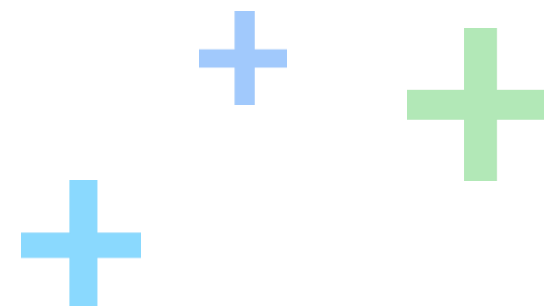


Glendale Water and Power 2024 Integrated Resource Plan Townhall 1

June 29, 2023



Agenda

- + What is an IRP, and why is it important? (25 min)
 - + Presentation and Q&A with Scott Mellon, Glendale Water and Power
- + What are we studying in this IRP? (20 min)
 - + Presentation and Q&A with Brandon Mauch, Ascend Analytics
- + How can the Glendale community help shape this IRP? (10 min)
 - + Presentation with Dhruv Bhatnagar, Strategen Consulting
- + Community resource preference activity (35 min)
- + Open discussion (30 min)

Objectives for this townhall

- + Introduce the concept of an Integrated Resource Plan, why it's important, and how the plan will be developed
- + Describe ways for the Glendale community to get involved in the IRP process
- + Get community input on the priorities to reflect in this IRP



What is an Integrated Resource Plan, and why is it important?

Scott Mellon, GWP



What is an Integrated Resource Plan (IRP)?

- + IRPs are planning documents required to be developed by California law every 5 years.
- + They study how much energy GWP will need in the future and develop potential strategies to supply that energy over the next 20 years.
- + The IRP will answer important questions about Glendale's future energy system:
 - + Where will Glendale get its power?
 - + How much of that power will be renewable or clean?
 - + How much will that power cost?
- + IRPs are a snapshot in time. They represent our best understanding of our system's needs – and options to meet it – at this moment.
 - + Things change quickly, which is why it's important to update this plan regularly.

What do IRPs do?

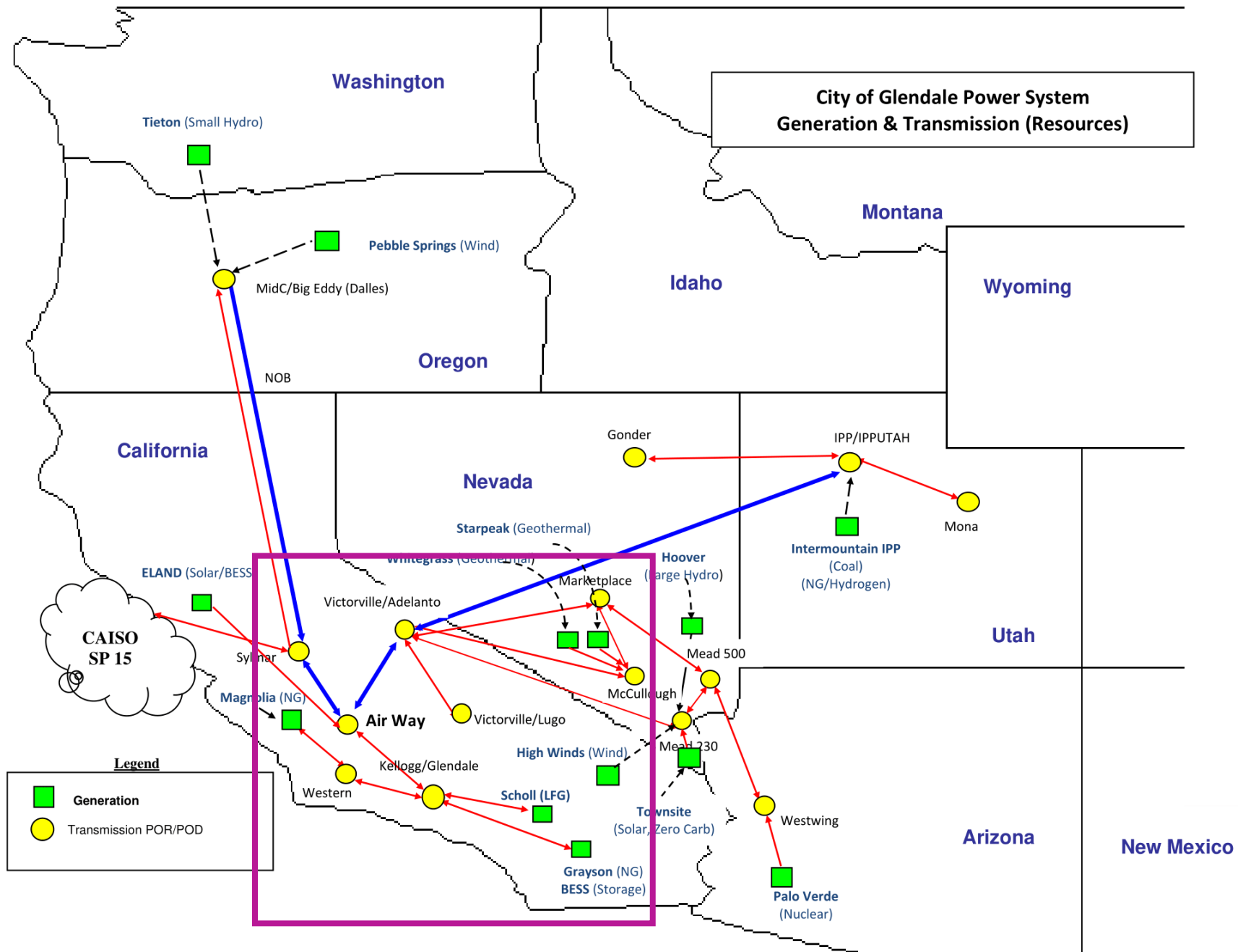
- + IRPs help GWP prepare for the future by developing multiple potential strategies (called “scenarios”) to meet Glendale’s future energy needs.
 - + **The scenarios can test:**
 - + Different mixes of energy resources (rooftop solar, wind, energy efficiency, etc.)
 - + Different timelines for achieving clean energy goals
 - + Different cost preferences
 - + Other variables
- + The scenarios are then explored to see how they’d perform in the future in terms of reliability, environmental responsibility, and cost.
- + Based on the results, GWP will choose the scenario that best meets its need for reliable power, while minimizing costs and maximizing environmental performance.

How will the IRP be developed?

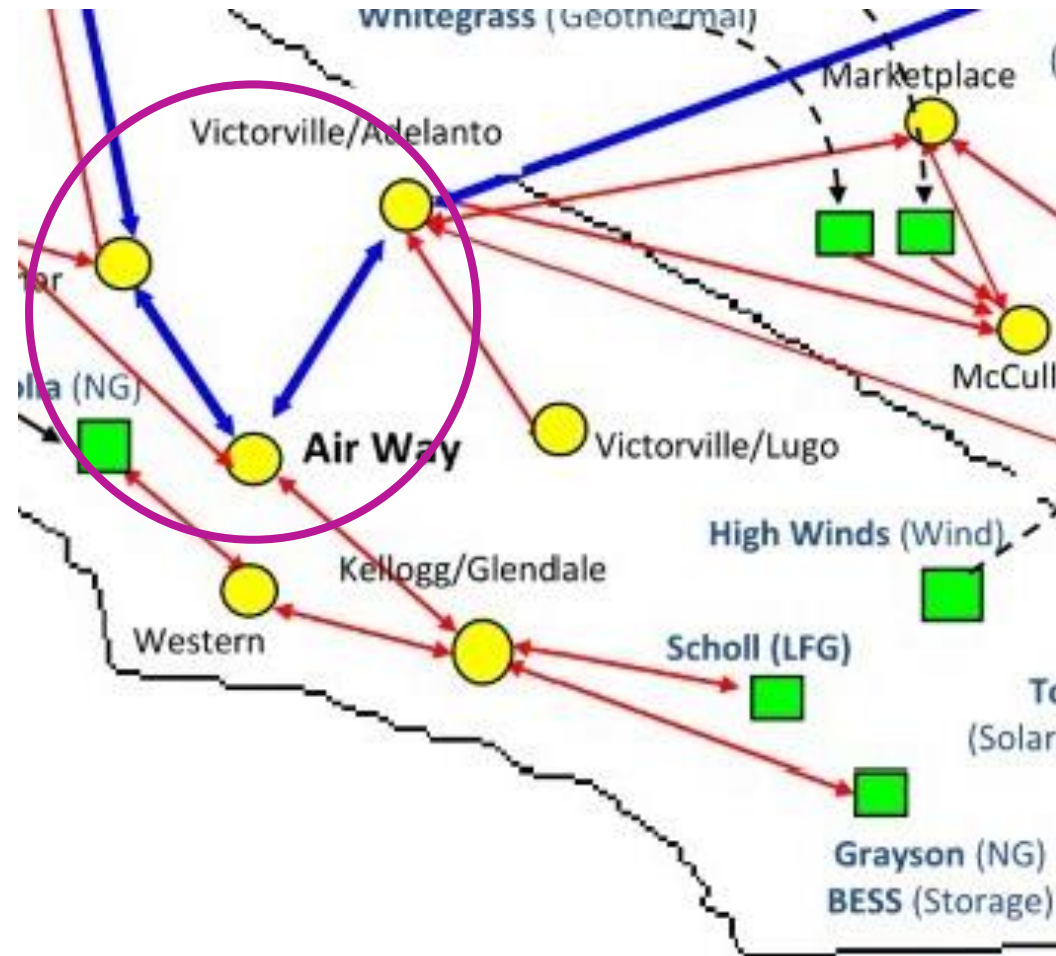
1. GWP and the Glendale community will develop multiple future energy scenarios to test in the IRP modeling process.
2. Ascend Analytics will test these strategies in their model to see how they compare on reliability, costs, and environmental responsibility.
3. GWP will present and discuss the results with the community to provide an opportunity for feedback.
4. Based on the results, GWP will choose a “preferred portfolio” of resources it will develop to meet Glendale’s energy needs over the next 20 years.

Overview of GWP's power system and planning challenges

- + GWP needs to meet Glendale's need for reliable power, at a reasonable cost, while also meeting California Renewable Portfolio Standard (RPS) requirements.
 - + **SB100:**
 - + 60% renewable energy by 2030
 - + 100% zero-carbon by 2045
 - + **Glendale goal: 100% clean energy by 2035**
- + Reliability and clean energy mandates create the 'guardrails' for our planning in this IRP.
- + Meeting our reliability and clean energy requirements depends heavily on our ability to get power from the Western U.S. into Glendale.



Glendale's system is constrained by only two transmission lines.



Q&A (10 minutes)



What are we studying in this IRP?

Brandon Mauch, Ascend Analytics



Introduction to Ascend Analytics

- + Software and advisory services firm based in Boulder, CO.
- + Provides analytical solutions and consulting support for resource planning, power system operations, and portfolio risk management.
- + We work with utilities across the United States and have completed multiple IRPs for California utilities.
 - + Glendale and Ascend have worked together since 2018.
- + PowerSIMM modeling software provides a full suite of tools to support Glendale's resource plan.

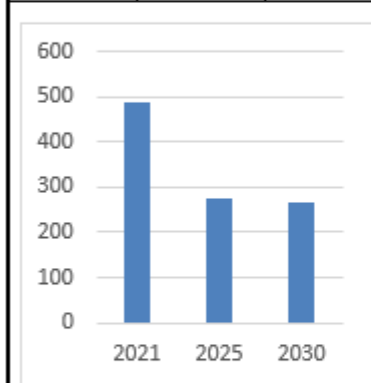
IRPs use modeling to evaluate multiple future energy paths for GWP.

- + The future is uncertain, and testing different versions of the future allows us to plan for that uncertainty.
 - + Modeling is a way to simulate the future so we can study it.
- + IRP models simulate GWP's energy demand and supply to project how resources operate under future conditions.
- + Power system models provide estimates of future system costs, GHG emissions, renewable generation, and many more outputs.
- + To create a model, we need to determine assumptions (model inputs) about the future.
 - + What technologies will be available and what are their characteristics?
 - + What is the risk of certain events (like wildfires) impacting GWP's system?
 - + What does future electricity demand look like?
 - + What are Glendale's clean energy policies/targets?
 - + What will future energy and fuel prices be? Can we project or estimate them?

What changes are already expected to GWP's system?

- + GWP is making changes to its portfolio to increase clean energy and reduce greenhouse gas emissions.
- + Expected changes in the next decade include:
 - + Intermountain Power Plant converting fully to hydrogen
 - + Addition of Eland solar and storage project
 - + Addition of Scholl biogas (landfill gas)
 - + Grayson repowering and battery storage
- + This IRP will focus on how to close the gaps to meet CA and Glendale clean energy goals.

POWER CONTENT LABEL						
City of Glendale						
Greenhouse Gas Emissions Intensity (lbs CO ₂ e/MWh)			Energy Resources	2021	2025	2030
2021	2025	2030	Eligible Renewable ²	35.3%	47.8%	47.0%
			Biomass & Biowaste	14.1%	4.6%	9.0%
			Geothermal	3.6%	10.2%	9.9%
			Eligible Hydroelectric	8.3%	2.3%	2.2%
			Solar	0.0%	26.8%	25.9%
			Wind	9.2%	4.0%	0.0%
			Coal	3.5%	3.0%	0.0%
			Large Hydroelectric	21.4%	11.3%	11.0%
			Natural Gas	31.3%	15.0%	11.0%
			Nuclear	8.4%	8.4%	6.8%
			Other	0.0%	7.0%	7.0%
			Unspecified Power	0.0%	7.5%	17.2%
			TOTAL	100.0%	100.0%	100.0%
Percentage of Total Clean Energy (RPS + ZeroCarb) Supplied to Load ¹				65%	75%	72%
¹ Percentages are calculated as the ratio of resource generation to mean system load. ² The eligible renewable percentage above does not reflect RPS compliance, which is determined using a different methodology.						
For specific information about this electricity portfolio forecast and any additional questions, contact: GWP-IRP@glendaleca.gov						



Q&A (10 minutes)

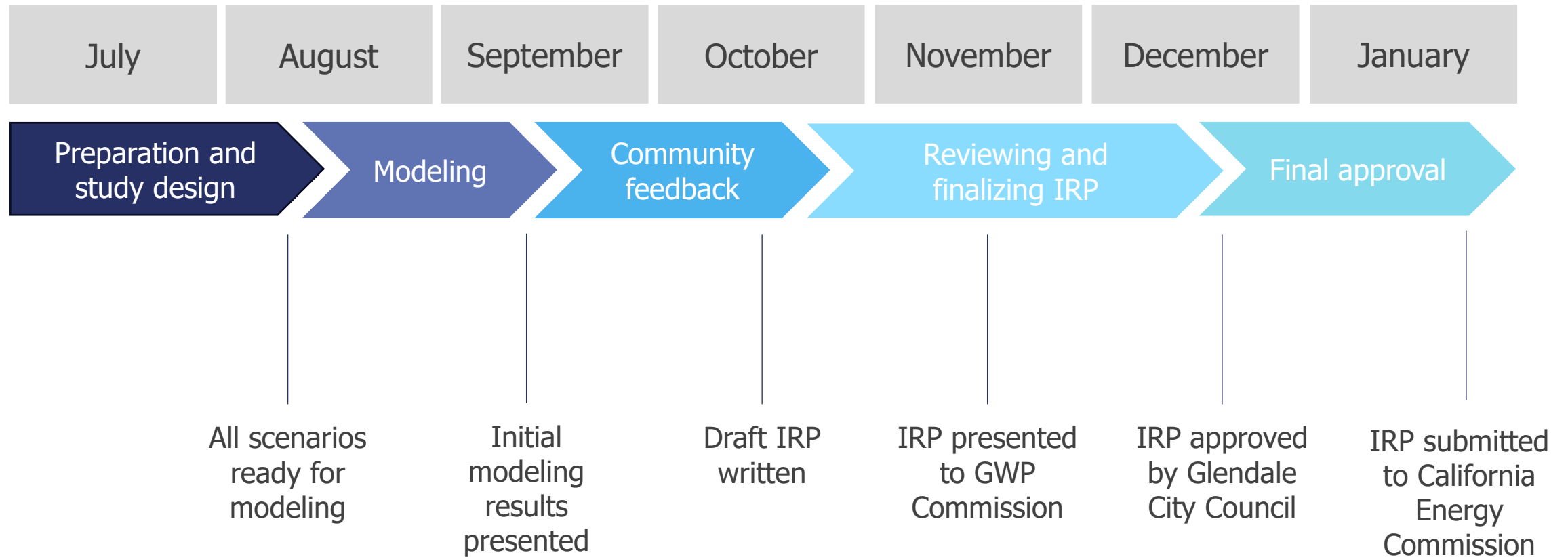


How can the Glendale community help shape this IRP?

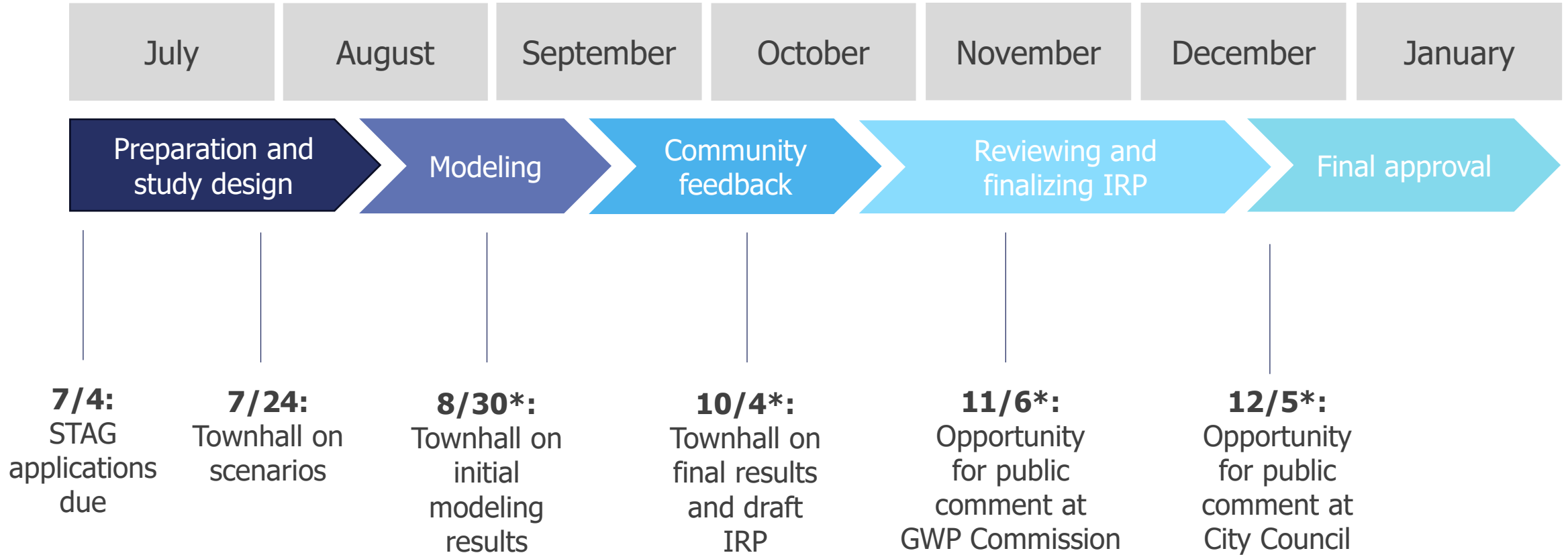
Dhruv Bhatnagar, Strategen Consulting



What is the process for creating this IRP?



When can the community be involved in the IRP process?



*Dates pending. Check glendaleca.gov/2024IRP for latest information.

There are multiple ways to help shape GWP's IRP.

Community townhalls

- + Multiple townhalls through October
- + Held in person throughout Glendale
- + Recordings and presentations will be posted online
- + All townhalls will explore different topics!

Stakeholder Technical Advisory Group (STAG)

- + Opportunity for detailed input to the IRP
- + Six in-person meetings through late September
- + Applications close Tuesday, July 4
- + Meeting minutes will be posted online

Community survey

- + Will go live on the GWP IRP website:
www.GlendaleCA.gov/2024IRP

Getting in touch!

- + Email GWP-IRP@GlendaleCA.gov with questions or comments
- + Great way to provide feedback if you can't attend a townhall

GWP needs your input to inform this plan!

- + The Glendale community can help inform:
 - + ***The energy resources we'd like to include in scenario testing***
 - + ***How much of GWP's energy portfolio each resource should make up***
 - + When those resources should be deployed
 - + The timeline on which GWP should provide 100% clean energy

- + Today we're focusing in on the ***first two items.***

Activity:

Exploring community resource preferences



Instructions

- + Strategen will present a range of potential energy resources that GWP could explore developing in the future.
- + These resources are also listed on posters hung throughout the room.
- + Attendees will be given six stickers to place on the resources they most prefer and least prefer.
 - + Three green stickers = resources you most prefer
 - + Three red stickers = resources you least prefer
- + You don't have to use all your stickers, but you can only use one sticker per resource. And no trading or bartering for additional stickers 😊

Goals of the activity

- + Get direction from the Glendale community on the types of energy resources they prefer, or don't prefer.
- + Explore the reasons behind the preferred resources and implications for energy costs, reliability, and the environment.
- + Use the results of the activity to inform the development of community-informed scenarios to test in the IRP modeling.
- + *Note that we're NOT attempting to finalize these scenarios today. That will be the goal of the next townhall.*

Potential resources

Utility scale resources

- + Intermittent
 - + Solar
 - + Wind
- + Firm or flexible
 - + Natural gas
 - + Green hydrogen
 - + Geothermal
 - + Small modular nuclear reactors
 - + Grid scale energy storage

Customer side resources

- + Distributed solar
- + Distributed energy storage
- + Energy efficiency & demand response

How can we evaluate and compare these resources?

- + *Maturity* – how proven or widely adopted the technology is.
- + *Cost* – how much the resource costs.
- + *Reliability impacts* – the way the resource might impact the reliability of electricity service on the grid, and any reliability benefits it provides.
 - + **Firm** resources = stable, non-intermittent sources of power.
 - + **Flexible or dispatchable** resources = able to be ramped up and down quickly to meet grid reliability needs on short notice.
- + *Environmental impacts* – climate and other environmental impacts of the resource.
- + *Note that this information is only meant as a reference for completing this exercise. Don't focus too much on whether these descriptions are comprehensive as they only provide a snapshot for each resource!*

Open discussion

- + What factors influenced your selection of preferred and least preferred resources?
- + What would be the implications of creating an energy portfolio of the group's most preferred resources?
 - + Do the group's most preferred resources create a reliable, cost effective, and environmentally responsible energy portfolio?
 - + If not, what additional resources might be needed to complement the most preferred resources?
- + Is there any additional input you want to be considered regarding the resource selection in the modeling scenarios?

Thank you and next steps!

- + **7/4:** STAG applications due!
- + Visit glendaleca.gov/2024IRP for application information.
- + **7/24:** Townhall 2
 - + Time and location to be announced
 - + This townhall will be a deep dive into the scenarios to be explored in modeling

