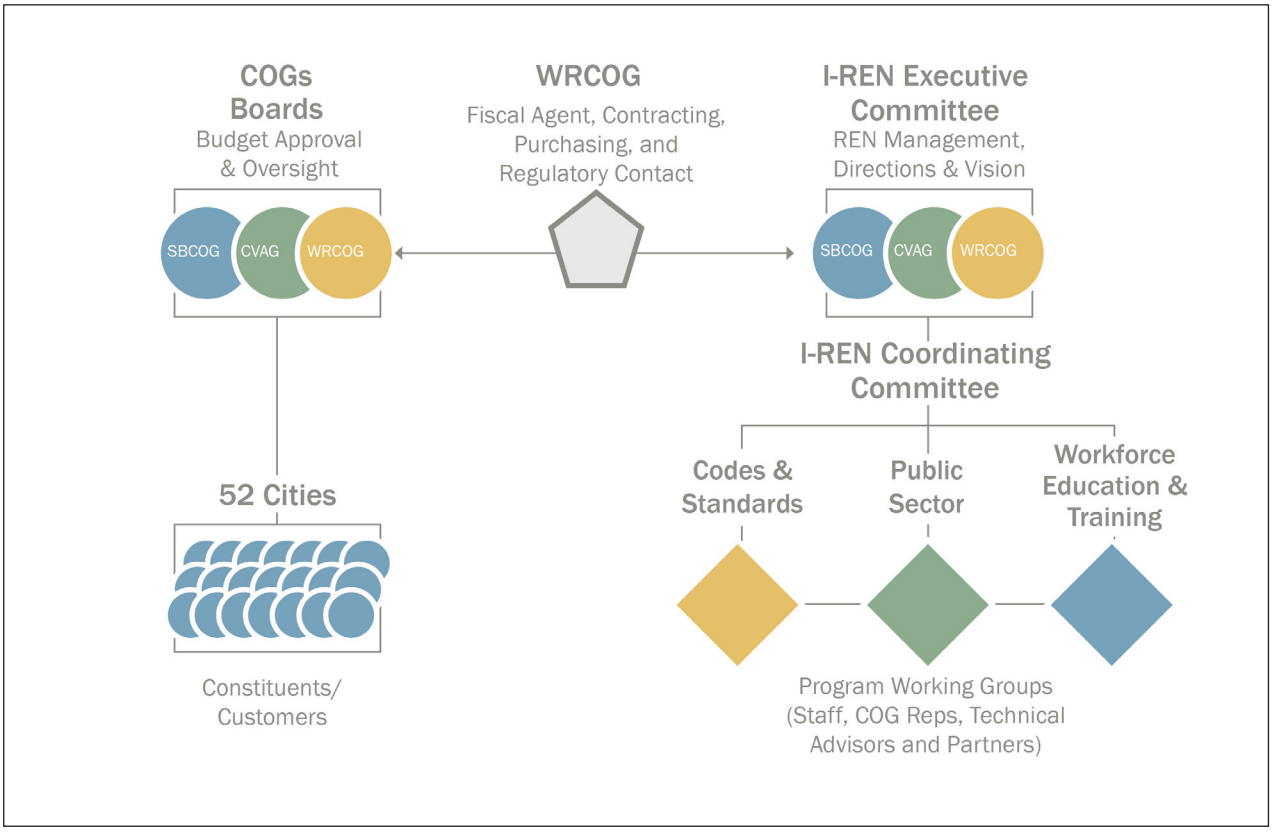
Introduction

from many workers. I-REN sees an opportunity to strengthen its workforce by delivering trainings locally and using regional connections, especially with the Community Colleges and CSUs, and knowledge to engage and build workforce networks. Through these activities I-REN can help bridge the divide between training providers, job seekers, and employers to support the growth of a clean energy workforce and economy in the Inland Empire.

I–REN Organization & Leadership

I-REN is a fully integrated, local government led organization with equal participation and leadership by three Councils of Government. The graphic below illustrates I-REN's structure and how it connects its 52 member cities to the oversight and management of the REN. A key aspect of I-REN is the 7 member Executive Committee comprised of elected leaders, representing the 52 cities. They oversee the three program areas and Program Coordinating Committees which include, staff and stakeholders.



I-REN Organization and Oversight

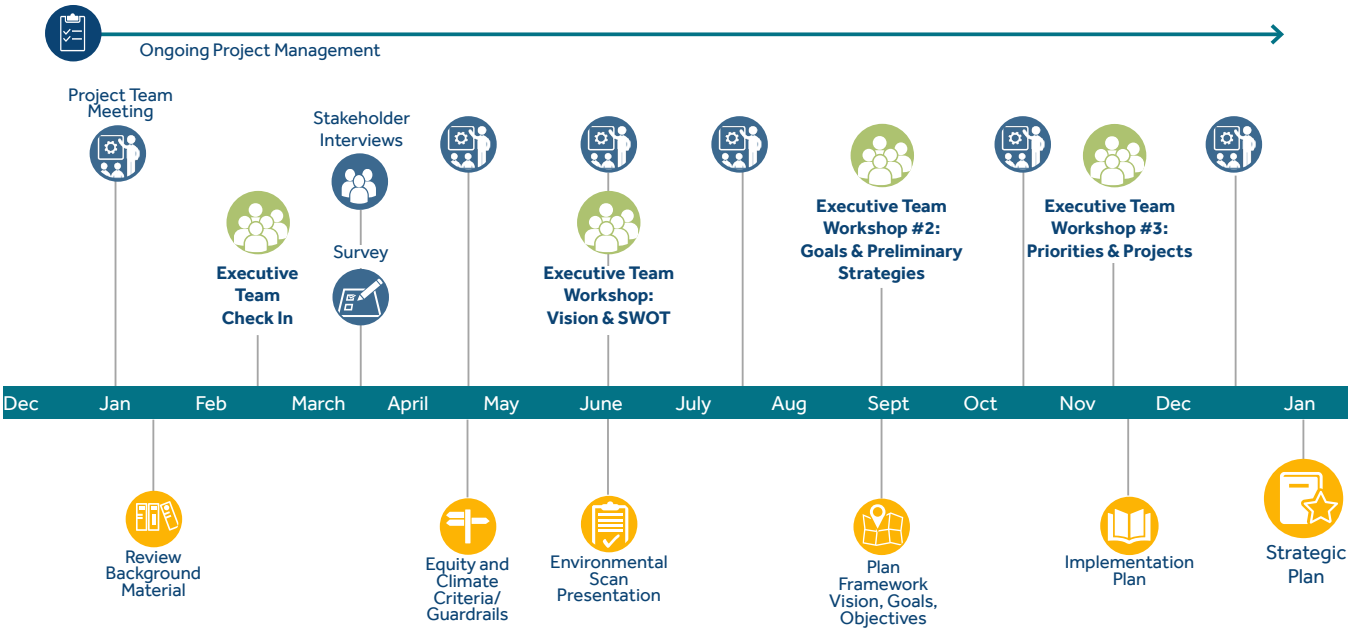
Strategic Plan

Strategic Plan Purpose and Need

The I-REN 2023-2027 Strategic Plan provides a path forward for the organization over the next 5 years with a focus on building a robust foundation for growth and innovation. This Strategic Plan explores how the organization, and its resources, services, and programs will meet future needs for the Inland Empire counties and member agencies. The Strategic Plan is an action-oriented plan with strategies and tactics to achieve the organization's objectives, including a framework for programs to evolve to meet bigger goals related to equity market transformation.

Process

The strategic planning process took place from December 2022 to September 2023 and was a collaboration between I-REN staff and the Executive Committee, with strategic planning support from a consultant, BluePoint Planning. The process kicked off with a survey to stakeholders and one-on-one interviews with key decision makers in the region. The process assessed I-REN's strengths, weaknesses, threats, and opportunities and considered its role in the region as a new organization, and how to most effectively deliver services and resources in a equal manner. The next step was to develop a five-year Strategic Framework with key goals, strategies and tactics. The final step included prioritizing the strategies and developing a detailed implementation plan for staff.



Strategic Plan Framework

I-REN MISSION

To actively participate in California's Clean Energy initiatives and build a stronger clean energy economy and community.

OUR VISION

I-REN's vision is to connect residents, businesses, and local government to a wide range of energy efficiency resources to increase energy savings and equitable access throughout San Bernardino and Riverside Counties.

ORGANIZATIONAL GOALS

Goal 1. Cohesive Region

I-REN operates as a cohesive regional program and will make available and distribute benefits equally through the region with the fair allocation of resources and services to the COGs and member agencies.

Goal 2. First 2 Years

I-REN will focus on the delivery of positive and tangible impacts to the region through a successful launch and roll-out of programs.

Goal 3. Awareness & Relationships

I-REN will actively be involved with all member agencies, tribes, special districts, and partners, and will strive to engage them as active participants.

Goal 4. Internal Organization

I-REN will be an effective and efficient organization, characterized by agility, responsiveness, and accountability.

OBJECTIVES

- Ensure that the COGs and member agencies benefit from REN programs and funds as equally as possible.
- Ensure the effective deployment of programs, services, and early wins.
- Create lasting and valuable relationships with jurisdictions throughout the region to ensure program uptake and participation.
- The internal I-REN team has capacity, is prepared, and is able to effectively to manage and drive the launch of the I-REN programs.

STRATEGIES

- 1.1 Effective Governance
- 1.2 Data Sharing and Monitoring
- 1.3 Program Design and Delivery
- 2.1 Program Priorities
- 2.2 Roll-Out Strategy
- 2.3 Reporting and Performance
- 3.1 Regional Outreach, Education, and Engagement
- 3.2 Community Roundtables
- 3.3 Dedicated Partnerships
- 3.4 State Actors
- 4.1 Strong Organization
- 4.2 Regulatory Capacity
- 4.3 Performance Management

Priorities and Key Activities

Equal Benefits Region–Wide

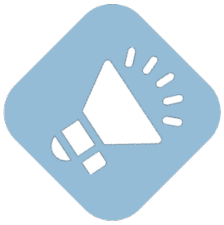
Establish tools and approaches to offer equal benefits for COGs and member agencies

- Establish a collaborative and productive working relationship with the Executive Committee
- Work closely with implementers and the community to ensure that program design considers the unique and varied needs of the entire region

Program Development and Launch

Ensure successful launch of programs in first 2 years to help build I–REN's momentum.

- Establish the Fellows Program with placements in multiple jurisdictions
- Identify program priorities and essential enabling activities to launch programs that are relevant and responsive
- Focused program development and roll out in areas with the greatest need, particularly in disadvantaged and underserved communities



Regional Engagement

Ensure that the diverse voices of the region are engaged and part of the development of the programs

- Develop and complete Education, Outreach, and Engagement Plan.
- Establish and launch Community Roundtables to create champions and thought leaders for program development
- Create materials, communication tools, and a website that succinctly and effectively relays key information to stakeholders

Strong and Successful Organization

Create the foundation for an effective and responsive organization.

- Define roles and responsibilities, protocols, and resources for making I-REN and it's programs successful
- Build capacity and ability to ensure regulatory requirements are met

Goal 01 Cohesive Region

I-REN operates as a cohesive regional program and will make available and distribute benefits equally through the region with the fair allocation of resources and services to the COGs and member agencies.

Objective

Ensure that the COGs and member agencies recognize the strength of the regional program and benefit from REN programs and funds as equally as possible and in line with CPUC guidance.

Desired Outcomes

- The COGs and members begin to identify as a region rather than individual jurisdictions.
- Staff resources are allocated fairly and available to all regions equally.
- Building Upgrade Concierge (BUC) platform is deployed and available for all member agencies.
- Uptake of programs and services is monitored and shared with transparent reporting to the Executive Committee.
- Community voices are representative of the region and inform the program design.

STRATEGY 1.1. Work collaboratively and proactively with the I-REN Executive Committee (EC) to inform budget-making, resource allocation, and program development, ensuring responsiveness and agile decision-making.

1.1.1 Conduct an annual strategic planning session with the Executive Committee to identify progress, opportunities, and any strategic elements for the Executive Committee to address.

1.1.2 Establish clear budgeting processes to enable effective engagement by Executive Committee and enable appropriate authority for staff implementation.

1.1.3 Document protocols and processes to streamline critical approvals and activities that cannot wait for quarterly Executive Committee meetings with existing documentation.

1.1.4 Develop onboarding education process and materials for orienting new Executive Committee members and other key partners.

STRATEGY 1.2. Utilize the Building Upgrade Concierge (BUC) platform to provide an online dashboard and information-sharing portal that allows I-REN members to learn about and track opportunities, monitor program uptake, and find events and new activities.

1.2.1 Establish clear protocols and processes for maintaining and updating shared database and communicating changes.

1.2.2 Provide regular communications to members to encourage them to use the BUC platform and to participate and learn about opportunities for their communities.

1.2.3 Ensure there are trained and dedicated staff to manage and support the BUC platform at the regional level and agency level.

STRATEGY 1.3. Ensure that program design and delivery consider the needs of the entire region, providing focused support for areas with the greatest need and tracking progress towards goals and is in line with the CPUC.

1.3.1 Gather information, data, and details related to relevant policies and procedures, and engage with member agencies to identify needs and interests to support equal access to program benefits.

1.3.2 Identify methodology and mapping for high-need member agencies and communities that should receive additional support to ensure access to services in alignment with CPUC equity metrics.

1.3.3 In concert with Community Roundtables (Connect to S3.4,) develop and design outreach and engagement approaches to ensure access, limit administrative burden, and to support flexibility in serving various needs.

1.3.4 Work with implementers to establish contract performance metrics aligned to overall CPUC and program metrics, with a focus on fair distribution of benefits. (Connect to S2.3)

1.3.5 Form guiding principles for management among COGs around contract compliance, metrics, benchmark parameters, and contract review.

1.3.6 Ensure all parties support and provide accurate reporting, and analyze trends to improve KPIs, and identify other contributing variables to program success.

1.3.7 Create and utilize marketing and branding guidelines.

Goal 02 First 2 years

I-REN will focus on the delivery of positive and tangible impacts to the region through a successful launch and rollout of programs.

Objective

Ensure the effective deployment of programs and services and early wins in the initial phase of 2024-2026.

Desired Outcomes

- Funds expended
- Number of training participants
- Number of fellows placed
- Number of local agencies served
- Number of projects enrolled

STRATEGY 2.1. I-REN staff, in collaboration with the Executive Committee and the implementers, will identify program priorities and essential enabling activities to launch programs.

2.1.1 Identify and prioritize disadvantaged communities and underserved areas that need assistance the most, in line with CPUC guidance. (Connected to S1.3.2)

2.1.2 Identify gaps and needs for data and conduct market research and engagement to make informed decisions about program priorities.

2.1.3 Determine program areas that have potential for greatest impact and ease of implementation to focus on first.

2.1.4 Operationalize performance feedback to institute changes to programs as needed and possible to address misalignment or inability to meet proposed outcomes.

2.1.5 Proactively follow up with leads from implementers and foster relationships, promoting feedback and flexibility in response.

Goal 02 First 2 years

STRATEGY 2.2. I-REN staff will work with implementers and program teams to establish feasible roll-out schedules and process for each program launch and aggressively work to meet those timelines.

2.2.1 Complete implementer onboarding by the first quarter of 2024 and ensure there are clear roles and responsibilities for all involved.

2.2.2 Establish Community Roundtable and engagement process by the end of 2024.

2.2.3 Define and meet milestones, timeframes, and goals of each program action item to ensure early wins.

2.2.4 Establish effective communication channels and protocols with CPUC and other key actors.

STRATEGY 2.3. Establish transparent reporting and performance metrics to demonstrate success and alignment with the CPUC, member agencies, and Stakeholders. (Connect to S1.3.4)

2.3.1 Determine appropriate metrics to reach outcomes identified in the business plan based on current CPUC regulations.

2.3.2 Develop consistent reports and metrics based on available program data and QA/QC results to ensure accuracy.

2.3.3 Align the expectations and interests of COGs with program implementers work plans.

2.3.4 Maintain consistent communication with consultant team and implementers, including weekly meetings, as needed, to ensure accountability and coordination of scheduling services.

2.3.5 Establish regular check in and progress meetings and conduct routine contract performance review.

Goal 03 Awareness & Relationships

I-REN will actively engage with all member agencies, tribes, special districts, and partners and strive to establish them as active participants.

Objective

Create lasting and valuable relationships with jurisdictions throughout the region to ensure program engagement uptake and participation.

Desired Outcomes

- Engagement and Outreach Plan (EOP) is adopted and utilized routinely
- All I-REN member agencies are aware and understand what I-REN does and I-REN is a trusted subject matter expert
- Number of state and other key stakeholders have heard of I-REN
- I-REN is a relevant influencer and known entity at the state level
- Community roundtables are established and operational

STRATEGY 3.1. Conduct meaningful outreach and education activities throughout the region, building relationships with each member agency, and making sure that those who are typically underserved can participate and learn about I-REN program opportunities.

3.1.1 Develop an EOP that includes equity considerations with an implementation plan to monitor and measure the effectiveness of the engagement tactics, which identifies key audiences, reach methods, and best approaches for long-term relationship building.

- 3.1.1.1 Measure the effectiveness of EOP, including social media campaigns.
- 3.1.1.2 Utilize outreach and social media outlets to help connect and find additional channels for engagement.

3.1.2 Develop and operationalize a branding strategy and marketing plan that includes simple, clear, and tailored messaging and communication materials and identifies the direct benefit of the programs for all audiences. (what they care about, a compelling why).

3.1.3 Actively engage and identify member pain points and concerns when developing programs.

3.1.4 Develop a feedback loop for energy efficient topics and issues in the region, helping solve problems directly and collaboratively.

3.1.4 Develop and maintain a robust website and engagement platform to deliver ongoing and consistent information and data to the region in conjunction with social media channels.

3.1.5 Ensure accessibility through translating material in multiple languages and providing appropriate accommodations to engage as many people as possible.

3.1.6 Conduct an annual/periodic program focused survey(s) to measure awareness and needs. (Connected to S4.3.4)

Goal 03 Awareness & Relationships

STRATEGY 3.2. Identify and collaborate with community champions and thought leaders to be the voice of the program empowering the community through establishing and managing Community Roundtables.

3.2.1 Establish program specific Community Roundtables in accordance with the Memorandum of Agreement.

3.2.2 Determine a process for Community Roundtables to inform program design at launch and overtime.

3.2.3 Develop a compensation policy for roundtable members, including community-based organizations, community members, and outreach partners who are representing disadvantaged community audiences and equity goals, appropriately for their time. Set up the process with contractors and implementers.

3.2.4 Update participants, roles, and responsibilities of the Community Roundtables over time to reflect priorities and needs.

STRATEGY 3.3. Utilize dedicated staff and resources to develop and maintain relationships and partnerships with members, potential partners, and other stakeholders throughout the region.

3.3.1 Establish a Regional Partnership Plan that identifies partner priorities, gaps, and needs in alignment with program priorities, as well as roles and responsibilities for I-REN staff.

- 3.3.1.1 Identify vital partnerships for each sector, including with community-based organizations, higher education institutions, workforce investment boards, energy employers, industry experts, contractors, architecture and engineering firms, associations, assessors, and unions.
- 3.3.1.2 Develop relationships with high schools and youth organizations to develop pathways into green jobs and programs.
- 3.3.1.3 Leverage COG contacts and resources.
- 3.3.1.4 Continue to work with other agencies and partners to bring non-ratepayer resources and funds to the region and fill gaps

3.3.2 Develop and maintain contact relationship management (CRM) system to map and identify partners and track by program and region.

3.3.3 Identify staff members to steward partnership development with support from all I-REN staff and the Executive Committee as appropriate.

Goal 03 Awareness & Relationships

STRATEGY 3.4. Expand relationship development to state actors at the CPUC, CEC, Legislature, other Program Administrators, and beyond to build the I-REN stature and influence beyond the region, and act as a conduit to share information back to the region.

3.4.1 Identify and train state partnership lead(s) and support staff who are responsible for monitoring various channels for information and connecting the appropriate I-REN staff to engagement opportunities.

3.4.2 Explore opportunities for I-REN staff members to join board or commission meetings, and webinars with state organizations to ensure active participation in decision-making.

3.4.3 Research the landscape to determine the connections and ensure staff training on upcoming legislative matters is up to date.

3.4.4 Utilize Civic Well for regional messaging about state activities to ensure state people are at the table.

3.4.5 Maintain membership and actively participate in CECC, LGSEC, and CAEECC.

3.4.6 Work closely with the other RENs to share best practices, coordinate regulatory responses, and overall increase the impact and influence of the local government program administrators.

Goal 04 Internal Organization

I-REN will be an effective and efficient organization, characterized by agility, responsiveness, and accountability.

Objective

The internal I-REN team has capacity, is prepared, and is able to effectively manage and drive the launch of the I-REN programs.

Desired Outcomes

- Budget goals are met
- Participation targets are met
- Organizational survey results indicate the I-REN is responsive, relevant and important
- I-REN meets staff and capacity requirements

STRATEGY 4.1. Foster a strong organization around a clear and central mission, with defined roles and responsibilities for making the I-REN and its programs successful.

4.1.1 Ensure that the administrative process and approval systems are in place to enable agile and streamlined decision-making by the end of 2023 without undue burden.

4.1.2 Provide resources to increase staff knowledge about the program topics and keep up to date through internal training on equity and DEI.

4.1.3 Identify clear roles, and responsibilities while building the team through organizational meetings, effective onboarding, training, hiring and maintaining staff capacity.

4.1.3.1 Provide job description with roles and responsibilities.

4.1.3.2 Develop and maintain organizational chart.

4.1.3.3 Establish file sharing and communication protocols.

4.1.3.4 Create specific and detailed work plans.

Goal 04 Internal Organization

STRATEGY 4.2. Build capacity and ability to ensure that regulatory requirements are met and become standards of operations.

4.2.1 Train and support staff in learning and building capacity to work with regulators.

4.2.2 Engage with other RENs, and CALREN to understand key issues and to build capacity and strength in the RENs position.

4.2.3 Create templates and resources to make responses consistent and simpler.

4.2.4 Routinely subscribe, follow, and read information from CPUC, CEC, and CAAEEC.

STRATEGY 4.3. Annually review organizational performance and provide a routine means to make changes and updates to systems, processes, and overall operations as needed.

4.3.1 Develop and manage internal organization budget.

4.3.2 Maintain and update the strategic plan annually.

4.3.3 Engage with internal stakeholders to understand areas for improvements and changes.

4.3.4 Conduct an annual member survey to measure effectiveness with member agencies. (Connected 3.1.6)

Acknowledgments

Western Riverside Council of Government (WRCOG)

WRCOG's goal is to unify Western Riverside County so that it can speak with a collective voice on important issues that affect its members. Representatives from 18 cities, the Riverside County Board of Supervisors, and the Eastern and Western Municipal Water Districts, have seats on the WRCOG Executive Committee, the group that sets policy for the organization.

San Bernadino Council of Government (SBCOG)

SBCOG's purpose is to speak with a collective voice on important issues that affect its member agencies. Representatives from 24 cities and towns, and the San Bernardino County Board of Supervisors have a seat on the SBCOG Board of Directors.

Coachella Valley Association of Governments (CVAG)

CVAG is the regional planning agency coordinating government services within the Coachella Valley. By providing solutions to the common issues of the local governments and tribes that are its members, CVAG promotes a better quality of life and balanced growth for residents of Central and Eastern Riverside counties.

Executive Committee

Oscar Ortiz, City of Indio

Debroah Robertson, City of Rialto

Curt Hagman, County of San Bernadino

Art Bishop, Town of Apple Valley

Jacque Casillas, City of Corona

Chris Barajas, City of Jurupa Valley

Crystal Ruiz, City of San Jacinto

I-REN Staff

Casey Dailey, Director of Energy and Environmental Programs WRCOG

Benjamin Druyon, Program Manager WRCOG

Tyler Masters, Program Manager WRCOG

Karina Camacho, Senior Staff Analyst WRCOG

Cheryl Chesnut, Program Manager SBCOG

Kelly Lynn, Chief of Air Quality and Mobility Programs, SBCOG

Stacey Morales, Management Analysis SBCOG

David Freedman Program Manager CVAG

Jacob Alvarez, Program Manager - Energy & Sustainability CVAG

Erica Felci, Chief Operating Officer, CVAG

BluePoint Planning - Strategic Planning

Mindy Craig, Principal-in-Charge

Allisia Sandoval, Project Associate

Frontier Energy

Nancy Barba, Director

Margaret Marchant, Program Manager

Attachment

I-REN 2023-2027

Implementation Plan

Goal 1

I-REN operates as a cohesive regional program and will make available and distribute benefits equally through the region with the fair allocation of resources and services to the COGs and member agencies.

Anticipated Outcome

Ensure that the COGs and member agencies recognize the strength of the regional program and benefit from REN programs and funds as equally as possible and is in line with CPUC guidance.

Strategic Objective	Strategies	Timeline	Frequency	Status
1.1 Work collaboratively and proactively with the I-REN Executive Committee to inform budget-making, resource allocation, and program development, ensuring responsiveness and agile decision-making.	Conduct an annual strategic planning session with the Executive Committee to identify progress, opportunities, and any strategic elements for the Executive Committee to address.	January Annually	Ongoing	On Track
	Establish clear budgeting processes to enable effective engagement by Executive Committee and enable appropriate authority for staff implementation.	January and July Annually	Ongoing	On Track
	Document agreed protocols and processes to streamline critical approvals and activities that cannot wait for quarterly EC meetings within existing documentation.	Feb 2024		Complete
	Develop onboarding education process and materials for orienting new Executive Committee members, and other key partners.	2023		Complete
1.2 Utilize the Building Upgrade Concierge (BUC) platform to provide an online dashboard and information-sharing portal that allows I-REN members to learn about and track opportunities, monitor program uptake, and find events and new activities.	Establish clear protocols and processes for maintaining and updating shared database and communicating changes.	2023		Complete
	Provide regular communications to members to encourage them to use the BUC platform and to participate and learn about opportunities for their communities.	Initial Outreach; 2024 Ongoing	Ongoing	On Track
	Ensure there are trained and dedicated staff to manage and support the BUC platform at the regional level and agency level.	Q1 2024	Ongoing	On Track
1.3 Ensure that program design and delivery consider the needs of the entire region, providing focused support for areas with the greatest need and tracking progress towards goals and is in line with the CPUC.	Gather information, data, and details related to relevant policies and procedures, and engage with member agencies to identify needs and interests to support equal access to program benefits.	Q4 2023 - Q1 2024; ongoing outreach	Ongoing	On Track
	Identify methodology and mapping for high-need member agencies and communities that should receive additional support to ensure access to services in alignment with CPUC equity metrics.	Q2 2024	Ongoing	On Track

	In concert with the Community Roundtable (Connect to S3.4), develop and design outreach and engagement approaches to ensure access, enable flexibility, limit administrative burden for various users needs.	Q4 2024	Ongoing	On Track
	Work with implementers to establish contract performance metrics aligned to overall CPUC and program metrics, with a focus on fair distribution of benefits. (Connect to S2.3)	Q1 2024		Complete
	Marketing & branding guidelines.	Q3 2023		Complete
	Form guiding principles for accountability and management among COGs around contract compliance, metrics, benchmark parameters, and contract review. Connect to annual reporting.	Q4 2024	Ongoing	On Track
	Ensure all parties support and provide accurate reporting, and analyze trends to improve KPIs, and identify other contributing variables to program success. Inputs for the Annual Report.	March 1 Annually	Ongoing	On Track

Goal 2
I-REN will focus on the delivery of positive and tangible impacts for the region through a successful launch and rollout of programs.
Desired Outcome
Ensure the effective deployment of programs and services and early wins in the initial phase of 2024-2026.

Strategic Objective	Strategies	Timeline	Status	Status
2.1 I-REN staff, in collaboration with the Executive Committee and the implementers, will identify program priorities and essential enabling activities to launch programs.	Identify and prioritize disadvantaged communities and underserved areas that need assistance the most, in line with CPUC guidance.	Q2 2024	Ongoing	On Track
	Identify gaps and needs for data and conduct market research and engagement to make informed decisions about program priorities.	Q4 2024	Ongoing	On Track
	Determine program areas that have potential for greatest impact and ease of implementation to focus on first.	Q2 to Q4 2024	Ongoing	On Track
	Operationalize performance feedback to institute changes to programs as needed and make possible to address misalignment or inability to meet proposed outcomes.	Annually	Ongoing	On Track
	Proactively follow up with leads from implementers and foster relationships, promoting feedback and flexibility in response.	Ongoing	Ongoing	On Track
2.2 I-REN staff will work with implementers and program teams to establish feasible roll-out schedules and process for each program launch and aggressively work to meet those timelines.	Complete implementer onboarding by end of 2024 and ensure there are clear roles and responsibilities for all involved.	Q4 2024		Complete
	Establish Community Roundtable and engagement process by the end of 2024.	Summer 2024		Complete
	Define and meet milestones, timeframes, and goals of each program action item to ensure early wins.	Monthly Metrics, Q1 Reporting	Ongoing	On Track
	Establish effective communication channels and protocols with CPUC and other key actors.	Monthly Meetings; CAEECC, etc.	Ongoing	On Track
2.3 Establish transparent reporting and performance metrics to demonstrate success and alignment with the CPUC, member agencies, and Stakeholders. (Connect to S1.3.4)	Determine appropriate metrics to reach outcomes identified in the business plan based on current CPUC regulations.	Report in April 2024	Ongoing	On Track
	Develop consistent reports and metrics based on available program data and QA/QC results to ensure accuracy.	Annually March	Ongoing	On Track
	Align the expectations and interests of COGs with program implementers work plans.	Ongoing	Ongoing	On Track
	Maintain consistent communication with consultant team and implementers, including weekly meetings, as needed, to ensure accountability and coordination of scheduling	Ongoing	Ongoing	On Track
	Establish regular check in and progress meetings and conduct routine contract performance review.	Ongoing	Ongoing	On Track

Goal 3

I-REN will actively engage with all member agencies, tribes, special districts, and partners and strive to establish them as active participants.

Desired Outcome

Create lasting and valuable relationships with jurisdictions throughout the region to ensure program engagement uptake and participation.

Strategic Objective	Strategies	Timeline	Frequency	Status
3.1 Conduct meaningful outreach and education activities throughout the region, building relationships with each member agency, and making sure that those who are typically underserved can participate and learn about I-REN program opportunities.	Develop Education and Outreach Plan (EOP) that includes equity considerations with an implementation plan to monitor and measure the effectiveness of the engagement tactics, which identifies key audiences, reach methods, and best approaches for long-term relationship building.	Q1 2024	Ongoing	On Track
	Develop and operationalize a branding strategy and marketing plan that includes simple, clear, and tailored messaging and communication materials and identifies the direct benefit of the programs for all audiences. (what they care about, a compelling why).	Q2 2023		Complete
	Actively engage and identify member pain points and concerns when developing a program.	Ongoing	Ongoing	On Track
	Develop a feedback loop for energy efficiency topics and issues in the region, helping solve problems directly and collaboratively.	24 months		Complete
	Develop and maintain a robust website and engagement platform to deliver ongoing and consistent information and data to the region in conjunction with social media channels.	Q3 2023	Ongoing	On Track
	Ensure accessibility through translating material in multiple languages and providing appropriate accommodations to engage as many people as possible.	Ongoing		Complete
	Conduct an annual/periodic program focused survey(s) to measure awareness and needs. (Connected to S4.3.4)	Q1 Bi-annually	Ongoing	On Track

3.2 Identify and collaborate with community champions and thought leaders to be the voice of the program empowering the community through establishing and managing Community Roundtables.	Establish program specific Community Roundtables in accordance with the Memorandum of Agreement.	Q4 2024	Ongoing	On Track
	Determine a process for Community Roundtables to inform program design at launch and over time.	Q4 2024		Complete
	Develop a compensation policy for roundtable members, including community-based organizations, community members, and outreach partners who are representing disadvangaged community audiences and equity goals, appropriately for their time. Set up the process with contractors and implementers.	Q3 2024		Not Started
	Update participants, roles, and responsibilities of the Community Roundtables over time to reflect priorities and needs.	Annually	Ongoing	On Track
3.3 Utilize dedicated staff and resources to develop and maintain relationships and partnerships with members, potential partners, and other stakeholders throughout the region.	Establish a Regional Partnership Plan that identifies partner priorities, gaps, and needs in alignment with program priorities, as well as roles and responsibilities for I-REN staff.	June 2025		Complete
	Develop and maintain contact relationship management (CRM) system to map and identify partners and track by program and region.	2023		Complete
	Identify staff members to steward partnership development with support from all I-REN staff and the Executive Committee as appropriate.	Q4 2024	Ongoing	On Track
3.4 Expand relationship development to state actors at the CPUC, CEC, Legislature, other Program Administrators, and beyond to build the I-REN stature and influence beyond the region, and act as a conduit to share information back to the	Identify and train state partnership lead(s) and support staff who are responsible for monitoring various channels for information and connecting the appropriate I-REN staff to engagement opportunities.	Ongoing	Ongoing	On Track
	Explore opportunities for I-REN staff members to join board or commission meetings, and webinars with state organizations to ensure active participation in decision-making.	Ongoing	Ongoing	On Track
	Research the landscape to determine the connections and ensure staff training on upcoming legislative matters is up to date.	Ongoing	Ongoing	On Track
	Utilize Civic Well for regional messaging about state activities to ensure state people are at the table.	Ongoing	Ongoing	On Track

region.	Maintain membership and actively participate in CCEC, LGSEC, and CAEECC.	Annually	Ongoing	On Track
	Work closely with the other RENs to share best practices, coordinate regulatory responses, and overall increase the impact and influence of the local government program administrators.	Ongoing	Ongoing	On Track

Goal 4
I-REN will be an effective and efficient organization, characterized by agility, responsiveness, and accountability.
Desired Outcome
The internal I-REN team has capacity, is prepared, and is able to effectively manage and drive the launch of the I-REN programs.

Strategic Objective	Strategies	Timeline	Frequency	Status
4.1 Foster a strong organization around a clear and central mission, with defined roles and responsibilities for making the I-REN and its programs successful.	Ensure that the administrative process and approval systems are in place to enable agile and streamlined decision-making by the end of 2023 without undue burden.	2023		Complete
	Provide resources to increase staff knowledge about the program topics and keep up to date through internal training on equity and DEI.	Ongoing	Ongoing	On Track
	Identify clear roles, and responsibilities while building the team through organizational meetings, effective onboarding, training, hiring and maintaining staff capacity.	Ongoing	Ongoing	On Track
4.2 Build capacity and ability to ensure that regulatory requirements are met and become standards of operations.	Train and support staff in learning and building capacity to work with regulators.	Ongoing	Ongoing	On Track
	Engage with other RENs and CALREN to understand key issues and to build capacity and strength in the RENs position.	Ongoing	Ongoing	On Track
	Create templates and resources to make responses consistent and simpler.	As needed	Ongoing	On Track
	Routinely subscribe, follow, and read information from CPUC, CEC, and CAEECC.	Ongoing	Ongoing	On Track
4.3 Annually review organizational performance and provide a routine means to make changes and	Develop and manage internal organization budget.	May-June Annually	Ongoing	On Track
	Maintain and update the strategic plan annually.	January Annually	Ongoing	On Track

updates to systems, processes, and overall operations as needed.	Engage with internal stakeholders to understand areas for improvements and changes.	Ongoing	Ongoing	On Track
	Conduct an annual member survey to measure effectiveness with member agencies. (Connected 3.1.6)	Bi-Annually	Ongoing	On Track

Inland Regional Energy Network
I-REN Executive Committee

Staff Report

Subject: **Workforce Education & Training Sector I-REN Energy Fellowship Program Activities Update**

Contact: **Jennifer Aguilar, San Bernardino Council of Governments Program Manager, jaguilar@gosbcta.com, (909) 884-8276**

Date: **February 18, 2025**

Recommended Action(s):

1. Receive and file.

Summary:

The Inland Regional Energy Network (I-REN) Energy Fellowship Program is driving significant growth in agency participation, with applications for 2025 expected to increase due to improved outreach strategies. Fellows have directly contributed to 26 energy efficiency projects, securing $1.1M in savings for agencies, representing nearly 40% of public sector incentive dollars, and highlighting the program's broader impact on workforce development and regional energy efficiency efforts.

Discussion:

Background

The I-REN Energy Fellowship Program partnered with CivicSpark, an AmeriCorps Program, and has a goal to place up to 27 Fellows within public agencies in the Inland Empire. Fellows are college or university students / alumni with at least an associate's degree who have submitted an application, are interviewed, and ultimately selected by interested public sector agencies in the I-REN subregion. Fellows are placed with a public sector agency full-time for 11 months to provide energy efficiency project support on all things I-REN, at no cost to the member agency. While participation comes at no cost to public sector agencies, these Fellows are provided a living stipend of $31,000 annually. This stipend is covered by I-REN on behalf of the city that is receiving the support.

The Fellowship Program launched in 2023, and there were a total of 11 Fellows deployed at 11 separate agencies throughout the regions of all three local I-REN COG partners. The first cohort of Fellows were able to participate in a trip to the ESRI Campus in the City of Redlands, as well as the 15th Annual California Climate and Energy Collaborative Forum as part of their energy efficiency and networking skill building. One of the main requests from the Fellows was increased involvement in energy efficiency educational experiences and additional opportunities for networking within the field. The Workforce Education & Training (WE&T) team responded to that feedback and began exploring options to expand

additional energy-related learning opportunities and resources for Fellows participating in the 2024 cohort.

The 2024 Program service year saw a marked increase in both interest from potential Fellows as well as agencies interested in utilizing Fellows' support. A total of 14 Fellows were recruited and placed across 12 agencies. This cohort started in September 2024. Five agencies agreed to continue hosting a Fellow and six new agencies applied for assistance. There are also currently four, second-year Fellows within the 2024 cohort who remained within their prior agency to continue their work. To provide additional professional growth opportunities, the WE&T team has scheduled six energy efficiency excursions for the Fellows and invited them to attend multiple conferences, workshops, and additional events in an effort to increase networking opportunities and educational growth. Each event is coordinated by not only the WE&T team, but also by a current Fellow working within WRCOG whom has taken on a lead role in managing these events. Every Fellow has been provided an opportunity to grow not only in their energy efficiency experience but also gain access to better understand how public agencies function, budget, plan, and even manage issues on a daily basis. Agencies that host a Fellow are provided support for their agency in both energy efficiency programs at no cost to the agency.

Present Situation

The 2025 applications for agencies are expected to open in March 2025 and the WE&T team is expecting to see marked growth in the number of agencies that apply and want to participate. Multiple marketing strategies have been discussed, and outreach is expected to be far more effective based on current results of the Fellowship Program.

The latest figures have shown that there are 26 projects in the Public Sector Cash for Kilowatts incentive program queue from 12 agencies where a Fellow has direct involvement in the project and process for completion. Four agencies that have retained a Fellow for a second year are moving forward with energy efficiency projects that their Fellow is actively coordinating. This amounts to an annual energy savings of $272,867 across all 26 projects, an overall energy savings of 1,070,513 kWh/yr, and 5,329 therms/yr. The most impressive result of having Fellows working within the agencies is the incentive dollars they have secured for their respective site hosts.

Currently, $1,126,104 in savings has been allocated to agencies for energy efficiency projects utilizing a Fellow, and that figure is expected to rise as seven of the projects are still in the initial measures list phase and incentive dollars have not yet been fully factored in. Currently, nearly 40% of all the incentive dollars within the public sector pipeline are allocated to projects utilizing an I-REN Energy Fellow. In line with that figure, 35% of the annual energy savings within the total public sector pipeline is tied to projects utilizing a Fellow.

The Fellowship Program is not only providing valuable support for agencies within the region, but is also providing an avenue to increase energy savings and participation in I-REN’s Public Sector project pipeline. The host sites are receiving no-cost project management and potential energy savings through their involvement in the Public Sector arm of I-REN. As a whole, the Fellowship Program was designed to place highly engaged individuals into public sector positions to gain experience and an opportunity to practice energy-related work, but the end result has impacted both the site agencies and the energy efficiency landscape in a much more meaningful way. The correlation between the sectors has resulted in a synergy that allows the WE&T Sector to realize actual energy efficiency savings which further encourages the need for more Fellows to be placed within the region.

The WE&T team is working with the marketing consultants and various outside groups to continue to pursue higher involvement from both sides of the application process. The goal of 27 agencies hosting a Fellow is still in reach and the WE&T team will continue to pursue a spot for as many applicants as possible within the region.

Prior Action(s):

None.

Financial Summary:

Activities related to I-REN are included in the Fiscal Year 2024/2025 budget under the I-REN Fund (Fund 180). Regarding the Fiscal Year 2025/2026 Fellowship funding, once the amounts have been determined, they will be programmed and included in the Fiscal Year 2025/2026 budget.

Attachment(s):

None.