



SEEC Virtual Forum: Webinar #2

June 10, 2020 | 11:00 AM – 12:30 PM PST

Community Energy Resilience for Local Governments



**COMMUNITY ENERGY
RESILIENCE SERIES**



11th Annual Statewide Energy Efficiency Virtual Forum

June - November | 18 Webinars | 6 Networking Events

Organized by  Local Government Commission
Leaders for Livable Communities

Upcoming Events

6/18 – Webinar #3

Maintaining Local Momentum towards Climate Goals: Reach Code Collaboration

6/23 – Networking Activity

Speed Networking

6/30 – Webinar #4

Community & Climate Engagement During COVID-19: What to do when in person isn't possible

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**COMMUNITY ENERGY
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Microgrids: Backup Power for Business

Wednesday, June 24th, 2020, 11:00 AM – 12:30 PM

In collaboration with Business for Clean Energy and the California Business Alliance for a Clean Economy

Resilient Schools – Safe Communities

Wednesday, July 8th, 2020, 11:00 AM – 12:00 PM

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Community Energy Resilience Policy Summit

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Microgrid Resource Coalition

Clean Coalition



Agenda

Welcome

Ellie Cohen | The Climate Center

EPIC Program: Enabling a 100% Clean Energy Future

David Erne | California Energy Commission

Energy Resilience Case Studies

Rick Theis | The Climate Center

Incentive Funding for Project Development

David Burdick | Terra Verde

Long Term Community Energy Resilience Planning

Tanya Barham | Community Energy Labs

Commercialization of Microgrids: Policy & Regulation in California

Allie Detrio | Reimagine Power

Audience Q&A

Closing Remarks

Q&A

- Submit questions for panelists through the Q&A module at any point during the webinar.
- Upvote questions that you are interested in hearing responses to.

Audio Settings ^



Chat



Raise Hand



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- Engage in a dialogue with your peers – share resources, case studies, and best practices
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EPIC Program | Enabling a 100% Clean Energy Future

California Energy Commission

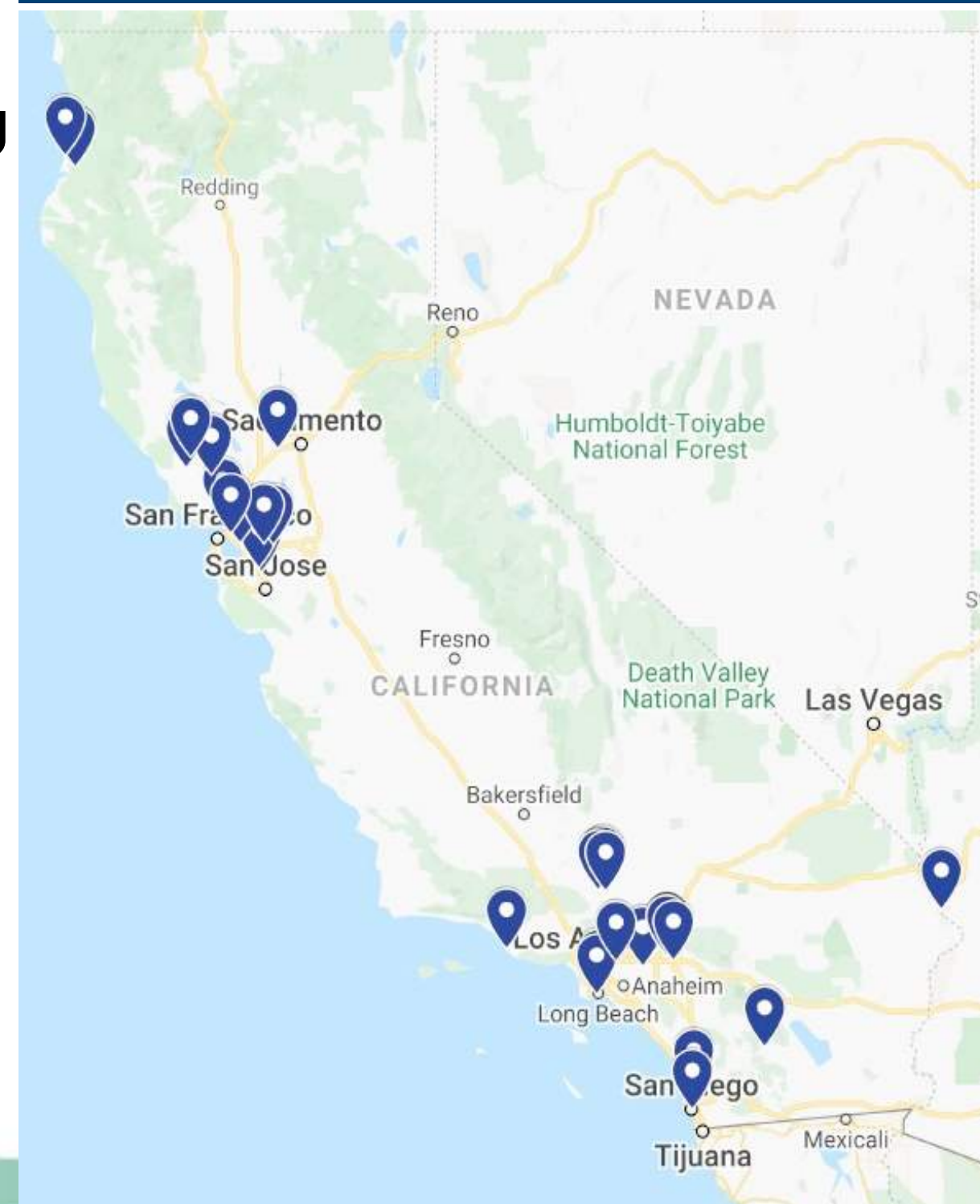


Deploying Clean Energy Microgrids

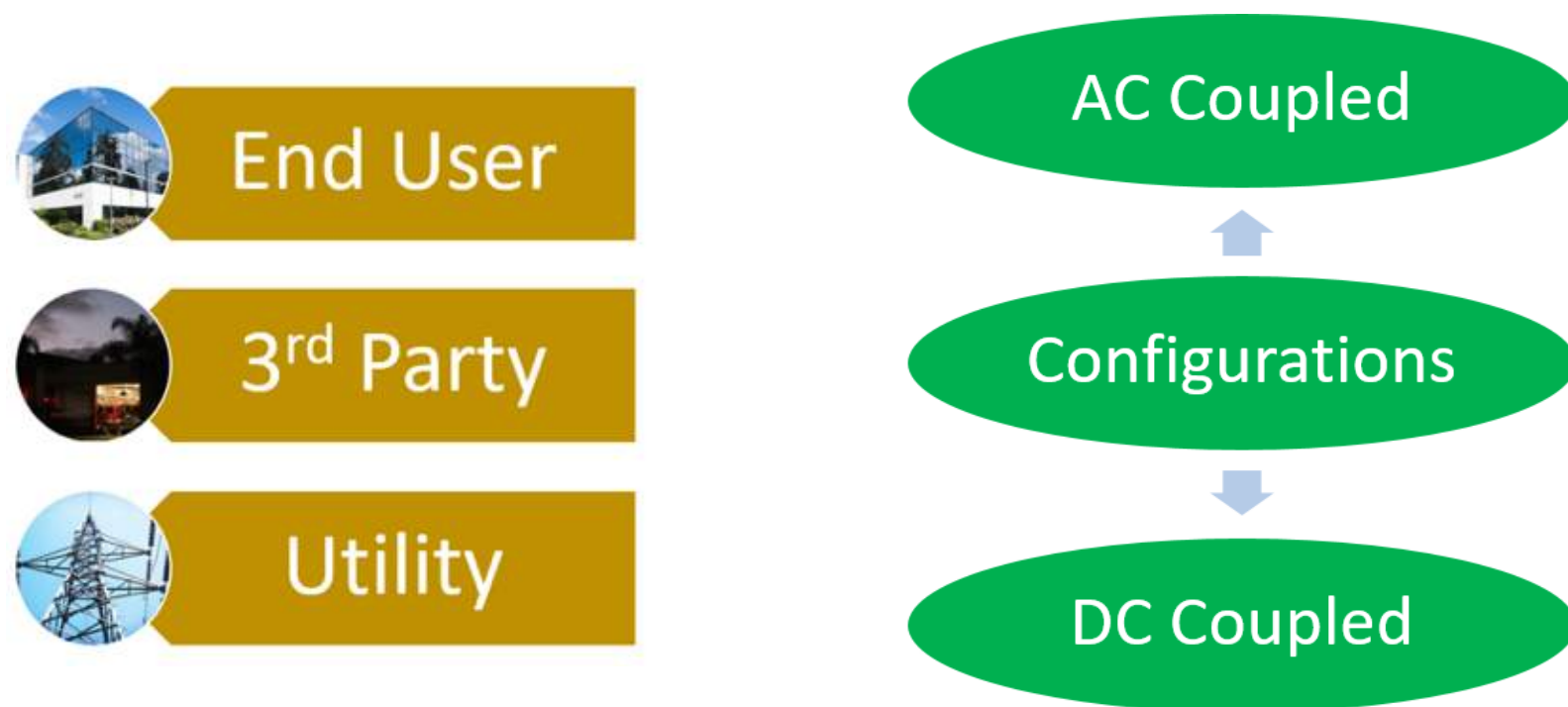
35 microgrids | \$100M EPIC fund invested | \$80M match funding

- Increasing resiliency
- Maturing microgrid control technologies
- Learning best approaches to integrating multiple resources
- Sharing lessons learned and best practices
- Driving down costs and establishing deployment norms

Locations of EPIC funded Microgrid Projects

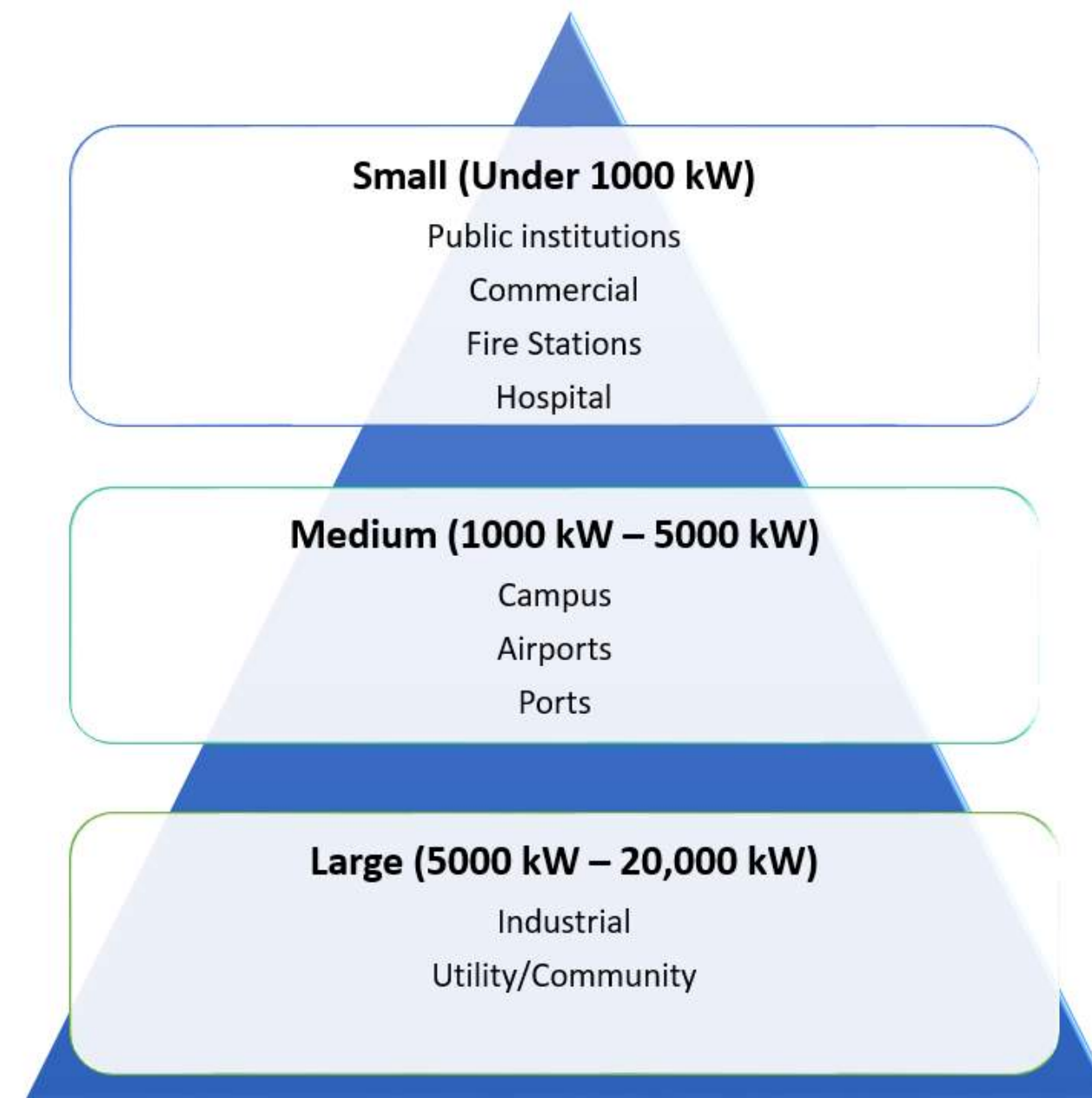


Diverse Designs



Element †	Low	High
Generation	37 kW	32 MW
Storage	33kW/110kWh	2.2MW/8.8MWh

Microgrid Sizes*



*Total inverter size

A Range of Applications

Critical Facilities



Red Cross Shelter



Medical Center



Fire Stations



City Hall, Police HQ, and Community Centers



Waste Water Treatment Plant



Airport

Ports



Military



Communities



Industrial



Digester



Distribution Center



Low-Carbon Community Microgrid at Blue Lake Rancheria



Microgrid Design

Solar: 420 kW AC PV ground-mounted array

Energy Storage: 500 kW / 950 kWh lithium-ion battery storage

Software & Controls: Siemens Spectrum Power 7 Microgrid Management System and Schweitzer Engineering Laboratories Protection Relays

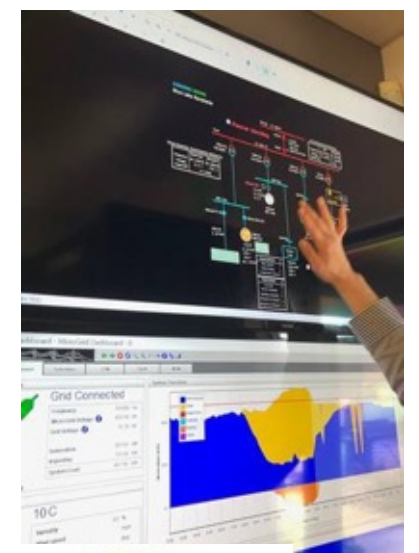
Other Infrastructure: Purchased distribution system infrastructure to create a new point of common coupling with the grid, integrating six buildings into the microgrid behind one electric meter

Technology Integration: The Schatz Energy Research Center at Humboldt State University



UNIQUE PROJECT ASPECTS

- ✓ American Red Cross shelter
- ✓ Successfully islanded during several unplanned utility outages due to weather and nearby wildfires
- ✓ Can deploy five levels of load shedding depending on the outage and system conditions
- ✓ Achieving cost savings: 58% overall energy



Emergency Microgrids for Fire Stations

Microgrid Design

Solar: 38 kW solar PV at Fire Station 11, 43 kW each at Fire Stations 6 and 7

Energy Storage: 110 kWh li-ion battery storage at each

Software & Controls: Gridscape Solutions' cloud-based predictive distributed energy resource management software (DERMS) and energy management system – EnergyScope

Technology Integration: Gridscape Solutions



UNIQUE PROJECT ASPECTS

- ✓ Displaces diesel generation and extends fuel reserves in emergency, keeping the fire station online longer as a viable first responder
- ✓ System design refined over deployments.
- ✓ Demonstrated more than 10 hours of islanding capability
- ✓ Gridscape expanding to other communities

GRIDSCAPE





Redwood Coast Airport Microgrid

Humboldt State University

- Collaborative design and operation
 - RCEA – 2.2MW PV & 2.2MW/8.8 MWh storage (CAISO participation) & 320 KW PV (reduces airport electricity bill)
 - PG&E – FTM microgrid
- Community-scale system – multiple customers, including USCG Air Station
- Create experimental tariffs/agreements for fair allocation of costs & compensation of third party generator
- Participate in CAISO wholesale market
- Create a replicable business model



CEC: \$5M

Match: \$6.3M



REDWOOD COAST
Energy Authority



SCHATZ
ENERGY
RESEARCH
CENTER

Building a Diverse Base of Innovators

Empower Innovation Tool

- Web platform to connect underserved communities, researchers, technology developers, and investors
- Browse resource libraries, funding sources, tools, and databases



Visit: <https://www.empowerinnovation.net/>



Over 30% of prime or subcontractor recipients are women, minority, disabled veteran, or LGBT owned



Questions

David Erne
California Energy Commission
916-327-1399
David.Erne@energy.ca.gov

Community Energy Resilience Case Studies

INCENTIVES & FUNDING FOR ENERGY RESILIENCY PROJECTS

SEEC Virtual Forum 2020

TerraVerde
ENERGY

David Burdick

Executive Vice President

david@terraverde.energy

INDEPENDENT ENERGY ADVISORS

supporting public agencies with evaluating & deploying energy resiliency projects

Feasibility Assessment

- Project Evaluation
- System Sizing & Modeling
- Funding & Incentives Eval
- Financial Projections
- Environmental & Permitting

Project Development

- Interconnection Strategy
- Interconnection Management
- Procurement Strategy
- Solicitation & Selection
- Contract Negotiations

Project Implementation

- Oversee Vendor Including:
 - Design Completion
- Interconnection Completion
- Construction Management
- Commissioning

Asset Management

- Performance Optimization
- Active System Monitoring
- Operations & Maintenance
- Performance Reporting
- Financial Analysis



CALIFORNIA IS ADJUSTING TO A NEW NORMAL

Wildfire related Public Safety Power Shutoff (PSPS) events are leaving communities vulnerable to the prospect of annual recurring outages that could last for days at a time.



CAL FIRE

2018 Incident Archive



1,963,101 Acres
Estimated Acres Burned



7,639 Incidents
Number of Wildfires



100 Fatalities
Confirmed Loss of Life



24,226 Structures
Structures Damaged or Destroyed



NATIONAL

Nearly 1 Million Customers To Lose Power In Planned PG&E Power Outages

October 27, 2019 · 12:06 AM ET

TerraVerde
ENERGY

One Solution Many Are Exploring...

DEPLOYING FACILITY MICROGRIDS



Solar PV plus battery energy storage configured with the controls and switching necessary to provide backup power during a grid outage



Solar PV



Load Management



Battery Storage



Switching



Controller

MICROGRID EQUIPMENT

ECONOMIC BENEFITS OF BATTERIES

Peak Demand Reduction

- Demand charges: portion of electricity bill based on maximum power demand (kW) during a billing period (30 days)
- Defined by the highest 15-minute demand (kW) interval during a billing period
- Operations and facilities with significant demand charges and the right load profile can reduce their demand (and demand charges) by discharging batteries during peak periods
- This is also referred to as "peak shaving"



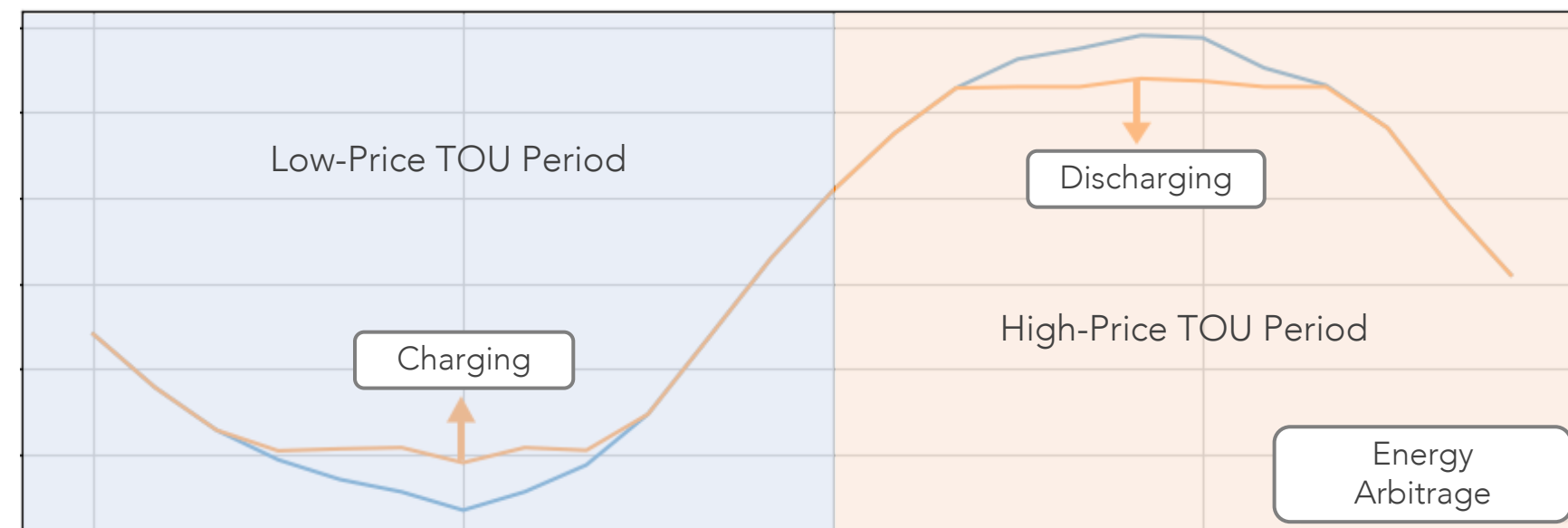
Source: USAID <https://www.usaid.gov/energy/efficiency/basics>

ECONOMIC BENEFITS OF BATTERIES

Energy Arbitrage

- Many rate structures have rate variability based on the time of day (time-of-use rates), and seasonal changes
- Batteries can be charged when rates are at their lowest, and discharged when rates are their highest, thereby reducing energy costs

Example Energy Arbitrage Charge / Discharge Profile



ECONOMIC BENEFITS OF BATTERIES

Grid Services & CCA Programs

Batteries can participate in and earn revenue from various grid services program and be compensated for providing benefits such as:

- Resource Adequacy
- Spinning Reserves

In addition, CCAs are launching innovative program to incentivize the deployment of battery energy storage systems. Examples:



Distributed Resource Adequacy Program

Incentivizing residential & commercial battery projects with resiliency benefits to customers



Solar + Battery Program

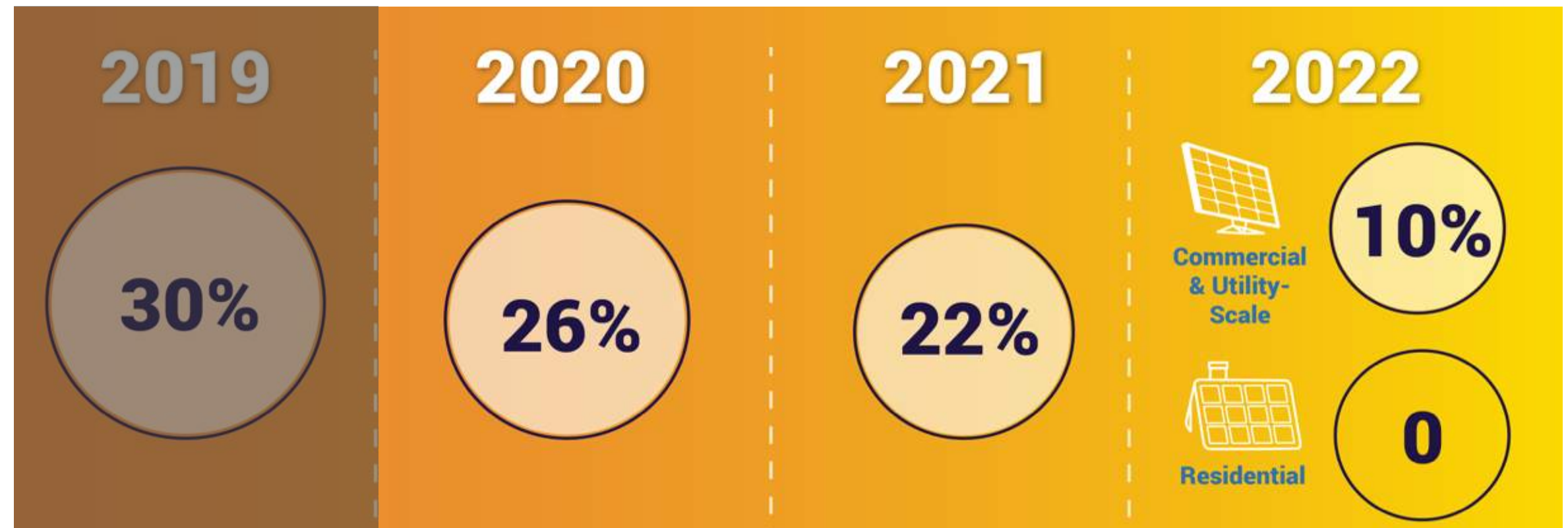
Incentivizing solar & battery projects at municipal and school district facilities

INCENTIVES FOR RESILIENCY PROJECTS



Federal Investment Tax Credit (ITC)

- When new solar PV & battery energy storage are integrated in a single installation, both the solar & the battery energy storage portions of the project can qualify for the ITC
- Currently, adding a battery to existing solar (retrofit) does not qualify
- The ITC is stepping down annually



INCENTIVES FOR RESILIENCY PROJECTS

California Self-Generation Incentive Program (SGIP)

- A long-standing incentive program
- Many recent changes to the program
- SB 700 added \$675M in funding over the next 5 years
- New & increased incentive levels are now available for projects in vulnerable communities, especially at critical facilities



Base & Adder	Residential Base	Large-Scale Base	Resiliency Adder
	\$0.25 / Wh	\$0.35 - \$0.40 / Wh	+ \$0.15 / Wh
Equity	Single Family	Multifamily	Non-Residential
	\$0.85 / Wh	\$0.85 / Wh	\$0.85 / Wh
Equity Resiliency	Residential	Non-Residential	
	\$1 / Wh	\$1 / Wh	

INCENTIVES FOR RESILIENCY PROJECTS

SGIP Budgets For Local Government Projects

Base Incentive	Resiliency Adder	Equity Incentive	Equity Resiliency
\$0.35 – 0.40 / Whr	+ \$0.15 / Whr	\$0.85 / Whr	\$1.00 / Whr
	<ul style="list-style-type: none"> critical facilities located in a HFTD or experienced two or more PSPS events 	<ul style="list-style-type: none"> local gov, schools, non-profits, or small businesses Located in a low-income or disadvantaged community 	<ul style="list-style-type: none"> critical facilities located in a HFTD or experienced two or more PSPS events and servers a low-income or disadvantaged community that is in a HFTD or has experienced two or more PSPS events

INCENTIVES FOR RESILIENCY PROJECTS

SGIP Qualifiers: Critical Facilities

- Police & Fire Stations
- Emergency Response Providers & EOCs
- 911 call centers
- Medical facilities
- Gas, electric, & water facilities
- Jails & prisons
- PSPS, cooling, & homeless shelters
- Grocery stores with annual gross of \$15M or less
- Independent living centers
- Food banks

INCENTIVES FOR RESILIENCY PROJECTS

SGIP Qualifiers: Disadvantaged Communities (DAC)



- census tract that ranks in the statewide top 25% most affected census tracts in the most recently released version of CalEnviroScreen
- or census tracts that score within the highest 5% of CalEnviroScreen's pollution burden

INCENTIVES FOR RESILIENCY PROJECTS

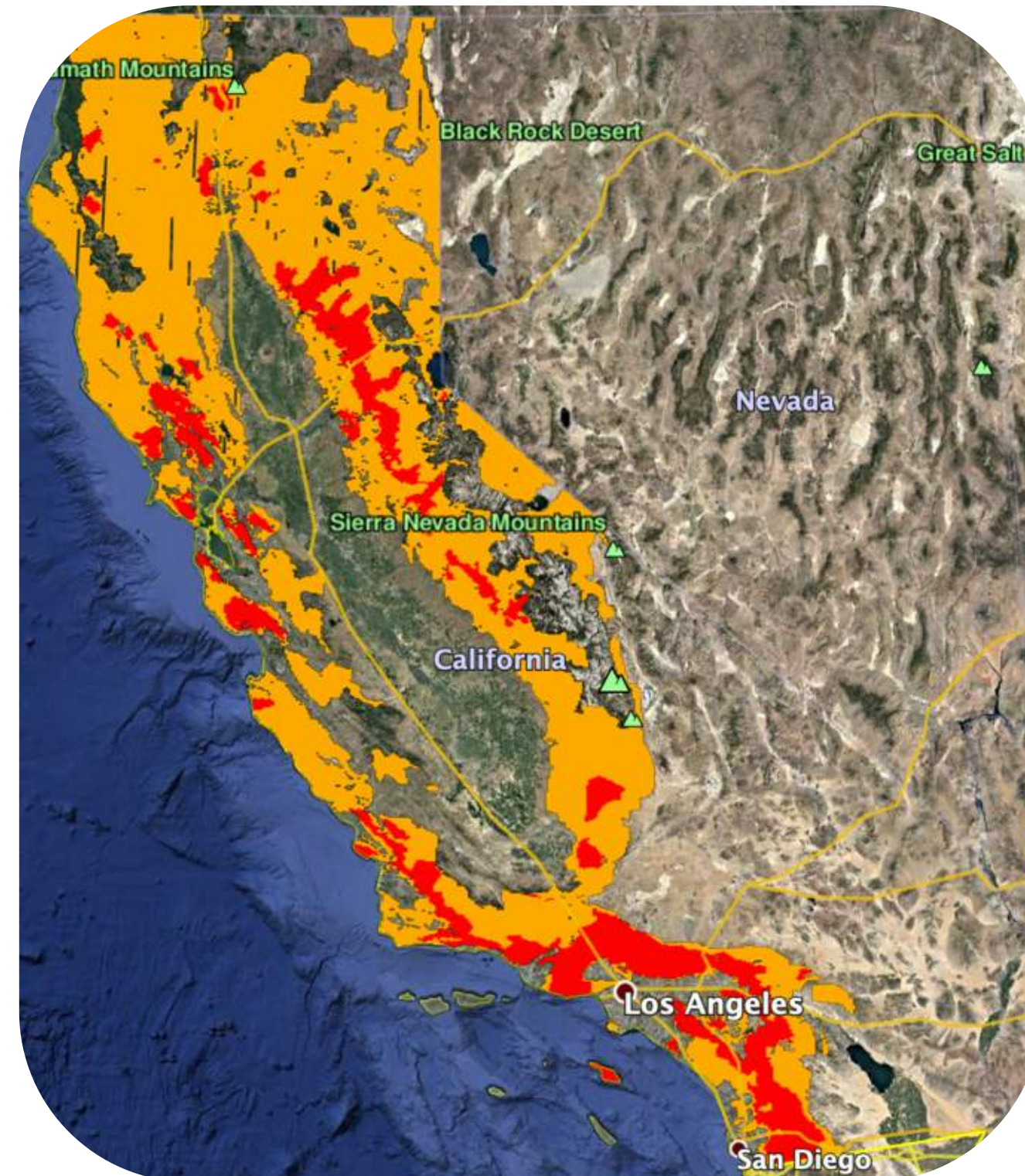
SGIP Qualifiers: Low-Income Communities



- census tracts with median household incomes at or below 80% of the statewide median income
- or with median household incomes at or below the threshold designated as low-income by the Department of Housing and Community Development's list of state income limits adopted pursuant to Section 50093.

INCENTIVES FOR RESILIENCY PROJECTS

SGIP Qualifiers: High Fire Threat District / Impacted by PSPS



- located in a Tier 3 or Tier 2 High Fire Threat District per CPUC
- or were subject to two or more discrete PSPS events prior to the date of application for SGIP incentives

INCENTIVES FOR RESILIENCY PROJECTS

The Latest on the SGIP Non-Residential Equity Budget

- Incentive Level: \$0.85 / Whr
- Eligibility: local or State government, schools, non-profits, or small businesses located in a low-income or disadvantaged community
- Opened on May 12th at the increased level
- Substantially oversubscribed, with no SB 700 allocations to re-supply

	SDG&E	PG&E	SCE	SCG	Total
Available Funding on May 1, 2020	\$8.5M	\$21.5M	\$12.8M	\$5.7M	\$48.5M
Current Status	<i>Oversubscribed, Waitlist (No-Additional Funding Currently Planned)</i>				
Estimated Waitlist Incentive Value	\$120M		\$150M	TBD	\$270M

INCENTIVES FOR RESILIENCY PROJECTS

The Latest on the SGIP Equity Resiliency Budget

- Incentive Level: \$1.00 / Whr
- Eligibility: critical facility located in or serves a low-income community in a High Fire Threat Zone (or has experienced two or more PSPS events)
- Receive \$513M of funding from SB 700
- Opened on May 12th at the increased level of \$1 / Whr

	SDG&E	PG&E	SCE	SCG	Total
Available Funding on May 1, 2020	\$13M	\$44M	\$34M	\$9M	\$100M
Current Status	Waitlist (Awaiting SB 700 funding)			\$2.5M Available (as of 6/2/2020)	-

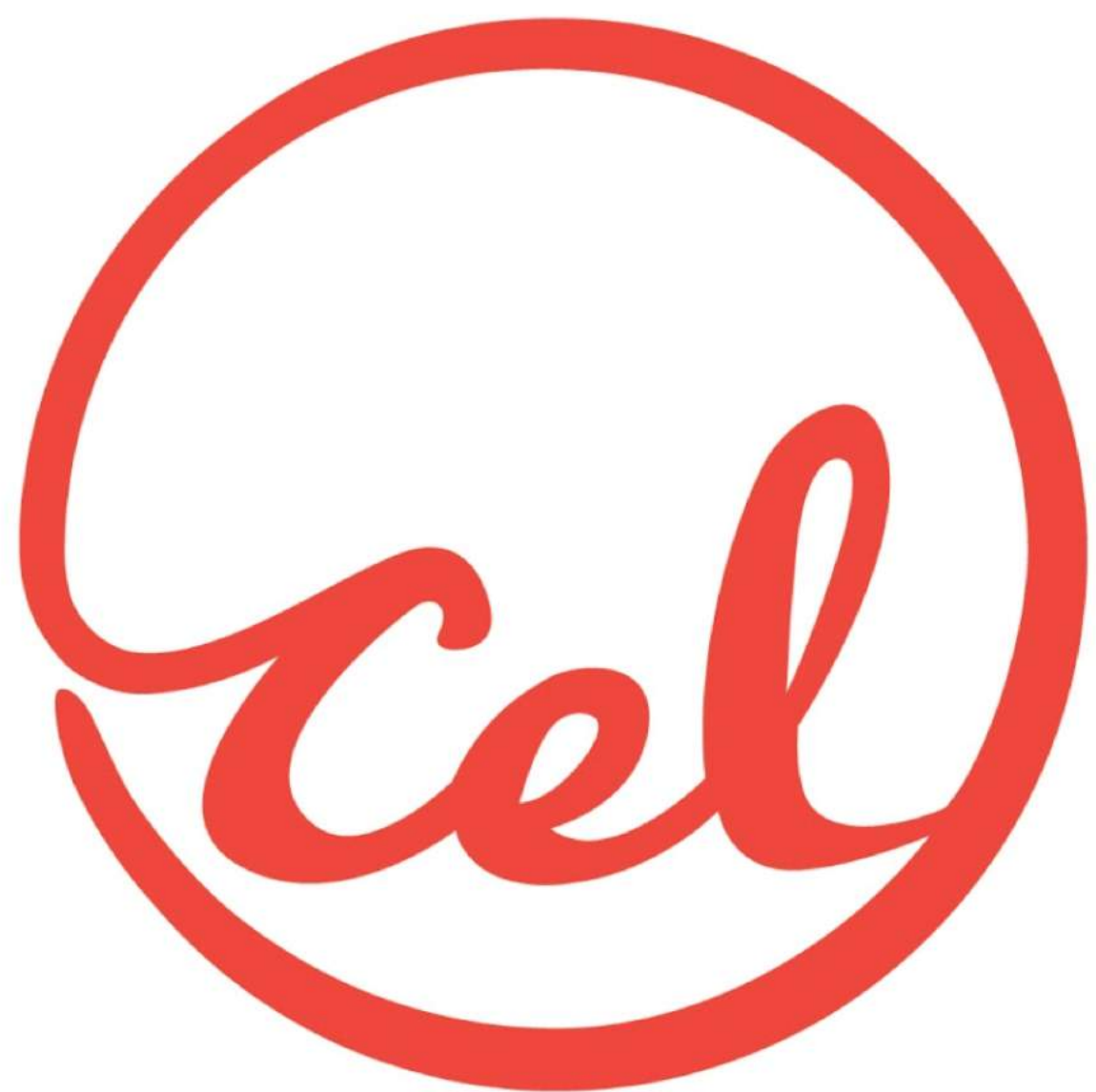


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878

TerraVerde
ENERGY

David Burdick
Executive Vice President
david@terraverde.energy



**COMMUNITY
ENERGY LABS**



Luck is what happens when
preparation meets opportunity.

Seneca

quote fancy

Climate Resilience Planning Now?



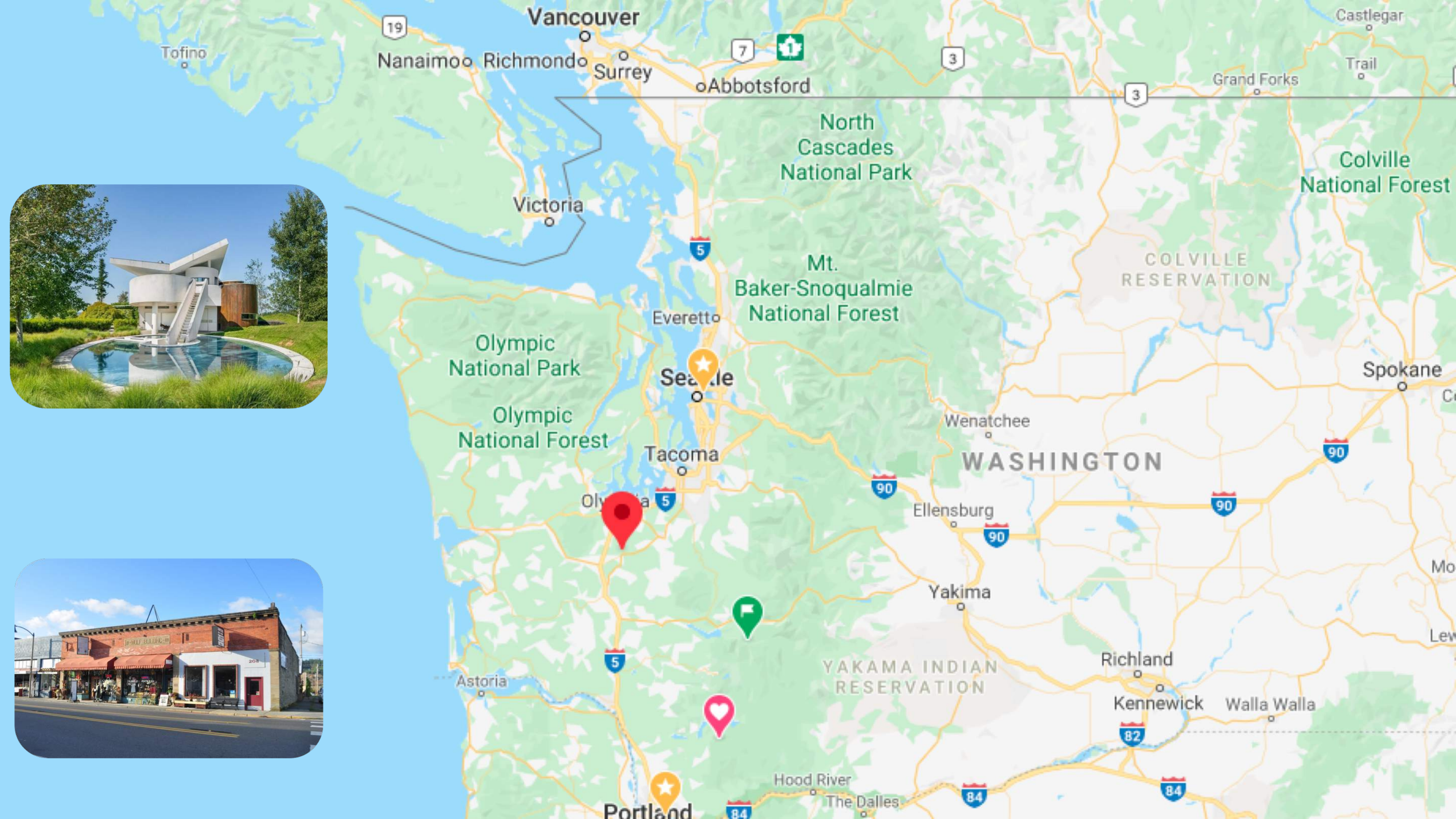
Community Energy and Emergency Planning follows a process.

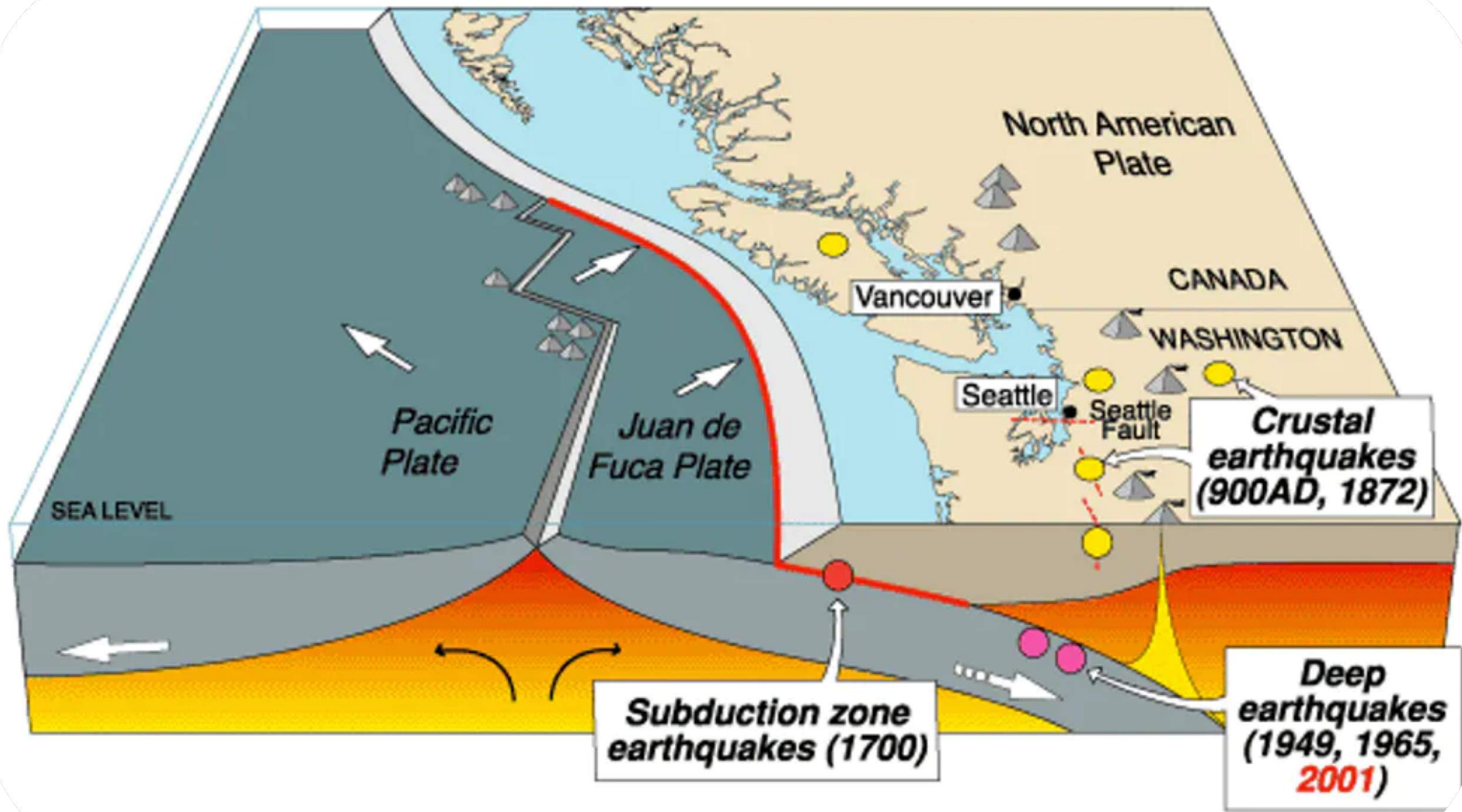
Successfully following this process can also form a bedrock for other types of local planning whether economic, climate resilience, or a combination.



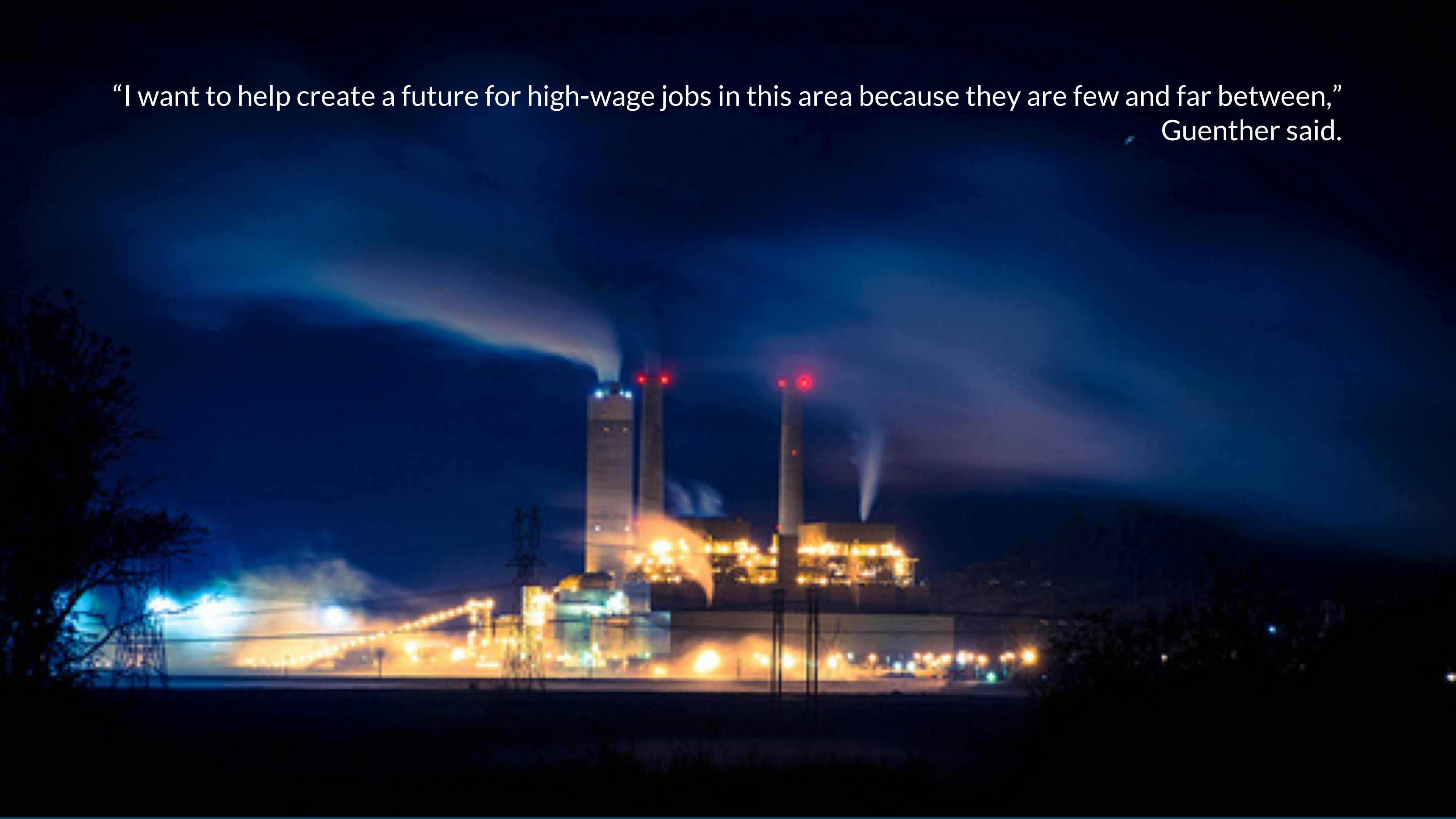
Or climate impact response later?

“2017 wildfire season was one of the worst on record for both Oregon and the nation in terms of total acres burned.”





“I want to help create a future for high-wage jobs in this area because they are few and far between,”
Guenther said.



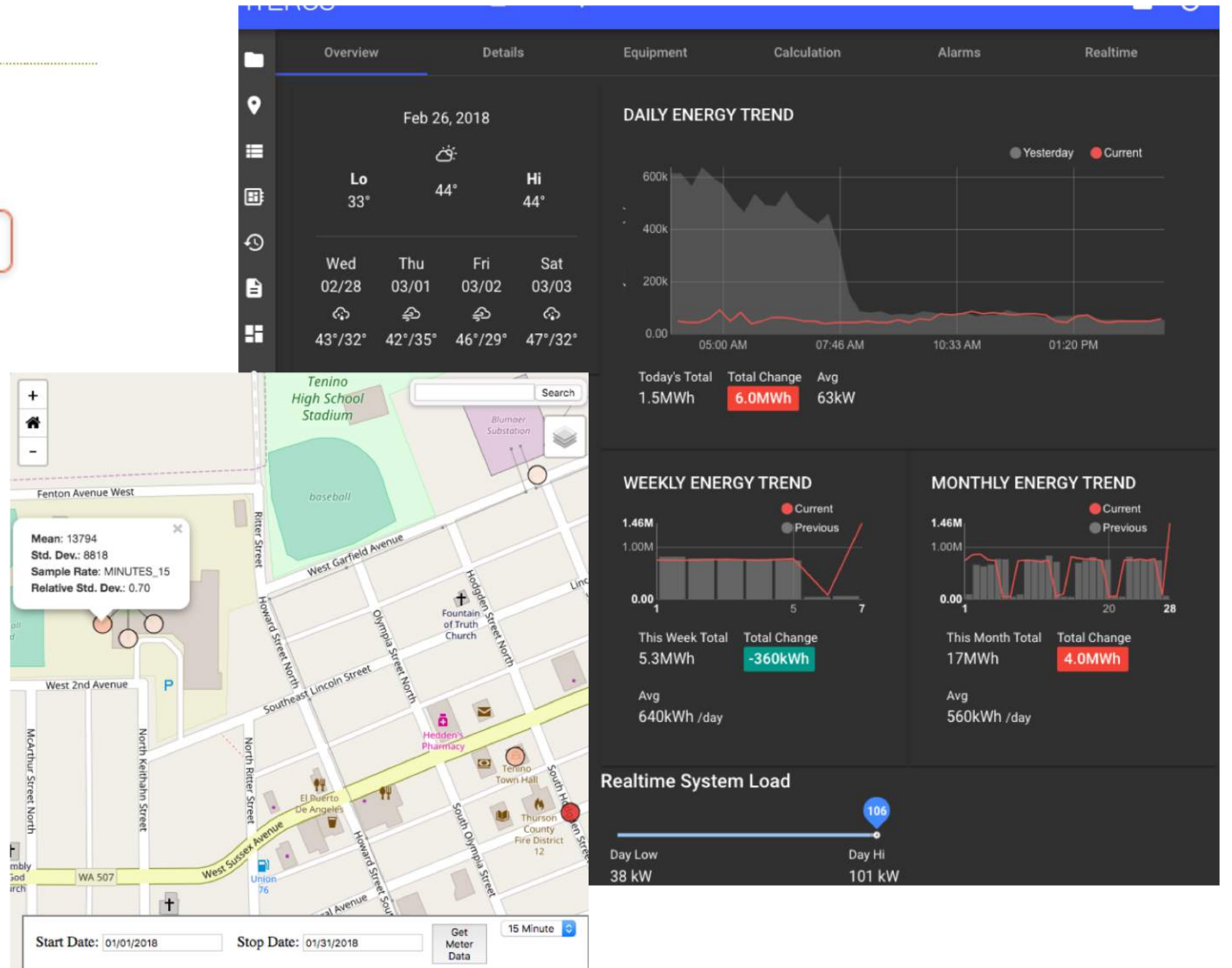
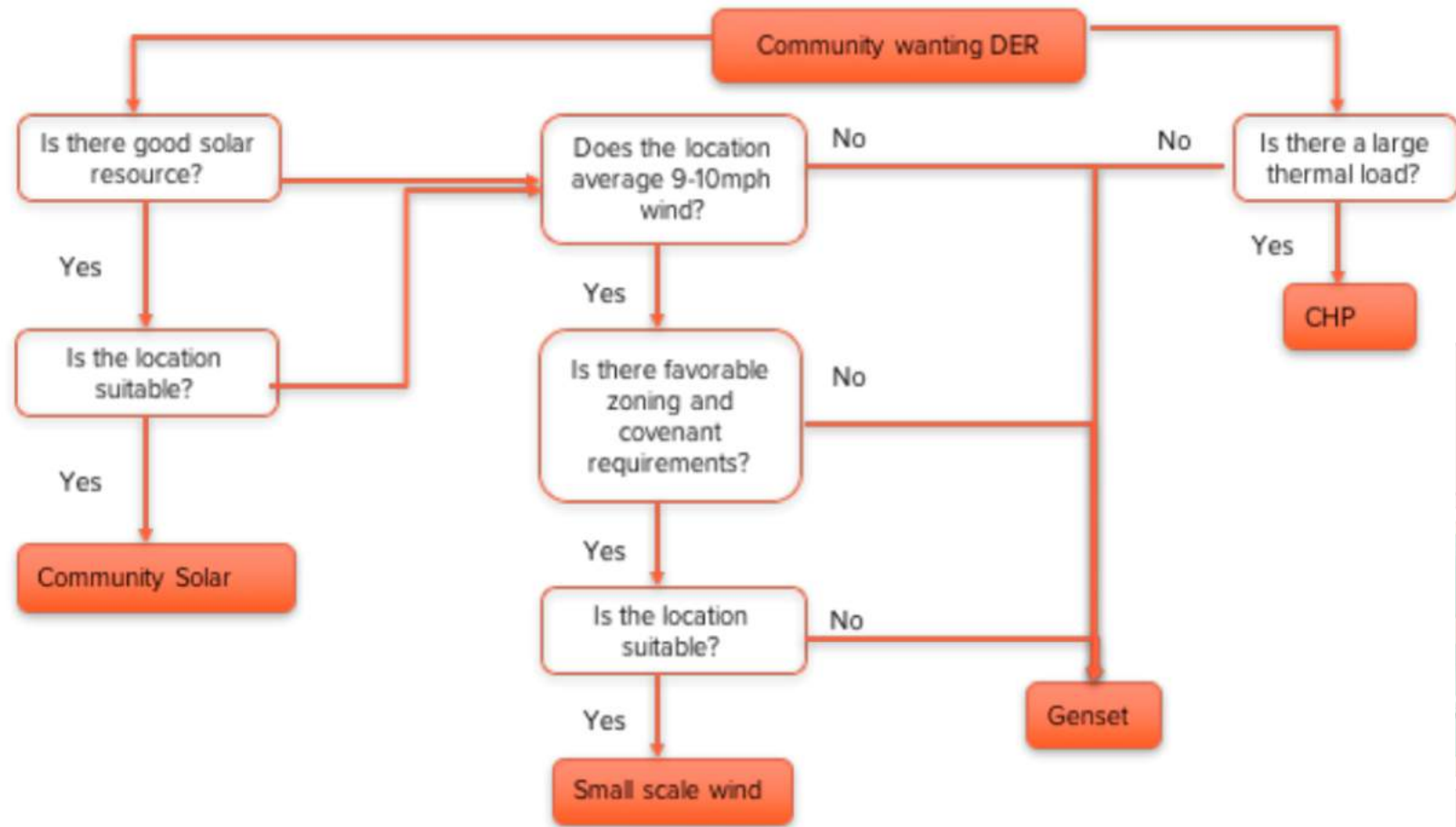
“The name of the game for us is to find these folks who want to collaborate, be innovative and try new things,” said Tenino Mayor Wayne Fournier. Projects like this that are scalable can be tested out and be less expensive in a smaller areas where there can be more control over variables and more of a proving ground for concepts. We’re trying to do things that are different and to our strength, and this has certainly been a good example of that.”



Community Asset mapping & Stakeholder Alignment

March 2017 - June 2018

COMMUNITY DISTRIBUTED GENERATION (DER) DECISION TREE



Community Engagement & Feasibility

July 2018 - March 2019



Community Engagement & Feasibility

July 2018 - March 2019

Grid

Community & Utility Owned
Microgrid

Vocational Training

Community College, Unions
& K-12 District and educators

Living Lab

Community, non-profits,
Industry, researchers



Secure Investment, LOIs 2019-2020



Department of Commerce
Innovation is in our nature.



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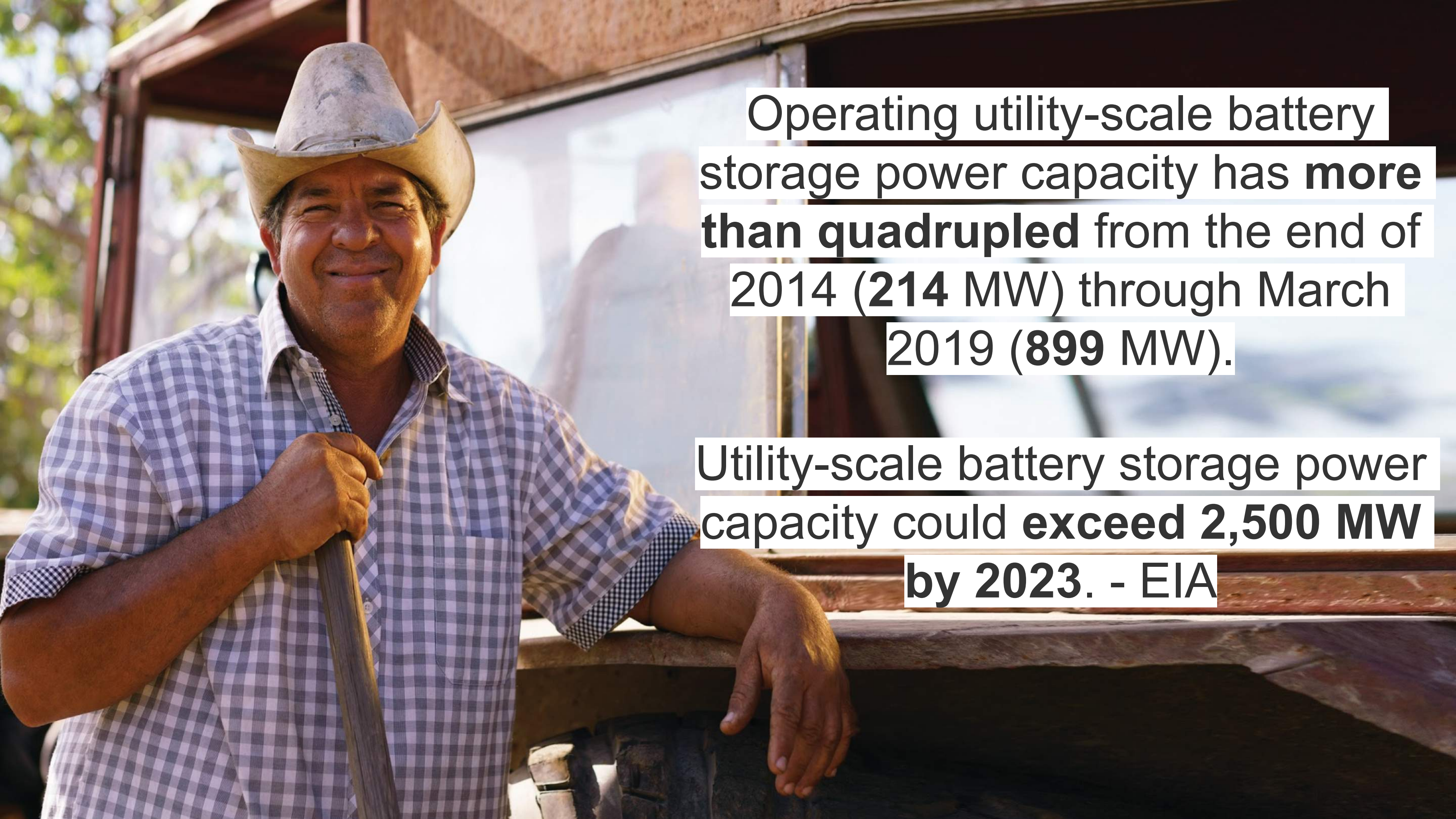
CENTRALIA COAL
Transition Grants

TENINO SCHOOL DISTRICT
Learning Today, Leading Tomorrow



TransAlta





Operating utility-scale battery storage power capacity has **more than quadrupled** from the end of 2014 (**214 MW**) through March 2019 (**899 MW**).

Utility-scale battery storage power capacity could **exceed 2,500 MW** by 2023. - EIA

Climate Resilience Planning Now!



Community Energy and Emergency Planning follows a process.

Successfully following this process can also form a bedrock for other types of local planning whether economic, climate resilience, or a combination.

Community Energy Resiliency: Policy & Regulation in California

Allie Detrio

Chief Strategist, Reimagine Power Inc.

Community Energy Resiliency Summit

June 10, 2020

State of the Capitol & Budget Turmoil

- ◆ **Governor's original proposed budget released January 10th**
 - ◆ Originally estimated \$5 billion surplus
 - ◆ Over \$12 billion allocated towards climate change and resiliency
- ◆ **Governor's May Revise released May 15th**
 - ◆ Bare bones budget – Pandemic decimated main sources of state revenue
 - ◆ Projected budget shortfall estimates vary wildly (\$23-54 billion)
- ◆ **State budget must be passed by June 15th by constitution**
- ◆ **August Revise will be issued – more comprehensive state budget**
- ◆ **Climate and resiliency budget significantly reduced**
- ◆ **\$50 Million for Community Energy Resiliency still included !!**

Pandemic Impacting Policy Priorities

- ◆ SB 1314 (Dodd) – Community Energy Resiliency Act of 2020
- ◆ SB 1240 (Skinner) – Open Access Distribution System Operator
- ◆ SB 947 (Dodd) – Performance Based Regulation
- ◆ AB 3251 (Bauer-Kahn) – DERs and Resource Adequacy (VPP bill)
- ◆ AB 3021 (Ting) – Resilient Schools
- ◆ SB 953 (Wiener) – DER Discriminatory Fees
- ◆ AB 2313 (Eggman) – Bioenergy resources (BioMAT fix bill)
- ◆ SB 1365 (Hertzberg) – Renewable Energy FIT (ReMAT fix bill)
- ◆ AB 2789 (Kalmager) – DER and power outage cost avoidance study
- ◆ SB 917 (Wiener) – NorCal Utilities District (PG&E Municipalization)

Climate & Energy Legislation Still Moving

- ◆ **SB 1215 (Stern) – Microgrids**
 - ◆ Currently in Senate Appropriation
- ◆ **AB 3256 (Garcia, et al) – Wildfire Prevention, Safe Drinking Water, Climate Resilience, Drought Preparation & Flood Protection Bond Act of 2020**
 - ◆ Currently authorizes \$6.8 billion climate and resiliency bond
 - ◆ Passed out of Asm. Appropriations Committee on 6/3 and referred to Rules Committee
- ◆ **SB 1258 (Stern) – California Climate Technology & Infrastructure Financing**
 - ◆ Currently in Senate Appropriations
- ◆ **AB 3163 (Salas) – Biogas definition expansion**
 - ◆ Passed out of Assembly Appropriations Committee on 6/2; Referred to floor
- ◆ **SB 350 (Hill) – Golden State Energy Act**
 - ◆ Currently in Assembly U&E; Pulled on 5/28; Hearing reset for 6/10

Microgrids: The Opportunity to Revolutionize the Power Sector

- ◆ Achieving true resilience and decarbonization will require us to rethink how we modernize our grid and value distributed energy resources.
- ◆ Microgrids necessitate that policymakers rethink the planning, project management and construction process for building a cleaner, safer, resilient, and more technologically advanced grid.
- ◆ Need to encourage policymakers to reimagine the roles of the utility, developers, customers, and the regulatory model that governs the power sector and energy markets.
- ◆ Be bold and forward thinking – embrace and nurture innovation in clean energy technology and market diversity.

Microgrid history lesson

- ◇ 2014 – 2019 – CA Energy Commission issues grants for microgrids
- ◇ SB 1339 (Stern) – 2018
 - ◇ Directs the CPUC to create a standardized interconnection process for microgrids and separate rates and tariffs as necessary to facilitate the commercialization of microgrids by December 2020.
 - ◇ Passed and signed into law September 2018
- ◇ Q4 2018 – Wildfires ravage the state
- ◇ Q1 2019 – PG&E declares bankruptcy
- ◇ Q2-Q4 2019 – PSPS initiated around the state
- ◇ Q4 2019 – Microgrid proceeding gets underway (opens in late Sept)
- ◇ Q1 2020 – Senator Stern authors SB 1215, currently in Assembly Appropriations

California Microgrid Regulation

CPUC Order R.19-09-009 (2019 – 2020) implementation of SB 1339

- ◆ Scoping Ruling issued December 2019
 - ◆ Amended topic to include “and resiliency strategies” to address issues with PSPS
 - ◆ Breaks proceeding into 3 tracks: short, medium, long term solutions
 - ◆ Focus on critical facilities, local government data access, and actions that can be taken before 2020 fire season
- ◆ Track 1 – utility and staff proposals for near-term solutions
 - ◆ Party comments Q1 2020
 - ◆ Proposed Decision issued Q2
 - ◆ Final Decision expected June 11th
- ◆ Track 2 – scoping memo issued hopefully immediately after

California Microgrid Regulation

Track 2

- ◆ Needs to begin immediately to conclude by December 2020
- ◆ Needs to focus on creating microgrid tariffs so all customers, especially critical facilities, can start deploying microgrids
- ◆ Long duration resiliency solutions need to be addressed
- ◆ Should address other barriers to microgrid deployment
 - ◆ Financial barriers like departing load and standby charges
 - ◆ Technical barriers like interconnection of BTM microgrids incorporating multiple technologies that can act as single controllable entity with respect to the grid

Microgrids: The Opportunity to Revolutionize the Power Sector

- ◆ Microgrids are a double-triple bottom line solution to many of our policy priorities, especially community energy resiliency
- ◆ California should boldly lead the way in facilitating the commercialization of a robust and diverse microgrid market as is the statutory intent of the states' legislation
- ◆ Microgrid market development will have the effect of managing the impacts of PSPS, addressing the critical resiliency needs of communities, and advancing our state's climate, equity and sustainability policy goals

Q&A – Thank you!

Allie Detrio

Chief Strategist, Reimagine Power Inc.

Senior Advisor, Microgrid Resources Coalition

allie@reimagine-power.com

Q&A

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Resource Coalition**

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Coalition**



**the
climate
center**



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