

PARTNERSHIP AREA FRAMEWORK

POLICY+INNOVATION COORDINATION GROUP
CALIFORNIA EPIC PROGRAM

DRAFT VERSION 1 | MARCH 16, 2020

PREPARED BY

THE ACCELERATE GROUP

POLICY+INNOVATION COORDINATION GROUP
PROJECT COORDINATOR

DRAFT

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BACKGROUND ON CPUC'S EPIC PROGRAM

Energy research, development, and deployment (RD&D) programs are an essential part of the effort to achieve California's climate and energy policy goals. As California moves toward a clean energy future, the technologies and practices that keep the state's electricity and natural gas systems safe, reliable and affordable must be modernized.

The Electric Program Investment Charge (EPIC) supports the development of new, emerging, and non-commercialized clean energy technologies in California and provides assistance to commercially viable projects. These projects must be designed to produce electricity ratepayer benefits in the form of increased reliability, improved safety, and/or reduced electricity costs. EPIC consists of three program areas: Applied Research and Development (Applied R&D), Technology Demonstration and Deployment (TD&D), and Market Facilitation.

Overseen and monitored by the California Public Utilities Commission (CPUC) and paid for by California ratepayers, EPIC funds are currently administered by four administrators: the California Energy Commission (CEC), which administers 80% of EPIC funds, Pacific Gas and Electric (PG&E), Southern California Edison (SCE), and San Diego Gas & Electric (SDG&E), which together administer the remaining 20% of EPIC funds.

Since 2012, the CPUC has approved approximately \$1.5 billion for EPIC projects.

WHAT IS THE POLICY+INNOVATION COORDINATION GROUP?

In Decisions 18-01-008 and 18-10-052, the CPUC established the Policy + Innovation Coordination Group to increase the alignment of California's Electric Program Investment Charge (EPIC) investments and program execution with California Public Utilities Commission and California energy policy needs through increased coordination among program administrators and between program administrators and the CPUC.

The PICG is dedicated to (1) the technical, complex coordination task of identifying timely opportunities for substantive feedback and coordination among EPIC investments and California's energy innovation needs and goals, and (2) providing the support functions to

allow this feedback and coordination to occur effectively. The PICG does not provide any formal direction or binding guidance to administrators regarding which projects they should fund. Further, this effort is aimed at coordination in the near term, where the CPUC has already approved most projects or project areas.

The PICG is made up of a) the Project Coordinator, b) one representative from each EPIC administrator at the program management/leadership level (i.e. Commissioner and/or Division Director/Deputy for the CEC; senior leadership level with oversight over EPIC and innovation projects for the IOUs), c) CPUC staff and Commissioners.

The Project Coordinator, The Accelerate Group, is primarily responsible for creating an environment for coordination between the CPUC's energy policy and planning needs, and the energy R&D supported by EPIC funding. As the dedicated entity that provides support for improved coordination, the Project Coordinator is organizing and facilitating PICG activities and produce deliverables and activities as described in this Workplan. This arrangement allows members of the group to focus on substantive input and creating meaningful dialogue.

POLICY+INNOVATION COORDINATION GROUP GOALS

In Decision 18-10-052, the California Public Utility Commission established the overarching goal of the PICG: to ensure that EPIC investments are optimally aligned with and informed by key California Public Utilities Commission and California energy innovation needs and goals. Building off of these requirements, the PICG established the group's objectives as follows:

PIPA IDENTIFICATION	TRANSPARENCY	ALIGNMENT	EQUITY
To identify Policy+ Innovation Partnership Areas.	To create transparency of EPIC Program results.	To ensure alignment between policy and projects.	To center equity in process and programs.

POLICY+INNOVATION PARTNERSHIP AREA IDENTIFICATION

WHAT IS A POLICY+INNOVATION PARTNERSHIP AREA?

Policy + Innovation Partnership Areas are “issue areas of common interest and substantive opportunity, around which the PICG will engage in targeted coordination.” The PICG is undergoing a process in the first 6 months of 2020 to identify a set of 3-5 Partnership Areas where targeted coordination can be most effective. PICG members will provide input to this process, and the CPUC and its staff provide direction to the PICG and Project Coordinator. The PICG will use the following criteria to qualify areas to be potential Partnership Areas:



WHERE ARE TIMELY OPPORTUNITIES TO CONNECT RD&D TO POLICY?

These Partnership Areas will be identified as topics in which there is an opportunity for the CPUC to gain insights, lessons learned, and data from ongoing or completed EPIC projects or other RD&D efforts, as part of timely and critical policy-making discussions. For example, does the CPUC have an open proceeding where they are trying to come to a decision in the next year, but need specific data or information to inform the decision.



WHERE CAN ENHANCED COORDINATION ACCELERATE OUTCOMES?

These Partnership Areas will also be identified where there are opportunities for the EPIC program administrators, the California Public Utilities Commission, and other stakeholders to coordinate efforts among various RD&D projects to accelerate innovation or overcome identified obstacles to the state's policy goals. In many cases, projects that may not have obvious connections because of their subject matter may actually be working on overcoming similar obstacles to state energy policy.



WHAT ARE THE MOST CRITICAL CHALLENGES?

Finally, the Partnership Areas will identify topics of critical concern to the CPUC in its policymaking, to signal to the broader research and technology community where challenges lie ahead in meeting state energy policy goals, and more information and innovation is needed.

WHAT WILL THE PICG DO WITH IDENTIFIED POLICY+INNOVATION PARTNERSHIP AREAS?

Once the California Public Utilities Commission has selected the final set of 3-5 Partnership Areas, the PICG will kick-off a set of 3-5 corresponding workstreams for each of the Partnership Areas. The workstreams will be focused on gathering input and lessons learned from EPIC projects and other stakeholders on core policy challenges, encouraging enhanced coordination, supporting knowledge- and results-sharing, and convening public meetings on each topic.

3-5

FINALIZE 3-5 PARTNERSHIP AREAS. JUNE 2020.

The CPUC will finalize the initial Partnership Areas for 2020 per the process outlined below.

ANNOUNCE PARTNERSHIP AREAS AND RECRUIT PARTICIPANTS FOR WORKSTREAMS. JUNE 2020.



The PICG will announce the selection of the 3-5 Partnership Areas for 2020, and provide stakeholders and EPIC projects details on how to get involved in Partnership Area workstreams, the logistics of Partnership Area meetings, and key questions for the Partnership Areas to tackle. Participation in Partnership Areas work will not be limited to current EPIC projects, but are intended to collect insights, lessons learned, community needs, results, and data from key R&D and innovation efforts throughout the community.

OUTREACH TO DISADVANTAGED COMMUNITIES JUNE 2020



As part of the effort to ensure members of disadvantaged communities and representatives of community-based organizations have a voice in the process, the PICG will work to actively recruit leaders from community organization to participate in the PIPA meetings, as well as present the distinct needs and challenges facing their communities. This outreach will be focused on the finalized 3-5 PIPAs and opportunities for alignment, and participation. Outreach will take place in the language and methods most appropriate for the communities being reached.

CONDUCT PARTNERSHIP AREA STAKEHOLDER MEETINGS. SEPTEMBER 2020 - MARCH 2021.

The PICG will organize and facilitate 3-5 individual PIPA meetings, in coordination with project administrators and CPUC Energy Division staff, to allow for program partners and stakeholders to provide input on program priorities, discuss opportunities for coordination and collaboration on goals, metrics, strategies, and needs. The meetings will be organized by the Project Coordinator and be held in diverse geographic areas of the state if possible, and appeal to local feedback as much as possible while maintaining the goal of aligning stakeholders around the PIPA outcomes.



CONDUCT AN ANNUAL POLICY + INNOVATION FORUM NOVEMBER 2020

The PICG will host an annual Policy + Innovation Forum, the first in November 2020, and a second one in September 2021. The Project Coordinator will coordinate the Forum. This Forum will be designed to allow for the PICG to present the work to date on PIPAs and database design to stakeholders and community members. The meetings will recruit participants from all areas of the state. It is projected that this annual forum will last for at least one half-day but may involve multiple “tracks.”



EPIC PROJECT TRANSPARENCY AND DATA.

The PICG will work alongside its public stakeholder efforts to also support the enhancement of EPIC project data transparency, figuring out the best way to pull project lessons learned, data, and results from all project administrators into a single location. This will involve coordination with the California Energy Commission’s existing Energy Innovation Showcase tool. The data transparency effort will allow for interested parties to find EPIC project information relevant to the selected Partnership Areas, or other organized challenges and obstacles.



HOW IS THE CPUC IDENTIFYING POLICY+INNOVATION PARTNERSHIP AREAS?

The identification of Partnership Areas is following a three-part approach.

1

DEVELOPING THE PARTNERSHIP AREA FRAMEWORK.

First, the Project Coordinator has been working to compile an initial assessment of the obstacles and challenges to meeting the state's energy policy goals, gathering input from statutes, regulatory proceedings, executive orders, reports, workshops, studies, and interviews. Interviews have included staff and Commissioners from the California Public Utilities Commission, staff and Commissioners from the California Energy Commission, and the utility PICG members Pacific Gas & Electric, Southern California Edison, and San Diego Gas & Electric. The initial results of this research and assessment are included in this document.

MARCH 23
2020

2

MAP EPIC PROJECTS ONTO OBSTACLES AND CHALLENGES IN PARTNERSHIP AREA FRAMEWORK.

Once the Partnership Area Framework is completed, the Project Coordinator, with the input of the EPIC Program Administrators, will identify where clusters of EPIC RD&D projects may be working on the same, similar, or related obstacles and challenges. The key focus for mapping projects will not necessarily be limited to the subject matter of the project, but instead be focused on identifying where lessons learned or data from a project can inform policy work around an obstacle or challenge to a state policy goal and related efforts. If a project is mapped to an obstacle or challenge in the Partnership Area Framework, it is not bound or restricted to only that area, and will be able to participate in activities around whichever the Partnership Area they feel is appropriate.

APRIL
2020

3

IDENTIFY POSSIBLE PARTNERSHIP AREAS.

With the mapping of EPIC projects onto the Partnership Area Framework, the Project Coordinator will present an initial set of Possible Partnership Areas to the PICG, identifying where there are significant opportunities for coordination among EPIC projects working on the same, similar, or related obstacles, and/or where input into California Public Utilities Commission proceedings or other energy policy issues would be timely and relevant. This will include a description of ongoing or upcoming proceedings, challenges or obstacles being addressed in the proceedings or other state policy deliberations, and how they map to the Partnership Area Framework as well. While there will be a preference toward identifying Partnership Areas where there is an upcoming policy decision, possible Partnership Areas may be identified where there is no CPUC proceeding ongoing or anticipated in 2020 or 2021. The initial set of possible Partnership Areas is expected to be between 5-10 topics.

APRIL 15
2020

4

NARROW PARTNERSHIP AREAS INTO TO 3-5 FOR 2020.

The PICG, including CPUC Commissioners and staff, CEC Commissioners and staff, and the utility EPIC Program Administrators will review the initial set of 5-10 possible Partnership Areas, and discuss which topics would be the most “ripe” and “timely” to engage on for the remainder of calendar year 2020. The recommendations from the PICG members will be provided to the CPUC Energy Division. Based on recommendations from the PICG members, CPUC Energy Division will select the final 3-5 Partnership Areas for 2020.

JUNE
2020

WILL THE CPUC UPDATE POLICY+INNOVATION PARTNERSHIP AREAS?

After launching the Policy+Innovation Partnership Areas in June 2020, and leading public engagement events around each of the topics, the California Public Utilities Commission will have a chance to consider alternative Partnership Areas for 2021 at an end-of-year forum to be held in late Fall 2020. The forum will review the work of the PICG over the previous calendar year, discuss critical and timely topics with EPIC project leaders and other stakeholders, and consider opportunities for further coordination and alternative Partnership Areas for 2021. Partnership Areas for 2021 may stay the same, be added, subtracted, or altered, at this time.

NOVEMBER
2020

PARTNERSHIP AREA FRAMEWORK [DRAFT]

The PICG Project Coordinator compiled an initial assessment of the obstacles and challenges to meeting the state's energy policy goals, gathering input from statutes, regulatory proceedings, executive orders, reports, workshops, studies, and interviews. The results of that assessment are organized in the enclosed Partnership Area Framework, an outline of technology, market, and policy challenges to meeting the state's core policy goals.

The Partnership Area Framework will be a tool to help the PICG Project Coordinator outline and identify key policy goals, strategies, and obstacles, or combinations thereof, that would be ripe for identification of Partnership Areas.

The Partnership Area framework is intended to present a wholistic view of California's energy policy goals as well as the specific policy strategies which can impact those goals and the obstacles or challenges to the identified strategies. This visualization will help the Policy+Innovation Coordination Group more easily identify obstacles and strategies that are critical, timely, and results can be enhanced by improved coordination.

STRUCTURE

The Partnership Area Framework is organized into three main layers of California energy policy:

GOALS

The topline goals and objectives of California energy policy as determined by statute, executive order, agency rules, commission decisions, or other policy declaration. For the purposes of this framework, it is important to simplify these overarching goals into a small set of core headlines, under which many strategies may fall. These are the general high-level objectives that are pursued through state policymaking, whereas there may be many strategies that are employed and balanced to achieve these goals and results. In the case of California, these overarching goals have been summarized as follows:

EMISSIONS REDUCTION

AFFORDABILITY

SAFETY

RELIABILITY/RESILIENCY

EQUITY

STRATEGIES

The next layer of the Partnership Area Framework, underneath the overall goals, are the specific policy strategies – the pathways California is employing to reach the top level policy outcomes. These strategies typically change in magnitude and preference overtime, compared to goals that are generally consisted through the years. These strategies will typically have their own objective established in state policy (such as a percentage of renewables under a Renewable Portfolio Standard, or a goal of achieving a certain number of zero-emission vehicles on the road). As well, strategies themselves serve as high-level topics, encompassing dozens of underlying issues and efforts. This Partnership Area framework has outlined 30 strategies generally corresponding with one or more of the overall identified goals. This delineation effort is designed not to come up with new strategies for the state to pursue, but to reflect the current strategies already identified or being pursued under California energy policy.

OBSTACLES AND CHALLENGES

The primary work under the Policy+Innovation Partnership Area Identification Process is to leverage the expertise of the PICG members to identify challenges and obstacles to achieving the state's energy policy strategies in the coming years, and to find areas where EPIC projects can provide lessons learned, data, results, or other input into policy-making efforts as the state seeks to overcome those challenges and obstacles in meeting its goals. The Project Coordinator, with input from the background research and interviews, has compiled a list of more than 200 identified obstacles and challenges, organized by strategy and goal they are potentially standing in the way of. The list of obstacles can be found under the individual strategy pages of the Partnership Area Framework.

The obstacles and challenges that have been identified represent technology, market, or policy issues that threaten to impact achievement of the state's strategies and policy goals. The identification of obstacles and challenges allow for the PICG to observe consistent challenges faced even if projects are not working on the same technology area.

SOLUTIONS AND STRATEGIES (NOT LISTED).

As part of the next step in this process, the Project Coordinator will work with EPIC Program Administrators to identify existing, completed, or proposed EPIC projects or other RD&D efforts that are aligned around each or any of the obstacles and challenges. This organization will allow the PICG to identify opportunities for enhanced coordination. Further, when the list of Partnership Areas is finalized by the California Public Utilities Commission, each Partnership Area will be matched to EPIC and other projects working to accelerate technology, market, or policy solutions to those challenges.

REGULATORY ASSESSMENT AND BACKGROUND MATERIALS

The Project Coordinator solicited input from PICG members on state policies, proceedings, or reports that could serve to identify state energy policy goals, strategies and obstacles. The Project Coordinator team conducted 13 one-on-one and group interviews with CPUC and CEC Commissioners and staff, as well as the utility program administrators, and reviewed more than 40 separate statutes, decisions, proceedings, submissions, and other documents to compile the Partnership Area Framework.

Note: Feedback from individual and group interviews has been aggregated so it is not attributed to any individual participant.

This regulatory assessment is a living document, and will grow over time and provide additional input into the Partnership Area Framework throughout the course of the project, and provide a sustaining source of policy organization even after the project has been completed. Once an initial framework is completed, it will be updated on at least a quarterly basis.

The index # in the first column of the list can be found next to each obstacle or challenge in the Partnership Area Framework where the source material was used to inform the addition of a strategy, obstacle or challenge.

PARTNERSHIP AREA FRAMEWORK: SOURCE INDEX

#	Source	Description
1	CEC Vice Chair Scott Interview	The Project Coordinator conducted a one-on-one interview with CEC Vice Chair Scott.
2	CPUC Commissioner Guzman Aceves Interview	The Project Coordinator conducted a one-on-one interview with CPUC Commissioner Guzman Aceves and staff.
3	CPUC Commissioner Shiroma Interview	The Project Coordinator conducted a one-on-one interview with CPUC Commissioner Shiroma and staff.
4	CPUC Commissioner Randolph Interview	The Project Coordinator conducted a one-on-one interview with CPUC Commissioner Randolph and staff.
5	CPUC Commissioner Rechtschaffen Interview	The Project Coordinator conducted a one-on-one interview with CPUC Commissioner Rechtschaffen and staff.

#	Source	Description
I	CEC Deputy Director ten Hope Interview	The Project Coordinator conducted a one-on-one interview with CEC Energy R&D Division Deputy Director Laurie ten Hope.
I	CPUC Energy Division Interview	The Project Coordinator conducted group interviews with representatives from the the CPUC Energy division working on transportation electrification, energy efficiency, renewable energy development, demand response, microgrids, resource planning, energy storage, and system planning.
I	CPUC Safety Policy Division Interview	The Project Coordinator conducted a group interview with representatives from the CPUC Safety Policy Division.
I	CPUC Wildfire Safety Division Interview	The Project Coordinator conducted a group interview with representatives from the CPUC Wildfire Safety Division.
I	CPUC Energy Division Interview	The Project Coordinator conducted a small group interview with the CPUC Procurement Strategy and Oversight Division.
I	PG&E Interview	The Project Coordinator conducted a one-on-one interview with PG&E's EPIC program manager, and representatives from its engineering, procurement, regulatory and emerging technologies teams.
I	SCE Interview	The Project Coordinator conducted a one-on-one interview with SCE's EPIC program manager, and representatives from its engineering team.
I	SDG&E Interview	The Project Coordinator conducted a one-on-one interview with SDG&E's EPIC program manager, and representatives from its distribution engineering and regulatory teams.
1	SB100	Established a renewable electricity goal of 60 percent by 2030 and codified the state's commitment to developing a carbon-free electricity sector by 2045
2	SB1339	Requires the CEC, CPUC, and CAISO to help transition microgrids from a promising emerging technology solution to a commercial product that helps California meet its energy goals
3	AB739	Sets a goal of reaching 1.5 million zero emission vehicles by 2025.
4	AB758	Requires strategies that increase energy efficiency, and achieve a statewide doubling of energy efficiency savings from electricity and natural gas end uses by 2030.

#	Source	Description
5	SB901	Requires electrical corporation under the CPUC's jurisdiction to submit annual wildfire Mitigation Plans
6	SB350	Integrated resources plans outline how load-serving entities, including investor- and publicly owned utilities, community choice aggregators, and private electricity suppliers, will meet demand reliably and cost-effectively while achieving state policy goals and mandates. Includes goals around transportation electrification, energy efficiency, renewables procurement, and consideration of disadvantaged communities.
7	SB3232	CEC must assess the feasibility of reducing GHG emissions in residential and commercial buildings 40 percent below 1990 levels by January 1, 2030.
8	AB523	Sets a goal for CEC's EPIC projects, requiring more than 25% of the technology demonstration and deployment funds to be allocated to projects in and benefitting disadvantaged communities, and at least 10 percent allocated to projects in and benefitting low-income communities
9	AB111	This bill creates the Wildfire Safety Division, which will appoint an administrator to oversee the Wildfire Fund. The Wildfire Safety Division is to take actions related to wildfire safety and overseeing the implementation of each utilities wildfire mitigation plans.
10	SB32	Set a statewide goal of reducing California's GHG emission 40 percent 1990 levels by 2030 with a focus on disadvantaged communities.
11	AB197	Required state's climate change policies and GHG emissions be transparent.
12	SB1477	Creates incentive programs to enable greater penetration of building decarbonization technologies and new building near zero or zero emissions construction. The legislation further incentivizes solutions for low income and disadvantaged consumers
13	AB2127	Requires CEC to assess the number and type of charging infrastructure necessary for California to meet its goal of 5 million ZEVs by 2030. The first assessment is expected at the end of 2020.

DRAFT

#	Source	Description
14	AB615	Report on the Impact of the Clean Vehicle Rebate Project on California's Zero Emissions Vehicle Market.
15	SB92	Report on VW Settlement
16	Executive Order B-55-18	Established statewide goal of achieving carbon neutrality as soon as possible, but no later than 2045
17	Executive Order N-19-19	Required the state to redouble efforts to reduce GHG emissions, specifically highlighting the need to reduce increased fuel consumption in the transportation sector including by reducing vehicle miles travelled and accelerating progress toward zero-emission vehicles.
18	Rulemaking 15-03-011	This rulemaking refines the Decisions establishing the Energy Storage Procurement Frameworks and Program for the three IOUs and includes recommendations from the California Energy Storage Roadmap, CEC and Cal ISO.
19	17-BSTD-02	Building Standards requiring new homes to include solar.
20	A19-04-026	Application requesting approval of the Research Administration Plan for the California EPIC Program.
21	R19-10-005	Order Instituting Rulemaking to consider renewal of the California EPIC Program.
22	19-12-042	Each year, electric utilities and other entities serving electric customers file their RPS Procurement Plans for Commission review and approval in accordance with Public Utilities Code Section 399.13(a)(1)
23	R18-12-005	In this proceeding, the Commission intends to use recent events to inform any revisions to existing guidelines in advance of the 2020 wildfire season in order to better promote and protect the public safety.
24	D18-05-041	This decision approves the energy efficiency business plans of eight program administrators, including: PG&E, SDG&E, SCG, SCE, BayREN, SoCalREN, Tri-County REN, and Marin Clean Energy.

#	Source	Description
25	D17-09-025	This decision adopts energy savings goals for ratepayer-funded energy efficiency program portfolios for 2018-2030.
26	D19-10-056	This decision imposes a non-bypassable charge on the ratepayers of California's large electrical corporations in order to support California's new Wildfire Fund.
27	R15-03-011	This rulemaking refines the Decisions establishing the Energy Storage Procurement Frameworks and Program for the three IOUs and includes recommendations from the California Energy Storage Roadmap, CEC and Cal ISO.
28	18-ALT-01	The investment plan set out by the CEC for the Clean Transportation program allocates funding for the 2019-2020 fiscal year. The program prioritizes funding which aligns with the states ZEV
29	CPUC Draft Transportation Electrification Framework	The TEF establishes a new process for California's IOUs to develop 10-year strategic investment plans to support TE infrastructure. The IOUs' holistic TE plans will focus IOU programs on investments with the highest value for meeting State TE goals while also supporting other State regulatory priorities.
30	CAISO VGI Roadmap	This Vehicle-Grid Integration (VGI) Roadmap accomplishes one of the ZEV Action Plan activities—mapping a way to develop solutions that enable electric vehicles (EV) to provide grid services while still meeting consumer driving needs.
31	SCE Wildfire Mitigation Plan	Southern California Edison Company 2020 - 2022 Wildfire Mitigation Plan is its second comprehensive plan to mitigate wildfire risks and improve public safety.
32	PG&E Wildfire Mitigation Plan	Pacific Gas and Electric Company (PG&E) updates to the 2020 Wildfire Mitigation Plan (2020 WMP), filed February 7, 2020.
33	SDG&E Wildfire Mitigation Plan	San Diego Gas & Electric Company Wildfire Mitigation Plan outlines the work the utility will do over the next three years to prevent and mitigate the risk of wildfires on the electric utilities grid as well as the impacts those fires can have on its customers
34	19-IEPR-01	The 2019 Integrated Energy Policy Report is CECs assessment of several energy issues facing California and are directly tied to many of the California energy policy goals. This report also presents the states new 10 year forecast for electricity and natural gas use as well as transportation fuels.

#	Source	Description
35	19-IEPR-07 Workshop Study - Reliability	Debra Lew LLC presentation at the IEPR Workshop in September 2019.
36	19-IEPR-07 Workshop Study - Flexibility	The Energy Futures Initiative presentation titled Optionality, Flexibility & Innovation: Pathways for Deep Decarbonization in California presented at the IERP workshop on September 24, 2019.
37	19-IEPR-07 Workshop Study - Decarbonization	E3's 2018 study "Deep Decarbonization in a High Renewables Future" was presented as part of the California Energy Commission's IEPR Workshop on Near-Zero Carbon Electricity on September 24, 2019.
38	CAISO briefing on post-operational outlook	CAISO briefing on post-operational outlook
39	Resource Adequacy Market Report	California Public Utilities Commission (CPUC) Decision 19-02-022 directed Energy Division staff to prepare two reports that would provide "reasonable insight about the current and future state of the Resource Adequacy (RA) market" in order to assist parties as they developed proposals for a central buyer of local RA.
40	CPUC Natural Gas R&D Program	CEC's plan proposes allocation of 24\$ million for natural gas research initiatives in energy efficiency, renewable energy, energy infrastructure and natural gas safety and integrity.
41	ZEV Action Plan	The action plan outlines important actions the state must take to reach California's transportation electrification goals set in EO B18-48-.
42	Resiliency EPIC Forum	EPIC Forum at Long Beach Convention Center on Wildfires and Resiliency.
43	CPUC Microgrid Workshop	CPUC Energy Division hosted public webinars on short-term actions to accelerate the deployment of microgrids and related resiliency solutions and to improve understanding of the staff and IOU proposals in order to inform parties' comments on the proposals and build a sound record on which to base a decision.
44	CARB 2017 Scoping Plan	Highlighted the importance of transitioning to zero emission cars, trucks, buses, and equipment, while increasing the use of clean, low carbon fuels where zero-emission options are not yet available.

PARTNERSHIP AREA PRIORITIZATION [DRAFT]

With the mapping of EPIC projects onto the Partnership Area Framework, the Project Coordinator will present an initial set of Possible Partnership Areas to the PICG, identifying where there are significant opportunities for coordination among EPIC projects working on the same, similar, or related obstacles, and/or where input into California Public Utilities Commission proceedings or other energy policy issues would be timely and relevant.

The PICG, including CPUC Commissioners and staff, CEC Commissioners and staff, and the utility EPIC Program Administrators will review the initial set of 5-10 possible Partnership Areas, and discuss which topics would be the most “ripe” and “timely” to engage on for the remainder of calendar year 2020. The recommendations from the PICG members will be provided to the CPUC Energy Division. Based on recommendations from the PICG members, CPUC Energy Division will select the final 3-5 Partnership Areas for 2020.

The Project Coordinator has put together the proposed Partnership Area Prioritization rubric, based on input from PICG members, CPUC Commissioners and staff, to help narrow and identify the possible universe of partnership areas into ones that are the most timely, critical, and where coordination can accelerate outcomes.

PICG members will be asked to provide additional input into this rubric prior to the selection of initial PIPAs.

DRAFT PARTNERSHIP AREA PRIORITIZATION RUBRIC



WHERE ARE TIMELY OPPORTUNITIES TO CONNECT RD&D TO POLICY?

- ★ ★ ★ There are open proceedings or near-term policy decisions which need to be made
- ★ ★ ★ There are challenges or obstacles which prohibit or drive future planning
- ★ ★ ★ Prioritization on current EPIC projects



WHERE CAN ENHANCED COORDINATION ACCELERATE OUTCOMES?

- ★ ★ ★ There are current ongoing efforts from at least one administrator (and possibly other stakeholders/researchers outside of EPIC)
- ★ ★ ★ The coordination brings together stakeholders with different areas of focus and expertise
- ★ ★ ★ Combined efforts create greater transparency



WHAT ARE THE MOST CRITICAL CHALLENGES?

- ★ ★ ★ California has identified an energy policy goal and associated strategies
- ★ ★ ★ California and CPUC do not currently have complete answers to ongoing policy questions
- ★ ★ ★ The magnitude of impact of overcoming the challenge is significant
- ★ ★ ★ Solutions to challenges are equitable with a focus on DACs and Low-Income residents

PARTNERSHIP AREA FRAMEWORK

Inputs from the review of relevant legislation, regulatory proceedings, reports, workshops, participant interviews, as well as other source material, identified three dozen core strategies aligned with meeting California's Pollution Reduction, Affordability, safety, Reliability/Resiliency, and Equity goals.

Strategies were organized to be a top-level category of an issue, but may contain many more sub-categories of topics. For example, Renewable Energy Development itself would likely have sub-categories by technology type, as well as by type of issue related to significant deployment of renewable energy.

Some obstacles and challenges may be overcome by other strategies on the list, even if listed separately.

Granular or highly-specific technology or other approaches are generally classified as solutions, and will be mapped to the obstacle they are trying to overcome.

STRATEGIES

GOALS

EMISSIONS REDUCTION

RE RENEWABLE ENERGY DEVELOPMENT

EV TRANSPORTATION ELECTRIFICATION

H HYDROGEN

BE BUILDING ELECTRIFICATION

EE ENERGY EFFICIENCY

LC LOW-CARBON FUELS

CO OTHER ZERO-EMISSION GENERATION

California has established an ambitious goal to achieve 100% decarbonization by the year 2045. Complementary to that broad goal, there exist several identified strategies or pathways to achieve that goal, including a Renewable Portfolio Standard, a Zero-Emission Vehicle goal, and several sector-specific targets.

AFFORDABILITY

IP INTEGRATED RESOURCE PLANNING

DM DEMAND-SIDE MANAGEMENT

SC SYSTEM COST REDUCTION

RD RATES AND RATE DESIGN

ME METRICS

UB UTILITY BUSINESS MODEL / INCENTIVES

The California Public Utilities Commission has an obligation to ensure that rates are just and reasonable. The Commission is currently working to establish a clearer definition of what is "affordable," particularly for essential utility service, as it may have different impacts to different customers.

PARTNERSHIP AREA FRAMEWORK

SAFETY

- WF WILDFIRE MITIGATION
- WT WORKER TRAINING
- PS PUBLIC SAFETY POWER SHUTOFFS
- CS CYBERSECURITY
- VM VEGETATION MANAGEMENT
- LC LIFECYCLE IMPACTS OF ELECTRICITY PRGS

Californians rely on utility services for full participation in society. The California Public Utilities Commission works to secure health and safety, with a goal of achieving zero accidents and injuries across its regulated entities, and works to prevent adverse public safety impacts that may arise from the electric system.

RELIABILITY/RESILIENCY

- MG MICROGRID DEVELOPMENT
- ES ENERGY STORAGE
- FR FAULT DETECTION AND RESTORATION
- RA RESOURCE ADEQUACY
- DB DAILY BALANCING
- GM GRID MODERNIZATION
- DP DISTRIBUTION RESOURCE PLANNING
- FB FOREST BIOMASS
- CA CLIMATE ADAPTATION

The California Public Utilities Commission works to assure an adequate supply of electricity, and assure the quality of electric service. Further, the California Public Utilities Commission works to assure that utility systems are resilient and capable of recovering from adverse events.

EQUITY

- IC INCLUSIVE ENERGY PROGRAM DESIGN
- WB WEALTH-BUILDING AND OWNERSHIP
- WD WORKFORCE DEVELOPMENT
- PO PUBLIC OUTREACH AND EDUCATION
- EA ENERGY BILL ASSISTANCE
- CI CLIMATE IMPACTS MITIGATION
- UC UTILITY CUSTOMER COMMUNICATION

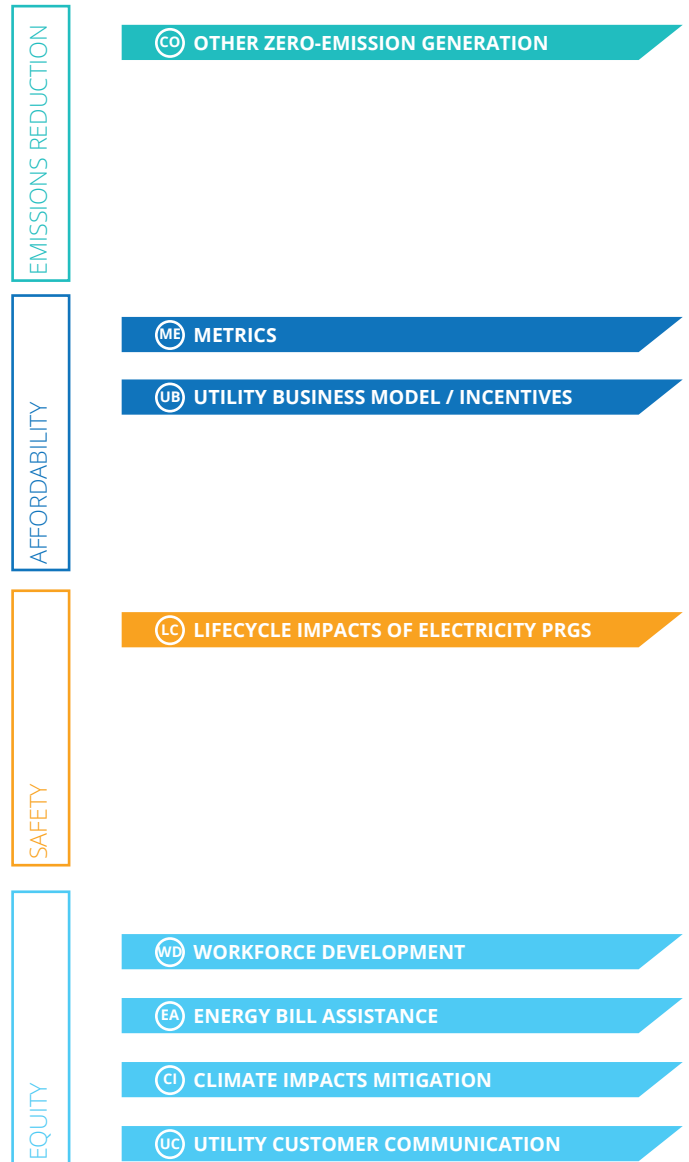
California energy policy efforts in recent years have placed a larger focus on ensuring that all residents of California are able to benefit from the transition to a clean energy economy. That includes direct benefits, such as participation in incentive programs, as well as other benefits, such as employment, affordability, and improved health and environment

PARTNERSHIP AREA FRAMEWORK

ADDITIONAL INPUT

The following strategies were identified through the Regulatory Assessment, background research, and PICG and CPUC interviews, but there were not a sufficient number of obstacles and challenges identified.

The Project Coordinator is seeking additional input from PICG members or other stakeholders on the known obstacles and challenges to successful implementation of these strategies, and to effectively achieve the top-line goals:



RE

RENEWABLE ENERGY DEVELOPMENT

A :: INTERMITTANCY OF ENERGY SOURCES

B :: SEASONAL VARIATION

C :: INADEQUATE TRANSMISSION CAPACITY

D :: INTERCONNECTION TIME AND COST

E :: PERMITTING TIME AND COST

F :: EXCESS RENEWABLE GENERATION

G :: LACK OF FIRM CAPACITY

H :: RPS COST LIMITATIONS

I :: IMPACTS OF DROUGHT ON HYDRO

J :: INCREASING UNANTICIPATED CURTAILMENT

K :: INTEGRATING MULTIPLE SOLUTIONS

L :: LACK OF VISIBILITY ON DISTRIBUTION GRID

M :: CREATE VOLTAGE/VAR/FREQUENCY FLUCTUATIONS

N :: NEW RAMP NEEDS

O :: IMPACTS OF CLIMATE ON SOL. THERMAL/GEOTHERMAL

P :: INVERTERS ARE GRID-FOLLOWING

Q :: NO TRANSPARENCY IN INTERCONN. CHALLENGES

R :: LACK OF RELIABLE COMMUNICATION WITH RESOURCES

RE RENEWABLE ENERGY DEVELOPMENT (cont.)

S : INADEQUATE FORECASTING TOOLS

T : HARD TO MAKE CHANGES ON TRANSMISSION LEVEL

U : OFFSHORE WIND PERMITTING/DEVELOPMENT DIFFICULT

EV

TRANSPORTATION ELECTRIFICATION

A : SLOW DEPLOYMENT OF LIGHT-DUTY CHARGING

B : LACK OF MULTIFAMILY RESIDENT ACCESS TO CHARGING

C : LACK OF MEDIUM/HEAVY-DUTY STANDARDIZATION

D : LACK OF MEDIUM/HEAVY DUTY CHARGING

E : UNKNOWN LOCAL IMPACTS TO ELECTRICAL SYSTEM

F : RANGE ANXIETY AND GEOGRAPHIC NEEDS

G : CUSTOMER AWARENESS

H : CUSTOMER PREFERENCES

I : HIGH UPFRONT COST OF VEHICLES

J : UNKNOWN VALUE OF INTEGRATION TECHNOLOGY

K : UNCLEAR ROLE OF VEHICLES IN DR/GRID SERVICES

L : LACK OF VEHICLE-GRID COMMUNICATION STANDARD

M : VEHICLE-GRID TECHNOLOGIES HAVE NOT BEEN PROVEN

N : UNKNOWN MARKET/BUS. MODEL FOR VEHICLE-GRID

O : LACK OF GRID OPERATOR VEHICLE-GRID CAPABILITY

P : CHARGING RATES AND RESALE OF ENERGY

Q : OWNERSHIP MODELS OF CHARGING INFRASTRUCTURE

R : DIFFERENCES IN LOCAL PERMITTING AND INSPECTION

EV

TRANSPORTATION ELECTRIFICATION (cont.)

S : INCONSISTENT POLICIES AND STANDARDS

T : UNCLEAR INTERCONNECTION FOR VEHICLE-GRID

U : VEHICLE-GRID NON-PERFORMANCE RISK

V : MEDIUM/HEAVY-DUTY VEHICLE COST

W : PORT/OFF-ROAD ELECTRIFICATION COST

X : HEAVY-DUTY REQUIRES LARGE CHARGING CAPACITY

Y : LACK OF PRICE COMPETITIVENESS

Z : CUSTOMER EDUCATION - TOTAL COST OF OWNERSHIP

AA : LACK OF DATA ON FUTURE MARKET TRANSFORMATION

AB : BUILDING CODES

AC : CHALLENGES RECRUITING FOR OPTIMIZED CHARGING

AD : USE OF RATEPAYER FUNDS IN LIMITED

AE : HOW TO AVOID COST SHIFTING

AF : HOW CAR COMP./CHARGERS,/CUST./UTILITY WORK TOG.

AG : CHARGER COMM. WITH ENERGY MANAG. SYSTEMS

AH : V2G NOT COMMERCIALY AVAILABLE

AI : WHEN SHOULD CHARGING BE OPTIMIZED FOR?

AJ : A LOT OF UNCOORDINATED PRIVATE INVESTMENT

H HYDROGEN

A : HIGH UPFRONT COST OF VEHICLES

B : SLOW DEPLOYMENT OF FUELING INFRASTRUCTURE

C : UNKNOWN MARKET AND BUSINESS MODELS

D : LACK OF SUPPORT FOR PRODUCTION OF FUEL

E : DISTRIBUTION OF HYDROGEN FUEL FOR VEHICLES

F : O&M COSTS OF LIGHT-DUTY VEH. INFRASTRUCTURE

G : LACK OF MEDIUM/HEAVY-DUTY VEH. STANDARDIZATION

H : CUSTOMER PREFERENCES (VEHICLES)

I : CUSTOMER AWARENESS (VEHICLES)

J : COST TO PRODUCE HYDROGEN (GRID)

K : UNCERTAINTY WHETHER HYDROGEN (GRID) IS VIABLE

L : UNCERTAINTY WHEN HYDROGEN (GRID) IS VIABLE

M : SAFETY RISKS OF INFRASTRUCTURE AND FUEL

N : LACK OF TESTING/UNCERTAIN QUALITY OF HYDROGEN

BE

BUILDING ELECTRIFICATION

A : BUILDINGS ACCOUNT FOR 1/4 OF STATEWIDE GHG

B : DISTRIBUTION GRID NOT SIZED FOR ELECTRIFICATION

C : BUILDING CODES CAN BE RESTRICTIVE

D : SOME CUSTOMERS USE WOOD OR PROPANE

E : FAILURE OF AGING GAS INFRASTRUCTURE

F : GAS/METHANE LEAKS

G : EXISTING GAS PIPE AND HOOKUPS IN BUILDINGS

H : INDUSTRIAL SECTOR RELIES ON GAS FOR PROCESSES

I : UNKNOWN COST TO REPLACE GAS INF. WITH ELECTRIC

J : HIGH COST OF ELECTRIC HEATING EQUIPMENT

K : END OF LIFE REPLACEMENT VS. MID-LIFE

L : WHAT TO DO WITH EXISTING GAS DISTRIBUTION SYSTEM

M : SPLIT INCENTIVE WITH MULTI-FAMILY BUILDINGS

N : CULTURAL PREFERENCES FOR GAS FOR COOKING

O : WHOLE-HOME RETROFITS ARE NOT "OFF THE SHELF"

P : NOT COORDINATED WITH ENERGY EFFICIENCY POLICY

Q : GAS SYSTEM COSTS PUT ON LOW-INCOME

R : MAY REQUIRE PANEL UPGRADES

BE BUILDING ELECTRIFICATION (cont.)

S : HIGH UPFRONT COST

T : EQUIP. FAILS AT WRONG TIME FOR SYSTEM OVERHAUL

U : TRADES NOT PREPARED TO SELL ELECTRIFICATION

V : CODES/STANDARDS ATTAINMENT

W : BUILDING OPERATIONS NO ALIGN WITH CLEAN GEN.

X : DIFFICULTY PERMITTING REQUIRED INFRASTRUCTURE

EE

ENERGY EFFICIENCY

A : HIGH CAPITAL COST

B : LACK OF WORKFORCE

C : IMPACTS OF FINANCING ON HOME TRANSFER

D : LACK OF RATES OR AUDITORS

E : SPACE HEAT / WATER MAIN DRIVERS OF BUILD. ENERGY

F : SOME BUILDINGS - MULT. CUSTOMERS SHARE SYSTEMS

G : NO EE BASELINE FOR ELECTRIC CONVERSION

H : FINANCING AND INCENTIVES FOR EE ARE LIMITED

I : MARKET POTENTIAL IS UNKNOWN AND DATA LIMITED

J : EE MISALIGNED WITH DEMAND-SIDE DECARB NEEDS

K : ALL LOW-HANGING FRUIT HAS BEEN HARVESTED

L : LACK OF FOCUS ON HEALTH/SAFETY IN WEATHERIZ.

M : DEVELOPING/IMPLEMENTING MARKET TRANSFORM.

N : NO EE BASELINE FOR MARKET TRANSFORMATION

O : LACK OF ENFORCEMENT IN BUILDING CODES/STAND.

P : WHOLE-HOME RETROFITS ARE NOT "OFF THE SHELF"

Q : NO CONNECTION BETWEEN R&D/PROGRAM ROLL-OUT

LC LOW-CARBON FUELS

A : LIMITED BIOFUEL

B : SOURCES OF LOW-CARBON FUELS ARE OUT OF STATE

C : LIMITED ACCESS TO ALT. PETROLEUM FUEL SOURCES

D : INCREASING DEMAND FOR RENEWABLE HYDROGEN

E : DIFFICULTY OF AG SECTOR SWITCH TO BIOFUELS

F : LACK OF DATA ON FUTURE MARKET TRANSFORMATION

G : PETROLEUM MARKET DYNAMICS CREATE UNCERTAINTY

H : HOW TO ACHIEVE LOWEST CARBON PATHWAY

I : LACK OF COORDINATED VISION ON RENEWABLE GAS

J : ROLE OF RENEWABLE GAS IN CLOSED SYSTEMS

K : RENEWABLE GAS SUPPLY IS LIMITED

L : COST OF BIOFUELS

M : REN. GAS LOCATIONS IN PIPELINE HARD TO TRACK

IP

INTEGRATED RESOURCE PLANNING

A : SHIFTING EVENING PEAK

B : EARLY RETIREMENT OF RESOURCES

C : FRAGMENTED PROCURE. AND PLANNING ACROSS CA

D : DIMINISHING CUSTOMER BASE DUE TO CCA/DIRECT PRO.

E : INCREASING RELIANCE ON IMPORTS

F : LOWER WIND/SOLAR LOAD-CARRYING CAPAB. FACTORS

G : LARGE UNIT RETIREMENTS - GRID INSTABILITY

H : GAS PLANTS SERVE AS FLEXIBLE SUPPLY

I : FAILURE OF AGING GAS INFRASTRUCTURE

J : IMPACT OF ELECTRIFICATION ON LOAD SHAPE

K : NEED TO MINIMIZE CRITERIA POLLUTANTS ON DACS

L : MAGNITUDE OF HYDROGEN STORAGE OPPORTUNITY

M : WHERE DOES LAST 20% OF DECARB COME FROM?

N : STILL ON LOW-HANGING FRUIT/UNCLEAR PATH

O : WHAT IS THE POTENTIAL OF OFF-SHORE WIND



DEMAND SIDE MANAGEMENT

A : HIGH PENETRATION OF RENEWABLES CREATES RAMPS

B : DR HAS BEEN UTILITY/CUSTOMER DISPATCH FOCUSED

C : UNDERPERFORMANCE OF DR MWS IN IOU PORTFOLIOS

D : DR LESS SUCCESSFUL FOR RAMPS

E : UNCLEAR ROLE OF ENERGY STORAGE IN DR

F : STORAGE FOLLOWING CUST. SIGNAL CAN COUNTER GRID

G : TRANSACTIVE ENERGY ADOPT. AND BEHAV. UNKNOWN

H : LACK OF DYNAMIC/GRANULAR DATA FOR LOAD SHIFT

I : UTILITY IT INSUFFICIENT FOR GRANULAR SETTLEMENT

J : DR LESS SUCCESSFUL THAN IN MARKETS OUTSIDE CA

SC SYSTEM COST REDUCTION

A :: OPPORTUNITY/ABILITY FOR STORAGE TO DISPLACE T&D

B :: UTILITY CAP. INVEST. PLANNING NOT CONN. TO GIS

C :: HOW CAN GRID HARDENING ACCOMPLISH SAVINGS?

D :: DESPITE APPROVAL, NO NON-WIRES IMPLEMENTED YET

E :: CAN DER ACTUALLY REPLACE TRADITIONAL ASSETS

F :: LACK OF DATA ON PERF. OF DERS AS NON-WIRES

RD RATES AND RATE DESIGN

A : LACK OF CUSTOMER AND MARKET BEHAVIOR STUDIES

B : LACK OF MARKETING/OUTREACH ON RATE STRUCTURES

C : CUSTOMER UNCERTAINTY OF IMPACTS OF NEW RATES



WILDFIRE MITIGATION

A : RISK OF IGNITION

B : RISK OF SPREAD

C : EXISTING INFRASTRUCTURE FAILURE

D : LACK OF SITUATIONAL AWARENESS

E : INACCURATE WEATHER FORECASTING

F : CLIMATE CHANGE INCREASING RESILIENCY NEEDS

G : DATA AND MODELS ARE OUTDATED / INACCURATE

H : BIG DATA ONLY USEFUL FOR SHORT-TERM FORECAST

I : POOR DATA QUALITY FOR AUDITING / RISK ANALYSIS

J : NO CONNECTION BETWEEN PREDICTIONS-OPERATIONS

K : STAKEHOLDER COMMUNICATION GAPS

L : INSUFFICIENT COMMUNICATION DURING EVENTS

M : NO EFFECTIVE WILDFIRE INCIDENT REPORTING

N : NO CONSENSUS ON FIRE RISK INDEX

O : NO FIRE SPREAD MODELING

P : NO DATA ON COST-BENEFIT OF ALTERNATIVES

Q : LACK OF DATA AND SOFTWARE FOR IND. ANALYSIS

R : LACK OF PERFORMANCE GOALS ON GRID/CUST IMPACT



WILDFIRE MITIGATION (cont.)

S : VEGETATION CONTACT WITH ELECTRIC FACILITIES

T : CUSTOMER OPPOSITION TO VEGETATION MANAGEMENT

U : COMMUNITY/ENVIRO. IMPACTS OF VEG. MANAGEMENT

V : VEGETATION MANAGEMENT WORKFORCE

W : FUEL RISK AND MANAGEMENT

X : NEW TECHNOLOGY DEVELOPMENT IS TOO SLOW

Y : NEW TECHNOLOGIES ARE UNTESTED

Z : HIGH COST OF SYSTEM HARDENING

AA : LACK OF SYSTEM CONTROL AND FLEXIBILITY

AB : DIFFICULTY IN SECTIONALIZING/RE-ROUTING POWER

AC : SITE CONTROL AND PERMITTING CONSTRAINTS

AD : LACK OF DATA ON FUTURE NEEDS

AE : QA/QC OF INSPECTIONS

AF : COST OF CONTRACTING DUE TO LIABILITY COSTS

AG : EXISTING UTILITY RESOURCE CONSTRAINTS

AH : CUSTOMER COSTS DURING OUTAGE OR DUE TO FIRE

AI : TRANSMISSION PLANNING/MAINTENANCE AT FERC

AJ : LACK TOOLS TO IDENTIFY HIGH THREATS OF IGNITION

WT WORKER TRAINING

A : INSUFFICIENT TRAINING FOR WILDFIRE PREVENTION

B : VEGETATION MANAGEMENT WORKFORCE GAP

C : INSUFFICIENT WORKFORCE FOR SERVICE RESTORATION

D : MATCHING TRAINING TO BROADER ENERGY LANDSCAPE

E : WHAT ROLE SHOULD BE PLAYED BY LABOR?

F : COORDINATION WITH HIGH SCHOOLS/COMM. COLLEGES

G : UNKNOWN THREATS FROM NEW INFRASTRUCTURE

H : CONSTANTLY EVOLVING TRAINING NEEDS

PS

PUBLIC SAFETY POWER SHUTOFFS

A : IMPACTS ON PUBLIC SAFETY SERVICES

B : IMPACTS ON RESIDENTIAL CUSTOMERS

C : IMPACTS ON BUSINESSES

D : COMMUNITY ENGAGEMENT

E : DIFFICULTY COMMUNICATING WITH CUSTOMERS

F : MANUAL REPORTING, QC AND COMMUNICATION

G : LIMITATIONS TO MONITORING TO MINIMIZE SHUTOFFS

H : ASSESSING CONDITIONS TO QUICKLY RESTORE POWER

I : NO IDENTIFICATION OF CRITICAL FACILITIES

J : COST OF GRID UPGRADES TO MINIMIZE OUTAGES

K : NOT ENOUGH CA-PERMITTED TEMP GENERATION

L : ELECTRIFICATION WILL INCREASE IMPACTS

M : DACS/LOW-INCOME COULD GET LEFT BEHIND

N : SIGNIFICANT INCREASE IN ADOPTION OF GENERATORS

O : RELIABILITY MEANS DIFF. THINGS TO DIFF. CUSTOMERS

P : UNDERSTAND. COMM. RISK AT DIFF. TIME THRESHHOLD

CS CYBERSECURITY

A : ENSURE PRIVACY AND ACCURACY OF DER DATA

B : PROVIDING SEEMLESS ACCESS TO DATA TO 3RD PARTIES

C : NO SET OF STANDARDS ON CYBERSECURITY

D : CYBERSECURITY OF DER COMMUNICATIONS

E : CAN'T ENABLE TRANSACTIONAL ENERGY W/OUT CYBER.

F : VULNERABILITY OF HOME ENERGY HARDWARE

G : THREAT FROM AGGREGATION OF COMPROMISED DER

H : SEC. TESTING OF CUST. HARDWARE/SOFTWARE COSTLY

VM VEGETATION MANAGEMENT

A : VEGETATION CONTACT WITH ELECTRIC FACILITIES

B : VEGETATION MANAGEMENT WORKFORCE GAP

C : CUSTOMER OPPOSITION TO VEG. MANAGEMENT

D : COMM. AND ENVIRO. IMPACTS OF VEG. MANAGEMENT

E : COST OF CONTRACTING DUE TO LIABILITY COSTS

F : LACK OF PRIORITIZATION OF VEG. MANAGEMENT



MICROGRID DEVELOPMENT

A : UNCLEAR VALUE TO THE CUSTOMER

B : UNCLEAR VALUE TO THE GRID

C : HIGH UPFRONT COSTS

D : INTERCONNECTION TIME AND COST

E : HIGH SOFT COSTS

F : LONG DEVELOPMENT TIME

G : PRIMARILY CUSTOM-DESIGNED/NOT PLUG AND PLAY

H : SOLUTIONS ARE COMPLEX / REQUIRE SOPHISTICATION

I : SPACE CONSTRAINTS FOR GENERATION

J : LOCAL PERMITTING LIMITATIONS

K : NO COMMUNICATION STANDARD

L : NO STANDARD UTILITY/CUSTOMER COMM/CONTROL

M : SYSTEM BALANCING WITHIN MICROGRIDS

N : LACK OF CONTROLS TO ISLAND GRID SEGMENTS

O : NO ACCESSIBLE DATA ON UTILITY INFRASTRUCTURE

P : THREAT OF SHIFTING COSTS

Q : TARIFF AND INCENTIVE MISALIGNMENT

R : COST OF OWNERSHIP/ O&M FOR SPECIAL FACILITIES



MICROGRID DEVELOPMENT (cont.)

S : INTERCONNECTION NAMEPLATE CAPACITY LIMITS

T : DEPARTING LOAD CHARGES

U : INTERCONNECTION MISALIGNMENT

V : NO ACCESS TO WHOLESALE MARKETS

W : NO MECHANISM FOR REMOTE GRIDS AS ALTERNATIVES

X : LACK OF SUPPORT FOR HYBRID MICROGRIDS

Y : INSUFFICIENT UTILITY STAFF TO SUPPORT MICROGRIDS

Z : IDENTIFYING PRIORITY MICROGRID LOCATIONS

AA : LACK OF LONG-DURATION RESOURCES

AB : FOSSIL MICROGRIDS WORK AGAINST POLICY GOALS

AC : SGIP FUNDING ELIGIBILITY

AD : EQUITY IMPACTS ON CUSTOMERS UNABLE TO AFFORD

AE : REG. UNCERTAINTY OVER TRANSACTIONAL ENERGY

AF : REG. UNCERTAINTY OVER SHARED DER

AG : UNCERTAIN ABILITY OF FOREST BIOMASS

AH : HIGHEST PRIORITY MICROGRIDS OFTEN MOST COSTLY

AI : LACK OF DATA ON WHAT DESIGNS EVEN WORK

AJ : UNCLEAR EQUIPMENT NEED AT POINT OF INTERCONN.



MICROGRID DEVELOPMENT (cont.)

AK : FINANCING MODELS AND ECONOMICS ARE UNCLEAR

AL : UNKNOWN LESSONS LEARNED OF FAILED PROEJCTS

AM : ADDITIONAL FUNDING SOURCES ARE UNCLEAR

AN : WHAT IS COMMON THAT WORKED?

AO : WHAT ARE BEST PRACTICES AND MODELS?

AP : WHAT ARE RANGE OF OPTIONS (RELATIONSHIPS/TYPES)?

AQ : DACS/LOW-INCOME COMM. COULD GET LEFT BEHIND

AR : FINDING VIABLE GENERATION OTHER THAN GAS

AS : PV+STORAGE TOO EXPENSIVE AS MULTI-DAY SOLUTION

AT : ASSESSING CAPABILITY OF COMBINED RESOURCES

AU : GRID SEPARATION AND RE-INTEGRATION

ES ENERGY STORAGE

A : LACK OF LONG-DURATION STORAGE OPTIONS

B : LACK OF REVENUE OPTIONS FOR ENERGY STORAGE

C : COST EFFECTIVENESS

D : INTERCONNECTION AND PERMITTING

E : SAFETY OF STORAGE LOCATED NEAR ELECTRIC FAC.

F : FOCUS HAS BEEN ON LI-ION

G : UNCERTAIN ROLE OF VEHICLES AS ENERGY STORAGE

H : LACK OF COMMUNICATION STANDARD FROM UTILITY

I : 3RD PARTY COMMUNICATION WITH TECHNOLOGY

J : NEM CAPACITY LIMITS RESTRICT CUSTOMER RESILIENCY

K : NEM RESTRICTIONS ON GRID CHARGING BEFORE EVENT

L : MEASUREMENT DATA / ANALYSIS ON USE OF STORAGE

M : LACK OF DATA ON FUTURE MARKET TRANSFORMATION

N : UNDERVALUED FOR RESOURCE ADEQUACY

O : LACK OF SEASONAL STORAGE OPTIONS

P : UNKNOWN PROSPECT FOR HYDROGEN AS STORAGE

Q : HIGH COST OF EMERGING STORAGE TECHNOLOGY

R : PATH TO GET LONG-DURATION STORAGE READY BY 2030

ES ENERGY STORAGE (CONT.)**S** : LACK OF COMMONALITY IN DESIGN**T** : WHOLESALE MKT, PARTIC. FOR BTM STORAGE UNCLEAR**U** : HOW TO INCENTIVIZE STORAGE TO DO WHAT IS NEEDED**V** : DIFFICULTY STACKING REVENUE**W** : LACK OF LOCATIONAL VALUE**X** : SIGNIFICANT INCREASE IN ADOPTION OF GENERATORS**Y** : HIGHER USE CAN CONTRIBUTE TO THERMAL OVERLOAD**Z** : HIGH UPFRONT COST**AA** : DIFFICULT TO PILOT PROJECTS ON TRANSMISSION SYS.**AB** : LIFECYCLE COSTS UNKNOWN**AC** : MOBILE BATTERIES ARE HEAVY/RESTRICTED

FR FAULT DETECTION AND RESTORATION

A : LACK OF SYSTEM CONTROL AND FLEXIBILITY

B : LACK OF FAULT DATA

C : SENSOR TECHNOLOGY IS UNTESTED

D : COST-BENEFIT ANALYSIS

RA RESOURCE ADEQUACY

A : SIGNIFICANT INCREASE IN IMPORTS TO MEET RA

B : LSES HAVE HAD DIFFICULTY PROCURING LOC. CAPACITY

C : UNUSED CAPACITY IN SYSTEM, INCLUDING IMPORTS

D : MISMATCH BETWEEN LOC. REQUIREMENTS AND NQC

E : NON-CPUC LSES MAY HAVE CAPACITY, NOT SELLING

F : CAPACITY SHORTFALLS

G : CHALLENGES MEETING SUMMER EVENING PEAK LOAD

H : CAPACITY PROCUREMENT IN FRAGMENTED

I : DR HAS BEEN UTILITY/CUSTOMER DISPATCH FOCUSED

J : GAS PIPELINE OUTAGES - CURTAILMENT RISK

K : 4-HOUR BATTERY LIKELY INSUFFICIENT

L : UNCLEAR ROLE OF LONG-DURATION ENERGY STORAGE

M : CALCULATION OF ENERGY STORAGE CONTRIBUTION

DB DAILY BALANCING

A : DIFFICULT TO FOLLOW LOAD WITHOUT FLEXIBLE GEN.

B : NEW RAMP NEEDS

C : DIFFICULT TO WORK WITH CIASO ON R/T OPERATIONS

D : LACK OF RELIABLE COMMUNICATIONS W/ RESOURCES

E : INADEQUATE FORECASTING TOOLS



GRID MODERNIZATION

A : COST OF DISTRIBUTION CONTROL

B : COST-BENEFIT OF SYSTEM CONTROL INVESTMENTS

C : SITUATIONAL AWARENESS

D : COST TO SECTIONALIZE/RE-ROUTE CIRCUITS

E : LACK OF DATA ON HIGH-PRIORITY AREAS

F : HISTORICAL DISINVESTMENT

G : LOCAL POWER QUALITY IMPACTS FROM ELECT./DER

H : LARGE UNIT RETIRE. HAVE LED TO GRID INSTABILITY

I : USE OF SMART INVERTERS TO SUPPORT POWER QUALITY

J : FREQUENCY OF DATA COLLECTION

K : DATA COLLECTION ERRORS

L : RELIABILITY MEANS DIFF. THINGS TO DIFF. CUSTOMERS

M : DACS/LI COMMUNITIES COULD GET LEFT BEHIND

N : VOLTAGE OPT. NOT COST EFFECTIVE ON ALL CIRCUITS



DISTRIBUTION RESOURCE PLANNING

A : LACK OF RELIABLE COMMUNICATION WITH RESOURCES

B : IDENTIFYING BEST LOCATIONS FOR DERS

C : HOW CAN WE USE DERS TO MAKE GRID BETTER?

D : REVERSE POWER FLOW

E : VOLTAGE MANAGEMENT

F : MORE COMPLEX PROTECTION

G : HIGH PENETRATION OF RENEWABLES

H : ADVERSE INTERACTIONS BETWEEN ASSETS ON THE GRID

I : LACK OF OPEN COMMS BETWEEN RESOURCES

J : MANAGING FREQUENCY VARIATIONS

K : SUNK COST AND COST SHIFT

FB FOREST BIOMASS

A : COST EXCEEDS ALTERNATIVES

B : LACKS MODULAR TECHNOLOGY

C : INTERCONNECTION TIME AND COST

D : GEOGRAPHICALLY LIMITED

E : CLEAR-CUTTING AND LOCAL POLLUTION IMPACTS

F : FINANCING

CA CLIMATE ADAPTATION

A : GAPS IN CLIMATE IMPACT MODELING ON ENERGY SYS.

B : IMPACTS ON INF. NEEDS NOT FACTORED INTO INVEST.

C : CLIMATE IMPACT ON WORKERS HEALTH & SAFETY

D : IMPACTS ON WATER RESOURCE / HYDRO AVAILABILITY

E : OVERNIGHT HEAT COULD CAUSE THERMAL OVERLOAD

F : IMPACTS ON ELECTRIFICATION LOAD

IC INCLUSIVE ENERGY PROGRAM DESIGN

A : HIGH UPFRONT COST OF CUSTOMER TECHNOLOGY

B : CUSTOMER AWARENESS OF ZERO-EMISSION VEHICLES

C : LACK OF CHARGING INFRASTRUCTURE IN DACS

D : LACK OF PRIVATE INVESTMENT FOR CHARGING

E : IMPACTS ON THOSE UNABLE TO AFFORD MICROGRIDS

F : LACK OF DATA ON BENEFITS OF PROJECTS WITH DACS

G : LACK OF UNDERSTAND OF DAC COMMUNITY NEEDS

H : LIMITED ACCESS TO AND BENEFITS FROM COMM. SOLAR

I : DACS/LI COMMUNITIES NOT TARGETED BY DEVELOPERS

J : VULNERABLE TO FRAUD

K : MULTI-FAMILY / MULTI-TENANT RESTRICTIONS

L : LACK OF KNOWLEDGE OF TECHNOLOGY & PROGRAMS

M : NEED TO UNDERSTAND RISK OF NEW TECHNOLOGY



WEALTH-BUILDING AND OWNERSHIP

A :: LIMITED FINANCING OPTIONS

B :: ACCESS TO CAPITAL AND CREDIT

C :: ACCESS TO TAX CREDITS AND INCENTIVES

D :: LIMITED RESOURCES TO CONTRACT FOR BUSINESS

E :: HIGH UPFRONT COSTS

F :: PROJECTS REQUIRE MULTIPLE FINANCING MECHANISMS

G :: IS SYSTEM WELCOME TO DIVERSE HOST SITUATIONS?

H :: NEED FOR LONG-TERM COMMITMENT TO COMMUNITY

I :: THOSE WHO ACCESS INCENT. AREN'T W/ MOST NEED

PO PUBLIC OUTREACH AND EDUCATION

A : OUTREACH EFFORTS AREN'T TRACKED

B : LACK OF OUTREACH STRATEGY FOR PROGRAMS

C : NO DATA ON OUTREACH RESULTS

D : BENEFITS TO DACS/LI ARE UNCERTAIN/UNKNOWN

E : CLEAN TRANSPORTATION/MOBILITY NEEDS UNKNOWN

F : DIFFICULT COMMUNICATING TECHNICAL CONCEPTS

G : CBOS HAVE LIMITED RESOURCES

H : LANGUAGE BARRIERS

I : NEW TECH DEPLOYMENT REQ'S ONGOING ENGAGEMENT

J : LACK OF CUSTOMER AND MARKET BEHAVIOR STUDIES

K : UNDERSTANDING COMMUNITY NEEDS

L : LACK OF TIME AND RESOURCES TO PARTICIPATE

M : COST OF OUTREACH



thank you

PREPARED BY:

ANDREW BARBEAU
The Accelerate Group
PICG Project Coordinator
www.theaccelerategroup.com

REBECCA GOOLD
2R Group
www.the2rgroup.com

AMANDA FORNELLI
2R Group
www.the2rgroup.com