



CITY OF GLENDALE, CALIFORNIA REPORT TO THE CITY COUNCIL

AGENDA ITEM

Report: 2024 Integrated Resource Plan.

- 1) Resolution Adopting the 2024 Glendale Water and Power Integrated Resource Plan (IRP) in compliance with the requirements of California Senate Bill (SB) 350.

COUNCIL ACTION

Item Type: Action Item

Approved for December 12, 2023 **Calendar**

EXECUTIVE SUMMARY

The Integrated Resource Plan (IRP) are planning documents required to be developed and submitted to the California Energy Commission every five years pursuant to Senate Bill (SB) 350. It is also a critical component of Glendale Water and Power's strategy to meet future energy needs over the next 20-year horizon.

This report to City Council outlines the comprehensive preparation conducted by GWP to draft the utility's 2024 Integrated Resource Plan, highlighting the scenarios modeled and their corresponding results. There were six scenarios studied in the IRP, as follows:

Scenario 1: CA Policy – Meets the SB 100 target of 60% RPS by 2030 and 100% zero-carbon resources by 2045, including SB 1020 interim targets of 90% by 2035, and 95% by 2040.

Scenario 2: Zero-Carbon Emissions by 2035: Achieves the City Council's 100% clean energy goal by 2035.

Scenario 3: Clean by 2045 with REC Purchases for Offsets: Meets RPS and clean energy requirements partially with purchased renewable energy credits (RECs). This scenario is the same as Scenario 1, but with less renewable generation. The lower renewable generation is offset with REC purchases to meet the California mandates.

Scenario 4: High local resources + accelerated electrification by 2035. Focuses on local resources (both customer-sited and utility-scale), while achieving City Council's clean energy goals (i.e., 100% by 2035, 10% of customers with solar by 2027, reach code, 100 MW of DERs).

Scenario 5: Moderate local resources + long-duration energy storage by 2042. Achieves 90% clean energy by 2035 and 100% by 2042. Will take a “middle path” on local resource assumptions, assuming higher potential for utility-scale and customer-sited resources than GWP’s baseline, but lower than Scenario 3. This scenario also models a long-duration energy storage (LDES) project built in Glendale during the IRP period.

Scenario 6: Moderate local resources by 2040. Achieves 90% clean energy by 2035 and 100% by 2040. This scenario takes more moderate assumptions on local resource potential compared to Scenario 1 and Scenario 4.

The report also emphasizes GWP’s preferred pathway (*Scenario 1: CA Policy*) for achieving goals related to system resiliency, increased renewable resource integration, and emission reduction. The proposed approach focuses on balancing reliability, affordability, and environmental sustainability, ensuring a strategic and viable trajectory for the utility’s future energy initiatives.

RECOMMENDATION

Adopt the GWP 2024 Integrated Resource Plan (IRP) and authorize the submission of the IRP report, including potential minor revisions and supporting documents to the California Energy Commission pursuant to the requirements under Senate Bill (SB) 350 before January 1, 2024. The 2024 IRP is attached hereto as Exhibit A.

BACKGROUND

The Renewable Portfolio Standards (RPS) have been the primary driver for reducing emissions by requiring utilities to increase the use of renewable energy to supply electricity needs. The Clean Energy Act of 2018 (SB 100) requires that 60% of the utility’s retail sales be supplied from renewable resources by 2030. The bill also sets a 100% clean energy electricity goal and establishes a new target to achieve carbon neutrality by 2045. The passage of SB 1020 in 2022 revises the state policy and adds interim targets of 90% by 2035, and 95% by 2040.

SB 350 requires the governing body of a Publicly Owned Utility (POU) with an annual electrical average load exceeding 700 GWh, to adopt an IRP and provide updates at least once every five years to assist the utility in achieving specified planning goals. SB 350 requirements are further defined in the California Energy Commission’s (CEC) POU IRP Submission and Review Guidelines and prescribe the format and content of the IRP for entities within CEC’s jurisdiction.

In December 2018, the City Council adopted through Resolution 18-221 an interim IRP to meet the regulation’s deadline while the Clean Energy RFP initiative was in progress, with the instruction to update the said IRP in 2019 when the council provides direction on Grayson Repowering and the Clean Energy RFP. In addition, council established the following schedule for updating the IRP:

1. Once every 5 years from December 31, 2018
2. Next IRP update shall be completed no later than January 1, 2024

3. At any time at the discretion of the City Council or the General Manager of GWP where GWP expects a major change in the portfolio, market conditions, state/federal policies, and/or when new information is discovered that changes or warrants a change in the direction of the IRP strategy.

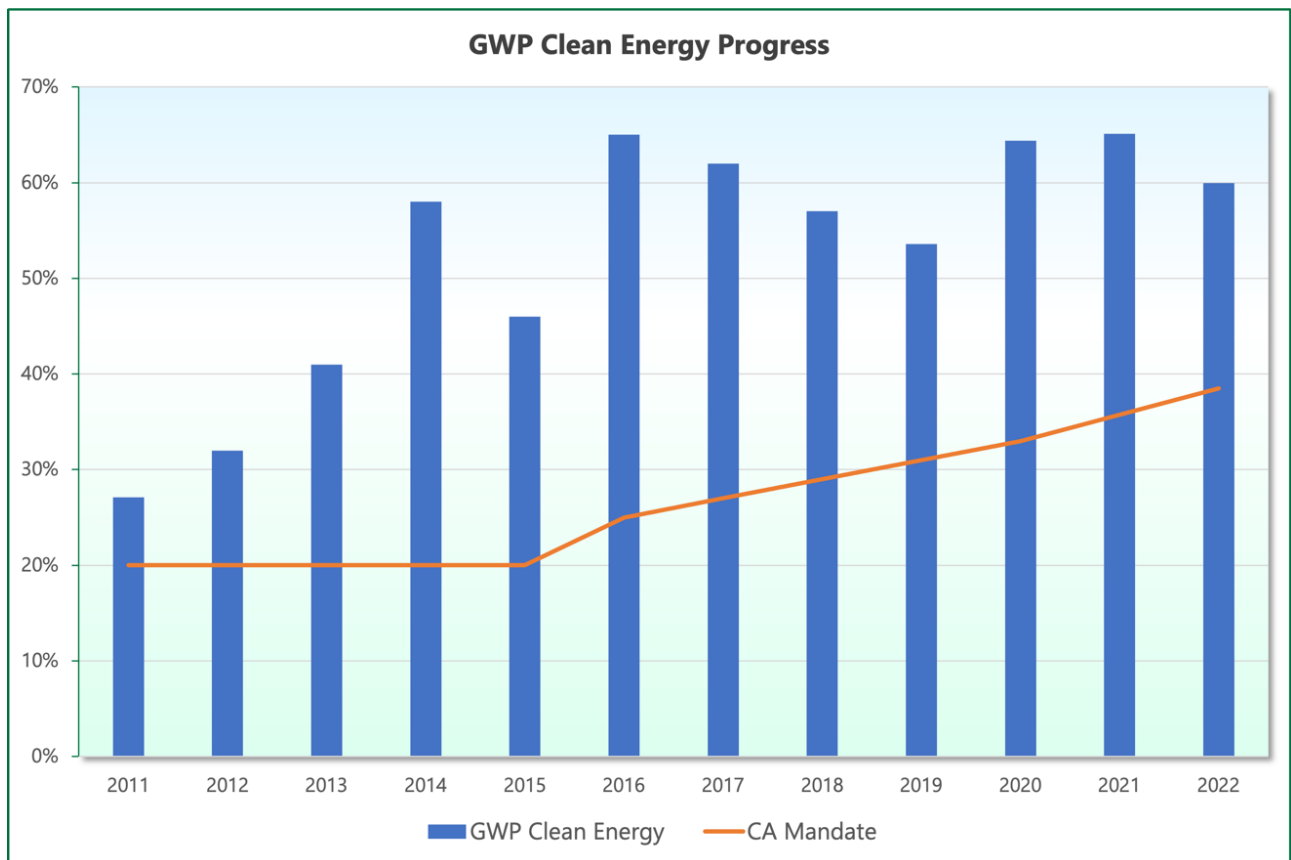
As directed, the revised IRP which included a local build-out capacity of 93 MW internal combustion engine (ICE) units, 75 MW battery energy storage system (BESS), and 50 MW of distributed energy resources (DER) was filed with the CEC for review in 2019, and determined to be complete and consistent with the requirements of the code by the Energy Commission Executive Director.

The planned build-out of resources outlined in the 2019 IRP encountered setbacks as several key elements failed to materialize. The original staff recommended ICE capacity was reduced by Council direction from 93 MW to approximately 56 MW. Additionally, the proposed virtual power plant was reduced by half under Council direction due to the original significant cost of the project and was eventually cancelled by the vendor. Anticipated gains in demand response and energy efficiency have not been attained due to low customer participation.

GWP will submit the next IRP update by January 1, 2024, as scheduled. To assist in the development of the 2024 IRP, GWP engaged Ascend Analytics for modeling, with Strategen Consulting as a subcontractor to guide a comprehensive stakeholder engagement effort.

ANALYSIS

GWP has demonstrated unwavering dedication to clean energy, consistently surpassing ambitious targets and achieving remarkable milestones. Our commitment to sustainability has been at the forefront, ensuring a delicate balance between reliability, affordability, and environmental responsibility. The chart below depicts GWP's persistent clean energy progress throughout the past decade.



The 2024 IRP considers all the requirements and criteria set forth in SB 350, while considering the increased RPS and clean energy targets under SB 100 and added interim goals in SB 1020.

Load Forecast and Contingency Requirements

The IRP used the CEC Final 2022 IEPR Update, published on February 28, 2023, that included the California Energy Demand Update (CEDU) 2022 report for the mid-demand AAEE energy as a baseline in the modeling process. With Glendale specific load modifiers, it was calculated that by 2035, GWP's peak demand will reach 416 MW and, on a N-1-1 contingency situation where PDCI and one line of the STS are derated to zero, there would be a shortfall of approximately 40 MW of capacity, as shown below in Table 1:

N-1-1 Resource Contribution	MW
Southwest AC Intertie (without the STS line)	113
Grayson Unit 9	48
Magnolia	35
Internal Combustion Engines	54
Battery Energy Storage System	75
Scholl Canyon	8
Eland Solar and Storage	25
City Solar	10
Demand Response	8
Total	376
Peak Load Forecast	416
Capacity Shortfall	40

Table 1

Modeling Methodology, Assumptions, and Results

The fundamental purpose of resource planning is to ensure adequate capacity to generate energy for current and forecasted demand while maintaining reliability and addressing competitive, stable rates in compliance with state regulatory requirements.

Ascend used three models to evaluate each of the six scenarios, specifically:

4. *Resource Adequacy Model* – to test whether energy flows regardless of the situation such as during very hot or cold days.
5. *Capacity Expansion Model* – to determine the optimal mix of resources to meet GWP's energy needs, and to determine the amount of those resources that will be renewable and zero carbon.
6. *Production Cost Model* - to test the overall cost of the modeled portfolio.

Across all scenarios, the considered candidate resources for incremental buildout were limited only to non-fossil, renewable, and clean energy resources that GWP could realistically procure. This includes wind, solar, BESS, geothermal, green hydrogen, and nuclear small modular reactors.

Table 2 below shows the capacity by resource type in 2035 and 2045 for all scenarios. Scenarios 1 through 3 assume projected growth in customer-sited resources, such as behind-the-meter solar and demand response, aligned with historical data trends. Scenarios 4 through 6 assume a more amplified projected growth in these resources which would help offset some of the resource needs from utility-scale resources.

Resource	Capacity in 2035						Capacity in 2045					
	Scenarios											
	1	2	3	4	5	6	1	2	3	4	5	6
Wind	50	100	50	80	80	80	50	100	50	80	90	90
Solar PV	55	55	55	75	55	55	65	75	65	75	65	65
BTM Solar	38	38	38	98	48	48	48	48	48	100	63	63
Biomass	8	8	8	8	8	8	6	6	6	6	6	6
Hydro	20	20	20	20	20	20	20	20	20	20	20	20
Natural Gas	140	0	140	0	140	140	140	0	140	0	0	0
Contract	60	60	60	60	60	60	60	60	60	60	60	60
Nuclear	10	10	10	10	10	10	10	10	10	10	10	10
Geothermal	66	66	66	66	66	66	66	66	66	66	66	66
Hydrogen	33	123	33	123	33	33	33	168	33	168	168	168
Storage	180	220	180	240	235	240	190	250	190	250	245	245
Demand Response	7	7	7	15	10	10	8	8	8	24	14	14

Table 2

In scenarios 1 and 3, the natural gas units are retained throughout the planning horizon. Magnolia is assumed to be substituted with cleaner alternative(s) in scenario 4 by 2038. To address reliability and system resiliency in scenarios 2,4,5 and 6, the natural gas units transition to green hydrogen as a fuel source.

Table 3 below shows the customer-sited and local utility-owned resource potential values for each scenario assumed in the model. The base resources in Scenarios 1 through 3 are identical.

Resource	Scenarios 1–3	Scenario 4	Scenario 5	Scenario 6
Customer-Sited Resource Potential				
Distributed Energy Resources	50 MW by 2045	100 MW by 2035	75 MW by 2042	75 MW by 2040
Energy Efficiency	1.8% of retail sales through 2031 0.9% of retail sales from 2032–2045	2.7% of retail sales per year for next 10 years 1.35% of retail sales from 2032–2045	1.8% of retail sales through 2031 0.9% of retail sales from 2032–2045	1.8% of retail sales through 2031 0.9% of retail sales from 2032–2045
Demand Response	Historical growth trends: 6.7 MW of demand reduced by end of 2028 and 7 MW by end of 2033 1% increase after 2033	10 MW of demand reduced by end of 2027 5% increase after 2027	8 MW of demand reduced by end of 2027 3% increase after 2027	8 MW of demand reduced by end of 2027 3% increase after 2027
Customer Solar	Doubling of solar capacity over 20 years: 50 MW by 2045	10% of customers adopt solar by 2027, ramping up to 100 MW total by 2045	60 MW by 2042	60 MW by 2042
Customer Storage	None	10 MW by 2034	10 MW by 2034	10 MW by 2034
Local Utility-Owned Resource Potential				
Utility-Owned Solar	10 MW of utility-owned solar by end of 2030 No defined assumption post-2030	15 MW of utility-owned solar by end of 2030 No defined assumption post-2030	12 MW of utility-owned solar by end of 2030 No defined assumption post-2030	12 MW of utility-owned solar by end of 2030 No defined assumption post-2030
Utility-Owned Storage	75 MW with possibility for increase after 2027	75 MW with possibility for increase after 2027	75 MW with possibility for increase after 2027 One long-duration energy storage project developed in Glendale	75 MW with possibility for increase after 2027

Table 3

A summary of the modeling outputs for each of the six scenarios is listed in Table 4 below:

Legend	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6
<i>Costs in \$Million (2024–2045)</i>	<i>California Policy</i>	<i>Carbon Free 2035</i>	<i>California Policy w/Offsets</i>	<i>Carbon Free 2035; High DER</i>	<i>Carbon Free 2042; Magnolia Retire 2038</i>	<i>Carbon Free 2040</i>
New Resource Costs	\$535	\$1,251	\$491	\$1,145	\$897	\$867
Operating Costs	\$1,073	\$970	\$1,098	\$1,086	\$1,131	\$1,142
Total Cost	\$1,608	\$2,221	\$1,589	\$2,231	\$2,028	\$2,009
Total Cost with SCC Sensitivity	\$1,916	\$2,490	\$1,917	\$2,440	\$2,278	\$2,274
Cost per MWh	\$93.97	\$129.80	\$92.87	\$130.39	\$118.52	\$117.41
Cumulative CO ₂ Emissions (tons)	2,597,041	1,642,076	2,765,838	1,434,150	1,816,241	2,035,232
Emissions Reduction in 2035 Compared to 2024	67%	100%	63%	100%	72%	71%
Emissions Reduction in 2040 Compared to 2024	70%	100%	68%	100%	99%	72%
Percent Clean in 2035	91%	109%	84%	129%	103%	95%
Percent Clean in 2040	97%	108%	90%	123%	109%	100%
Percent Clean in 2045	90%	105%	85%	109%	102%	103%

Table 4

All scenarios met required California mandates for RPS and Greenhouse Gas emissions; some have surpassed them. It is important to note that in accordance with the California policy, the calculation of RPS percentages hinges on Retail Sales rather than gross energy production. Transmission and distribution losses are excluded from the calculation and are generally considered to be around 10%.

Of the scenarios examined, the incorporation of green hydrogen as replacement for natural gas units has yielded significantly higher costs. In these scenarios, hydrogen is either produced onsite or piped in from a central hub. Green hydrogen technology is still in its early development, and establishing a definitive cost for modeling is a challenge. As a reference point, the IPP Repowering project capital cost is currently estimated at \$5 billion or about \$6 million per MW.

Furthermore, a Social Cost of Carbon (SCC) sensitivity test was conducted to assess the impact of carbon emissions on all scenario costs. Using the latest US Environmental Protection Agency's SCC estimates starting at \$208/Ton in 2024 and increasing to \$287/Ton in 2045, reveals no significant change in comparative outcomes. The scenarios maintained their relative positions mainly due to the reduced usage of natural gas units, except for scenarios 5 and 6, as shown below:

	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6
Costs in \$M Net Present Value (2024 - 2045)	CA Policy	Carbon Free 2035	CA Policy w/Offsets	Carbon Free 2035 - High DER	Carbon Free 2042 - Magnolia Retire 2038	Carbon Free 2040
Total Costs with CA Carbon Cost	1,608	2,267	1,589	2,231	2,027	2,009
Total Costs with Social Cost of Carbon	1,918	2,490	1,917	2,440	2,278	2,274

Table 5

GWP Preferred Scenario

Scenario 1: CA Policy is the preferred resource portfolio. It provides a balance between reliability and sustainability, while keeping costs lower for the residents of Glendale. This scenario also presents the most realistic path forward as it relies mainly on proven renewable and clean energy technologies: wind, solar PV, geothermal, and energy storage.

The path forward in the preferred portfolio includes a mix of geothermal, wind, solar PV, and energy storage while keeping Grayson Unit 9, Magnolia, and the ICE units. Retaining the natural gas units is the most economical option to keep the required capacity and dispatchable firm energy to maintain reliability, particularly during an N-1 and N-1-1 contingency event.

As shown in Table 4 above, Scenario 1 achieves 91% Clean Energy by 2035. While this scenario does not explicitly meet the City Council's goal of 100% Zero-Carbon by 2035, this is still a significant achievement. Acknowledging that the last 10% is the most challenging and cost prohibitive aspect aligns with the common understanding that the final steps toward complete decarbonization often require innovative solutions and cutting-edge technologies. In fact, several studies have been performed recognizing this concern and suggesting that preparing for possibilities, as well as allowing for time and technologies to fill the gap may be prudent. The following represents a few of those studies:

- 1) NREL Study Identifies the Opportunities and Challenges of Achieving the U.S. Transformational Goal of 100% Clean Electricity by 2035 (August 30, 2022)

<https://www.energy.gov/eere/articles/nrel-study-identifies-opportunities-and-challenges-achieving-us-transformational-goal>

"A growing body of research has demonstrated that cost-effective high-renewable power systems are possible, but costs increase as systems approach 100% carbon-free electricity, also known as the "last 10% challenge." The increase in costs is driven largely by the seasonal mismatch between variable renewable energy generation and consumption." – National Renewable Energy Labs

- 2) Getting to 100%: Six strategies for the challenging last 10% (September 21, 2022)

<https://www.sciencedirect.com/science/article/pii/S2542435122004056#abs0010>

In their conclusion from modeling the six potential strategies:

The challenges of achieving a 100% carbon-free grid are disproportionately driven by the difficulty of solving approximately the last 10%. There are significant uncertainties and unknowns with all six strategies reviewed; no option matches the (fictional) ideal one (Table 1), and no single strategy is the clear superior choice under all circumstances.

.... If the last 10% strategies ultimately fail to succeed, then emissions reductions will fall short of 100% but will still be significant. After all, a system still needs to reduce emissions by 90% before the last 10% strategies are truly required.

- 3) SB 100 Joint Agency Report: Charting a path to a 100% Clean Energy Future

<https://www.energy.ca.gov/publications/2021/2021-sb-100-joint-agency-report-achieving-100-percent-clean-electricity>

Key takeaway from the report:

Gas Capacity Is Retained for Reliability Needs but Cost Reductions and Innovation in Zero-Carbon Firm Resources and Storage May Reduce Gas Capacity Needs.

Natural gas capacity is the most economic option to provide capacity for reliability needs with current resource assumptions and demand scenarios. Cost reductions and innovation in zero-carbon firm resources and storage may reduce the amount of gas generation needed. – California Energy Commission

- 4) SMUD IRP Section 4 SMUD's 2030 Zero Carbon Roadmap: A Diverse and Flexible Resource Plan (September 14, 2022)

<https://efiling.energy.ca.gov/GetDocument.aspx?tn=246076&DocumentContentId=80241>

Our adopted portfolio sets SMUD on a path to zero emissions by 2030 with a strong foundation of proven clean resources that reduce our emissions by 90% and a broad portfolio of new technology and business strategies requiring additional research before final implementation to address the remaining 10%. Prior to committing to new unproven technologies, we will conduct additional research, industry outreach and community consultation. – Sacramento Municipal Utility District

- 5) LA100 Study Executive Summary

<https://www.nrel.gov/docs/fy21osti/79444-ES.pdf>

Key Distinctions Between Pathways to 100%

The LA100 scenarios show similar cost increases until approximately 80%–90% renewable energy. The pathways diverge with differences in the technologies deployed to meet the last 10%–20% of energy demand that cannot be easily served by wind, solar, and conventional storage technologies—and to maintain reliability in the face of extreme events.

...The resources used to help meet this last 10% and maintain reliability can produce local air emissions, particularly when based on combustion generation.

The CA Policy scenario provides long term viability adaptable to future innovations and changing energy technologies.

Action Plan

GWP's action plan going forward includes:

7. Sustaining efforts to procure clean energy resources (wind, solar, geothermal, storage). Explore and engage in power purchase agreements that align with the IRP goals.
8. Actively participating in discussions and decisions focused on reducing emissions from Magnolia Power Plant with co-owners, as well as accelerating the transition of the plant to low-carbon technologies.
9. Prioritizing the integration of distributed energy resources, such as rooftop solar, energy storage, and demand response. Looking for innovative models to engage GWP customers and businesses in these programs.
10. Learning from the Intermountain Power Plant's conversion to hydrogen.
11. Continuing to collaborate with LADWP and the City of Burbank on transmission and renewable resource development.

STAKEHOLDERS/OUTREACH

Effective stakeholder engagement is integral to the IRP process. Strategen lead the community townhalls and STAG sessions, and provided guidance to GWP staff as they conducted extensive outreach efforts aimed at gathering input and ensuring diverse perspectives were considered.

Stakeholder Technical Advisory Group

The Stakeholder Technical Advisory Group (STAG) was comprised of 14 individuals who live and/or work in Glendale who could provide consistent and detailed community input to the IRP process. The STAG was formed using a two-pronged approach:

1. GWP sent invitations to 12 organizations that represent important segments of the community (including renters, homeowners, environmental

advocates, the Latino and Armenian communities, and others). From these invitations, eight organizations ultimately confirmed their interest in serving on STAG.

2. Simultaneously, GWP issued an open call for STAG members with an application available on the GWP website and at the first IRP community townhall. GWP received 22 applications from this process. Strategen Consulting reviewed the applications based on a set of pre-established and publicly transparent criteria listed on the GWP website. After applying these criteria, Strategen narrowed the applicants down to the top seven who were then invited to join.

The STAG's size was reduced from 15 original members to 14 due to one applicant's absence to the first STAG meeting and unresponsiveness to communication requests. Strategen opted not to replace this member with another applicant, given that any replacement member would already have missed the STAG orientation.

A posted list of all STAG members and their organizations (if any) is available at the following website: www.glendaleca.gov/2024IRP/STAG. GWP and Strategen sought to make the STAG as widely representative as possible of the Glendale community, although there were challenges in doing so. The diversity of the STAG was limited by the number and demographic of the applicants, as well as the invited organizations' representative. Despite these demographic constraints, diverse opinions existed in the STAG that made for robust discussions and considerations of a wide range of issues in IRP decision-making.

STAG Sessions

July 12, 2023	Introduction to members and their priorities. Presentation on integrated resource plans, the basics of GWP's system, and the IRP modeling process, group discussion.
July 19, 2023	Additional information on GWP's system, based on member questions. Debrief on community preferences expressed at first townhall. Brief brainstorming activity on STAG's preferred clean energy timeline, resource preferences, and resource concerns. Discussion of the planning constraints and resource options STAG should consider in its scenarios.
August 2, 2023	Debrief on outcomes of last meeting's brainstorming activity and second townhall. Presentation of the planned modeling scenarios and potential options for STAG's scenarios. Discussion of STAG's scenario preferences, with a first scenario concept agreed upon by the end of the meeting.

August 9, 2023	Presentation and discussion of example modeling results (illustrative only). Presentation of inputs and assumptions on Glendale's load forecast, market and resource prices, and local resource potential. Presentation of survey results of STAG scenario preference, conducted prior to this meeting. Brainstorming and discussion on STAG scenario 2, with a concept agreed upon by the end of the meeting.
September 6, 2023	Presentation and discussion of initial modeling results from two of GWP's scenarios. Brainstorming and decision-making on STAG scenario 3, with a concept agreed upon by the end of the meeting.
November 1, 2023	Presentation and discussion of final modeling results from the six scenarios, including key findings, cost, emission reductions and RPS percentages.

Community Townhall Sessions

Thursday, June 29, 2023 Pacific Community Center	Introduction to integrated resource plans, the basics of GWP's system, and the IRP modeling process. Community resource preference activity to gather input on preferred and non-preferred energy resources. Attendees: 35
Monday, July 24, 2023 Sparr Heights Community Center	Additional details on GWP's system (local vs. remote resources, customer-sited resources). Update on GWP's planned modeling scenarios and the STAG process. Community preference activity to gather input on preferred clean energy timeline, community cost sensitivity, and preferred local vs. remote energy resources. Attendees: 35
Saturday, August 12, 2023 Brand Studios	Presentation of modeling inputs and assumptions. Update on STAG process and all proposed modeling scenarios. Discussion of scenarios and other topics. Attendees: 17
Thursday, November 16, 2023 Sparr Heights Community Center	Presentation of modeling results for the six scenarios, including key findings, capacity build-out, costs, emission reduction and RPS percentages. Discussion on the GWP preferred scenario and action plans. Attendees: 17

Summary of community input integrated in the IRP process:

3. Two additional townhalls and two additional STAG meetings
4. Addition of a third community-informed scenario for modeling, for a total of six scenarios
5. Application of social cost of carbon sensitivity analysis to all scenarios
6. Compilation of a public “key assumptions” spreadsheet from Ascend Analytics, referenced above as Table 3.

Recordings and presentations from these townhalls and minutes from STAG meetings have been posted to the City’s IRP website (<https://www.glendaleca.gov/2024IRP>).

STAG Final Surveys and Results

Following the sixth and final STAG meeting, Strategen issued two surveys that asked STAG members to indicate their preferred scenario. All STAG members responded to these surveys.

The surveys had two parts. First, STAG members chose their top three scenarios in no particular order of priority. STAG was then asked to allocate 100 points across their three selections to indicate which scenario they preferred, and how strongly. Members could allocate points any way they chose, including giving no points to one or more of their scenarios. The only requirement was that the total points allocated by a member had to equal 100.

This survey was conducted twice to capture STAG’s perspective at different points as results were validated and updated. The first survey took place shortly after the final STAG meeting, but before GWP had decided on its preferred scenario and presentation to the GWP Commission. Sometime after the Commission meeting, a review of the model’s cost inputs revealed that there was an inaccuracy in the cost assumptions for hydrogen. The costs were later updated, which changed the overall cost of each scenario that STAG had used to make its decision in the first survey. Ascend Analytics also completed its analysis of operating costs for all scenarios, further clarifying the original costs presented to STAG. Since STAG voted on its preferred scenario using the prior data, it was agreed to ask that STAG should revote on their preferred scenario with the complete and adjusted costs. These corrected costs are reflected in the first few rows of Table 4 above.

First Stag Survey Results

STAG’s top three scenarios:

In the first survey, every scenario was selected by at least one person for their top three. The scenarios that most members chose for their top 3 were:

1. GWP 1 (9 people)
2. STAG 2 (9 people)
3. STAG 1 (6 people)
4. STAG 3 (6 people)

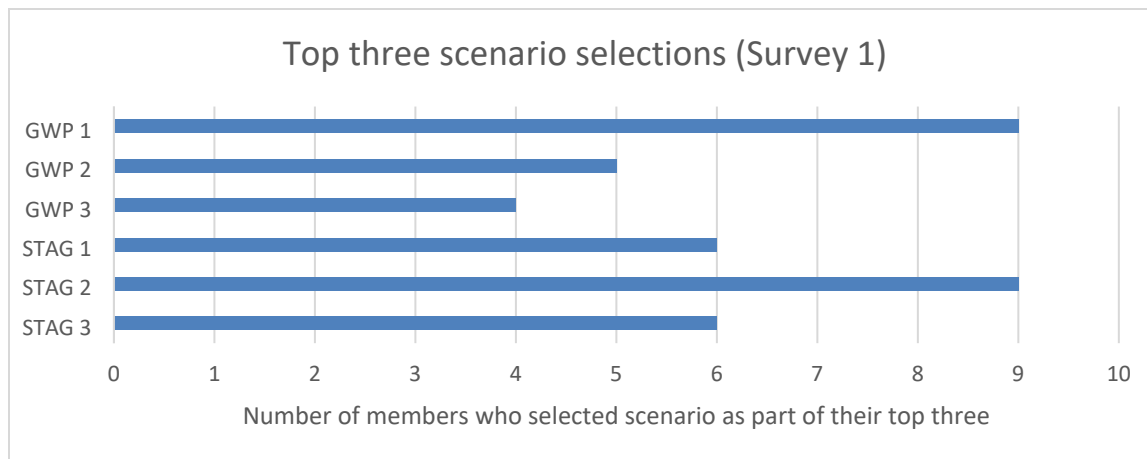


Table 6

STAG's scenario weighting:

When asked to weigh their top three scenarios by allocating 100 points across them, a different picture emerged. While STAG 2 and 3 were among STAG's most selected scenarios for the first question, they did not receive many points in the weighting exercise.

In total, GWP 1 received the most points, with 530.

- This scenario was the top choice for six members. That represents 55% of STAG, and 67% of the 9 people who put this scenario in their top three.
- Three members allocated all 100 of their points to GWP 1 (27% of STAG).

STAG 1 received the second most points, with 375.

- A difference of 155 points separated STAG 1 and GWP 1.
- One member allocated all 100 of their points to STAG 1 (9% of STAG).
- Although STAG 1 was not chosen in as many members' top three scenarios compared to GWP 1 (6 compared to 9), the people who chose it strongly preferred it. This scenario was the top choice for five members (46% of STAG). Five out of six members who put it in their top three ultimately chose it as their top choice (83%).

While STAG 2 was tied with GWP 1 for the greatest number of people who put it in their top three, only two members selected it as their top scenario, suggesting STAG 2 was a backup option for many.

- Three of the people who selected STAG 2 as one of their top scenarios ultimately allocated no points to it because they put all 100 toward GWP 1.

Scenario	Points allocated	# of members who put scenario in their top 3	# of members who allocated any points to scenario (i.e., more than 0 points)
GWP 1	530	9	9
STAG 1	375	6	6
STAG 2	180	9	6
STAG 3	135	6	5
GWP 2	70	5	4
GWP 3	10	4	1

Table 7

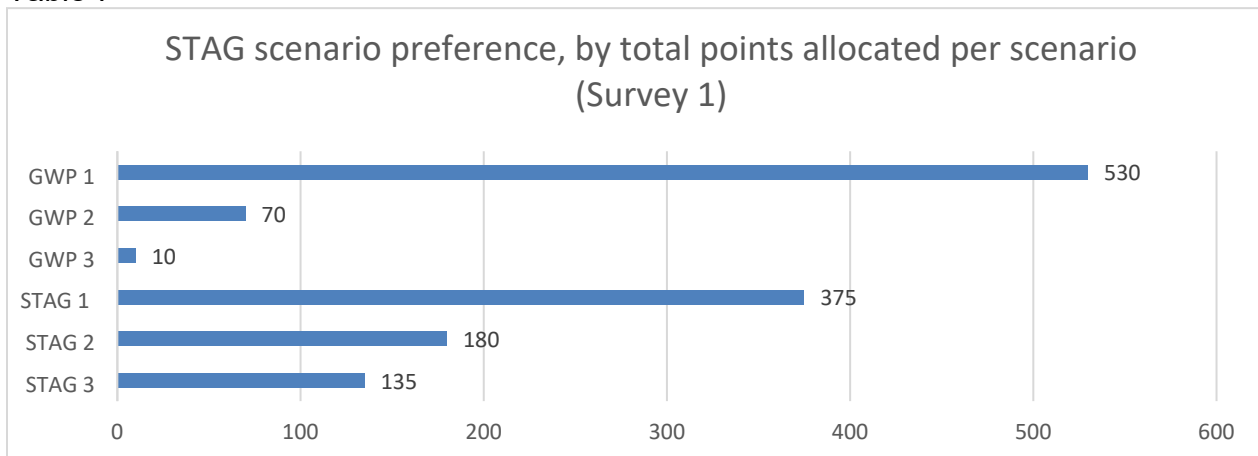


Table 8

Respondent comments:

1. Many of the members who chose GWP 1 as their top choice expressed that part of their reasoning for doing so was because of the technological uncertainty and cost of getting to true zero emissions sooner than 2045:
 - a. "We must remain grounded with technologies that are available today to achieve our goals... We have to face affordability and reliability realities in front of us at this moment."
 - b. "Most of the expensive scenarios rely on high-risk new technologies that might not be built or will underperform."
 - c. "I believe rushing to zero emissions can be at high costs and choosing resources too soon as new technology continues to emerge."

2. Concern about the use of renewable energy credits (RECs) in GWP 3 made that option unattractive for several members:
 - a. “I am not confident in the use of offsets.”
 - b. “I do not consider [RECs] to be effective in actually reducing carbon emissions.”
 - c. “I think offsets are a scam, so I do not support that option.”
3. Many of the members who chose STAG 1 or other STAG scenarios as their top option referenced the need to advance progress toward clean energy goals and increase the role for renewables:
 - a. “A net zero target of 2045 is no longer acceptable...”
 - b. “Future costs are largely fictional at this time, so we need to go for the greatest reduction of carbon by 2030.”
 - c. “We need forward-thinking, local dependence, harnessing freely available resources like sun, wind, water, wave energy, etc.”
 - d. “Considering the city’s transmission constraints, the immediate solution should be to emphasize local rooftop solar through the 10% resolution plan.”

Second Stag Survey Results

STAG’s top three scenarios:

Again, in the second survey, every scenario was selected by at least one person as among their top three. STAG’s selection of its top three scenarios differed only slightly from the last survey iteration. In this survey, the group’s top scenarios were:

1. STAG 2 (9 people)
2. GWP 1 (8 people)
3. STAG 1 (7 people)

STAG 2 was the group’s top choice this time around, with 9 members selecting it (the same number as the last time). One fewer person selected GWP 1 as among their top three (for a total of eight members), instead opting to replace that slot with STAG 1 (selected by seven members, up one from the last survey). Selections of the last three scenarios remained unchanged.

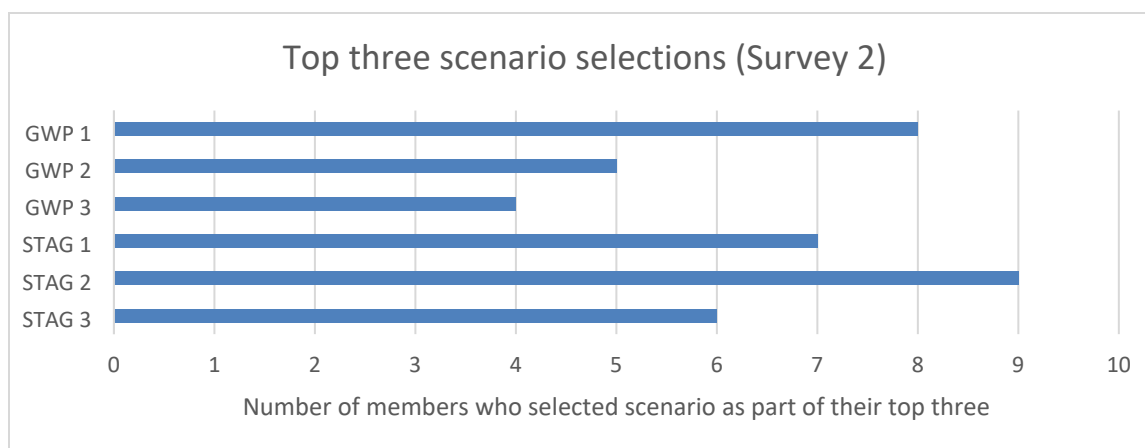


Table 9

Comparison of top 3 scenario selections between survey 1 and survey 2			
	Survey 1	Survey 2	Difference
<i>GWP 1: California policy</i>	9	8	-1
<i>GWP 2: Zero emissions by 2035</i>	5	5	Same
<i>GWP 3: CA policy with offsets</i>	4	4	Same
<i>STAG 1: High local resources, zero emissions by 2035</i>	6	7	+1
<i>STAG 2: Zero emissions by 2042, long-duration storage</i>	9	9	Same
<i>STAG 3: Zero emissions by 2040</i>	6	6	Same

Table 10

STAG's scenario weighting:

As with the first survey, a different picture emerged when looking at STAG's weighting of its top three scenarios. The results of this second survey remain overall the same as the first iteration with GWP 1, or the California Policy scenario, still receiving the most points, with the distance between STAG's first and second choices shrinking sizably.

In total, GWP 1 received the most points, with 525.

- This scenario was the top choice for 6 members, the same number as the first survey. That represents 55% of STAG, and 75% of the eight people who put this scenario in their top three.*
- Again, three members allocated all 100 of their points to GWP 1 (27% of STAG).*

Again, STAG 1 received the second most points, with 480.

- The gap between GWP 1 and STAG 1 shrunk considerably in this survey. In the first survey, the scenarios were separated by 155 points. In this survey, they were separated by 45.
- Two members allocated all 100 of their points to STAG 1 (15% of STAG). This is one more member than the last time.
- This scenario was the top choice for 6 members (55% of STAG). 6 out of 7 people who put it in their top three ultimately chose it as their top choice (86%).

While STAG 2 had the greatest number of people who put it in their top three, only 2 members selected it as their top scenario (one of these members had STAG 2 tied with GWP 1 for their top choice). As with the first survey, this suggests STAG 2 was a backup option for many.

- Also seen in the first survey, three of the people who selected STAG 2 as one of their top scenarios ultimately allocated no points to it because they put all 100 toward GWP 1.

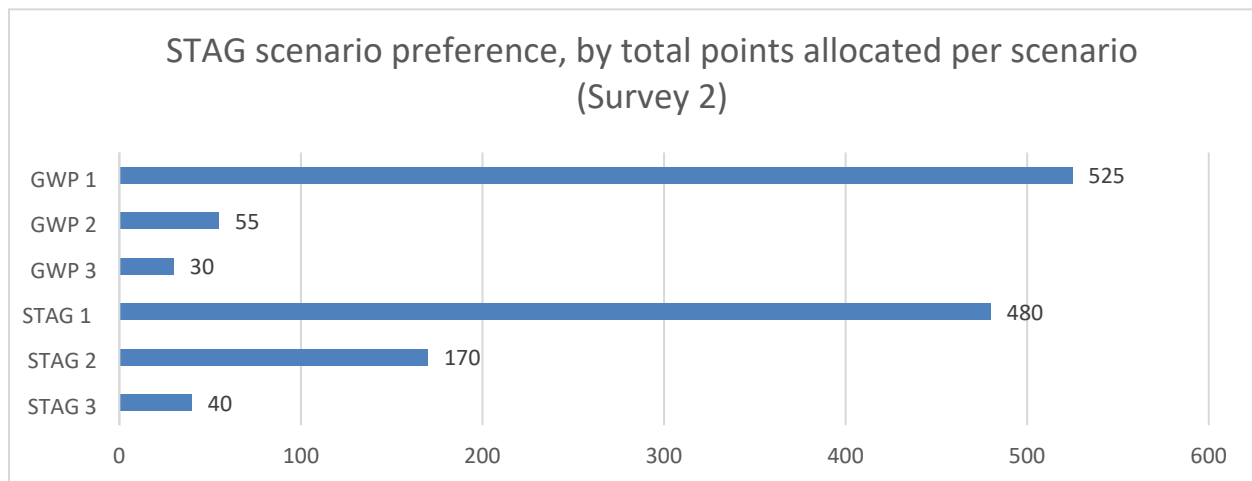


Table 11

Comparison of points allocation results between survey 1 and survey 2			
	<i>Survey 1</i>	<i>Survey 2</i>	<i>Difference</i>
<i>GWP 1: California policy</i>	530	525	-5
<i>GWP 2: Zero emissions by 2035</i>	70	55	-15
<i>GWP 3: CA policy with offsets</i>	10	30	+20
<i>STAG 1: High local resources, zero emissions by 2035</i>	375	480	+105
<i>STAG 2: Zero emissions by 2042, long-duration storage</i>	180	170	-10
<i>STAG 3: Zero emissions by 2040</i>	135	40	-95

Table 12

As can be seen above, in the second survey, members concentrated their points more heavily around the two scenarios that received the most points in the first iteration (GWP 1 and STAG 1) and decreased their support for GWP 2, STAG 2, and STAG 3.

These differences in voting behavior may stem from several sources. One potential reason is that the updated scenario costs changed the way STAG members weighed their preferences, making them more strongly support their top choice. Another possibility is that seeing the results of the first survey before responding to the second may have influenced the way members voted, encouraging them to concentrate their attention on the scenarios that got the most support in the first survey while reducing the emphasis placed on those scenarios that did not rise to the top initially. While all scenario options were still on the table in this survey, the second iteration may have therefore acted somewhat like a runoff election, with members narrowing down their choices between the first round's top two options. While the change in voting behavior is worth noting, ultimately the reasons for these differences are not as important as the results themselves.

Respondent comments:

Many of STAG's comments in the second survey reflected perspectives that were raised in the first iteration.

1. Respondents who chose GWP 1 continued to raise points around affordability and the uncertainty of new technologies:
 - a. "I am representing a group who provided feedback to me that affordability and reliability are of key importance. [This scenario] provides for a path to a sustainable future with the most affordable option..."
 - b. "GWP 1 (following CA policy) is most cost effective for ratepayers." Other scenarios "rely on underdeveloped infrastructure... We should decarbonize, but being the first to do so is just too costly and risky."

- c. “We have real challenges on affordability, and it will get worse over [the] next few years. We have to balance cost while trying to make progress toward the transition to clean energy. The state’s goals of transition by 2045 are already ambitious.”
- 2. Respondents who chose scenarios that aimed for a clean energy transition before 2045 again emphasized a desire to reach clean energy goals as quickly as possible. They also expressed that some of these scenarios’ costs may come down with technology developments. Some respondents who selected the 2040 or 2042 scenarios stated that they offered a balance between emissions reductions and cost.
 - a. “My goal is to reduce carbon emissions as quickly as possible.”
 - b. “I generally chose the STAG scenarios over the GWP scenarios because they get us to true carbon-free. They’re not that much more expensive and they result in significantly lower CO₂ emissions, particularly STAG 1.”
 - c. “Technology improvements will reduce the costs [of the 2035 scenarios]... We need to act now to start moving our city to clean energy!”
 - d. “If we are seeking to reach carbon free, then 2042 achieves this at substantial cleaner air and not an aggressive cost impact.”
- 3. Respondents who chose STAG 1 as their top scenario indicated that this scenario’s high solar and distributed energy resource (DER) assumptions were a central driver in their decision.
 - a. STAG 1 has “the greatest outcomes with DER and SOLAR.”
 - b. “I chose STAG 1 because it puts the most resources into solar.”

The STAG survey results highlight that, regardless of the perspectives of any one individual or any one group, the Glendale Community as a whole is concerned about the implications of the utility’s decisions for how we maintain reliability, enforce sustainability, and do so with a tempered eye towards preserving some level of affordability.

FISCAL IMPACT

There is no fiscal impact associated with this report.

ENVIRONMENTAL REVIEW

The action herein is not subject to the California Environmental Quality Act (“CEQA”) and, therefore, an environmental review is not required pursuant to Sections 15378, and 15061 of the CEQA Guidelines, California Code of Regulations, Title 14, Chapter 3.

CAMPAIGN DISCLOSURE

Not Applicable.

ALTERNATIVES

Alternative 1: Adopt the 2024 GWP IRP (Scenario1).

Alternative 2: Consider any other alternative not proposed by staff.

ADMINISTRATIVE ACTION

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EXHIBITS / ATTACHMENTS

Exhibit A: 2024 GWP IRP