



2024 SLTRP Meeting #4

June 27, 2024

Power System Planning Division

Agenda

9:30 – 9:35 am	Welcome and Introductions
9:35 – 9:45 am	Meeting Purpose, Agenda Overview, Guide for Productive Meetings and Mentimeter Connection
9:45 – 10:00 am	LA100 Equity Strategies Implementation Updates
10:00 – 10:30 am	Distribution System Planning Advisory Group Meetings
10:30 – 10:35 am	<i>Break</i>
10:35 – 10:50 am	Review of SLTRP Advisory Group Feedback (Meeting #3)
10:50 – 11:05 am	Updated SLTRP Scenario and Sensitivity Matrix
11:05 – 11:45 am	Continue SLTRP Advisory Group Breakout Sessions
11:45 – 11:55 am	SLTRP Breakout Sessions Reporting Back and Mentimeter
11:55 – 12:00 pm	Wrap Up and Next Meeting

Next Meeting: October TBD; Optional Distribution Planning AG Meeting in July/August (virtual)

Location: In-person, LADWP Wall Street





Advisory Group Roles

Provide input and feedback based on the expertise, knowledge, and resources of the organizations, institutions, and constituent groups represented by the Advisory Group Members

- **Provide Perspectives.** Discuss major issues that LADWP will face in the next 10-20 years. Provide input and review of strategic scenarios that are used in the resource analysis and final recommendations for near-term actions.
- **Continue the Collaborative Dialogue.** Build upon the momentum from the LA100 Equity Strategies Study and 2022 SLTRP Process.
- **Conduct Outreach to Respective Constituent Groups.** Bring diverse input into the process and keep constituents informed of the SLTRP process.
- **Consider Broader Community Input.** During Advisory Group discussions think of the various communities and considerations throughout the City of Los Angeles.
- **Provide Technical Information & Perspectives.** Add value through your areas of expertise.



Advisory Group Roles

Provide input and feedback based on the expertise, knowledge, and resources of the organizations, institutions, and constituent groups represented by the Advisory Group Members

Continued...

- **Read Pre-Meeting Materials.** Prior to each meeting materials and agendas will be distributed and you are expected to be prepared for the meeting. This includes reading and reviewing the 2022 SLTRP and LA100 Equity Strategies Study Report.
- **Participate in All Meetings.** A total of six (6) meetings are anticipated between March and December 2024. Meetings are expected to alternate between in-person and virtual. Each meeting will be conducted in 2-3 hours segments.
- **Alternate Representatives.** If you cannot attend a meeting, then please send an alternate on your behalf.
- **Balancing Perspectives.** To maintain stakeholder balance – only one representative per member organization in meeting discussions.

2024 Advisory Group Members

Stakeholder Category	Organization(s)	# of Representatives
Academia	CSUN, UCLA, USC	6
Business and Workforce	CEERT, Center for Sustainable Energy, Central City Assoc, IBEW – Local 18, LABC, LA Chamber, VICA, LABC	17
City Government	CLA, City Attorney, Council Districts, Rate Payer Advocate, Mayor’s Office, Civil & Human Rights and Equity Dept., CEMO, Housing Authority, LA City Planning, LADOT	26
Neighborhood Council	DWP Advocacy Committee, DWP MOU Oversight Committee, Neighborhood Council Sustainability Alliance, SLAANC	5
Environmental Community	CBE, EDF, Food and Water Watch, NRDC, LAANE, Sierra Club, Climate Resolve, Community Build, Enterprise Community Partners, Esperanza Community Housing, LA Cleantech Incubator, Move LA, PACE, Pacoima Beautiful, RePower, SLATE-Z, So. Cal. Association of Non-Profit Housing; SCOPE	20
Premier Accounts and Key Customers	LAUSD, LAWA, Metro, POLA, Valero Wilmington Refinery	10
Utilities	Southern California Gas, SCPPA, Water and Power Associates	6
Total		90

Note: LA100 Equity Strategies Steering Committee has been integrated into the SLTRP Advisory Group Roster

Guidelines

1

Everyone commits to all members having **equal time** to contribute input and perspectives

2

Keep input **concise** so all members have time to participate

3

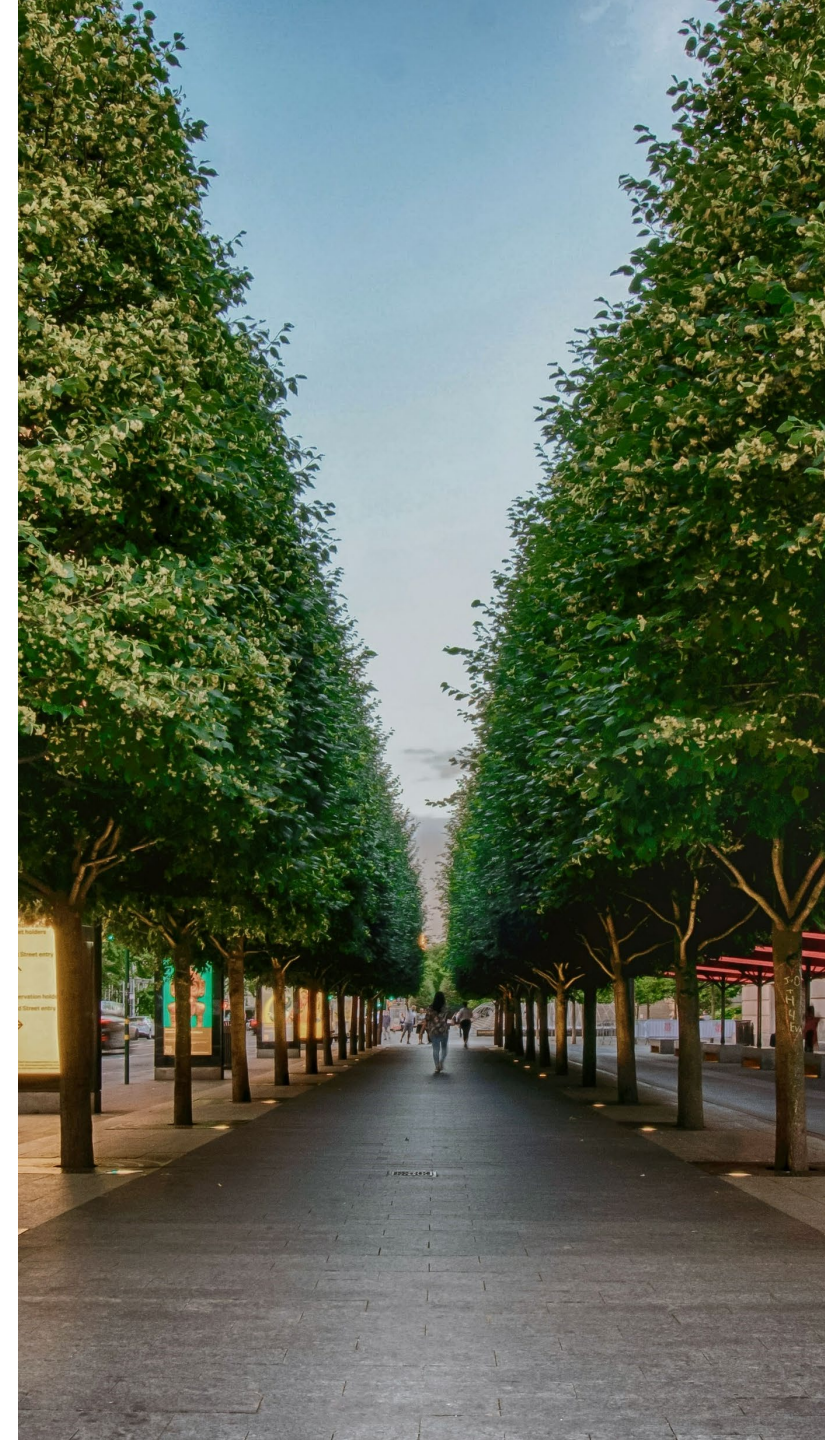
Actively listen to others, seek to understand perspectives

4

Offer ideas to address questions and concerns raised by others

5

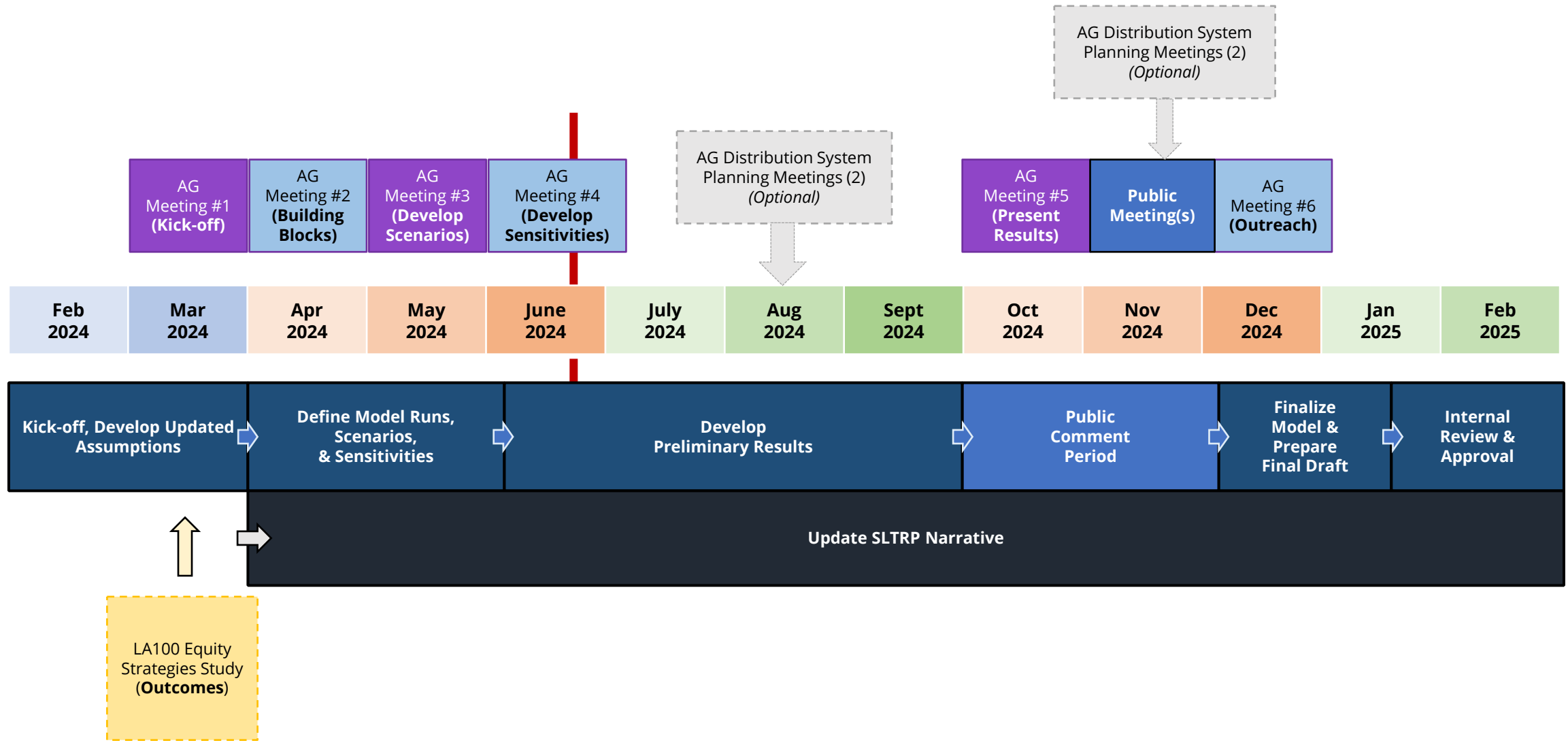
Participate by using the **Submitting Questions in Zoom Chat** or **Raise Hand in Zoom**





In-person Meeting
Virtual Meeting

2024 SLTRP Schedule



Note: Specific dates and meetings are subject to change.

Instructions

Go to

www.menti.com

Enter the code

5709 2611



Or use QR code

For SLTRP Modeling, what is the process/order for modeling? (Rank in order)

1st | Production Cost Modeling

2nd | Capacity Expansion

3rd | Resource Adequacy



What is stochastics and why is it important?

Introduces AI
to automate
modeling tasks



Reducing
computational
complexity by
removing
random
elements.



Inserting an
element of
randomness
and
uncertainty
into the model.



Removing
noise and
disturbances
for clearer
model
predictions.





Why do we evaluate bookends of scenarios?

- To capture a broad range of actionable roadmaps in order to assess impacts to reliability, cost affordability, and environment ✓
- To ensure consistency in outcomes by ignoring variations between scenarios. ✗
- To minimize uncertainty and avoid considering outlier situations. ✗
- To save time and resources by excluding less likely scenarios from evaluation. ✗

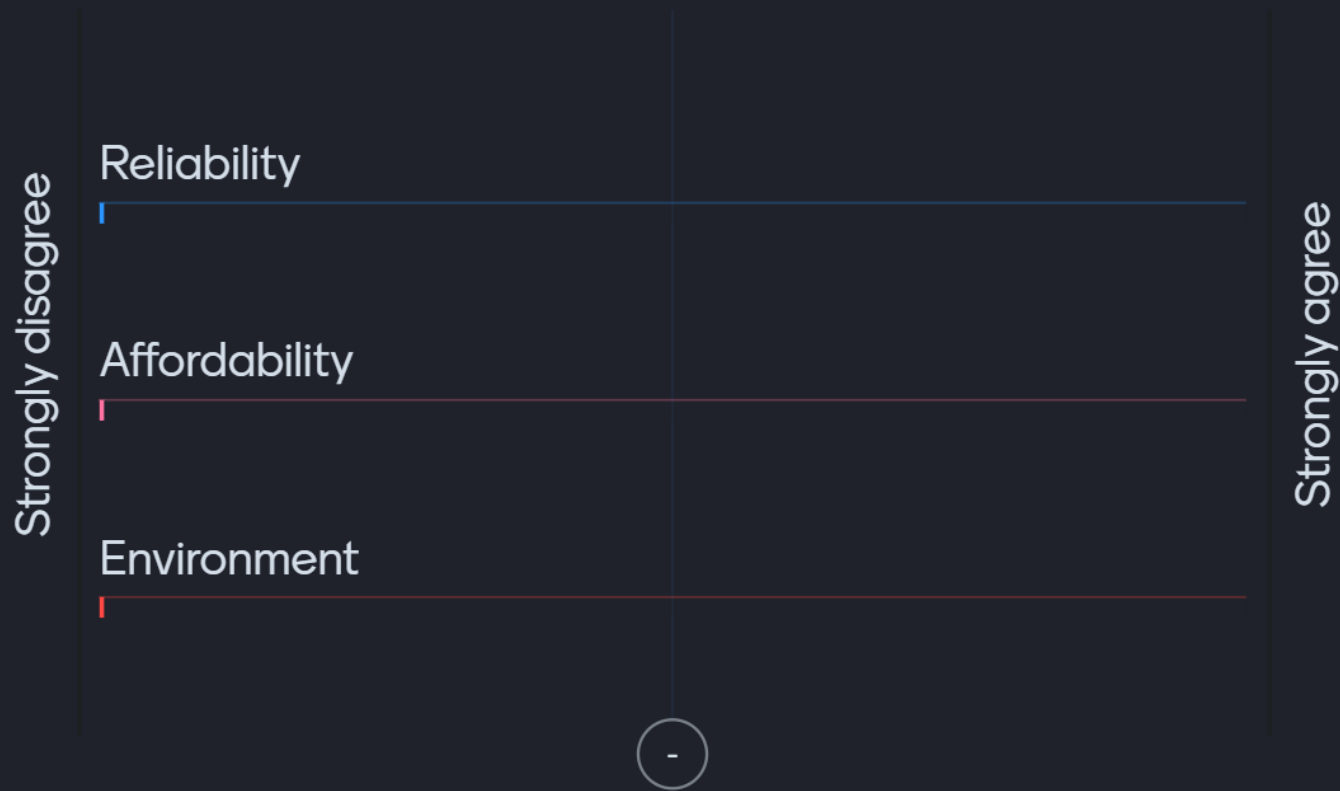


Why is it important to limit the number of scenarios and sensitivities?

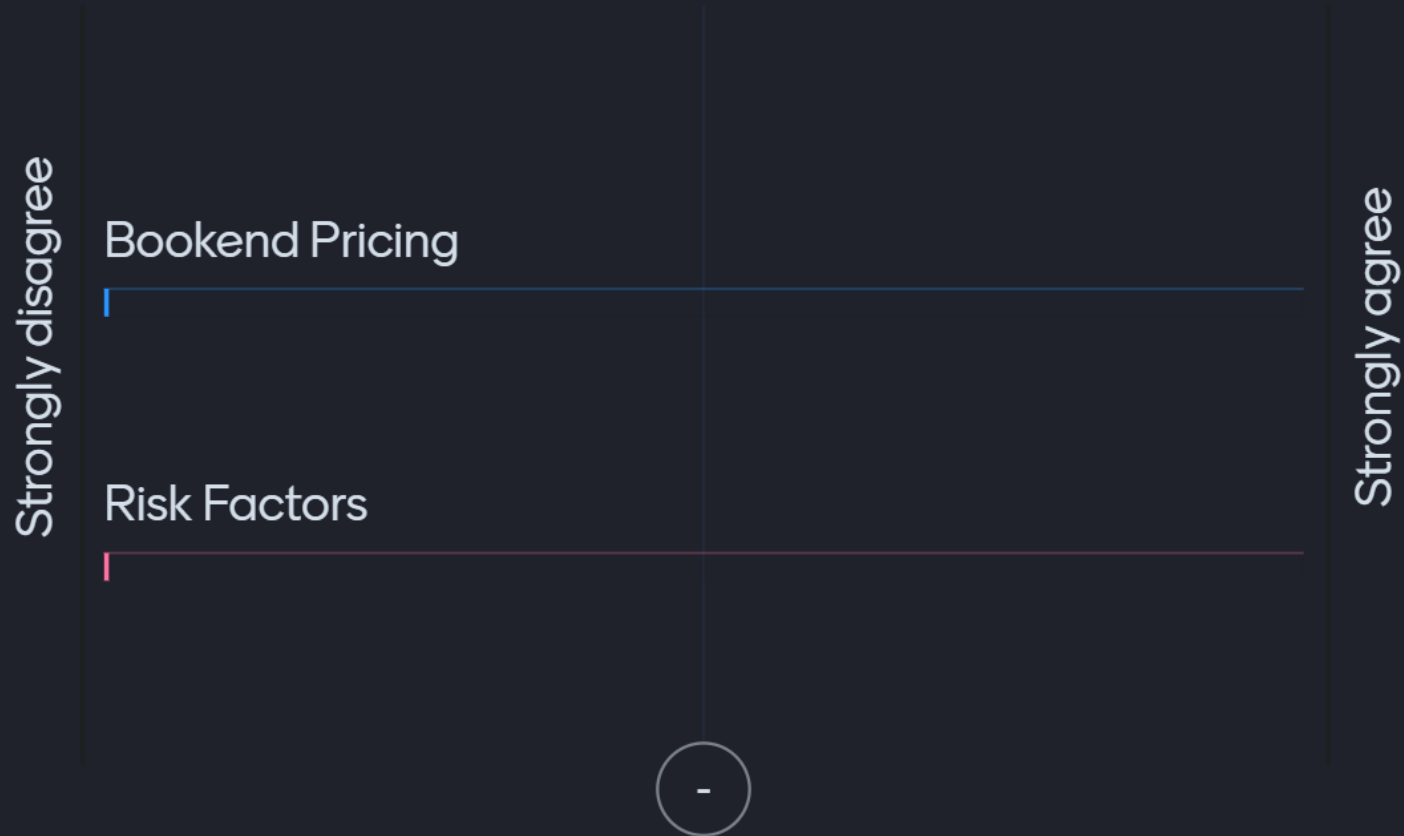
- To maintain a manageable process since each scenario/sensitivity requires time and resources 
- To ignore nuance and complexities associated with the SLTRP Process 



The draft scenarios (at least 1 scenario) capture your organization's interest and priorities in :



The draft scenarios (at least 1 scenario) capture your organization's interest and priorities in :





LA100 EQUITY STRATEGIES IMPLEMENTATION STATUS UPDATE



- GREG REED (UCLA) TO PROVIDE UPDATED SLIDES BY 6/13



2024 SLTRP

Q&A



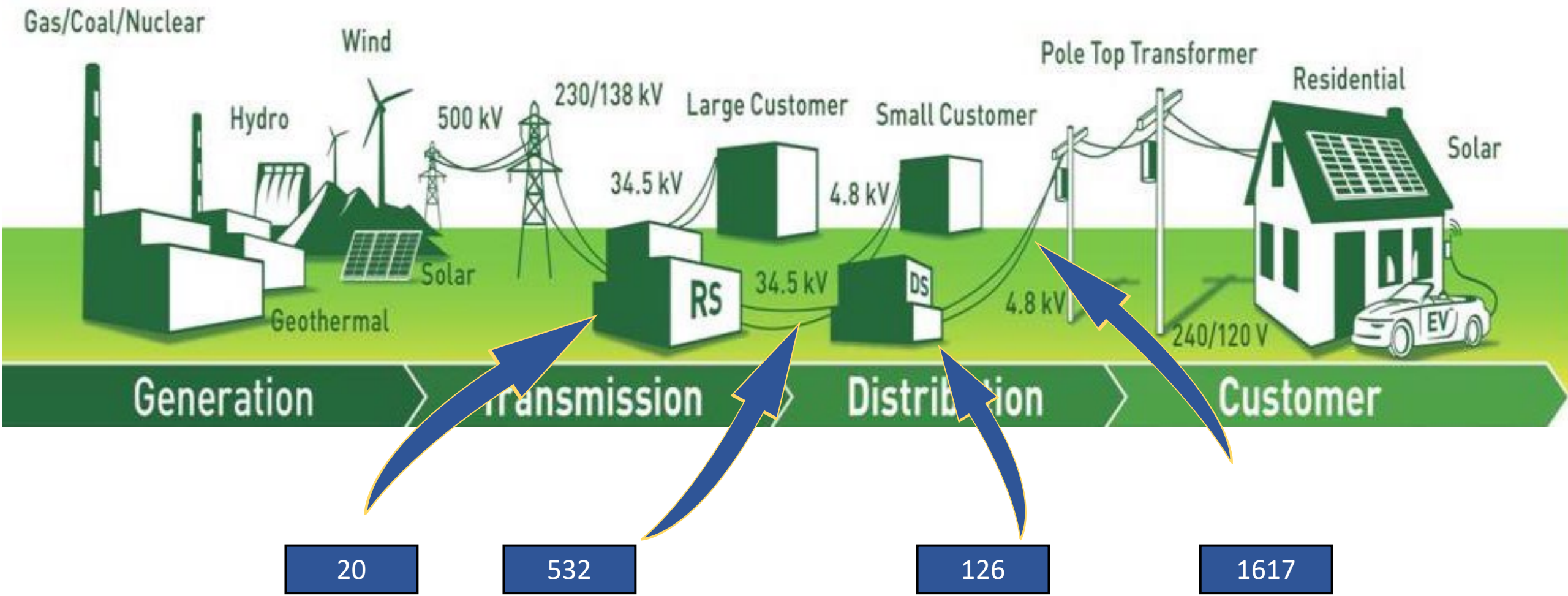


2024 SLTRP

**DISTRIBUTION SYSTEM PLANNING
ADVISORY GROUP MEETINGS**



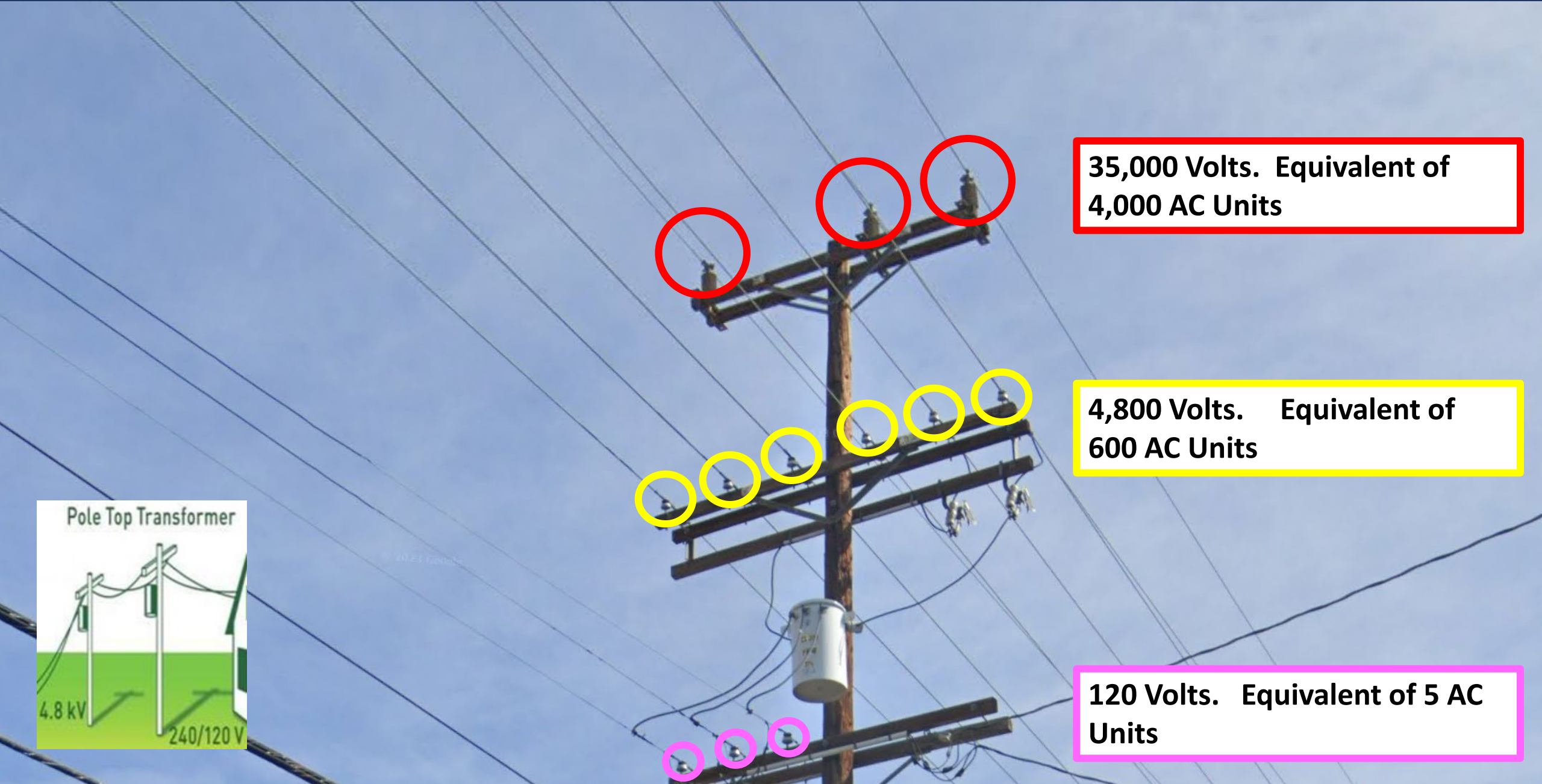
How Power Gets to You



Substations



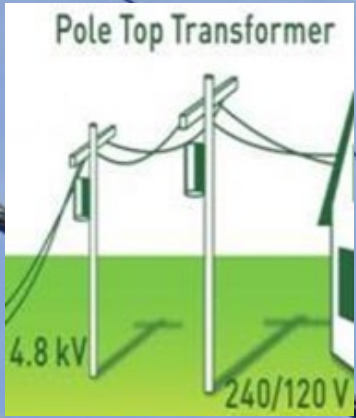
Distribution Lines



35,000 Volts. Equivalent of 4,000 AC Units

4,800 Volts. Equivalent of 600 AC Units

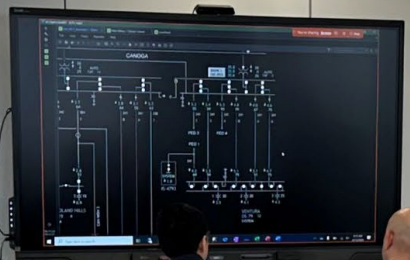
120 Volts. Equivalent of 5 AC Units





RS-J Monitor
RS-J Chassis
RS-A EL Snow
RS-F Solder A
RS-H Mfg Lead
RS-H Solder D
RS-H Wire
RS-K Solder B
RS-T Tester

Step1: Table Collection
Step2: Load PCBs
Step3: Connect YPRK
Step4: Add sensor location
Step5: Attach DS load
Step6: Load DS and Fanout
Step7: Check DS load meter and report fan demand
Step8: Attach DS load demand
Step9: Check CPU status
Step10: Run Load Flow



What do Distribution Planner Do?

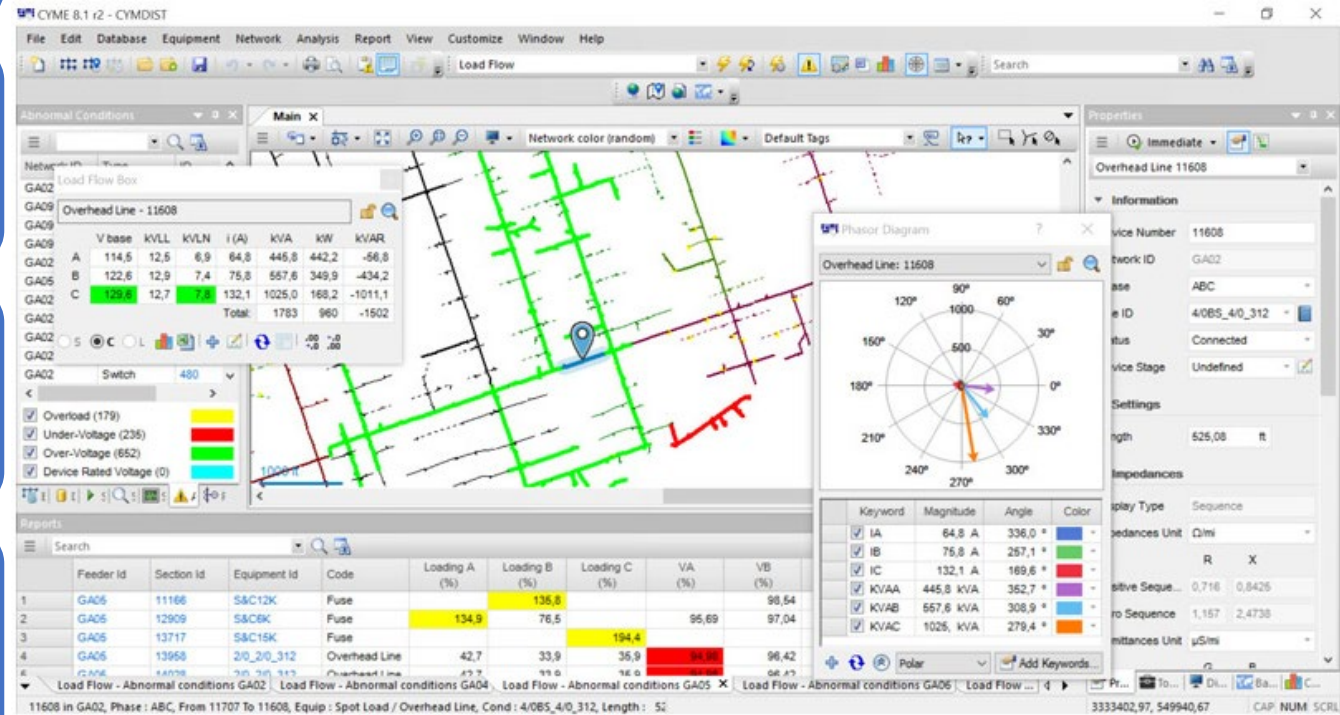
Track Energy Use by Asset

Identify System Constraints

Identify Power Quality Issues

Develop System Plans

Study Customer Interconnection Requests



Objectives & Schedule



Provide Transparency & Insights



Share Vision for the Distribution System



Inform AG & Provide Opportunity for Questions and Comments

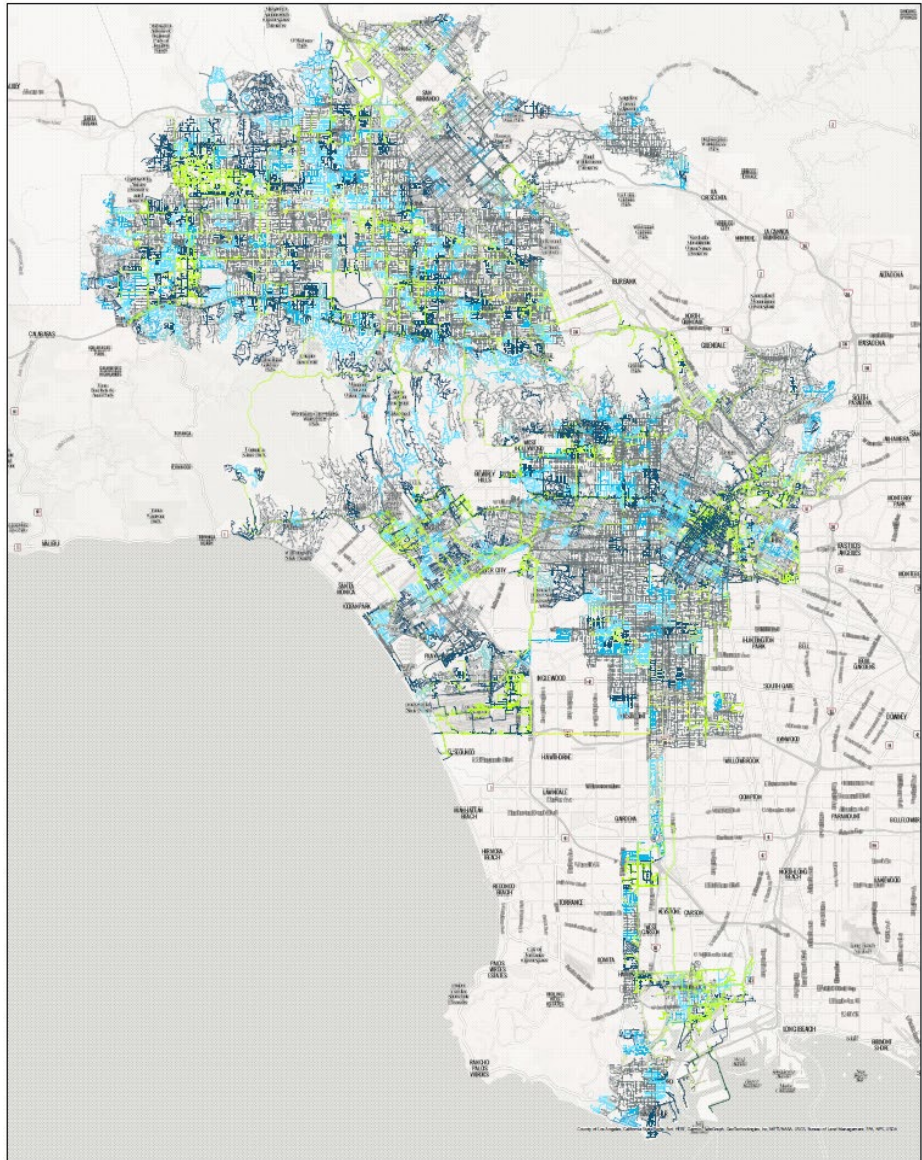
Schedule

Virtual Meeting 1: August 2024. Date TBD.

- Overview of Distribution System
- Results: Distribution System Loading and Shortfalls (2023)
- Inputs and assumptions
- Scenarios

Virtual Meeting 2: Q4 2024. Date TBD.

- Results: Distribution System Loading (2035)
- Results: Distribution System Shortfalls (2035)



Available Power Capacity (kW)

34.5-KV: > 7500	34.5-KV: 1500 - 2000	4.8-KV: 500 - 750
34.5-KV: 5000 - 7000	34.5-KV: 1000 - 1500	4.8-KV: 300 - 500
34.5-KV: 3000 - 5000	34.5-KV: 500 - 1000	4.8-KV: 100 - 300
	34.5-KV: NO CAPACITY	4.8-KV: 0 - 100
		4.8-KV: NO CAPACITY

Updated: 2023-02-03

0 1.75 3.5 7 Miles



2024 SLTRP

Q&A





2024 SLTRP

REVIEW OF SLTRP AG GROUP FEEDBACK
(THEMES AND BREAKOUT SESSIONS)



Breakout Session Feedback (1/2)

Draft Scenarios / Sensitivities

- ***Evaluated Scenarios/Sensitivities***

LADWP is considering several scenarios for the 2024 SLTRP. The main scenarios will be based on Case 1 of the 2022 SLTRP (100% Clean Energy by 2035) and evaluate overall cost, emissions, and system reliability as the main metrics.

- ***No-Combustion Scenario***

LADWP is finalizing a contract with NREL to conduct an independent study for a “No-Combustion” scenario. The 2024 SLTRP will contain a “No-Combustion” scenario as well.

- ***Dispatchable Capacity vs New Transmission***

Previous studies have evaluated replacing dispatchable generation with expanded transmission. Range of costs between study results vary greatly depending on the cost of electricity used to produce hydrogen.

- ***Extreme Heat Scenario***

A “what if” sensitivity will examine the implications of temperature rises during the study horizon, alongside other heat-related stress conditions.

Modeling Inputs

- ***Modeling Climate Change***

Metrics simulating climate change are input to various model items (e.g., Load Forecast, Generation De-Rate) and variables affected by climate change (e.g. weather) are refined using stochastic modeling.

- ***Modeling Cost***

GHG/Carbon costs will be included in the model, with high and low price sensitivities. The model does not evaluate emissions due to methane leakage which is consistent with Mandatory Reporting Requirements set by CARB.

- ***Modeling Energy Efficiency***

Energy efficiency values are input as a direct deduction to forecasted load. Intra-hour variability is not modeled directly but increasing storage will serve to alleviate potential issues.

- ***Modeling Hydrogen Uncertainty***

Multiple scenarios will be examined including a scenario with no in-basin hydrogen.

Breakout Session Feedback (2/2)

Modeling Outputs

- **Resilience Study Outcomes**

Resilience is modeled to understand system behavior during extreme events and evaluate the cost of developing systems to prevent any simulated loss of load. (E.g., Modeling a lost transmission line due to wildfire, calculating cost to supplement foreseen transmission losses via new infrastructure/market purchase.)

LADWP models “1-in-10” extreme events (events with a likelihood of occurring once every 10 years) using Monte-Carlo simulations to increase robustness.

- **Equity Outcomes**

The main model results examining equity are Affordability and Energy Burden. Potential rate increases inform affordability. Average % of household spending on electricity informs Energy Burden. Energy burden should not extend above 6% household spending.

Implementation Progress

- **New Generation**

LADWP is working actively to negotiate new renewable energy contracts in line with resource build expectations set in the 2022 SLTRP.

- **New Infrastructure**

The proposed “Eastern Corridor” transmission (line to New Mexico) is important to meeting LADWP’s RPS goals. Alternative proposals are being researched in case the line is not completed by 2035. Hydrogen infrastructure is being developed by external entities and all water sourcing for electrolysis is expected to be independent of LADWP.

Rate Actions

- **Rate Action Circumstances**

Rate Actions are dependent on rate-related results of the most recent SLTRP after review by the Financial Services Organization and approval from City Council and the General Manager/Chief Executive. If a rate action is called for it will be publicized.



2024 SLTRP

UPDATED 2024 SLTRP SCENARIO
AND SENSITIVITY MATRIX



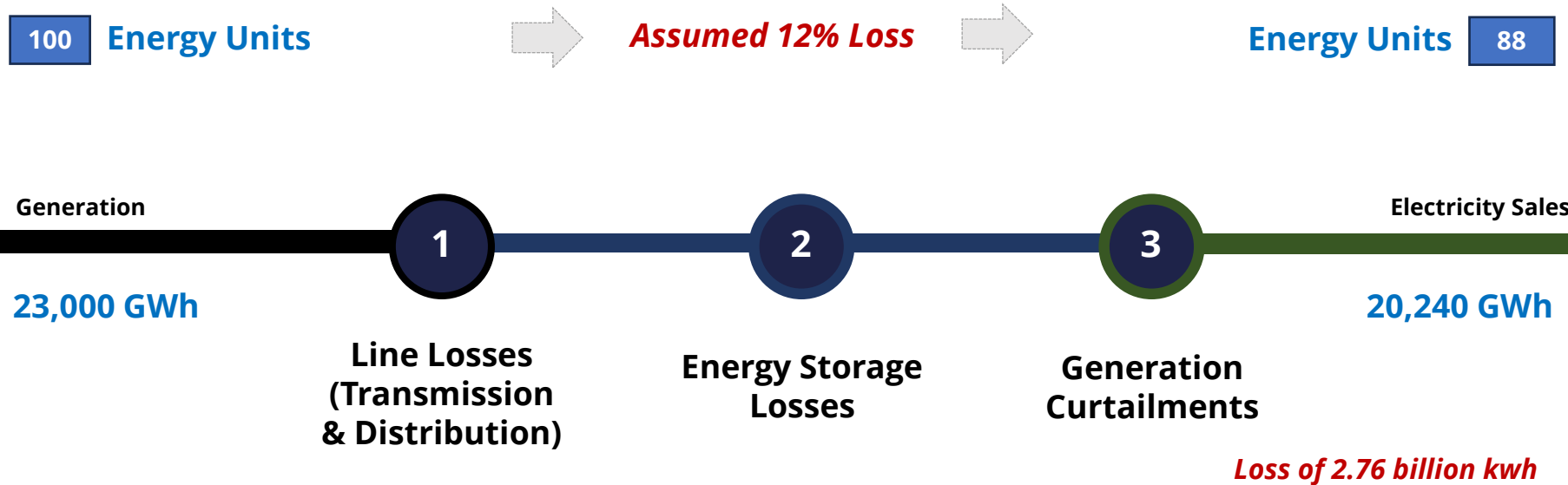
Sales vs Generation

Accounting for the production and sales of clean energy are not the same

“Carbon Free” refers to the entire generation portfolio consisting of clean energy resources

“Clean Energy” refers to the retail sales of clean energy resources

“Energy Sales” refers to the load being served by clean energy resources (not including losses, curtailments, etc.)



Clean Energy versus Carbon Free

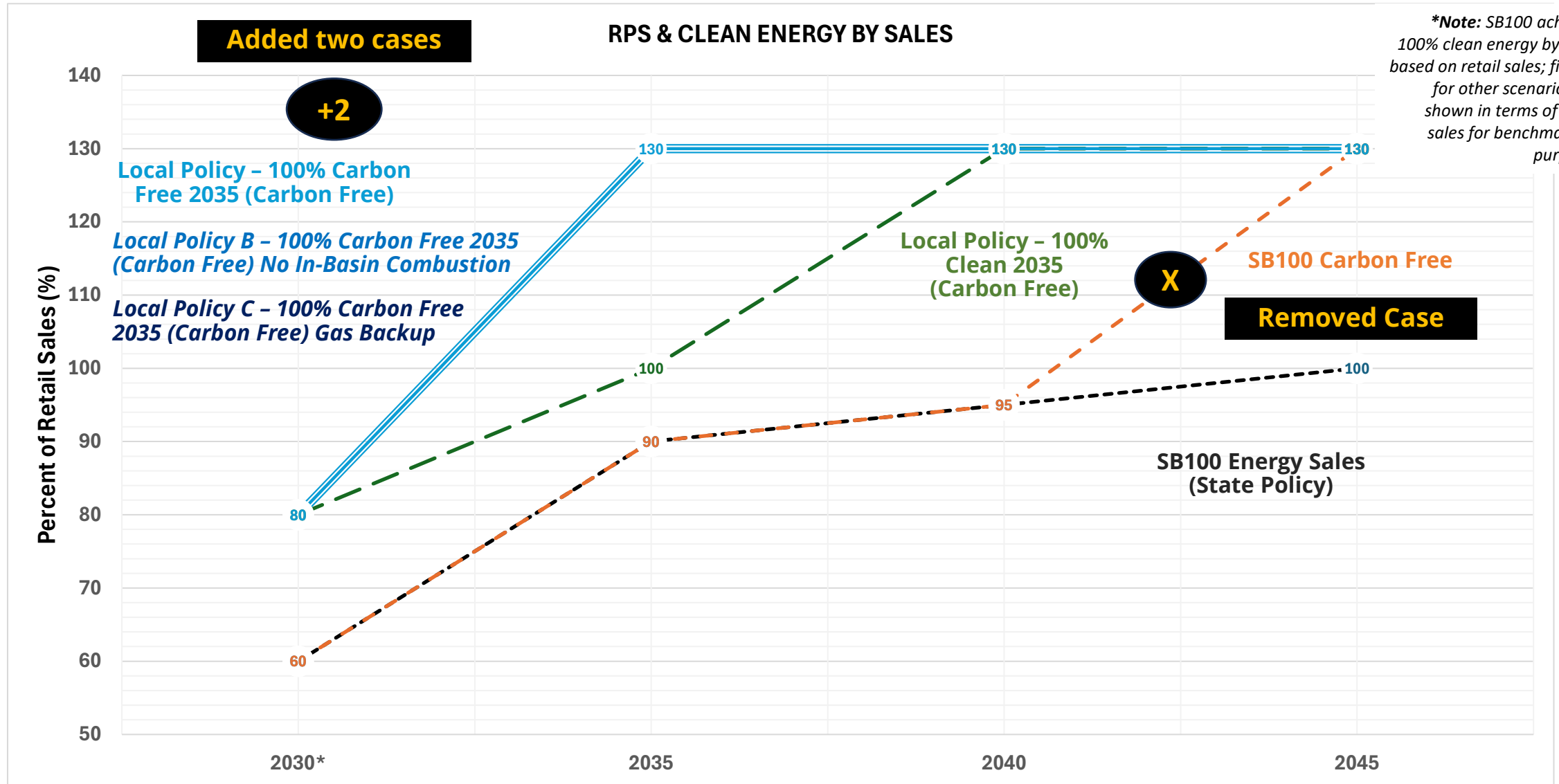
Term	Definition	Description	Example
<p>Clean Energy (e.g. 100% clean energy by 2045)</p>	<p>Target based on retail sales, not generation. Natural gas is allowed to make up losses</p>	<p>Clean energy represents zero-carbon resources, including renewable portfolio standard, large hydro, nuclear, and generic firm dispatchable and base loaded resources used to serve retail sales</p>	<p>LA100 Study’s SB100 scenario</p>
<p>Carbon Free (e.g. 100% carbon free by 2035)</p>	<p>Target based on generation. No natural gas allowed to make up losses.</p>	<p>Entire generation portfolio consisting of clean energy resources. Utility’s greenhouse gas emissions must reach absolute zero</p>	<p>LA100 Study’s Early & No Biofuels, Limited New Transmission, and Transmission Focus scenario</p>

Advisory Group's Feedback and Addressing Equity

Core Themes

- 1) Question Regarding **130% of Retail Sales** in order to achieve 100% carbon free by 2035
- 2) Adhere to **City Council's** direction to achieve **100% renewables by 2035**
- 3) **Opposition** to 100% carbon free by 2045 (**SB100 Carbon Free**) scenario
- 4) Include a scenario that **waits for technology advancement** to improve and become more cost effective
- 5) Model a **100% clean energy by 2035 based on retail sales** to understand the last **10% decarbonization**
- 6) Prefer to see a **no combustion scenario/sensitivity** sooner rather than later
- 7) Model a **no hydrogen, no combustion** scenario

Original 2024 SLTRP Scenarios



Draft

Updated 2024 Scenarios

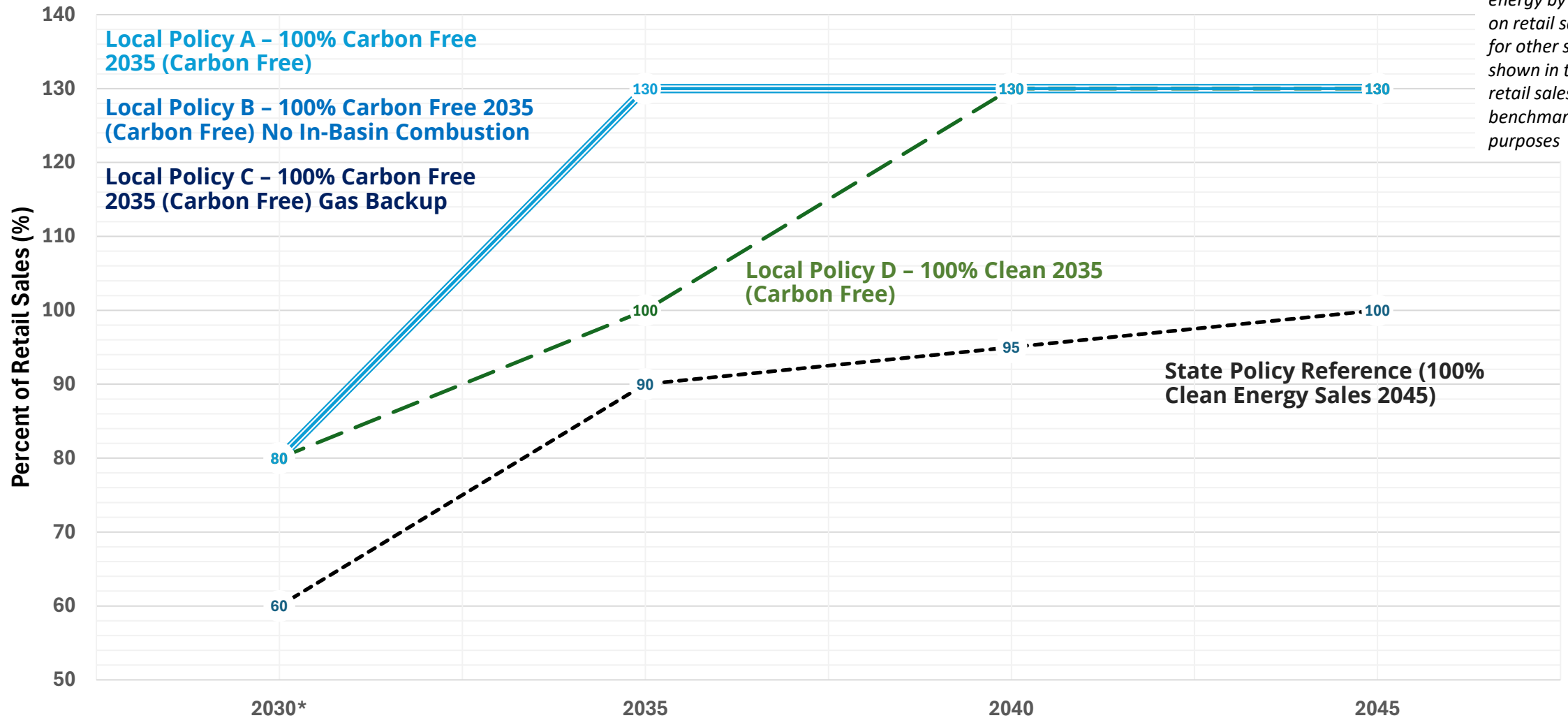
Scenario Number	Description	Clean Energy Milestones (based on retail sales)	Carbon Free Milestones (based on generation)	Stakeholders' interest
Local Policy A 100% Carbon Free 2035 (Carbon Free)	2022 SLTRP Case 1 (with updated assumptions)	80% RPS by 2030 130% clean energy by 2035	~70% RPS by 2030 100% carbon free by 2035	Current Local Policy, allows hydrogen combustion to address reliability
Local Policy B 100% Carbon Free 2035 (Carbon Free) No In-Basin Combustion	2022 SLTRP Case 1 prohibits in-basin hydrogen combustion	80% RPS by 2030 130% clean energy by 2035	~70% RPS by 2030 100% carbon free by 2035	No in-basin combustion by 2035
Local Policy C 100% Carbon Free 2035 (Carbon Free) Gas Backup	2022 SLTRP Case 1 retains existing gas as backup	80% RPS by 2030 ~120% to 130% clean energy by 2035	~70% RPS by 2030 ~95% to 100% carbon free by 2035	Allows natural gas for <u>back up only</u> to address reliability and cost
Local Policy D 100% Clean 2035 (Carbon Free), Flexible	100% clean energy based on sales by 2035, 100% Carbon Free by 2040	80% RPS by 2030 100% clean energy by 2035 130% clean energy by 2040	~70% RPS by 2030 ~88% carbon free by 2035 100% carbon free by 2040	More flexibility for emerging technologies to mature and improve in cost
State Policy Reference (100% Clean Energy Sales 2045)	100% clean energy based on sales by 2045	60% RPS by 2030 90% clean energy by 2035 100% clean energy by 2045	~53% RPS by 2030 ~79% carbon free by 2035 ~88% carbon free by 2045	State of California Policy

Note: Only State Policy does not achieve 100% carbon free; it achieves 100% clean energy based on retail sales.

Draft

Updated 2024 SLTRP Scenarios

RPS & CLEAN ENERGY BY SALES



***Note:** SB100 achieves 100% clean energy by 2045 based on retail sales; figures for other scenarios are shown in terms of retail sales for benchmarking purposes

Draft

Price Sensitivities

1 SB 100 Energy Sales(State Policy) (60% RPS by 2030, 90% clean energy by 2035, 100% clean energy by 2045)			
Load Growth	Low	Expected	High
Carbon Policy (\$)	Low	Normal	High
Gas Market (\$)	Low	Normal	High
Hydrogen Market (\$)	N/A	N/A	N/A
Renewables (\$)	Low	Normal	High

2 Case 1 (2035)(Local Policy) (80% RPS by 2030, 100% carbon-free by 2035)			
Load Growth	Low	Expected	High
Carbon Policy (\$)	Low	Normal	High
Gas Market (\$)	Low	Normal	High
Hydrogen Market (\$)	Low	Normal	High
Renewables (\$)	Low	Normal	High

What If Analysis

Six (6) "What If" factors applied to Local Policy Scenario Case A

6	Implementation Risk	Description	"What-if" Sensitivities Applied 100% by 2035 Case
	Demand Side Resources	Demand Response Local Solar and Storage Energy Efficiency	Reaching only half of LADWP's DER targets due to low customer adoption
	Low Load	Transportation/Building Electrification	Low Load
	High Load	Transportation/Building Electrification	High Load
	Resource Constraint	Shortfall of resources due to challenges	Unable to exceed current build rates
	Climate Change	Impacts of Climate change on resources	High peak loads, lower output from weather. Future wildfire.
	Hydrogen Supply	Impacts of the volatility of hydrogen resources	Unable to fully supply hydrogen fuel
Note: Applied to 100% by 2035 scenario only (Local Policy)			

1	Implementation Risk	Description	"What-if" Sensitivities Applied SB100 Case
	SB100 Carbon Free	Identify resources need for LADWP to achieve 100% carbon free by 2045 if State moves in that direction	100% carbon free by 2045 instead of 100% clean energy by 2045 based on retail sales

Draft

Summary Breakdown

SLTRP Modeling – Scenarios and Sensitivities



Final Recommended Case

Focused Development

Evaluate metrics, including affordability among scenarios. Allows for optimal use of time and resources to complete analysis within one year

“What If” Analysis

Focused on Implementation Risks

Based on the scenario most subject to risk (Local Policy)

Price Sensitivities

Based on Commodity Pricing

Scenarios

Based on Expected Load Growth



2024 SLTRP

CONTINUED BREAKOUT
SESSIONS AND MENTIMETER



Breakout Session

Introductions

1. Name and Organization

Draft Scenario and Sensitivity Matrix

1. What do you view as **strengths** of the updated scenario and sensitivity matrices?
2. Does the updated **scenario** matrix align with your organization's **priorities and interests**, and if not, why?

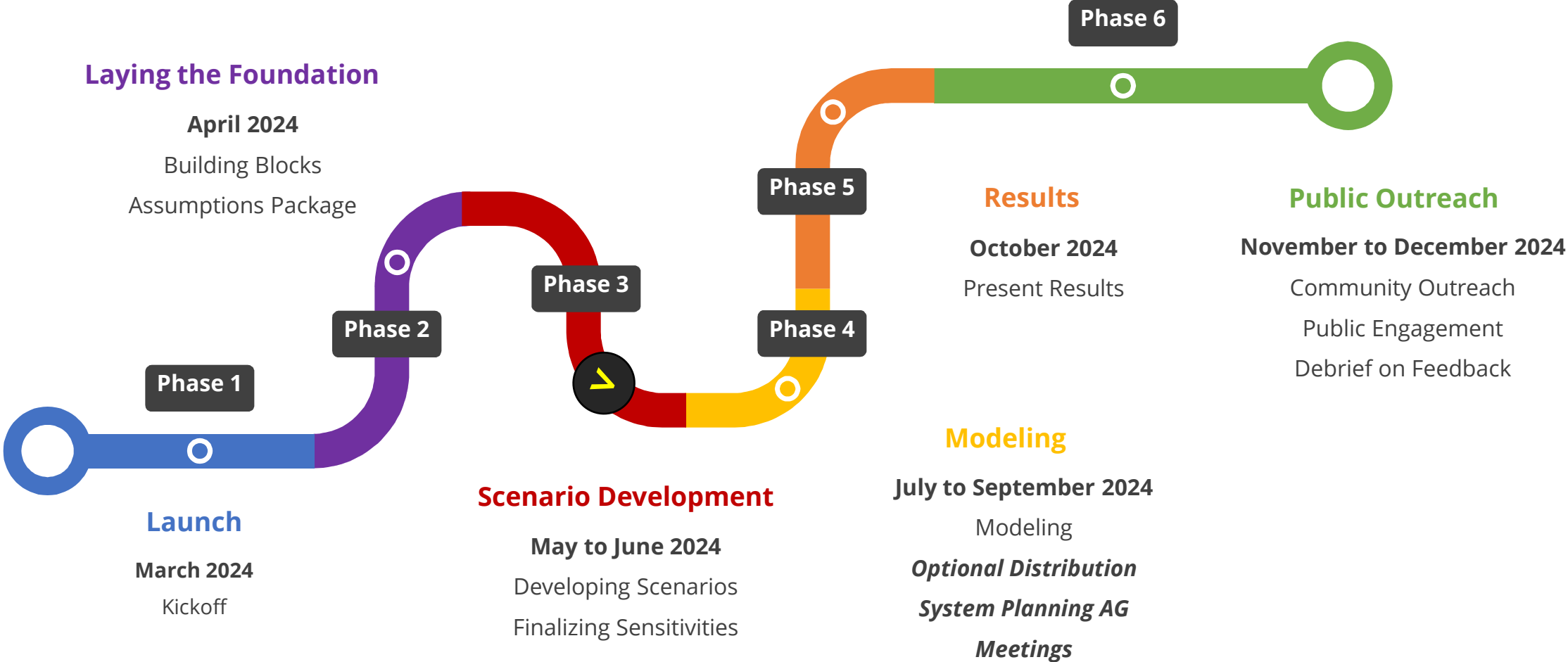


2024 SLTRP

BREAKOUT SESSIONS REPORTING & DISCUSSION AND MENTIMETER



NEXT STEPS – MEETING MAP



2024 SLTRP Advisory Group Draft Meeting Plan
Please note that dates are tentative and subject to change based on needs of the SLTRP process.



Thank You!

Email us @

PowerSLTRP@ladwp.com