Data Portals Workshop for the High DER Grid Planning Proceeding

Energy Division

July 26, 2022

California Public Utilities Commission

This Event is Being Recorded

Agenda

• Welcome, Remarks of Commissioner Houck	9:00-9:15
• Workshop Context & Proceeding Overview	9:15-9:45
• California Distribution Grid Planning Overview	9:45-10:30
• DRP Data Portals and Analytical Processes Overview	10:30-11:15
• DRP Data Portal Stakeholder Interviews to Date	11:15-12:00
• Lunch Break	12:00-12:30
• Feedback from Attendees	12:30-1:30
• Next Steps	1:30-1:45

Opening Remarks of Commissioner Darcie Houck

Workshop Objectives

1. Achieve high-level common understanding of how California utilities and regulators conduct distribution grid planning, including the primary data and tools leveraged.

2. Achieve high-level common understanding of what distribution grid planning data and tools are currently available to external stakeholders, including via the utility Distributed Resource Planning (DRP) data portals that include the Integration Capacity Analysis (ICA) and Grid Needs Assessment (GNA) tools

3. Discuss the primary use cases for the Data Portals:
   - Facilitating interconnection of DERs (ICA)
   - Facilitating siting of DERs and electric vehicle charging stations (ICA)
   - Supporting distribution planning and DER integration (GNA)

4. Inform attendees of feedback received from DER stakeholders to-date on suggested improvements to the utility data portals and provide an opportunity for additional feedback.

5. Inform attendees of the scope and timing of upcoming enhancements to the utilities' DRP data portals in development by the consulting team.

6. Inform attendees of additional opportunities to provide feedback on data portal improvement beyond today's workshop.

Logistics

- All attendees have been muted
- To ask questions, please 'raise your hand'  and a host will unmute you so you can ask your question at the end of each section. Please say which organization you represent.
  *Reminder: Please press mute when done speaking 
- Feel free to put questions/comments in the chat at any point; we will either answer them as we present or come back to them at the end of each section
  - We have disabled Q&A to avoid any duplication or confusion
- Please use this form to provide feedback and/or comments at the end of the workshop or in the days following:
  - Data Portals Workshop Feedback and Comments
  - You may need to copy and paste the link: https://forms.gle/UPUYSL2yk1t9WFg37

We Anticipate a High-Penetration Distributed Energy Resource (DER) Future

"This OIR anticipates a high-penetration DER future and seeks to determine how to optimize the integration of millions of DERs within the distribution grid while ensuring affordable rates."

– High DER OIR at p. 9

"This OIR neither seeks to set policy on the overall number of DERs nor does it seek to increase or decrease the desired level of DERs. This OIR focuses on preparing the grid to accommodate what is expected to be a high DER future and capture as much value as possible from DERs as well as mitigate any unintended negative impacts."

– High DER OIR at p. 10

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

The proceeding will:

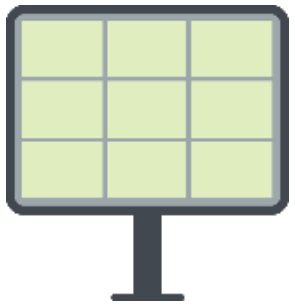
- Address unresolved and ongoing issues from the Distribution Resources Plans proceeding (R.14-08-013) and Integrated Distributed Energy Resources (IDER) proceeding (R.14-10-003)
  - Note: Unresolved issues associated with the IDER Avoided Cost Calculator are expected to be scoped into a separate proceeding.

In addition, the proceeding intends 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.

What are DERs?

- Per AB327 and Section 769(a):

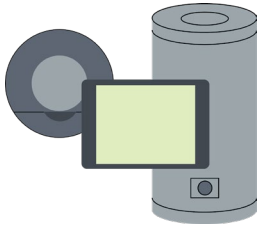


Distributed Renewable Generation Resources such as solar

Energy Efficiency

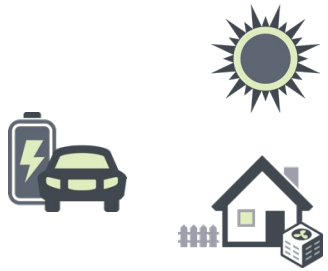
Energy Storage

Electric Vehicles



Demand Response Technologies

Organized Under Three Tracks



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Distribution Planning Process and Data Improvements

- Phase 1: Near-Term Actions
- Phase 2: Distribution Planning Process Improvements
- Topics:
  - IOU Distribution Planning Processes
  - Electrification Impacts and Potential Mitigation
  - Data Portals
  - Community Engagement Needs Assessment & Scoping

2

Distribution System Operator (DSO) Roles and Responsibilities

- Long-term grid vision
- Grid architecture
- Investigation of DSO models

3

Smart Inverter Operationalization and Grid Modernization Planning

- Phase 1: Smart Inverter Operationalization
- Phase 2: Grid Modernization Planning and Cost Recovery
- Topics:
  - Business Use Cases for Smart Inverters
  - DER Dispatchability
  - Smart Grid Investment Planning

Track 1: Distribution Planning Improvements

- Phase 1: Near-Term Actions
- Phase 2: Distribution Planning Process Improvements
- Topics:
  - IOU Distribution Planning Processes
  - Electrification Impacts and Potential Mitigation
  - Data Portals
  - Community Engagement Needs Assessment & Scoping

Track 1: Scoping Question #4 – Why we are here

4. How should Integration Capacity Analysis data and calculations be improved to enhance accuracy and usefulness for DER planning, siting, and interconnection, especially with respect to electrification load?

   - Should the Data Portal design be improved to provide access to data for multiple stakeholders in the DPP?

Data Portals Plan

Study Activities and Opportunities for Input

Consulting Team

All working together to support the proceeding

VERDANT

kevala

GRIDWORKS

Xanthus

Completed Phase 1 Data Portals Activities
These will be presented and discussed later today

Summary of regulations	Review of Public Comments	Stakeholder Interviews*	Use Data Portals
• What has been ordered • How requirements have developed • Future Improvements Ordered	• What organizations have commented • Identify comment themes • How have comment themes have changed	• Draw from public comments – no need to rehash what has already been stated • Talk to users and potential users to gather direct feedback	• Build experience to inform future work • Confirm any limitations stakeholders identified • Download data to enable comparisons

*To provide your additional input please use the Comments Form

Planned Phase 1 Data Portals Activities

Today's (July 26) Workshop

- Educate
  - Distribution Planning Tools and DRP portals
  - Planned improvements
- Discuss use cases
- Present feedback received
- Solicit feedback and discussion

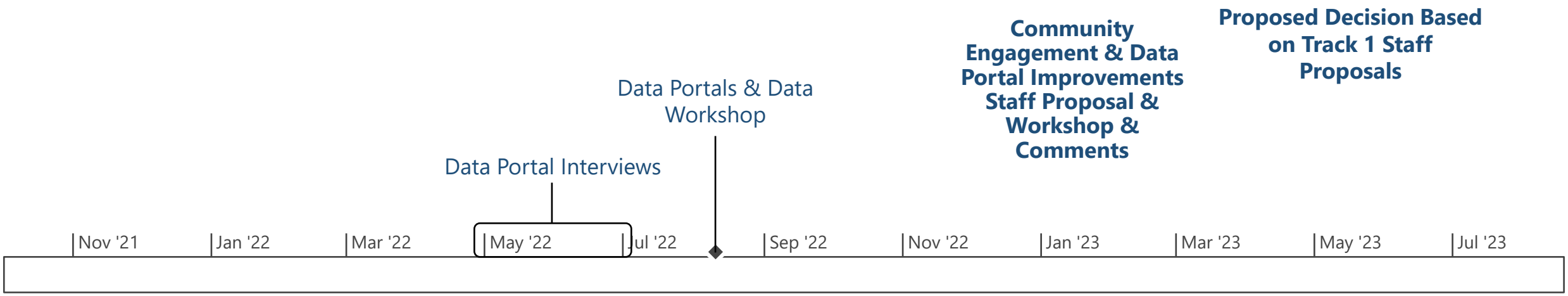
Staff Proposal – Fall 2022

- How should Integration Capacity Analysis data and calculations be improved to enhance accuracy and usefulness for DER planning, siting, and interconnection, especially with respect to electrification load?
- Should the Data Portal design be improved to provide access to data for multiple stakeholders in the DPP?

Staff Proposal Workshop Fall 2022

- Present staff proposal
- Clarify
- Answer questions
- Formal comments on Staff Proposal
- Will be used to inform Track 1 Proposed Decision 1st Quarter 2023

Data Portals Feedback Opportunities and Plan



How to Provide Feedback on Data Portals

- Participate in the facilitated discussion this afternoon
- Use the survey to provide additional comments (Comments Form)
- The staff proposal this fall will be followed by an additional opportunity to provide comments before the proposed decision

Question / Answer

For more information:

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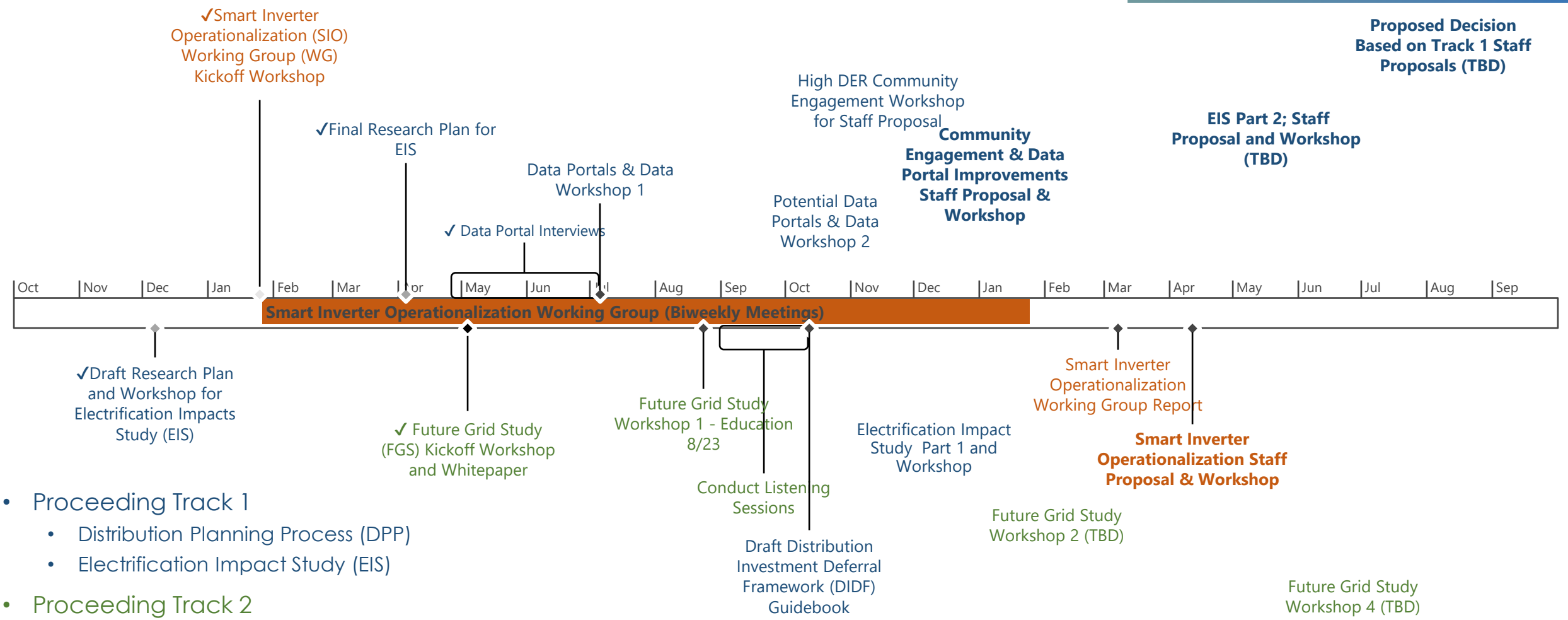
- Stephan@verdantassoc.com



- Proceeding Track 1
  - Distribution Planning Process (DPP)
  - Electrification Impact Study (EIS)
- Proceeding Track 2
  - Future Grid Study (FGS)
- Proceeding Track 3
  - Smart Inverter Operationalization (SIO)
  - Working Group (WG)
  - General Rate Case (GRC)

Data Portal Workshop 1

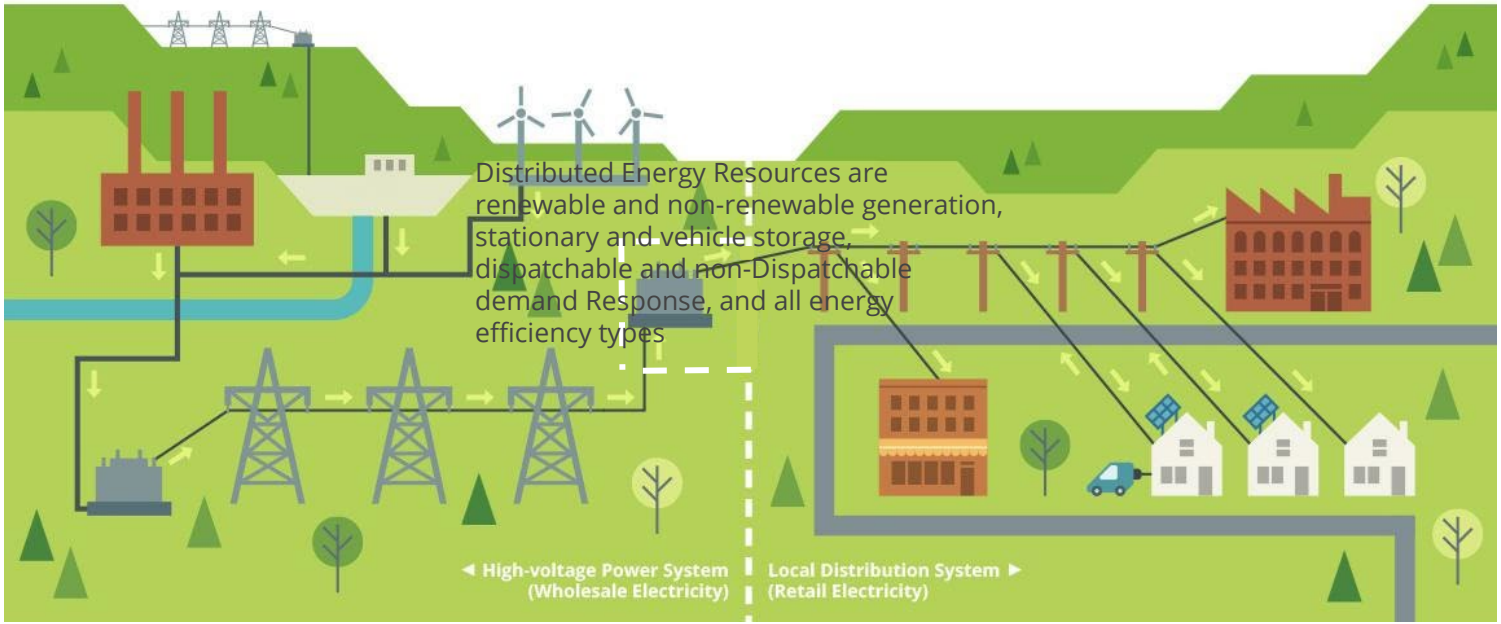
California Distribution Grid Planning Overview

Kevala

July 26, 2022

What is the Grid

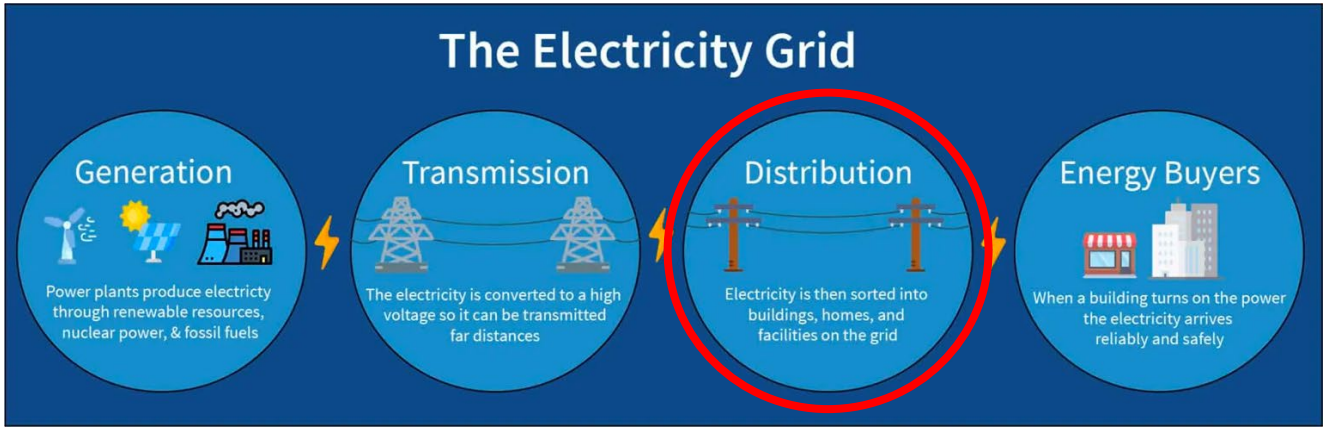
How electricity is produced, transported, and delivered to consumers



Source: Adapted from ISO New England

Grid Planning Activities in CA

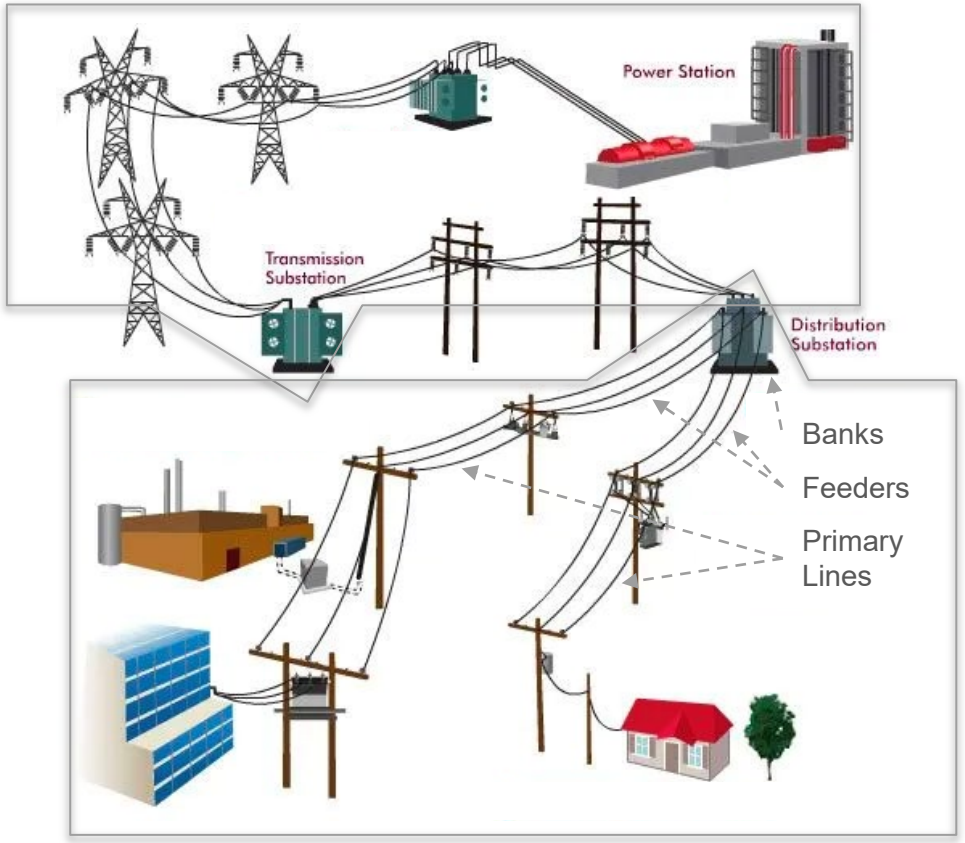
- Resource and infrastructure planning coordination:
  - Short, mid and long-term forecasts of energy demand produced by the CEC as part of its biennial Integrated Energy Policy Report (IEPR)
  - Biennial Integrated Resource Planning (IRP) proceedings conducted by the CPUC
  - Annual transmission planning processes (TPP) performed by the CAISO
  - Annual distribution planning processes (DPP) performed by the IOUs, reviewed by CPUC



Source: Best Practice energy

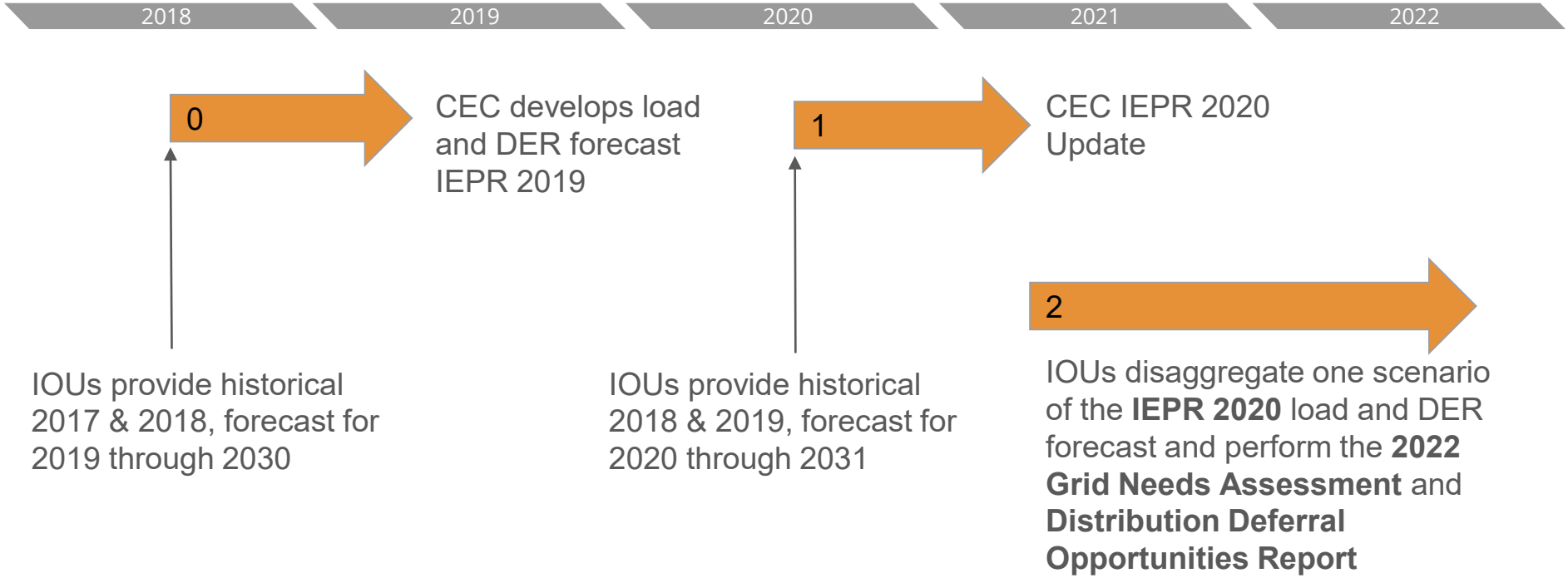
Distribution Deferral and Investment Framework

- Current DPP Goal: identify key new infrastructure and deferral opportunities to accommodate load and DER growth
  - Distribution transformer banks
  - Feeders
  - Primary line sections

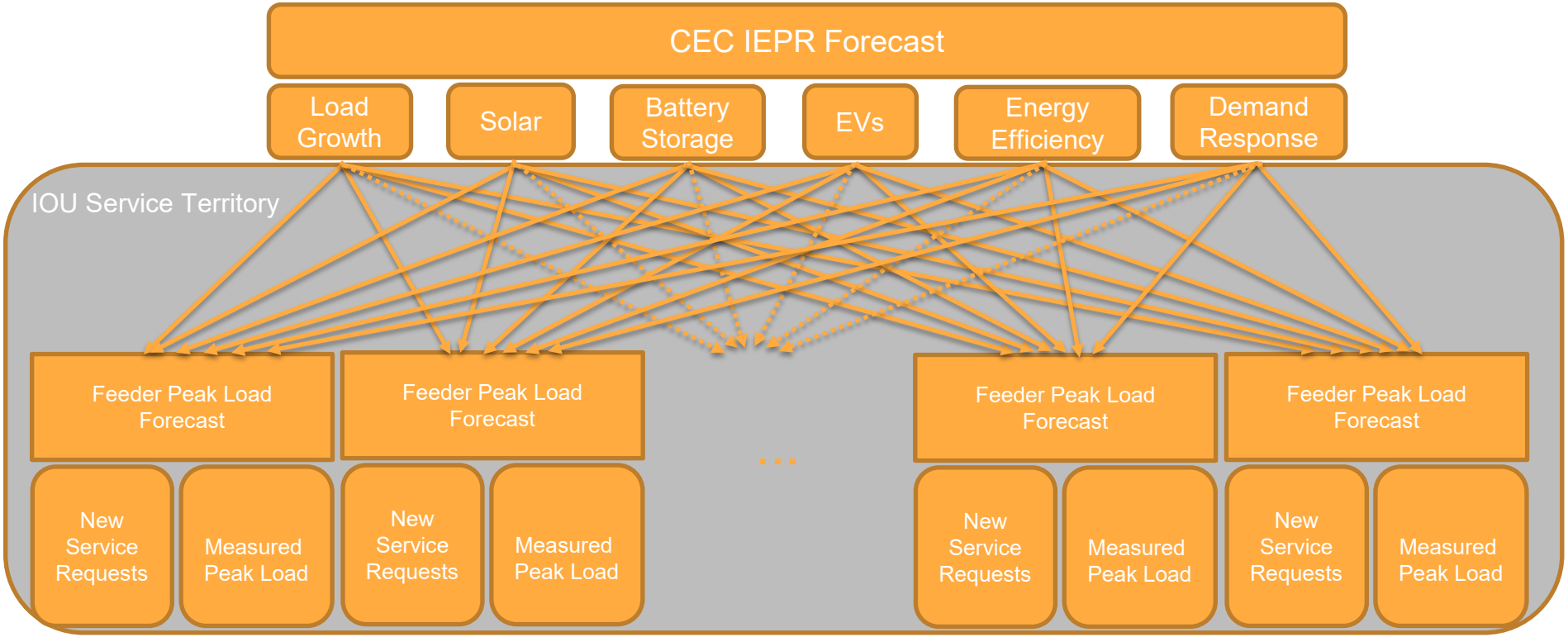


Source: Adapted from Pinterest

Distribution Grid Planning in CA



What is Load and DER Disaggregation?



Grid Needs Assessment

- GNA identifies grid modernization and capacity upgrades
  - Bank/feeder capacity needs
  - Reliability/resiliency needs
  - Line section capacity and voltage needs

Peak Deficiency and Loading			2021				
Peak Facility Loading (%) 2021-2025	Peak Facility Deficiency (MW) 2021-2025	Peak Facility Deficiency (%) 2021-2025	Facility Rating (MW)	Facility Loading (MW)	Facility Loading (%)	Deficiency (MW)	Deficiency (%)
80%	0.00	0%	15.05	11.64	77%	0	0%
76%	0.00	0%	8.40	6.17	73%	0	0%
66%	0.00	0%	11.82	7.75	66%	0	0%
91%	0.00	0%	6.49	5.71	88%	0	0%
31%	0.00	0%	10.16	2.93	29%	0	0%
31%	0.00	0%	10.16	3.14	31%	0	0%
36%	0.00	0%	9.28	3.11	34%	0	0%
20%	0.00	0%	6.50	1.04	16%	0	0%
84%	0.00	0%	3.04	2.55	84%	0	0%
CC	CC	CC	10.39	CC	CC	CC	CC
CC	CC	CC	10.28	CC	CC	CC	CC

PG&E 2021 Grid Needs Assessment (GNA)
Appendix E: GNA Results - Bank & Feeder Capacity Needs
Version Date: 08/16/21
Public

Facility Information						Distribution Service			Peak Deficiency and Loading			2021				2022				2023				2024				2025				
GNA Need ID	Distribution Planning Region	Division	Facility Name	Facility ID	Facility Type	Primary Driver	Distribution Service Required	Anticipated Need Date	Peak Facility Loading (%) 2021-2025	Peak Facility Deficiency (MW) 2021-2025	Peak Facility Deficiency (%) 2021-2025	Facility Rating (MW)	Facility Loading (MW)	Facility Loading (%)	Deficiency (MW)	Deficiency (%)	Facility Rating (MW)	Facility Loading (MW)	Facility Loading (%)	Deficiency (MW)	Deficiency (%)	Facility Rating (MW)	Facility Loading (MW)	Facility Loading (%)	Deficiency (MW)	Deficiency (%)	Facility Rating (MW)	Facility Loading (MW)	Facility Loading (%)	Deficiency (MW)	Deficiency (%)	Facility Rating (MW)	Facility Loading (MW)	Facility Loading (%)	Deficiency (MW)	Deficiency (%)
GNA_1822901_Capacity	Central Coast	Central Coast	HATTON BANK 1	1822901	Bank	None	None	None	80%	0.00	0%	15.05	11.64	77%	0	0%	15.05	11.72	78%	0	0%	15.05	11.81	78%	0	0%	15.05	11.9	79%	0	0%	15.05	12	80%	0	0%
GNA_1822911101_Capacity	Central Coast	Central Coast	HATTON 1101	1822911101	Feeder	None	None	None	76%	0.00	0%	8.40	6.17	73%	0	0%	8.40	6.22	74%	0	0%	8.40	6.27	75%	0	0%	8.40	6.33	75%	0	0%	8.40	6.38	76%	0	0%
GNA_1822911102_Capacity	Central Coast	Central Coast	HATTON 1102	1822911102	Feeder	None	None	None	66%	0.00	0%	11.82	7.75	66%	0	0%	11.82	7.75	66%	0	0%	11.82	7.74	65%	0	0%	11.82	7.72	65%	0	0%	11.82	7.7	65%	0	0%
GNA_1823701_Capacity	Central Coast	Central Coast	LAURELES BANK 1	1823701	Bank	None	None	None	91%	0.00	0%	6.49	5.71	88%	0	0%	6.49	5.76	89%	0	0%	6.49	5.82	90%	0	0%	6.49	5.88	91%	0	0%	6.49	5.93	91%	0	0%
GNA_1823711111_Capacity	Central Coast	Central Coast	LAURELES 1111	1823711111	Feeder	None	None	None	31%	0.00	0%	10.16	2.93	29%	0	0%	10.16	2.98	29%	0	0%	10.16	3.03	30%	0	0%	10.16	3.09	30%	0	0%	10.16	3.14	31%	0	0%
GNA_1823711112_Capacity	Central Coast	Central Coast	LAURELES 1112	1823711112	Feeder	None	None	None	31%	0.00	0%	10.16	3.14	31%	0	0%	10.16	3.14	31%	0	0%	10.16	3.14	31%	0	0%	10.16	3.14	31%	0	0%	10.16	3.14	31%	0	0%
GNA_1829401_Capacity	Central Coast	Central Coast	OTTER BANK 1	1829401	Bank	None	None	None	36%	0.00	0%	9.28	3.11	34%	0	0%	9.28	3.16	34%	0	0%	9.28	3.21	35%	0	0%	9.28	3.26	35%	0	0%	9.28	3.31	36%	0	0%
GNA_1829411101_Capacity	Central Coast	Central Coast	OTTER 1101	1829411101	Feeder	None	None	None	20%	0.00	0%	6.50	1.04	16%	0	0%	6.50	1.1	17%	0	0%	6.50	1.16	18%	0	0%	6.50	1.22	19%	0	0%	6.50	1.28	20%	0	0%
GNA_1829411102_Capacity	Central Coast	Central Coast	OTTER 1102	1829411102	Feeder	None	None	None	84%	0.00	0%	3.04	2.55	84%	0	0%	3.04	2.53	83%	0	0%	3.04	2.52	83%	0	0%	3.04	2.51	83%	0	0%	3.04	2.49	82%	0	0%
GNA_1820702_Capacity	Central Coast	Central Coast	CAMPHORA BANK 2	1820702	Bank	None	None	None	CC	CC	CC	10.39	CC	CC	CC	CC	10.39	CC	CC	CC	CC	10.39	CC	CC	CC	CC	10.39	CC	CC	CC	CC	10.39	CC	CC	CC	CC
GNA_1820711101_Capacity	Central Coast	Central Coast	CAMPHORA 1101	1820711101	Feeder	None	None	None	CC	CC	CC	10.28	CC	CC	CC	CC	10.28	CC	CC	CC	CC	10.28	CC	CC	CC	CC	10.28	CC	CC	CC	CC	10.28	CC	CC	CC	CC

- The results of the GNA Report is used to identify candidate distribution deferral opportunities for consideration of cost-effective DER solutions to address identified distribution grid needs

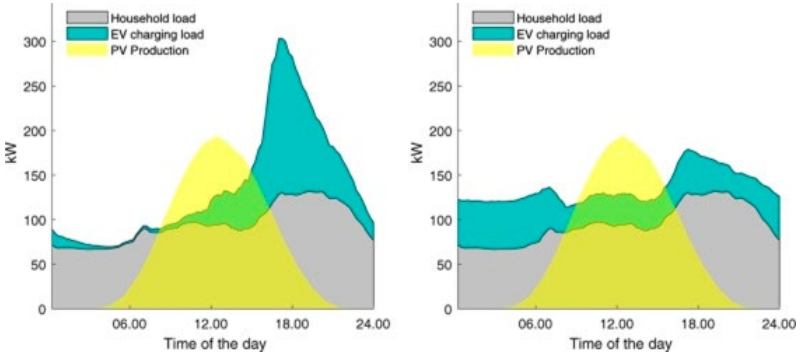
Distribution Deferral Opportunities Report (DDOR)

- The main objective of the DDOR is to utilize the GNA to identify candidate distribution deferral opportunities shortlist and project details for solicitation
  - The process acts as a funnel to identify candidate deferral projects, based on the grid needs identified in the GNA based on technical and timing screens
  - In 2021 between 2-10% of the GNAs were identified as potential candidates for pilots and RFOs
  - List of prioritization metrics (costs, forecast certainty and market assessment) results in tiering of candidates for different pilots and RFOs

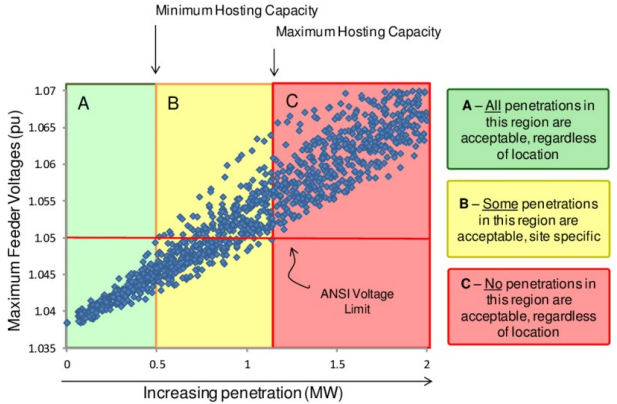
GNA and DDOR Key Take-Aways

- 2-3 year lag between IEPR load and DER forecast and GNA and DDOR capacity planning needs
- GNA and DDOR evaluation are based on one IEPR load and DER forecast scenario
- The time-horizon for capacity planning is 5-years
- Hard to evaluate risk management/uncertainty on future load and DER growth
- Load and DER forecasting and disaggregation methods are key drivers of results

Capacity Planning vs. Integrated Capacity Analysis



- Capacity planning predicts load and all DERs (or demand-side modifiers) into the future
- It captures the positive and negative effects of EV charging, solar, battery storage, energy efficiency, building electrification, etc.



- Hosting capacity uses 12 month of historical data
- Typically an iterative method to determine how much of one technology you can add at any given node
- Load and other DERs stay the same

Data Available to CPUC and Consultant Team to Improve the DPP

IOU Confidential

- Customer historical consumption* (AMI), rate and class
- Past DER adoption (type, location and size)
- Geo-spatial information of customers, DERs and electrical infrastructure
- Electrical infrastructure asset characteristics
- Measurements at available locations of the electrical infrastructure
- California Energy Commission load and DER forecasts
- Other public data: county parcel, census, climate, traffic, etc.

* 15-15 Rule: A 15-15 violation occurs if the load is comprised of less than 15 customers, or a single customer contributes to more than 15% of the loading value

3 years of AMI for all meters = Terabytes of Data!

- 10 MB = 1 storage box = 2,000 pages = 20 pounds
- 4 GB = 400 storage boxes = 500 foot ~ 1.5 football fields
- 12 TB = 1.2 mil storage boxes = 284 miles long (NYC to Boston to Portsmouth NH)
- 33 TB = 3.3 mil storage boxes = 780 miles (Chicago to NYC)

IOU	AMI Terabytes	Million of AMI meters*	# of distribution assets**
PG&E	31	5.45	844,000
SCE	25	4.96	753,000
SDG&E	7	1.46	163,000

https://www.betterbuys.com/dms/visualizing-the-size-of-databases/

*Combination of 15 min and hourly meters, **feeders, transformers, substations (received data)

What does the CA grid look like? Example of Bringing Data Together

Goal: Illustrate grid planning concepts visually in the Kevala Platform

Example - What is the Grid

- Show CA power plants
- Show Transmission System
- Show Distribution Substation locations
- Show Feeder routes
- Show Parcels

- Data overlays
  - Relate infrastructure and consumption to socio-economics, climate events, etc.

Key take-away: power is flowing 2 ways now and the demand and distribution side of the grid can affect transmission and the supply side

Key take-away: planning requires more data and visibility all the way where customers are where technologies will be adopted

Only Public data will be displayed

Example - Distribution Grid Planning key Objectives

- Show Distribution Substation locations
- Show Feeders routes
- Show simulated load for a customer
- Show feeder aggregate load 8760 concept with DERs
- Net-load versus native load and DER load
- Introduce historical versus load and DER forecast

Only simulated data will be displayed

* A 15-15 violation occurs if the load is comprised of less than 15 customers or a single customer contributes to more than 15% of the loading value

Example - Key concept of load and DER forecast

- Load correlation with temperature
- What does predicting load and DER look like
    - Load growth forecast example
    - EV forecast example
    - Bill calculation and tariff design

Key takeaway - DERs and load management strategies will be key in assuring distribution capacity over the mid and long term planning horizon


kevala
GRID INTELLIGENCE, DELIVERED.

DISTRIBUTION RESOURCE PLANNING DATA PORTALS

VERDANT

OVERVIEW

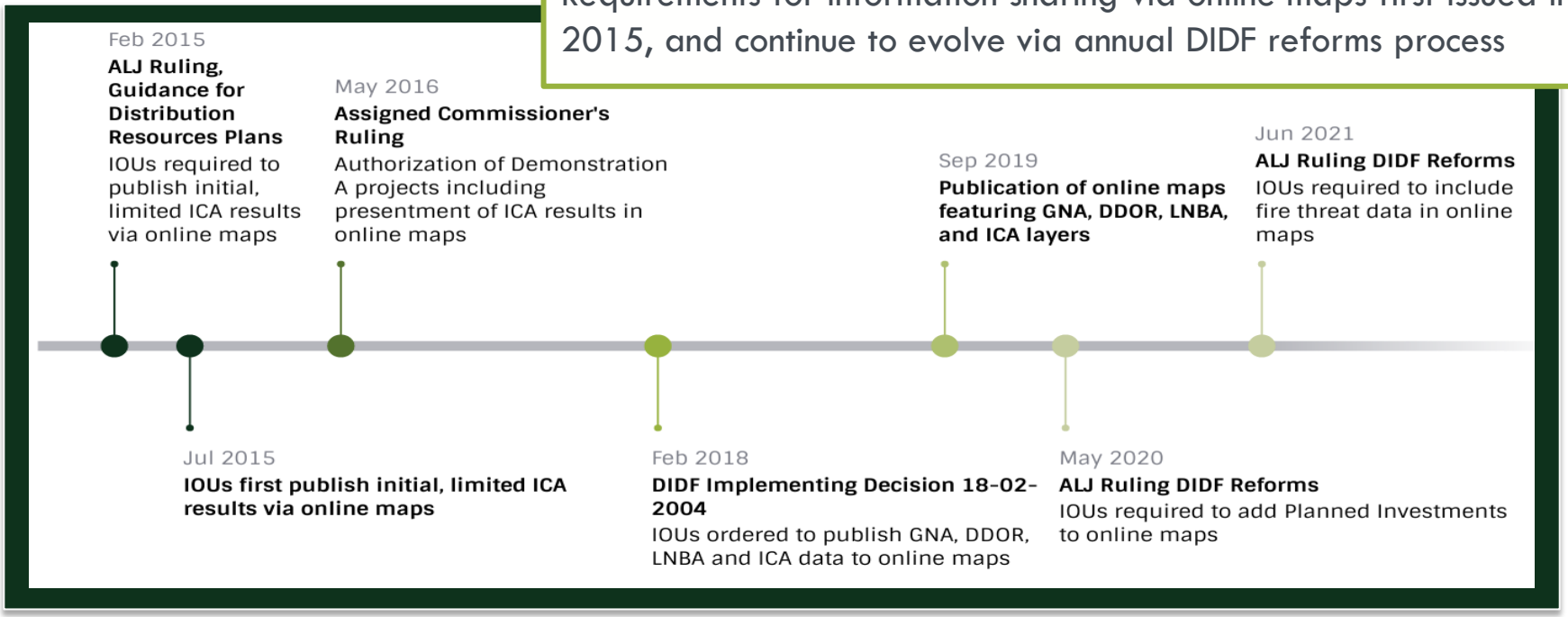
- Distribution Resource Planning (DRP) Data Portals Overview and Development History
- Requirements ordered by CPUC
  - Infrastructure layers (e.g., substation location)
  - Analytical and Operational layers (e.g., data related to annual grid planning process)
  - Map/portal features (e.g., search, bulk data access)
- Data validation status and activity
- Load Integration Capacity Analysis (ICA) Planned Improvements
- Q&A

WHAT ARE THE DRP PORTALS

- Data portals provide **extensive geospatial mapping data to the public about the electric distribution grid.**
- The purpose of the portals is to support DER siting & planning
- Data types include:
  - Integration Capacity Analysis (ICA)
  - Grid Needs Assessment (GNA)
    - Distribution Deferral Opportunity Report (DDOR)
    - Planned grid upgrade projects
  - Locational Net Benefits Analysis (LNBA)
  - Fire risk and Public Safety Power Shutoff (PSPS) history

DATA PORTALS REGULATORY TIMELINE

Requirements for information sharing via online maps first issued in 2015, and continue to evolve via annual DIDF reforms process



DATA ACCESS AND CONFIDENTIALITY CPUC RULINGS

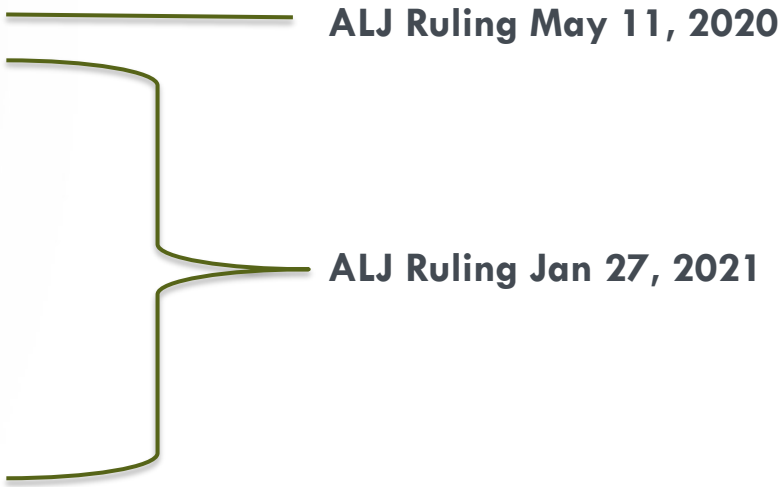
- Username/Password may be required to access portal
  - Non-Disclosure Agreements (NDA) shall not be req'd
- 15/15 Rule protects individual customer data
  - Information in a data set should be made up of at least 15 customers, and a customer's load must be less than 15% of an aggregation category
  - Applies to data in the ICA, LNBA, GNA, and DDOR
- ICA sections failing the 15/15 Rule
  - ICA results shall be aggregated to the circuit level for maps and data sets
- A formal CPUC process exists for IOUs to seek redaction of Critical Energy Infrastructure Information (CEII) from portal maps

ALJ ruling Dec. 17, 2018

ALJ Ruling Jul. 24, 2018

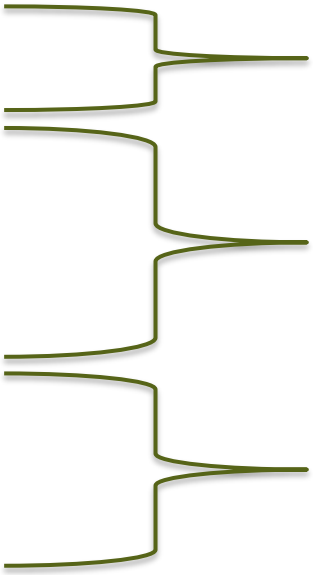
REQUIRED DATA ELEMENTS– INFRASTRUCTURE

- Approved transmission projects
- Transmission lines
- Three-phase feeder names
- Line segment numbers
- Substations
  - Existing generation
  - Queued generation
  - Total generation



REQUIRED DATA ELEMENTS– ANALYSIS/OPERATIONS

- Substation and circuit load profile
- Customer class proportions on circuit
- Integration Capacity Analysis (ICA) Results
- Grid Needs Assessment (GNA) Results
- Locational Net Benefits Analysis (LNBA) Results
- Candidate Deferral Opportunities (CDO)
- Grid upgrade investments planned by IOUs
- Public Safety Power Shutoff (PSPS) outages
- Fire threat and tree mortality [or the IOU's Fire Map]



Decision 17-09-026
Sep 28, 2017

Decision 18-02-004
Feb 8, 2018

ALJ Ruling
May 11, 2020

INTEGRATION CAPACITY ANALYSIS (ICA)

- Integration Capacity Analysis (ICA): **Quantifies the maximum amount of power** that can be injected to, or drawn from, the distribution system requiring minimal to no distribution upgrades or operational restrictions.
- Used for distribution planning, DER integration.
  - Siting DER, EVSE, and other loads

KEY FACTS

- PRINCIPAL USE CASE: Interconnection
- STUDY HORIZON: Near term
- STUDY GRANULARITY: Line section
- UPDATE FREQUENCY: Monthly
- STUDY CASE: 576 hours

Protection | Thermal | Steady State Voltage | Voltage Fluctuation | Operational Flexibility

GRID NEEDS ASSESSMENT (GNA)

- Grid Needs Assessment (GNA): Due Aug 15 of each year, **documents the assumptions and results of the annual distribution planning process**
- Used for Needs Assessments/DDOR
  - Identified extra capacity needed

KEY FACTS

- PRINCIPAL USE CASE: Planning
- STUDY HORIZON: 5 Years
- STUDY GRANULARITY: Circuit/Line section
- UPDATE FREQUENCY: Annually
- STUDY CASE: Single Hour

Facility ID

Service Required

Upgrade Date

Equipment Rating

% Deficiency

LOCATIONAL NET BENEFIT ANALYSIS (LNBA)

- Location Net Benefit Analysis (LNBA): Helps **identify the benefits that DERs can provide in each location,** particularly benefits associated with meeting a specific distribution need within the electric service categories that can result in avoided cost.
- Used to determine optimal locations for DERs
  - Creates quantitative Cost Effectiveness Metrics score

KEY FACTS

- CALCULATION: [$/(MW – yr)]
- Based on peak capacity needs

Distribution Capacity

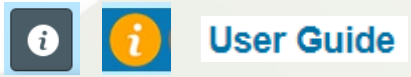
Voltage Support

Reliability (Back-Tie)

Resiliency (Micro-Grid)

REQUIRED DATA PORTAL FEATURES

- Updates to user guides when map functionality changes — **ALJ ruling, July 27, 2021**



- Geographic/keyword search capability
  - Query & export data in tabular form based on geographic or keyword search — **D.18-02-004, Feb. 8, 2018**
  - Enhanced query and search functions — **ALJ ruling, July 27, 2021**
- Application Programming Interface (API) capability for bulk data access — **D.18-02-004, Feb. 8, 2018**
  - Continue publishing shapefiles with ICA data — **ALJ ruling, July 27, 2021**

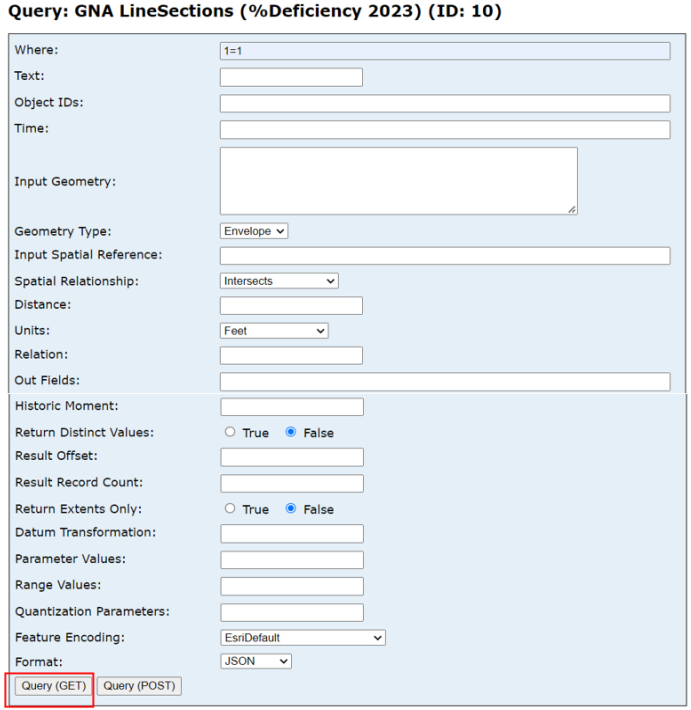
BULK DATA ACCESS OVERVIEW

- Data portals are required to have Application Programming Interface (API) capability allowing users to access data in a functional format from back-end servers in bulk.

- Several different approaches represented on the three IOU portals
  - ArcGIS web page query (ArcGIS is mapping software)
  - API via HTTP GET script (computer to computer connection)
  - ArcGIS web page download button
  - Map download button

BULK DATA – ARCGIS WEB PAGE QUERY

- PG&E, SCE, SDG&E
- Access to >10 data layers
  - Interconnection by line segment, Public Safety Power Shutoff (PSPS), Planned Projects, Etc.
- File formats
  - HTML – plain text in standard webpage language
  - JSON – plain text in JavaScript Object Notation
  - GeoJSON – plain text format similar to JSON
  - KMZ – zip-type file in Google Earth format
  - PBF – plain text in Protocolbuffer Binary Format
- Maximum 1000 records per query
- Results appear in web page below query form



BULK DATA – HTTP GET SCRIPT

- PG&E, SCE, SDG&E
- Access to >10 data layers
  - ICA Segments, PSPS, Planned Projects, Etc.
- Scripted solution to records-per-query limits
- May be automated to update regularly
  - Increased feasibility of monitoring changes through time
- Some specialized expertise required
- Security provisions vary and impact ease of access

Example Output

circuit_name	est_lnba_range	year
Havoc	4,787.58 $/MW-year	2021
Hellcat	4,787.58 $/MW-year	2021
Mosquito	4,787.58 $/MW-year	2021
Mosquito	8,922.05 $/MW-year	2021
Vengeance	8,922.05 $/MW-year	2021
Havoc	6,628.53 $/MW-year	2021
Warhawk	8,922.05 $/MW-year	2021
Hellcat	6,628.53 $/MW-year	2021
Mosquito	6,628.53 $/MW-year	2021
Garrett	18,496.87 $/MW-year	2021
Hofer	18,496.87 $/MW-year	2021
Kropp	18,496.87 $/MW-year	2021

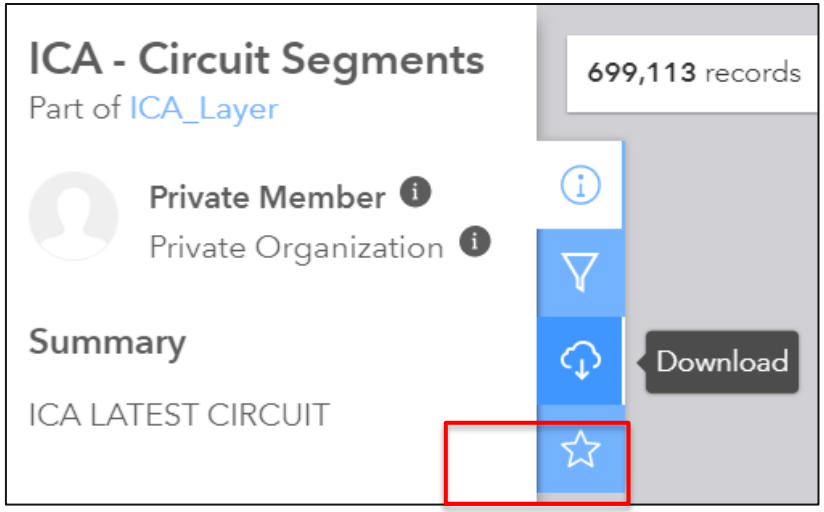
```python
# Submit HTTP GET request
response = requests.get('https://drpep.sce.com/arcgis_server/rest/services/Hosted/DDOR_Layer/FeatureServer/2/query', params=params, headers=headers)

# Save data into Dataframe
df2 = json.loads(response.text)
formatted_json = [feature['attributes'] for feature in df2['features']]
df4 = pd.DataFrame(formatted_json)
```

Illustrative Python script

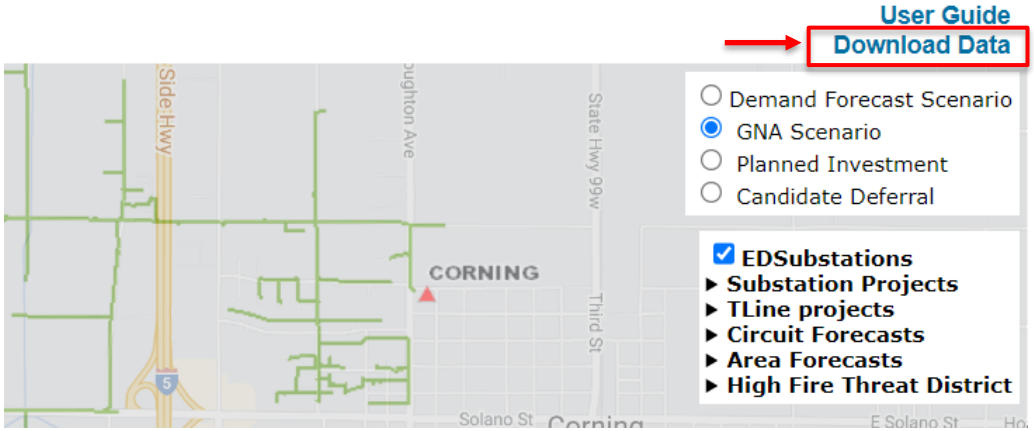
BULK DATA – ARCGIS WEB PAGE DOWNLOAD BUTTON

- SCE, SDG&E
- Access to >10 data layers
  - ICA Segments, PSPS, Planned Projects, Etc.
- File formats
  - Shapefile – set of files that work together
  - CSV – plain text comma-delimited file
  - KML – plain text file in Google Earth format
  - GeoJSON – plain text format similar to JSON



BULK DATA – MAP DOWNLOAD BUTTON

- Example is PG&E
- Layers
  - ICA Segments
  - DIDF GNA/DDOR filing data



ICA

Download Spatial Data

Geospatial Database

ICADisplay.gdb

GNA / DDOR

Download Data

- PGE_2021_DDOR_Appendix_A_B_Public.xlsx
- PGE_2021_DDOR_Appendix_C_JointIOUPrioritizationMetrics_Public.xlsx
- PGE_2021_DDOR_Appendix_D_CD LNBA_Public.xlsx
- PGE_2021_DDOR_Appendix_E_PI LNBA_Public.xlsx
- PGE_2021_DDOR_Appendix_H_Public_102221.xlsx
- PGE_2021_DDOR_Appendix_I_PI-Line sections-LNBA_Public_102221.xlsx
- PGE_2021_GNA_public_updated_Appendix_D-G_Refiling.xlsx

PLANNED IMPROVEMENTS

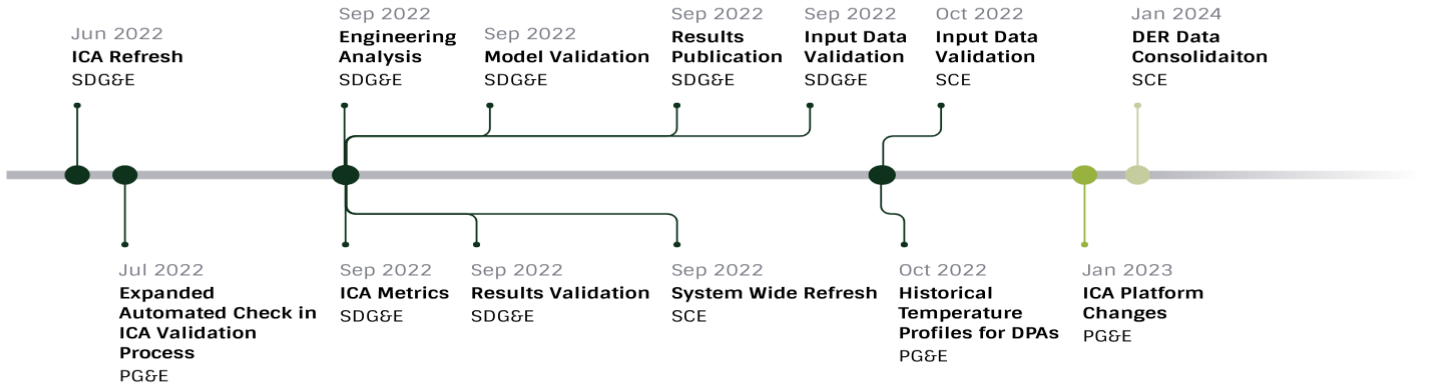
Validation

- Data validation recommendations were issued on January 19, 2022
- Responding efforts, and requirements, vary dependent on the specific IOU
- Each IOU has laid out comprehensive plans to address both the recommendations made by the Independent Technical Expert (ITE) and those made internally. The key areas of these are:

1. PROGRAM MANAGEMENT
2. DATA VALIDATION
3. DATA ENGINEERING

VALIDATION TIMELINE

Represented are improvements to which an estimated date of completion has been provided. Improvements with no specified data are not included



LOAD ICA METHODOLOGY PLANNED IMPROVEMENTS

September 9, 2021, ALJ Ruling to aid EV charger and other siting

» **IOU's were ordered to begin adopting modeling changes to Load ICA:**

1. Include all queued load projects and planned, known, near-term distribution system projects
2. Include distribution system upgrades with an approved construction schedule and an in-service date within one year
3. Consider forecasted DER growth
4. Consider planned network reconfiguration
5. Incorporate load forecast for the next year

» Full implementation of all ordered changes will not be complete for several years (~2025) per IOU ICA Refinements Workplans filed February 2022

LINKS TO DRP DATA PORTALS

PG&E

https://www.pge.com/en_US/for-our-business-partners/distribution-resource-planning/distribution-resource-planning-data-portal.page

SCE

https://drpep.sce.com/drpep/

SDG&E

https://www.sdge.com/more-information/customer-generation/enhanced-integration-capacity-analysis-ica


THANK
YOU
VERDANT

STAKEHOLDER INTERVIEW FEEDBACK & ANALYSIS

VERDANT

OVERVIEW

- Purpose of the interviews
- Sample selection and composition
- Research objectives and interview findings
  - Usage of data
  - Data accuracy
  - Portal usability
- Summary of key themes
- Future directions
- Q&A

PURPOSE OF INTERVIEWS

- Goal: **Continuous improvement to California's distribution planning process (DPP)**
- Distribution planning process changes 2014+
  - New stakeholders
  - New processes
  - New information needs
  - New information sources (incl. **DATA PORTALS**)
- Interviews of data portal stakeholders
  - Gather feedback in support of improving DPP information development & sharing

GROUPS OF STAKEHOLDERS INTERVIEWED

- Interviews focused on gaining perspective from a wide variety of organizations:
  - Community Choice Aggregators (CCA)
  - Public Agencies
  - Trade Organizations
  - EV, Storage, and Solar Developers

- These organizations' missions focus on:
  - Project development, siting, and design
  - Participating in policy and process development

RESEARCH OBJECTIVE 1: USAGE OF DATA

RESEARCH OBJECTIVE

Identify ability of data portals to satisfy stakeholder operations

- How does your organization utilize the data within the portals?
- Do available data satisfy stakeholder needs?
- How often are data available within the portals retrieved?

FINDINGS SUMMARIZED

- Data access a point of concern for majority of stakeholders
- Granularity constrained stakeholder planning
- Stakeholders' dependent on IOUs to access key data the data portals are unable to provide

RESEARCH OBJECTIVE 1: USAGE OF DATA (CONT.)

- **ICA data is the only data utilized by stakeholders**
  - 8% of Stakeholders considered themselves "familiar" with GNA data
  - 2% of Stakeholders considered themselves "familiar" with LNBA data
- **ICA lacks granularity**
  - Developers' abilities and project developments are limited by lack of granularity
- **Data requests required to access complete data**
- **ICA data used for rough forecasting of EV adoption**
- **Majority of stakeholders utilized the data portals as a form of "best practice"**
- **Data download and API use is not yet widespread**
  - 6% of interviewed stakeholders downloaded data, none of which utilized the API
- **Stakeholders are dependent on IOUs for quality and complete data**
  - Interconnection studies are required
  - Data within the portals and data received in interconnection process are from "two separate silos"

RESEARCH OBJECTIVE 2: DATA ACCURACY

RESEARCH OBJECTIVE

Evaluate the datasets that comprise the IOU data portals and their ability to aid the organizations they are intended to serve.

- Do you have any concerns regarding data methodology?
- Has the quality of the provided data impacted your organization?
- How does your organization utilize the data within the portals?

FINDINGS SUMMARIZED

- ICA inaccuracy is problematic for stakeholders' use of the data portals
- Limited data for rural communities
- Accuracy is one aspect of data interpretation that users find challenging

RESEARCH OBJECTIVE 2: DATA ACCURACY (CONT.)

- **ICA data is widely considered to be inaccurate**
  - 100% of stakeholders that considered themselves "familiar" with the portals cited ICA inaccuracy as being problematic
  - Several respondents reported inaccuracy causing hesitancy in greater adoption of the data portals
- **Data representing rural communities is limited**
  - Ex: Central Valley: 30-40% of lines are not shown
- **No method for stakeholders to independently verify accuracy**
  - EX: Circuits that show 0 MW with no annotation
- **Spatial data is at times inaccurate**
  - Difficult for developers to locate and identify switches
- **Load ICA data is undeveloped**
  - Cases in which 60% of feeders show zero capacity for load
- **Data is not clearly labeled**
  - “I trust it as much as I can decipher it"

RESEARCH OBJECTIVE 3: PORTAL USABILITY

RESEARCH OBJECTIVE

Evaluate the user-friendliness of the data portals and their ability to portray key data in a comprehensible fashion.

- How user-friendly do you find the portal interface to be?
- Do you find the data to be easily accessed and downloaded?
- How would you evaluate portal access requirements for each IOU?

FINDINGS SUMMARIZED

- Each IOU varies significantly in level of usability as reported by stakeholders
- Educational threshold paired with lack of available material presents challenges
- Inconsistent access requirements by IOUs causes frustration

RESEARCH OBJECTIVE 3: PORTAL USABILITY (CONT.)

- Majority of stakeholders rated SCE as having the highest quality data portal (DRPEP)
- PG&E's dual portal system (ICA and DDOR/GNA) was reported as being unfavorable
- Stakeholders desire more educational material to partner with user guides
- Inconsistent portal access methods present a variety of problems for stakeholders:
  - SCE's no account login requirements was most preferred
  - SDG&E's restrictive access especially challenges usage
    - "I'll go there every six months, and when I use it, I want to use it. I don't want to wait a week to be able to access it"

MAJOR TRENDS / TAKEAWAYS

Positive Trends

- Stakeholder relationship with IOUs
- Stakeholder interest in the data portals

Negative Trends

- Portal and data access
- Data accuracy
- Data granularity
- Lack of user education

KEY TAKEAWAYS

- Positive trends have encouraged stakeholder optimism regarding the portals
- Negative trends prevent stakeholders' independent and expanded use of the portals

LOOKING FORWARD

» The interviews provided the following ideas to further improve the data portals:

Portal Interface

- Singular interface
- More consistent and clearly labeled terminology

Data

- "The more data the better"
- CalEnviroScreen
- Census data
- Critical infrastructure
- Jurisdictions

Education

- Clearer user guides
- Way to track proceedings and developments
- Video guide
- Clearer and more in-depth legend

"I would hope that this tool doesn't strive to be everything for everybody, but is a really good vertical in doing one thing really really well"


THANK
YOU
VERDANT

GRIDWORKS

Attendee Feedback: Data Portals Improvement Workshop

July 26, 2022

Decarbonization of our economy is within reach, and more important than ever.

Gridworks convenes, educates, and empowers stakeholders working to decarbonize our economy.

GRIDWORKS

Objectives and Process for Agenda Item #6

Objectives

- Consulting team better understands current and future users and use cases for the existing data portals
- Attendees have the opportunity to provide feedback on improvements to the data portals

Process

- Participants will be asked to provide their thoughts on key questions via an online survey platform called “Slido”
- At various intervals, we will stop to review responses and highlight any key themes
- To the extent you have additional thoughts on these questions after today’s workshop, another channel will be made available

Connecting to Slido

- To access the survey for this portion of today's agenda, you can either:
  - Go to this link

  OR
  - Go to slido.com and enter our event code when prompted on the home screen: **2341044**
- If for any reason, neither of those two options appear to work, you can either:
  - Input your answers into the chat (please note the number of the question you are responding to); note that this will not be anonymous

  OR
  - Enter your thoughts into the Google Forms we are using to solicit feedback on the workshop itself by copying and pasting the link placed in the chat. This form will remain open for one week (also here: https://forms.gle/UPUYSL2yk1t9WFg37).

Questions for Feedback

1. Are you currently using any of the data portals or plan to use them in the future? If so, which ones?
2. For what purposes are you using/planning to use the data portals?
3. In general, how well are the data portals meeting your needs?
   - On a scale from 1 to 5, with 1 being "not at all" and 5 being "completely."
4. How well are you able to access, understand, and utilize the information contained in the data portals?
   - On a scale from 1 to 5, with 1 being "not at all" and 5 being "completely."
5. What changes could be made to the data portals (accessibility and content) to better meet those needs?
   - Different data? More in-depth data? Different assumptions to produce data? Different format for the data/way(s) to export data?

Providing Additional Thoughts

- To the extent you would like to share additional thoughts on these questions with the consulting team, a Google Form is available
- This Google Form includes an opportunity to provide responses to the questions posed in this agenda item as well as to provide feedback on the workshop more broadly
- Your responses will remain anonymous unless you choose to share your name and organization in your answer
- The Google Form will remain live for one week (until EOD 8/2)
- You can access the Google Form by copying and pasting the link placed in the chat (also here: https://forms.gle/UPUYSL2yk1t9WFg37)
- Note that any responses received via the Google Form will be considered informal comments and will not be part of the public record

Additional Feedback Beyond this Workshop

- Future fall workshop on the staff proposal
- Comments on the staff proposal
- Proposed Decision
- Email:
  - stephan@verdantassoc.com
  - chalbrook@gridworks.org

How can we help? Reach out!

CLAIRE HALBROOK

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