Staff Proposal Workshop

High DER Proceeding

March 27, 2024

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California Public
Utilities Commission

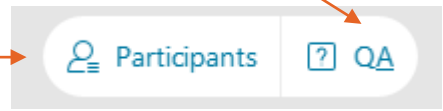
WebEx Logistics

- All attendees are muted on entry by default.
- Please write your questions in the Q&A panel. Questions will be addressed during the Q&A periods of the agenda.
- Comments or Questions can be provided verbally during the Q&A periods using the "raise hand" function.
  - The host will unmute you and you will have a maximum of 2 minutes to speak.
  - Please lower your hand after you've asked your question by clicking on the "raise hand" again.
  - If you have another question, please "re-raise your hand" by clicking on the "raise hand" button twice.

WebEx Tips

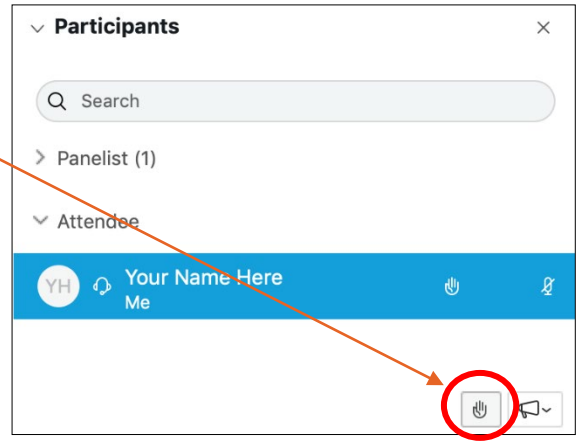
Access the written Q&A panel here

1. Click here to access the attendee list to raise and lower your hand.



2. Raise your hand by clicking the hand icon.

3. Lower it by clicking again.



Access your meeting audio settings here

WebEx and Call-In Information

Join by Computer:

https://cpuc.webex.com/weblink/register/r1d457811e28af655368eace15986f16d

Meeting Number: 2486 790 2379

Join by Phone:

- Please register using WebEx link to view phone number.

(Staff recommends using your computer's audio if possible.)

Notes:

- This meeting will be recorded.
- Contact Daniel Tutt, daniel.tutt@cpuc.ca.gov, or Tyler Nam, tyler.nam@cpuc.ca.gov, with any additional comments or questions.

Opening Remarks

Commissioner Darcie Houck

Agenda

Topic	Duration	Time
Opening Comments and Logistics	10 min	1:00 to 1:10
Staff Proposal Overview	20 min	1:10 to 1:30
The Current Distribution Planning and Execution Process	20 min	1:30 to 1:50
Issues and Proposals from the Staff Proposal	60 min	1:50 to 2:50
Improvements to Data Portals and Integration Capacity Analysis (ICA) Maps	20 min	2:50 to 3:10
Questions and Public Comment	40 min	3:10 to 3:50
Next Steps and Close	10 min	3:50 to 4:00

Objectives

1. Present the Track 1 Phase 1 Staff Proposal to stakeholders and the broader public.

2. Allow a space for verbal questions and informal comments from stakeholders, before formal comments are due on May 28.

3. Promote the submission of more informed, complete, and actionable formal comments.

A Staff Proposal document with corrected section numbers was sent to the Service List on Monday 3/25, and with the notification for this workshop.

Overview of the Staff Proposal

High DER Grid Planning Proceeding (R.21-06-017)

The proceeding aims to:

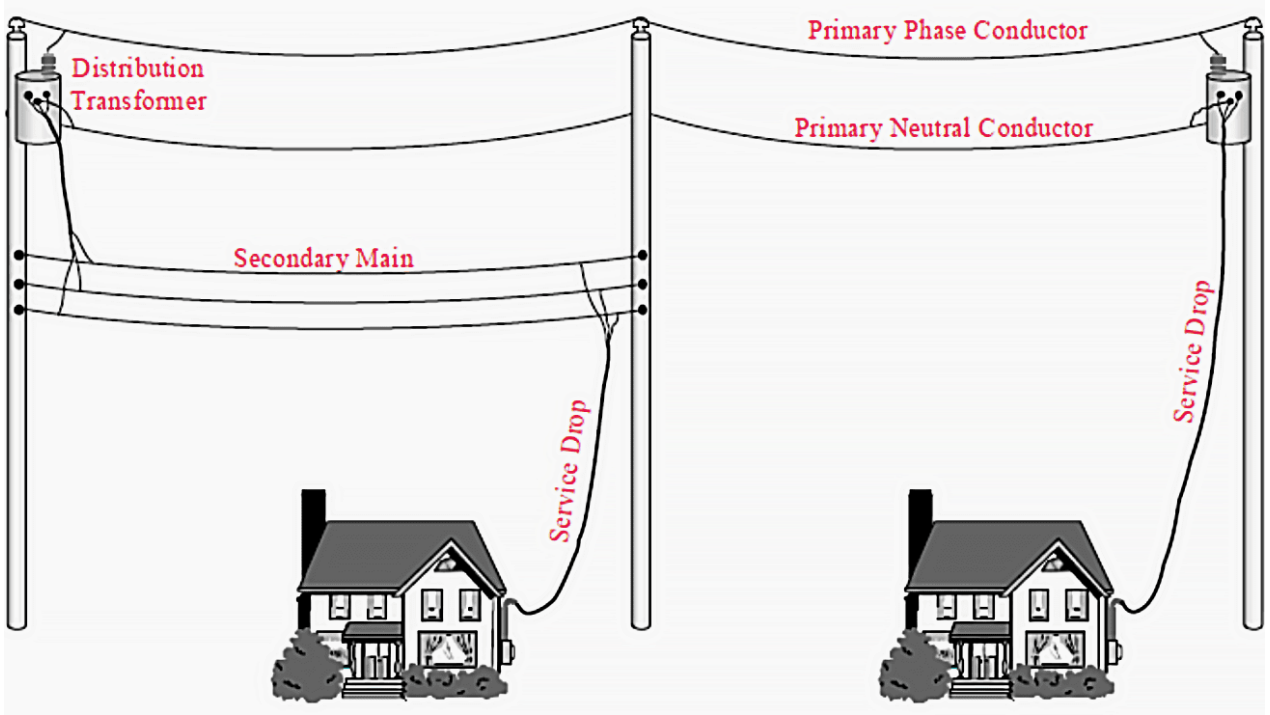
- Enable swift evolution of grid capabilities and operations to integrate solar, storage, electric vehicle/electric vehicle supply equipment and other DERs to meet the State's 100 percent clean energy goals;
- Improve distribution planning, including charging infrastructure forecasting to support cost effective and widespread TE; and
- Optimize grid infrastructure investments by facilitating community input about planned developments, DER siting plans, and resiliency needs.

Track 1 of the proceeding focuses on the Distribution Planning and Execution Process and Data Improvements.

Phase 1 covers actions that can be taken in the near term.

Energization Process vs Distribution Planning Process

- The staff proposal is focused on making improvements to the Distribution Planning Process (DPP) and execution of distribution upgrades. The DPP is a proactive and reactive process for planning upgrades to the **primary distribution system** that relies both on known loads and economic forecasting.

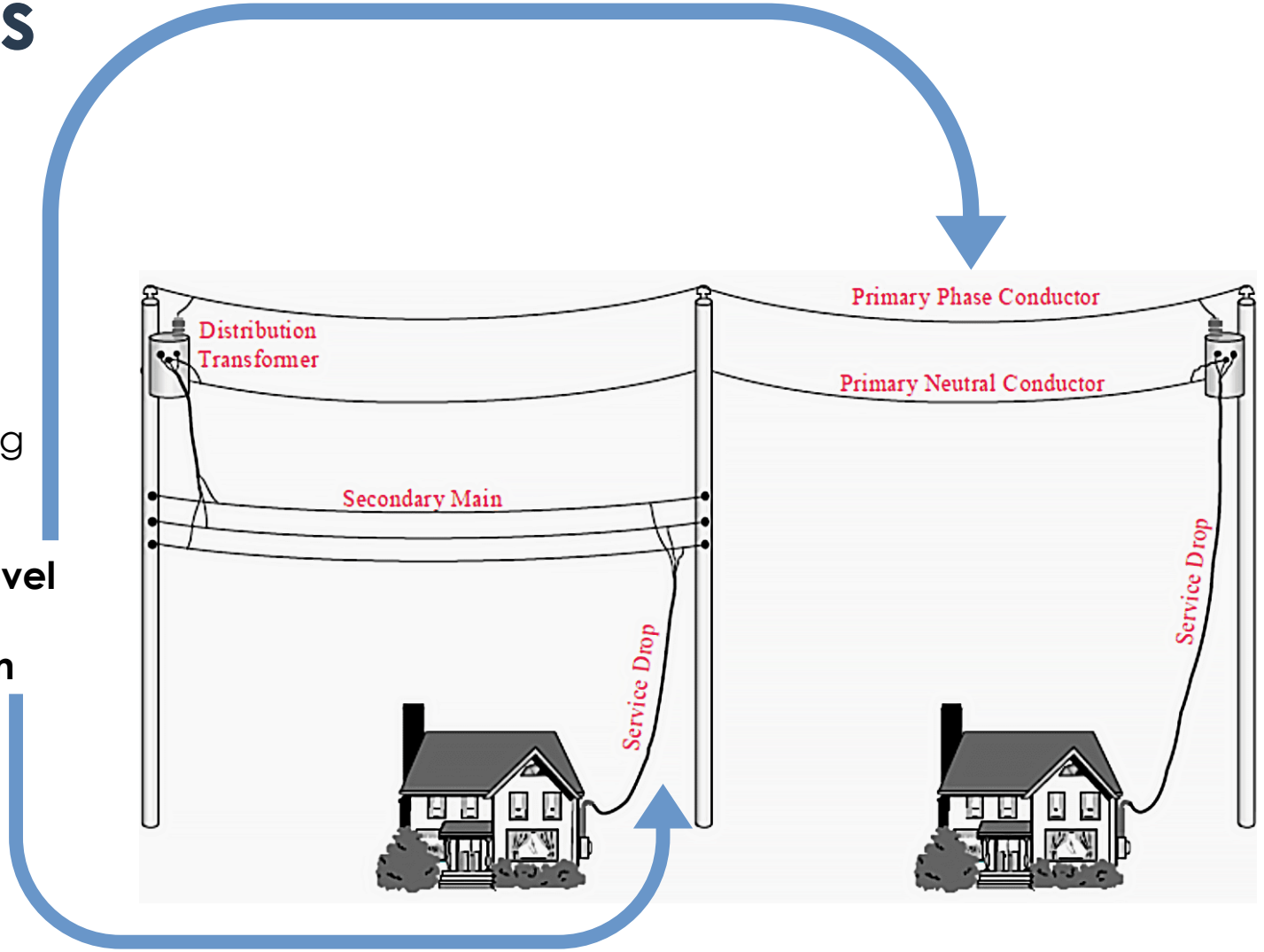


- The staff proposal is not directly changing the energization process, which is a different process from DPP and is governed by Rules 15/16/29/45.
  - The energization process is a reactive process that is triggered when a customer submits an electric service request application, which requires the utility to conduct a study of needed electrical facilities to provide that customer service.
  - The energization process generally covers the **secondary distribution system and service drops**, as well as direct work with customers, although is sometimes covers and always informs work on the primary system. The energization rules govern that process and deal with cost allocations between the customer and the utility.

Energization Process vs Distribution Planning Process

- One of the primary goals of making improvements to the distribution planning process is to ensure sufficient electric system capacity is already planned and potentially constructed **at the primary level and above**, so that the core work of the energization process **from the Distribution Transformer to the customer panel** can proceed normally.

- In short, one primary goal of this staff proposal is to make the energization process run more smoothly.



Response to Legislation: Senate Bill 410 and Assembly Bill 50

The Staff Proposal responds to all the requirements related to distribution capacity planning and the DPP from both SB 410 (specifically P.U.C. section 936) and AB 50 (specifically P.U.C. section 933.5).

Energization timelines are being addressed in a separate proceeding, R. 24-01-018.

P.U. Code #	Description
936 *(SB 410)*	**(a)** (1) Commission shall require utilities to consider the following in their annual DPPs: A. Federal, state, regional, and local air quality and decarbonization standards, plans, and regulations. B. The transportation and building electrification policies of state law. C. State agency, local agency, and local government plans and requirements related to housing, economic development, critical facilities, transportation, and building electrification. D. Known load, and projections of load provided by the Energy Commission. E. Projections of load that exceed forecasts provided by the Energy Commission. **(a)** (2) Commission shall require utilities to adopt and implement plans (1) to satisfy the state policies listed in PUC 933, such as upgrading the distribution system as needed and in time to achieve decarbonization and air quality goals, and conducting advance planning, engineering and construction so that customers can be energized without substantial delay; (2) to support achieving the requirements from 936 (a) (1) above; and (3) to generally meet the energization time periods required by PUC 934. **(b)** Utilities may only do E) if they provide the CPUC forecast details or what requests necessitated the alternate forecast.
933.5 (c) (1) *(AB 50)*	"To improve the accuracy of projected demand and facilitate achievement of the goal of timely electric service through energization, each electrical corporation shall **evaluate and update, as necessary, its existing distribution planning processes**."
933.5 (c) (2) *(AB 50)*	"To improve the accuracy of projected demand, each electrical corporation **shall have annual meetings with interested parties and experts in customer energization**, including representatives from local governments and the relevant county staff for each interested county in its service territory…"
933.5 (c) (3) *(AB 50)*	"To increase the pace and scale of local projects intended to meet state, regional, and local housing and economic development objectives, each electrical corporation **shall share relevant information, which may include, but is not limited to, data available through the integrated capacity analysis tool, upon request with local governments** about those areas where existing capacity either exists or could be easily added, and where existing capacity is planned to be added, within the distribution system to meet those objectives."

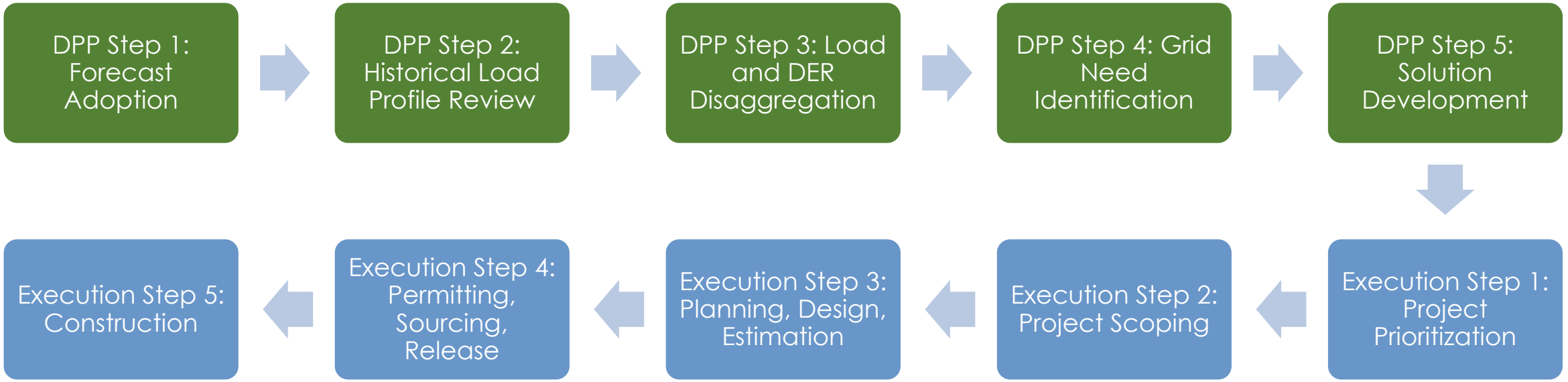
Two key sections: 2 is more narrative/historical and 3 identifies key issues and makes proposals

2. The Current Distribution Planning and Execution Process – Background and Recent History
   - 2.1. The Current Distribution Planning and Execution Process
   - 2.2. How We Got Here: Historic Load Growth, Conservative Planning Process, and PG&E Behind on Projects

3. Issues with Current Distribution Planning and Project Execution and Related Proposals
   - 3.1. Issues with the Current DPEP
   - 3.2. Proposals Related to Distribution Planning and Execution
   - 3.3. From DIDF to Transparency in Distribution Planning
   - 3.4. Commission Oversight

The Current Distribution Planning and Execution Process – Background and Recent History

Distribution Planning and Execution Process



What Are Grid Upgrades?

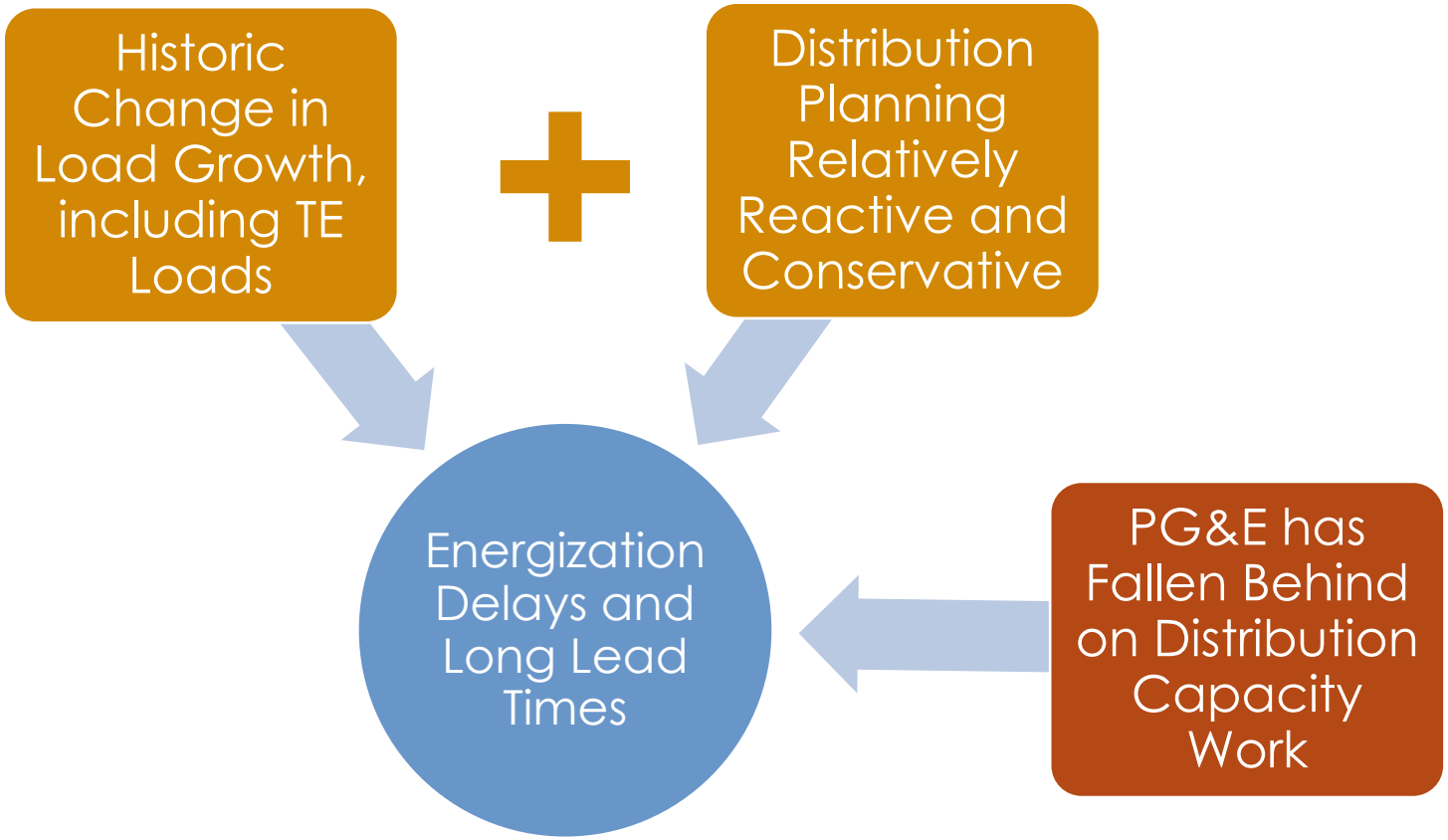
Why and when are they needed?

- Grid upgrades consist of upgrading or installing new:
  - Substations or substation transformers
  - Distribution circuits or line segments

- They are needed to ensure the safety of the distribution grid and everything connected to it.

- They respond to a violation of capacity, voltage, and/or reliability:
  - Capacity: the forecasted **peak demand** on a circuit or line section **exceeds the capacity**, or the utility determined limit.
  - Voltage: Voltage limits **(±5%)** are exceeded on a distribution feeder.
  - Reliability: A capacity violation appears due to a forced or planned **outage situation** under peak conditions where the customers impacted must be temporarily served by other assets for 24 hours or more.

High Level Narrative Around Long Lead Times for Energization



Issues and Proposals from the Staff Proposal

Coordination and Planning

Issue 3.1.4

Proposals 3.2.4, 3.2.9

Extending and Improving Long Term Forecasting and Disaggregation

- Extending and improving the long term forecast and disaggregation may help utilities with:
  - Proactive planning of larger infrastructure projects to reduce energization lead times.
  - Advanced awareness of workload, material, and other future needs.
  - Integrated planning between different utility work streams.

Proposal to extend the planning horizon to **10 years at minimum** from its current 5 years.

	PG&E Upgrade Time	SCE Upgrade Time	SDG&E Upgrade Time
Distribution line work	1-3 years	1.5-2 years	1 year
Adding a new circuit from an existing substation	2-3 years	2-3 years	No data provided
Add or replace substation transformer at an existing substation	3-4 years	3 years	No data provided
Build a new substation	5-7 years	5-10 years	No data provided

Integrated Planning: Consider Distribution Planning When Doing Other Distribution Work

- Utilities would be directed to propose, via Tier 2 Advice Letter, a method for referring to the results of their DPP when designing projects in other distribution workstreams.
  - They are directed to weigh the current increased costs from increased capacity against potential future cost savings from avoided duplicative work.
- During a time of growing power needs, it is reasonable to consider future load growth when building or maintaining the distribution system, for example during wildfire hardening or asset repair work.

(Increased Cost for Current Project)

is less than

(Probability of Future Grid Need) *multipled by*

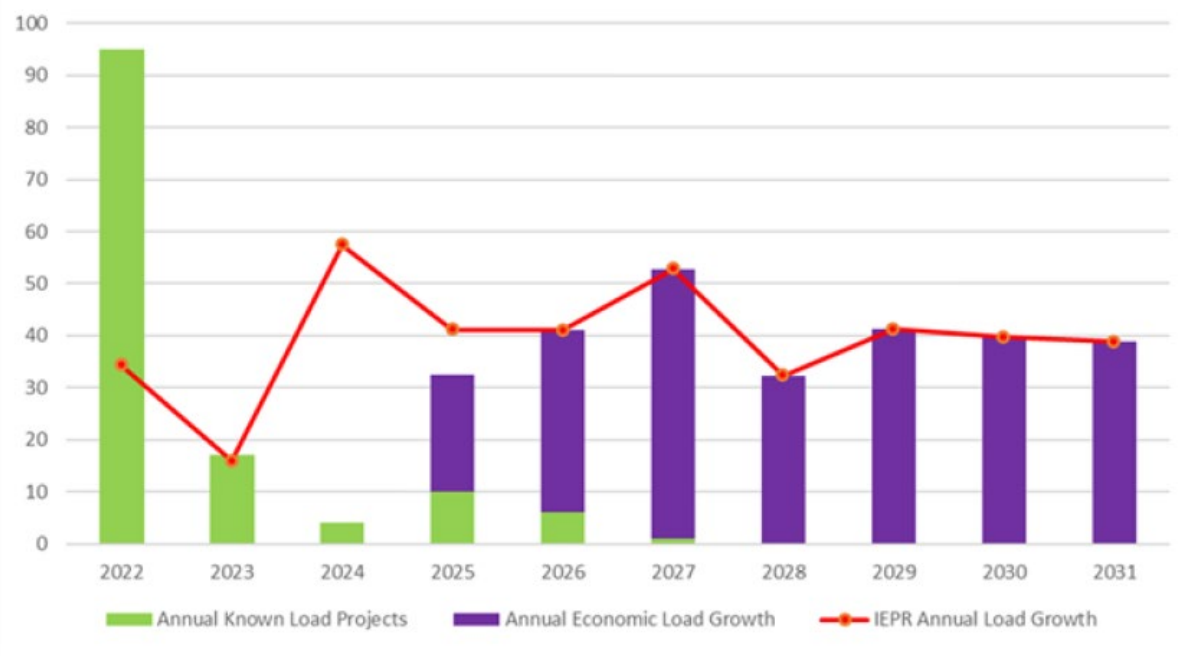
(Cost of Potential Distribution Capacity Project, Adjusted via Discount Rate)

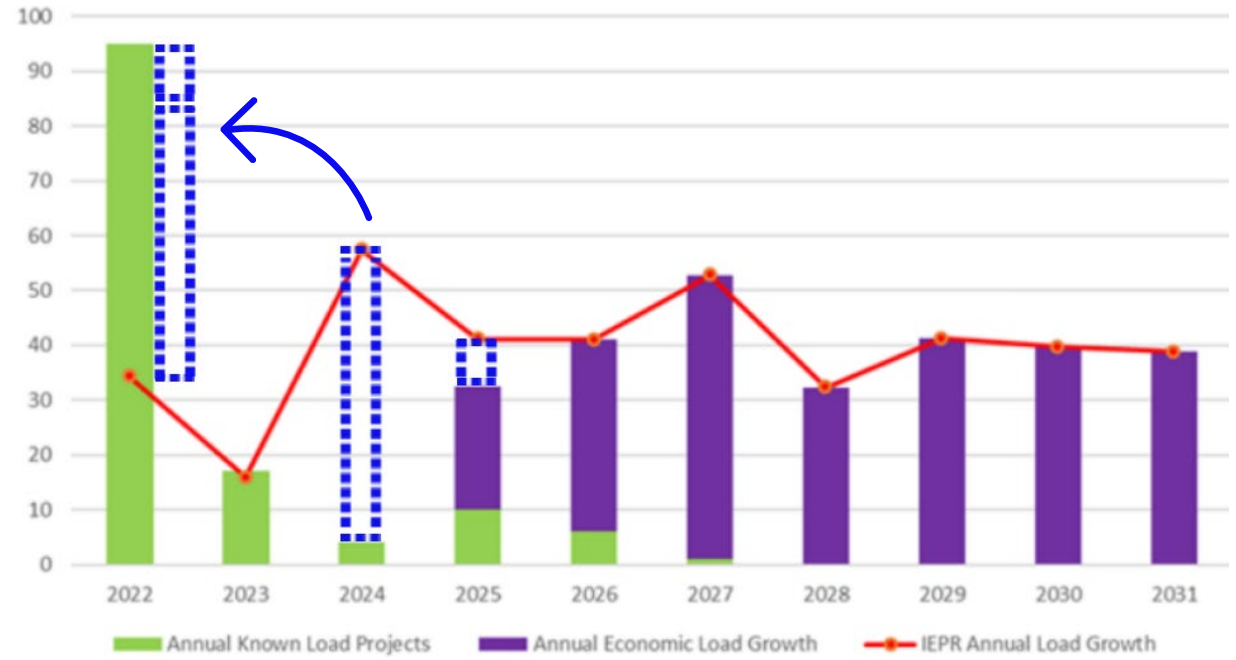
Near-Term Forecasting and Reconciling Bottom Up and System Wide Forecasts

Issues 3.1.1, 3.1.2

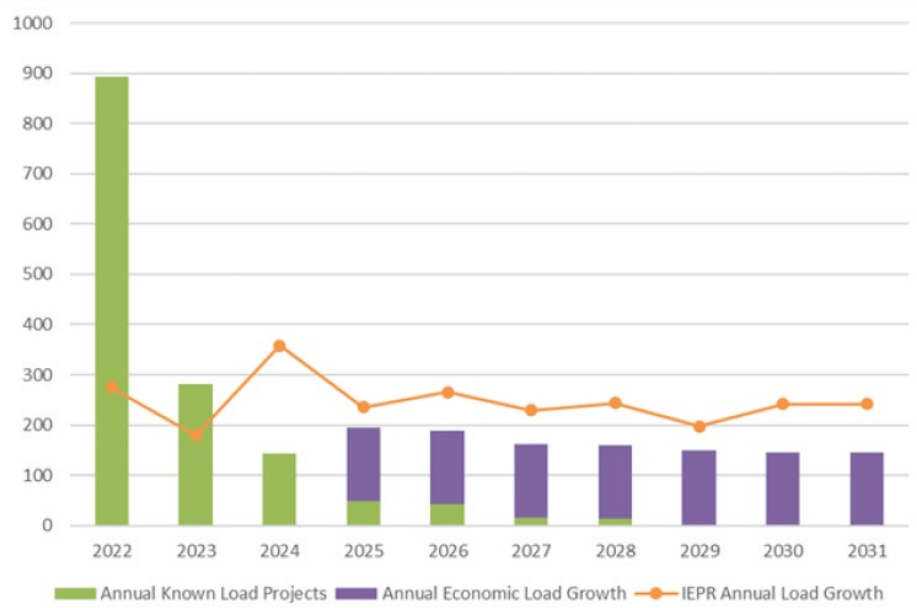
Proposals 3.2.1, 3.2.2, 3.2.3,

SDG&E as an Example: Current DPP Forecasting

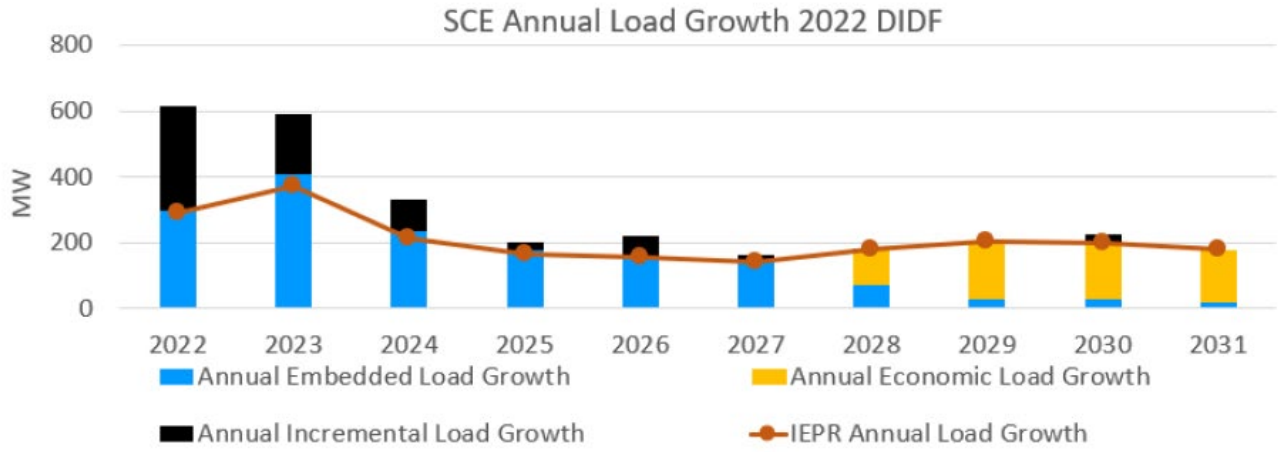




PG&E



SCE



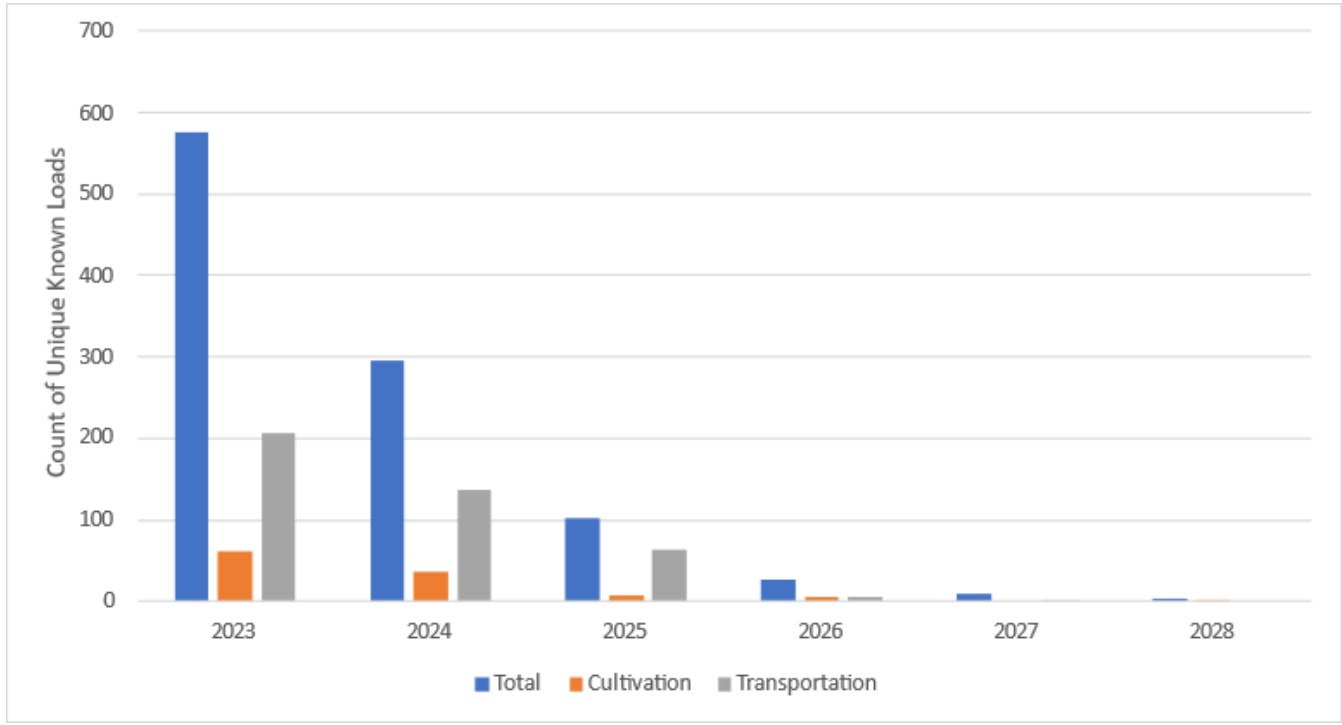
- Borrows load from the future years of IEPR forecast
- Makes mid- and long-term forecast less realistic and less reliable
- Challenge for proactive planning of mid- and long-term needs

Key Source of Distribution Planning Data: Known Loads or Energization Requests from Customers

- Known Load data are relatively accurate, both in the **amount** but also in the **location** of load.

- **Only exists in the near term** and are already heavily diminished in Year 2.
  - Customers typically do not plan out or communicate their needs to utilities 3+ years in advance

- Known loads **always** exceed the IEPR forecast in Year 1

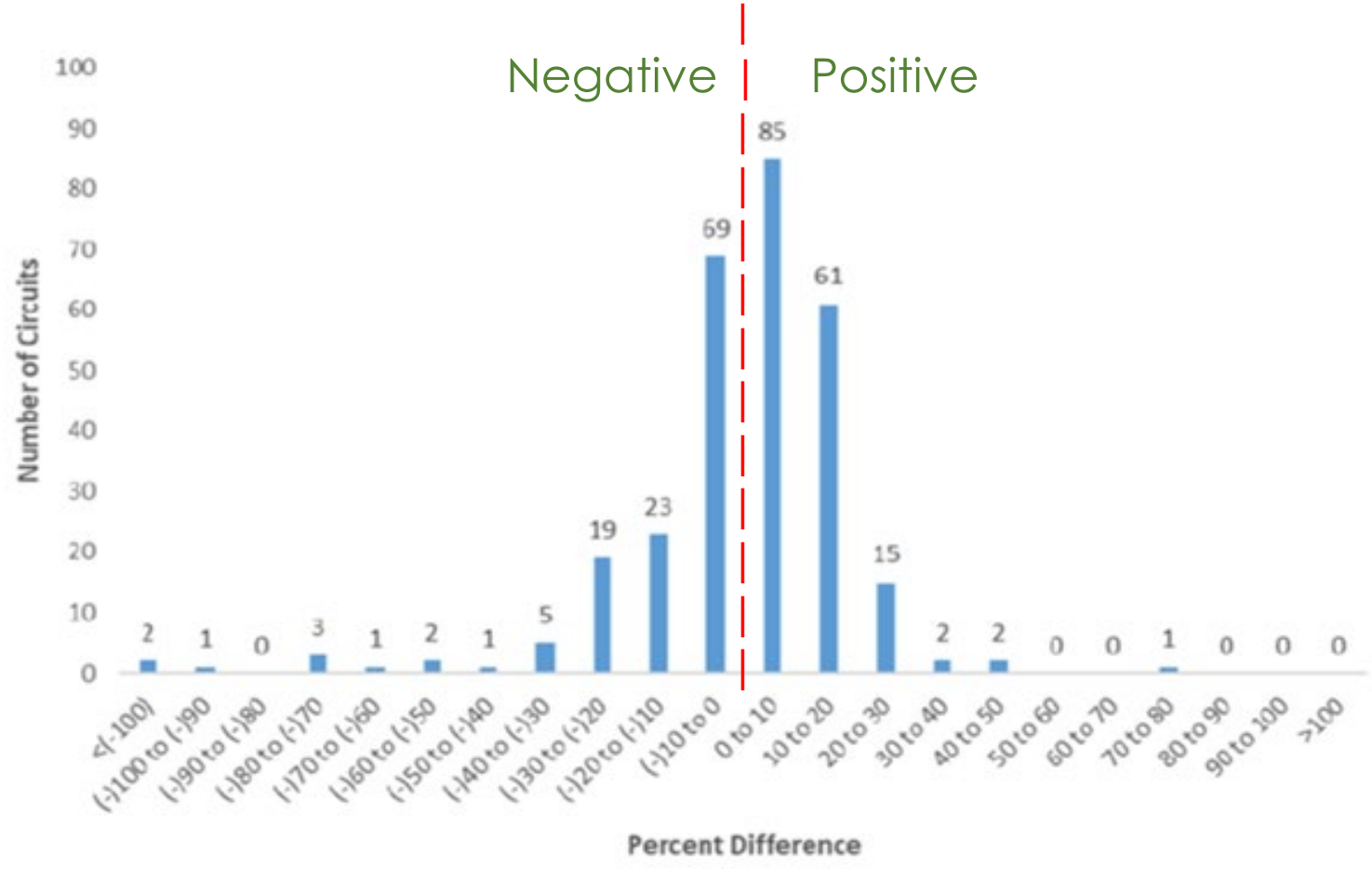


Planning for Known Loads is Effective

Percent difference between forecasted year 1 loads and actual loads that showed up the next year for a random selection of circuits

53% of loads were within **±10%**

81% were within **±20%**



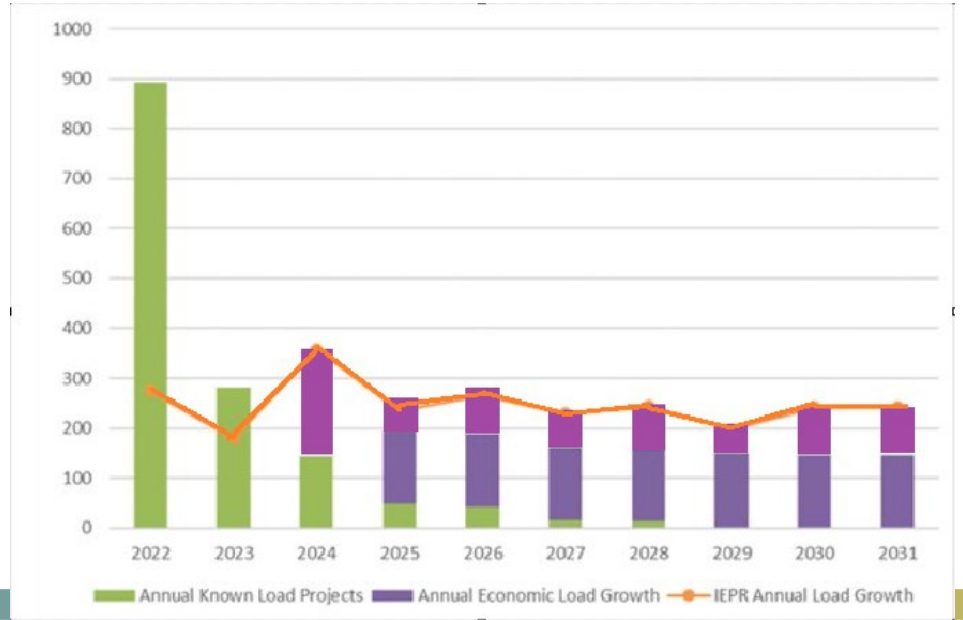
Source: 2022 IPE SCE DPAG Report

Based on data from 2020/2021 SCE DIDF Cycle

Allow Utilities to use Bottom-Up, Known Load Data to Determine Load Growth

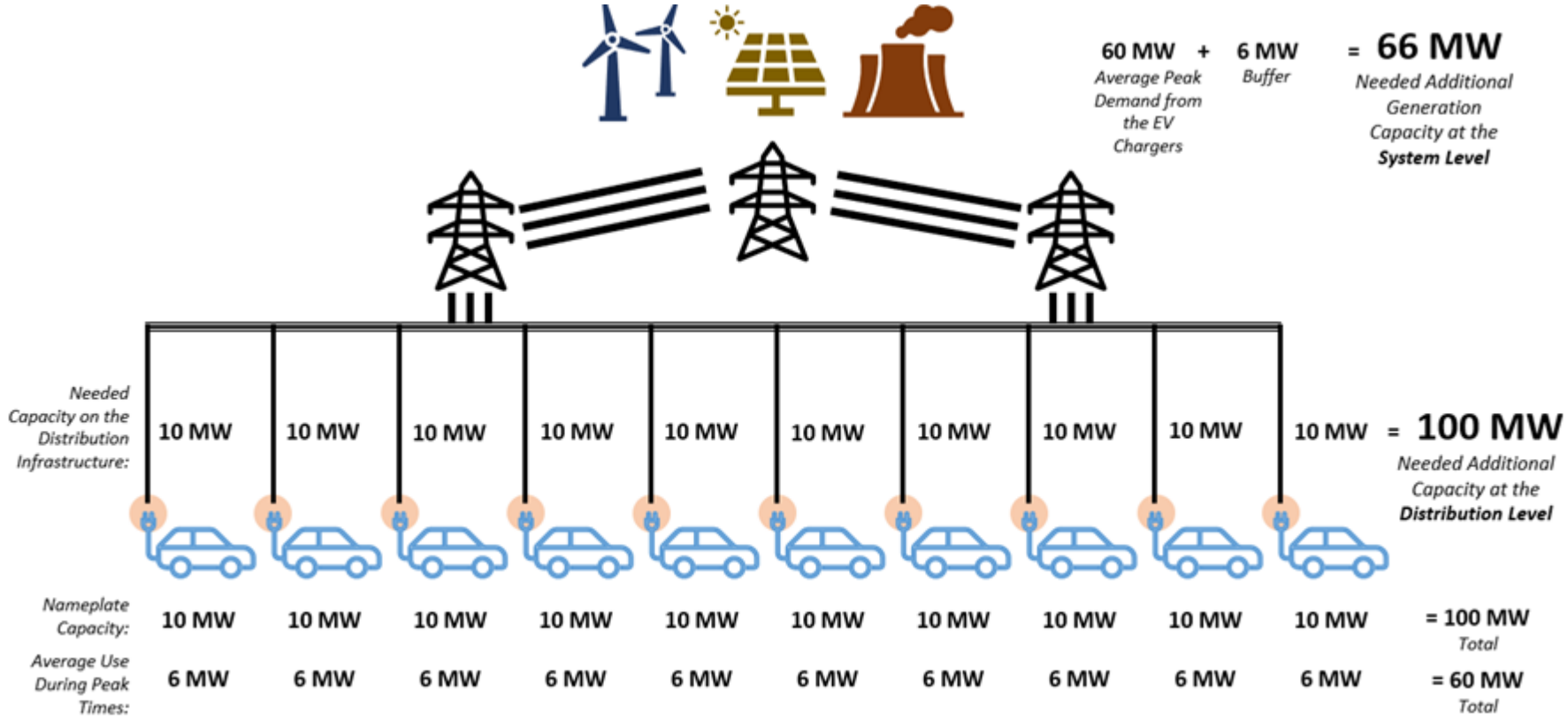
- All parts of the forecast should be reliable. Reliable near-term forecasts should not come at the expense of the mid- and long-term.
- Known loads are a good base for planning.

Proposal: Use reliable bottom-up data to estimate total load growth in a given year **even if it exceeds the IEPR** forecasted load growth for that year.



Reconciling Top-Down and Bottom-Up Forecasting

- The IEPR serves as the basis for transmission and resource planning for the larger electric grid.
- Using the IEPR at the distribution level ensures alignment with transmission and resource planning. However, there are differences between planning at the system-level and local-level.



Improve Method for Setting Caps on Load Growth from IEPR Data

- There are real differences between distribution level and system level planning.

Direct IOUs to improve methods of bringing the IEPR into the DPEP

- Account for these differences and move toward a method that allows more direct comparison

Table 3: Comparison of Peak System-Level Load from IEPR Forecasts with the Sum of Circuit-Level Peak Loads, PG&E and SDG&E (in GW)

Distribution Planning Cycle	2020-21 DIDF Cycle		2021-22 DIDF Cycle		2022-23 DIDF Cycle		2023-24 DIDF Cycle	
Utility	PG&E	SDG&E	PG&E	SDG&E	PG&E	SDG&E	PG&E	SDG&E
IEPR-Based Load Forecast	18.6	4.5	18.7	4.4	18.3	4.5	19.1	4.8
Load Forecast from Sum of Historical Peak Loading at the Circuit-Level	21.7	5.0	22.3	4.9	22.2	4.9	23.2	5.2
Circuit-Level as percentage of IEPR-Based	116%	112%	119%	110%	121%	109%	121%	109%

Source: IOU data from PG&E and SDG&E, SCE uses a different method based on the IEPR energy forecast so is not included here.

TE Growth and Mid-Term Forecasting

Issues 3.1.3, 3.1.5

Proposals 3.2.7

New Load Growth Can Be Fast

Traditionally, large load growth was associated with big construction projects that took significant time to build.

Now, large loads like EV DC fast chargers can be installed in weeks.

Between Known Loads and Economic Modelling

- Known Loads are only available in the first ~3 years.
- Distribution system upgrades can take **1-3 years** for circuit upgrades and **3-8 years** for substation upgrades.
- Therefore, advanced notice of new loads that could trigger the need for distribution system upgrades would be valuable.

- Long term forecast uses economic modeling to disaggregate load to circuits.
- Without knowing where and when load will appear, **load is spread out** across the grid relatively evenly.

- Currently, disaggregated load allocation tends to be spread out until it appears as a known load at a specific location.

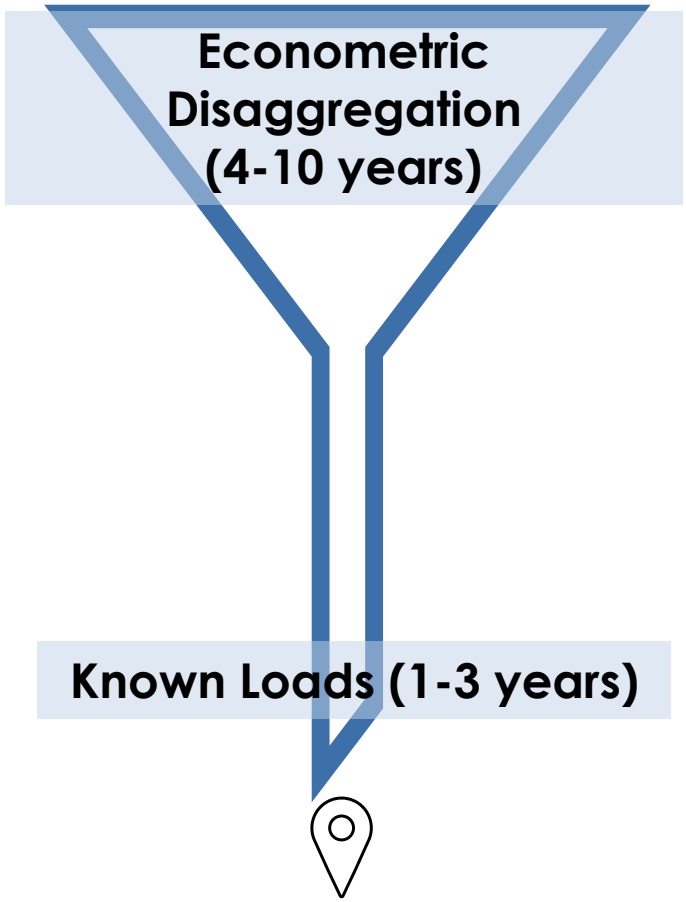
Pending Loads – build out the mid-term

Long-Term (6-10 years)
- Uncertain quantity
- Uncertain location

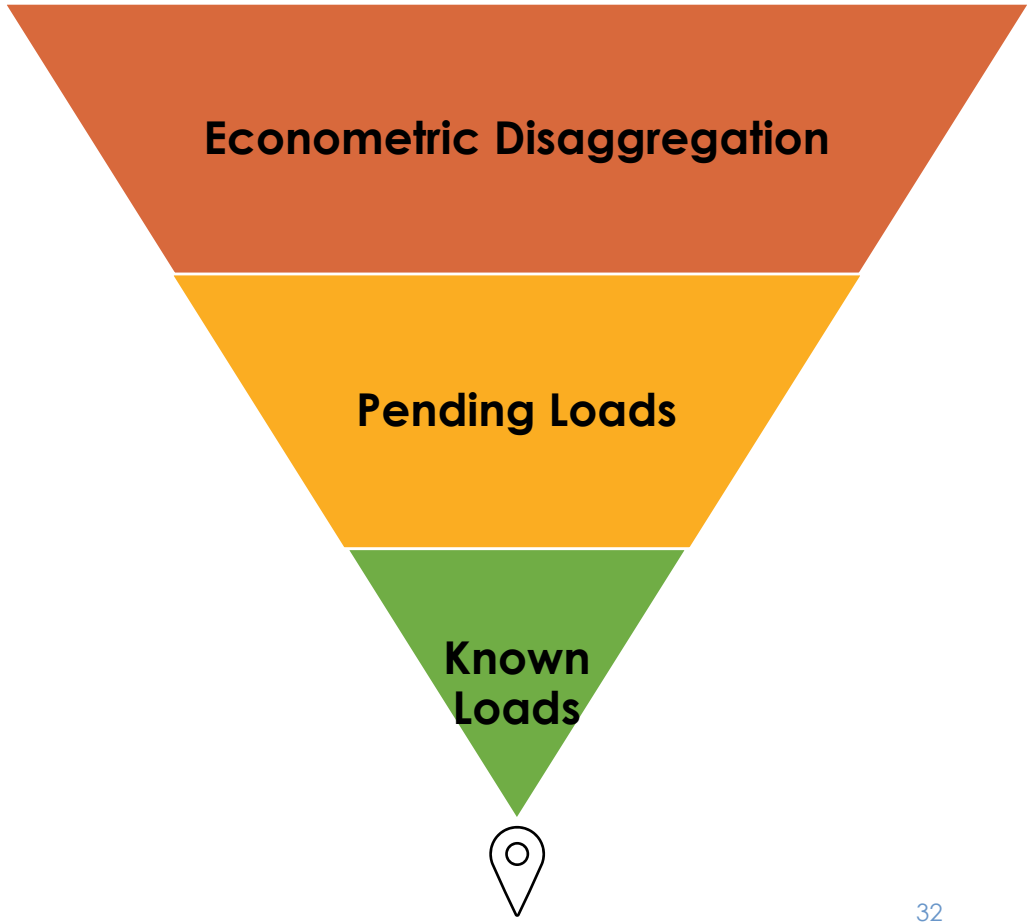
Mid-Term (4-6 years)
- General quantity
- General location

Near-Term (1-3 years)
- Certain quantity
- Certain location

Without Pending Loads (currently)



With Pending Loads (proposed)



Pending Loads – What are they?

Pending loads are a new category of load that leverages available information to add certainty to the location and/or quantity of load growth in the mid-term

- Local government development plans
- Fleets required to electrify
- Equity focused clean energy deployment programs
- Proactive planning frameworks
- Early customer outreach

Questions:

- How can pending loads be de-risked?
- Where and when should pending loads be used?
- How should they be implemented?
- Should pending loads be allowed to exceed the IEPR like known loads?

Long-Term Disaggregation

Issues 3.1.4

Proposals 3.2.6

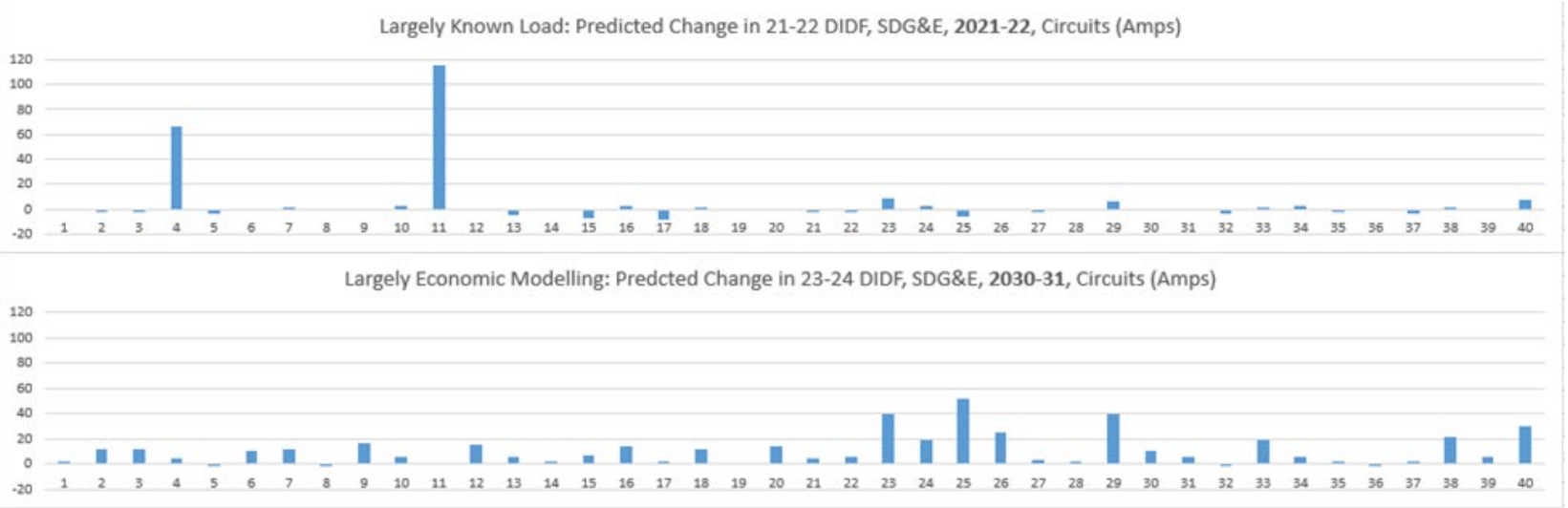
Known Loads versus Econometric Disaggregation

The top graph shows the Year 1 forecast based primarily on Known Loads

- Load growth is relatively **lumpy and concentrated**
- Both large and small loads
- More often reflects load decreases

The bottom graph shows the Year 8 forecast based primarily on econometric disaggregation

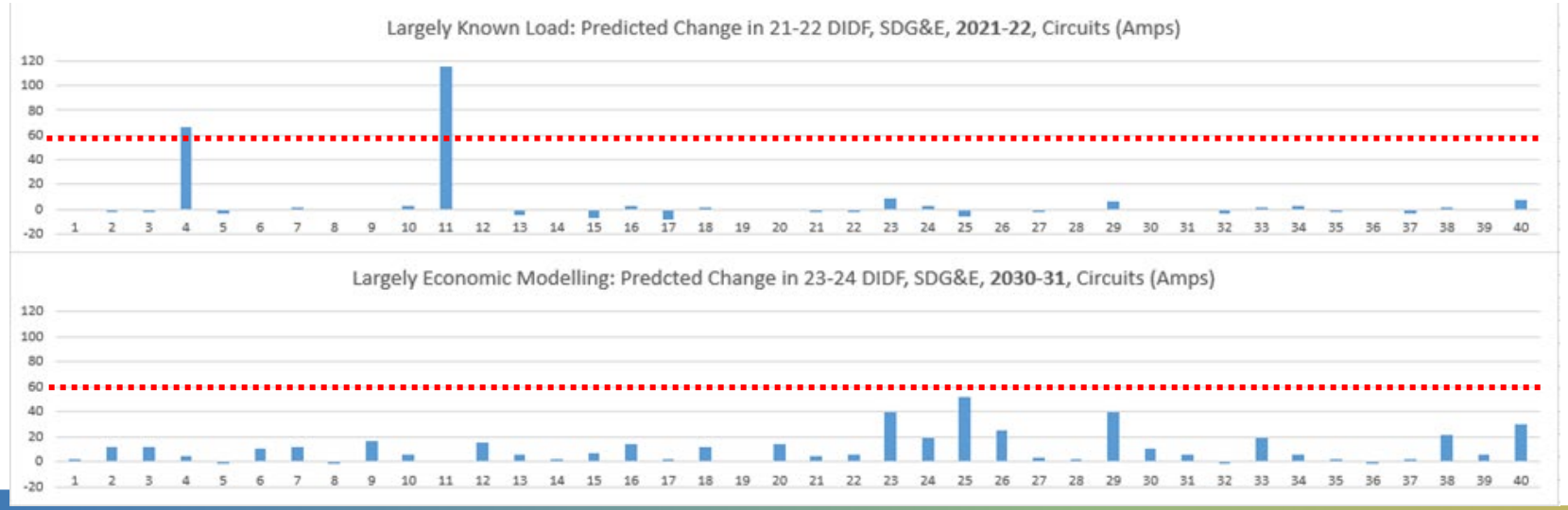
- Load growth is relatively **smooth and distributed**
- Almost entirely small loads
- Reflects fewer load decreases



Source: Random sampling of circuits from SDG&E data. Circuits listed from 1 to 40. Change measured in Amps.

Current Disaggregation Methodology is Binary

- The economic modelling assigns a specific amount of load to each location on the grid, which transforms a fundamentally uncertain quantity to a fixed amount.
- The result of the DPP is a binary Yes or No per asset:
  - Yes, the forecast creates a grid need on this asset
  - No, the forecast does not create a grid need on this asset
- Because long-term disaggregation methods spread out load growth, the changes on each circuit are less likely to lead to identified grid needs.



Illustrative example: Red line represents if upgrades on all circuits were triggered by a 60 Amp load increase. (In reality, each circuit would have a different triggering amount of load growth.)

Economic Modeling and Other Load Forecasting and Disaggregation in the Mid- and Long-Term

- Given that no reliable means exists to predict the exact location of energization requests in the long term, the current method is somewhat reasonable. However, with a longer planning horizon and more proactive planning, the long-term forecast should be improved.
- IOUs could use statistical analysis (e.g., Monte Carlo analysis) to model potential futures more realistically (lumpy and concentrated) without being determinative.
- This analysis would estimate the probability that a capacity limit is exceeded (no longer a binary output).
  - e.g., out of 1,000 scenarios, this circuit needed an upgrade in 80%

Community Engagement and Equity in Distribution Planning

Issues 3.1.9, 3.1.10, 3.1.11

Proposals 3.2.8, 3.2.13, 3.3.4

Key Goals for Longer Term Commission Action

Equity

Proactively consider equity as a priority in distribution planning by evaluating planning inputs, methodologies and outputs.

Community Engagement

Effective IOU coordination with local planning entities.

Project Prioritization

Improve prioritization under constrained funding.

Incorporating equity considerations into prioritization.

Prioritizing the acceleration of future projects.

EQUITY : Commission Action

IOU Requirement: Include specific data in Grid Needs Assessment (GNA) and Distribution Deferral Opportunity Report (DDOR) filings

Data Points	What we need…	What we DON'T need…
% of customers served in CARE/FERA programs	Required for facilities/equipment serving a set of customers (e.g., circuit segments, substations)	The data is unnecessary for equipment not serving specific customers (e.g., a new switch).
CalEnviroScreen 4.0 percentile for the served area		
Identification if the facility serves a Disadvantaged Community (DAC)		

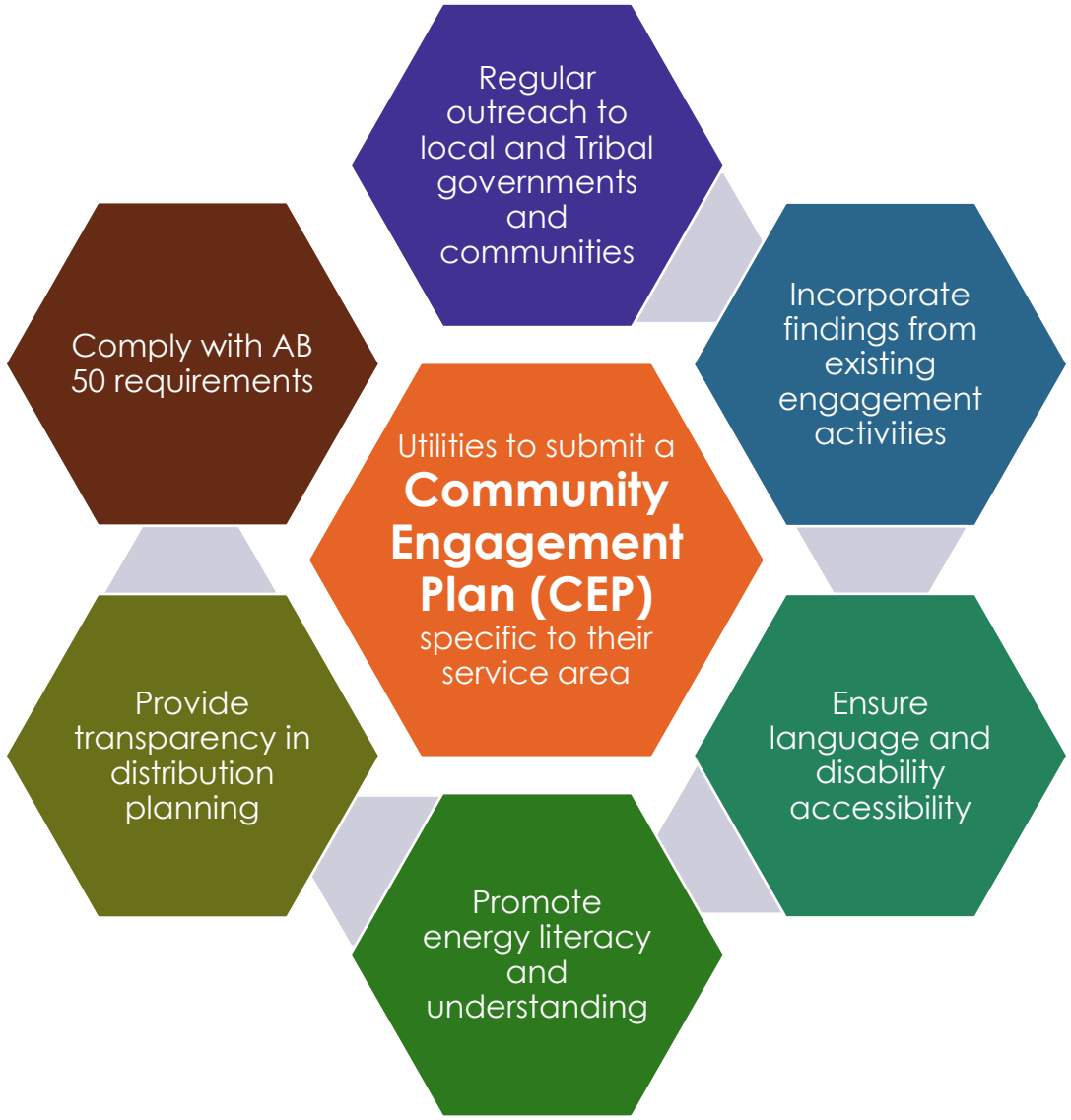
Tentative Timeline: 2025 DPP Cycle

COMMUNITY ENGAGEMENT : Commission Action

Tentative Timeline: 2025

Additional CEP Topics:

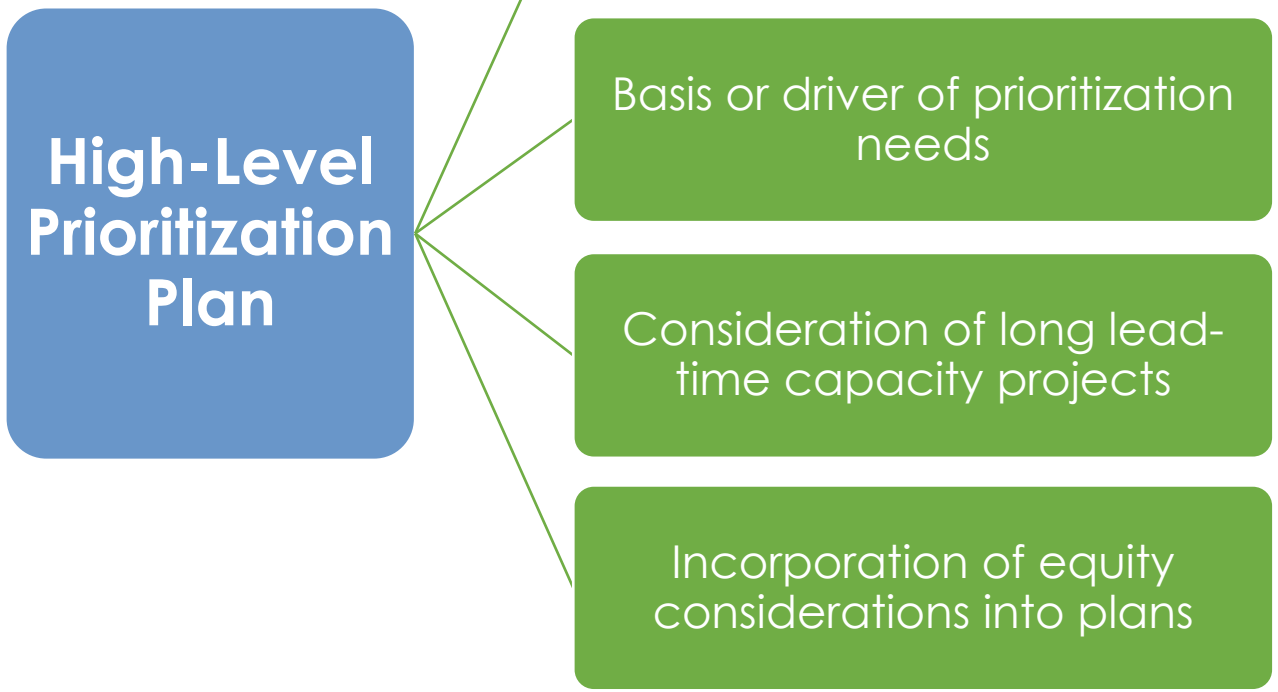
- Incorporate information from local governments, planning agencies, and Tribal entities on potential new energy needs.
- Address how community feedback will influence distribution planning.



Related Legislation:

- SB 410: PUC Section 936(a)(2)
- AB 50: PUC Sections 933.5(c)(2) and 933.5(c)(3)

PROJECT PRIORITIZATION: Commission Action



- **Grid need occurs in all forecast scenarios (low, medium, and high)**
- **Likelihood of grid need occurrence**
- **Number of grid needs addressed**
- **Timing, frequency, and duration of grid need**
- **Types of grid needs addressed by planned investment**
- **Whether grid needs are fully addressed by planned investment**
- **Cause of grid need (e.g., organic load growth vs. energization request)**
- **Number and types of customers served**
- **Disadvantaged community status of service area**
- **Grid need related to state policy goals or plans**

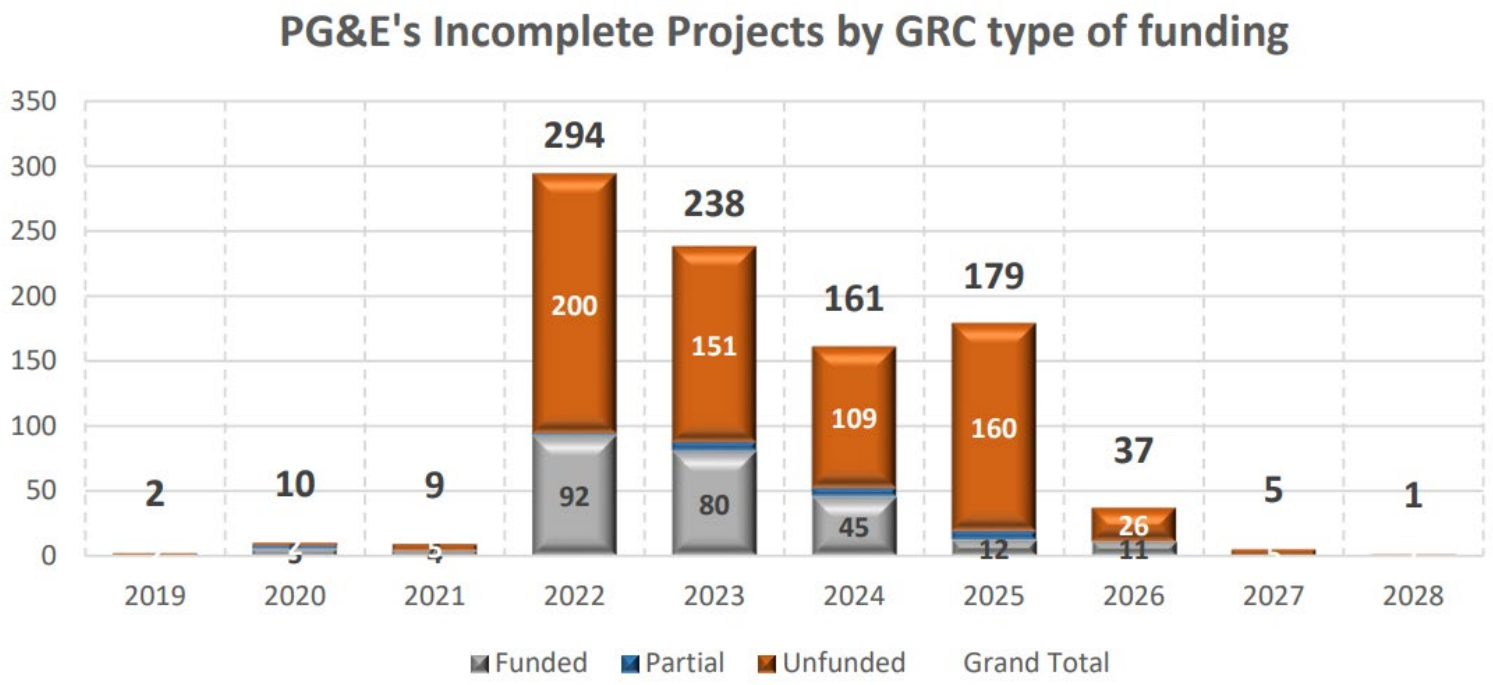
Tentative Timeline: 2024 Advice Letter

Cost Recovery

Issue 3.1.7

Proposal 3.2.12

Cost Recovery – Limiting and Outdated



Existing requirements lead to outdated and restricted inputs into the GRC

Outdated inputs can lead to under-forecasting and therefore funding issues

SB 410 allows utilities to file applications to alleviate these immediate issues

IEPR Vintage	IEPR Release Date	Associated DIDF Cycle	GNA/DDOR Release Date	Associated GRC	GRC Release Date
2019 IEPR	2/20/2020	2021-2022	8/16/2021	PG&E 2023 GRC	6/30/2021

Other Proposals

Other Proposals included in the Staff Proposal

Distribution Planning Improvements:

- Provide Flexibility on which IEPR Vintage Utilities Can Use in Distribution Planning and Develop Methodology for Incorporating Newer IEPR into Existing Planning
- Utilities to Improve Forecasting and Disaggregation with Scenario Planning
- Utilities to Develop Bridging Strategies to Better Accommodate Energization Requests that Trigger Distribution Capacity Work
- Utilities to Prepare a Load Flexibility DPP Assessment

Distribution Investment Deferral Framework (DIDF):

- Deprioritize DIDF to Free Up Stakeholder Time
- Include Metrics to Track Project Execution in Utility Distribution Plan Reporting
- Up-To-Date Utility Known Load Project Tracking and Reporting with the CEC.
- Facilitate Better Coordination and Data Sharing Between the DPP and Transportation Electrification Work

Improvements to Data Portals and ICA Maps

Data Portals & Interconnection Capacity Analysis (ICA)

Data Portals

The IOU Distribution Resources Plan (DRP) Data Portals are interactive web portals providing public access to key information about each utility's electrical grid. DRP Data Portals host online maps to help the public, in particular contractors and developers, identify hosting capacity, grid needs and other information to inform the planning of project sites for DERs.

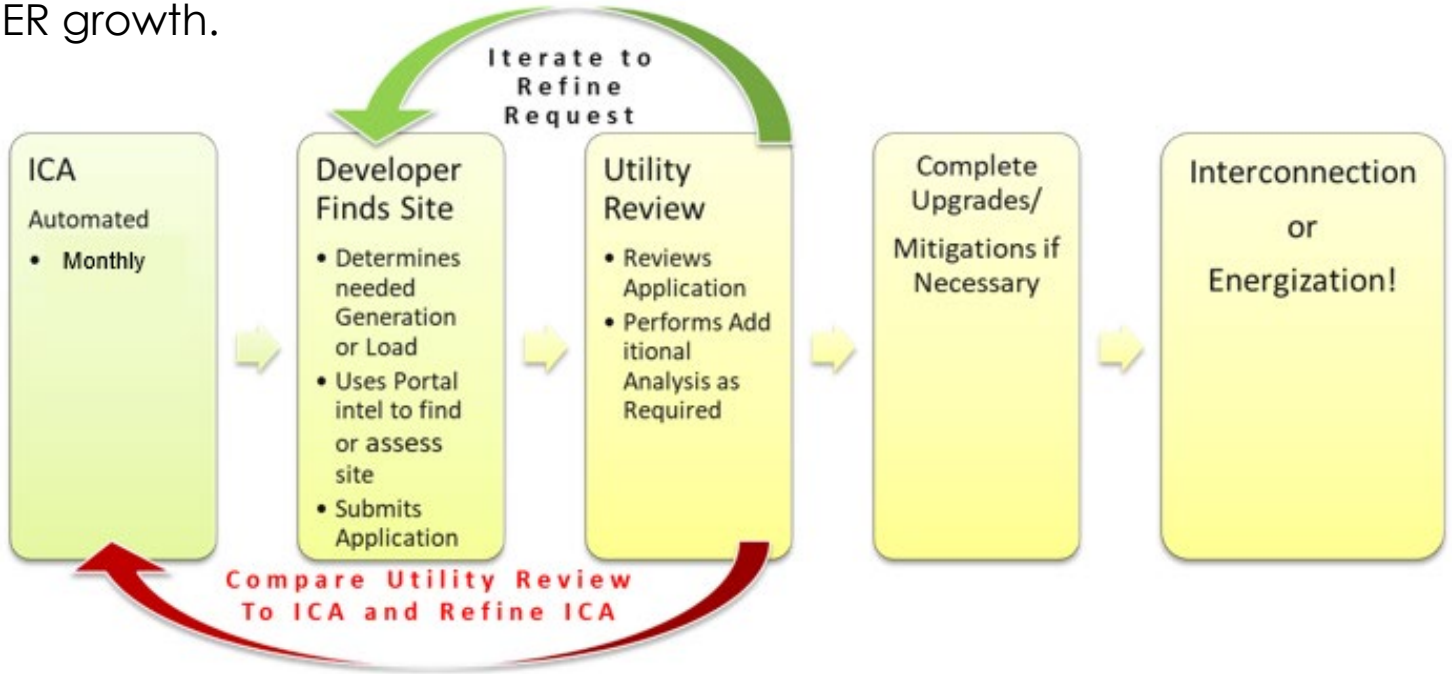
Screenshots from IOU Data Portal Pages (above)

Data Portals & Interconnection Capacity Analysis (ICA)

Interconnection Capacity Analysis (ICA) is the process by which an IOU estimates how much hosting capacity for new generation, or load, is available on the grid. Each IOU uses an iterative analytic methodology to estimate generation and load hosting capacity for each line segment. An ICA Map in a data Portal visually displays ICA results much like a heat map.

The primary use cases for ICA are to:

- Inform DER developers of grid locations where DERs can interconnect without system upgrades;
- Streamline (and eventually automate) steps in the Rule 21 interconnection process; and
- Inform annual distribution planning re: location of hosting capacity constraints due to expected autonomous DER growth.



ICA Results Use in Interconnection/Energization Process (above)

Identified Areas for Improvement

Key Goal 1: Enhance Usefulness

Accuracy

Accuracy refers to agreement of ICA results with the real-world hosting capacity determined by utility engineers who process interconnection/ energization applications. Increasing accuracy improves the usefulness of ICA maps by making the presented data more likely to be correct and actionable.

Level of Detail & Context

Increasing the level of detail and context available enables stakeholders to have a more thorough understanding of ICA results and their implications.

Key Goal 2: Improve Design

Design & Usability

Given the large quantities of data and technical information on the data portals, improving the design and usability increases their clarity, comprehensibility, and usefulness.

Staff Proposals for Improvement

Key Goal 1: Enhance Usefulness

Accuracy

- Modify ICA Methodology to Make use of Limited Generation Profiles (LGP) Application Information
- Develop New Reporting Aimed at Understanding the Frequency of Potentially Erroneous Zero Load ICA Values
- Incorporate Load ICA Results into Internal IOU Energization Business Processes and Publish Metrics (PG&E only)

Level of Detail & Context

- Incorporate More Detail of the Limiting Criteria into ICA Results in the Data Portal Maps
- Create New Report that Includes ICA Results Appended to Current Rule 21 Quarterly Interconnection Report Which Allows for Comparison Between ICA Values and Quarterly Interconnection Timelines Report
- Offer Bulk Download of all ICA and DIDF Map Data in Multiple File Formats

Key Goal 2: Improve Design

Design & Usability

- Remove All PG&E and SDG&E Registration Requirements for Data Portal User Access
- Utilities should Utilize the 15/15 Rule, not the 15/100/15 Rule, for Decisions about Data Redaction Protecting Individual Customer Privacy for the ICA, GNA, and DDOR
- Modify ICA Maps to Enable Straightforward Customer Creation of Limited Generation Profiles (LGPs)
- Several other suggested display and interface changes

Questions and Comments

On the Issues Raised in the Staff Proposal and Covered Here.

Next Steps and Close

Comments Due May 28, 2024

Reply Comments Due June 18, 2024

Parties are reminded that comments shall be presented in the same order as the Staff Proposal using the same headers and sub headers as those used in the Staff Proposal.