



HEBER LIGHT & POWER INTEGRATED RESOURCE PLAN

2023-2027

September 26, 2022

HEBER LIGHT & POWER ENERGY RESOURCE DEPARTMENT

31 S. 100 W. Heber City, Utah 84032

Table of Contents

Introduction	5
Plan Objective	5
Planning Approach	6
Stakeholder Input	6
System Studies.....	7
System Load and Demand Projections.....	7
.....	8
Planning Environment	9
Resource Adequacy	9
Renewables.....	10
Drought	11
Market.....	11
Electrification & Distributed Generation	12
Transmission	13
Distribution	14
Opportunities.....	14
Strengths.....	15
Resource Portfolio.....	16
Portfolio Cost Modeling.....	16
Our Energy Future	18
Carbon Conscious	18
Energy Efficient.....	18
Distributed Generation	19
Resource Plan	19

Cost of Wholesale Power 21

Conclusion24

References25

Figure 1 Portfolio Priority Survey Question..... 6

Figure 2 Energy Forecast..... 8

Figure 3 Demand Forecast 8

Figure 4 Coal Plant Retirement Schedule 9

Figure 5 Annual Capacity Additions.....10

Figure 6 U.S monthly Henry Hub Spot Price 12

Figure 7 HL&P Resource Portfolio16

Figure 8 Power Pool Cost Projections 17

Figure 9 Resource Portfolio Plan..... 21

Figure 10 2027- 2022 Power Prices 22

Figure 11 Supply Shortage 23

Introduction

Heber Light & Power's Integrated Resource Plan (IRP) is our guiding document for maintaining an energy portfolio that meets the needs and expectations of our customers, owner cities, and Board of Directors. It defines our strategy for supplying safe, affordable, and reliable power while facing local population growth and an evolving energy future. In this document, we define our objectives, characterize our planning environment, and identify the external factors that impact our decision-making. This document requires frequent updates as circumstances change.

The Company's mission is to provide its customers with safe, reliable energy in an open, responsible, and environmentally sound manner while undertaking a commitment to the values of integrity, innovation, accountability, and community service and to promote an internal culture that fosters safety, loyalty, and creativity as well as maintaining a highly skilled, motivated workforce.

Plan Objective

By focusing on resource reliability, affordability, environmental responsibility, and risk management, our IRP objectives support our company mission.

Reliable	○ A diverse portfolio with redundancy in resources and transmission is the key to reliability.
Affordable	○ Managing costs ensures that we provide our customers affordable service and stable rates.
Environmentally responsible	○ We seek innovative means of helping our customers reduce energy consumption and incorporate emissions-free resources into our portfolio.
Risk-averse	○ We mitigate risk by maintaining a diverse portfolio and redundancy within our system.

Planning Approach

We gather stakeholder input to begin our planning process, and use load forecasting, energy cost models, and system studies to determine our energy requirements. We then identify challenges and opportunities in the external environment and the strengths and weaknesses in our internal environment. This information informs decision making as we build on the existing energy portfolio and company programs to craft a plan for ensuring we have adequate resources and planning in place to provide safe, reliable, affordable service at the best possible price.

Stakeholder Input

During the IRP planning process, we seek customer input through various means to help us understand our customer's priorities and concerns related to resources and rates. Resource discussions are a regular part of our public board meetings. Recordings of these meetings are available to anyone who wants to learn more about HL&P's portfolio and planning process.

In 2022, we presented two IRP surveys to our customers via social media, the company website, and in person at the Heber Valley Market.

Additionally, our Key Accounts Manager and General Manager have visited with customers to discuss resource options and rates.

The survey results help us understand our customer's values and priorities when it comes to the energy that powers their homes and businesses. Of the customers who responded to a question about energy portfolio priorities, fifty-two percent answered that low cost and stable rates were the most important aspect of their energy.

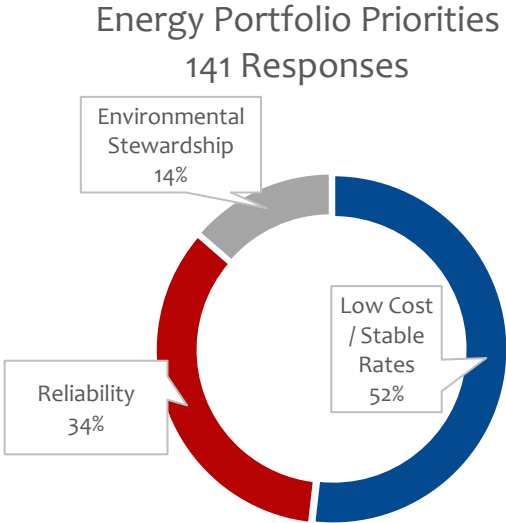


Figure 1 Portfolio Priority Survey Question

System Studies

System load and engineering studies are based on historical circuit load data, population growth projections, demographic data, weather data, energy efficiency program plans, distributed generation, load flow models, and other variables that impact how and where our system grows. We update our internal load studies monthly and when changing conditions are likely to result in new outcomes.

System Load and Demand Projections

In 2021 and 2022, we updated our system growth projections to include all known projects in our current service territory and annexation areas. New housing developments will drive load growth over the next five to ten years. More than 3500 new housing units and eighty commercial units are currently under construction, and thousands more are planned. We expect to add at least four hundred new customers to our system annually, increasing our system load by an average of three percent each year for the next ten years.

Our forecasts anticipate system load growth and coincident peak demand growth to be within one to four percent annually. Energy savings from our energy efficiency program, demand-side management programs, and our customer's continued investment in rooftop solar are factored into the forecast model. We expect time-of-use rates and demand management to offset the impact of electric vehicle charging loads, although multiple fast charging stations added to the system and local fleet electrification would trigger an update to the plan.

Historical and Projected Monthly Energy Consumption 2015-2030

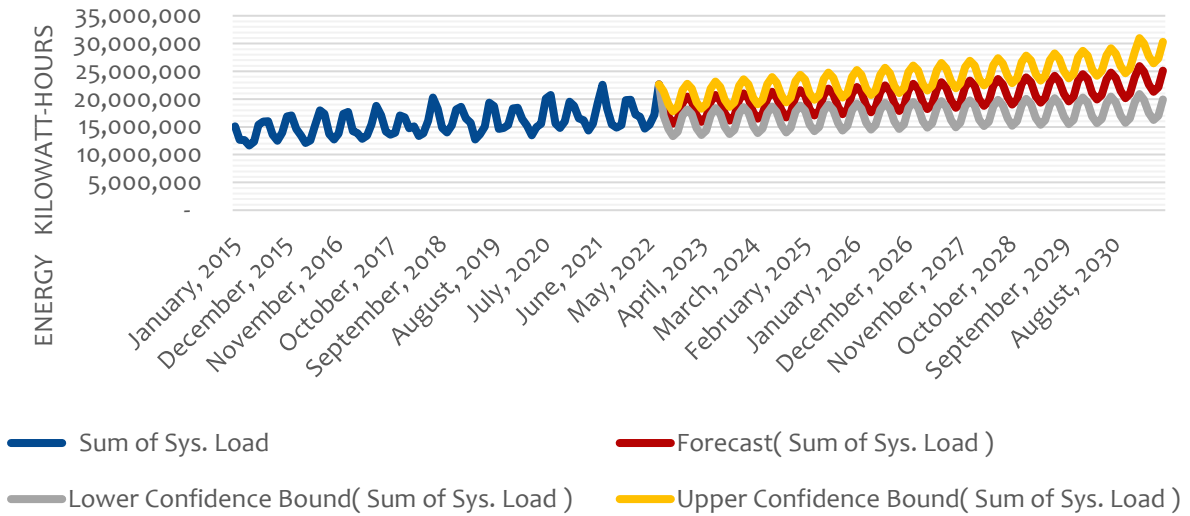


Figure 2 Energy Forecast

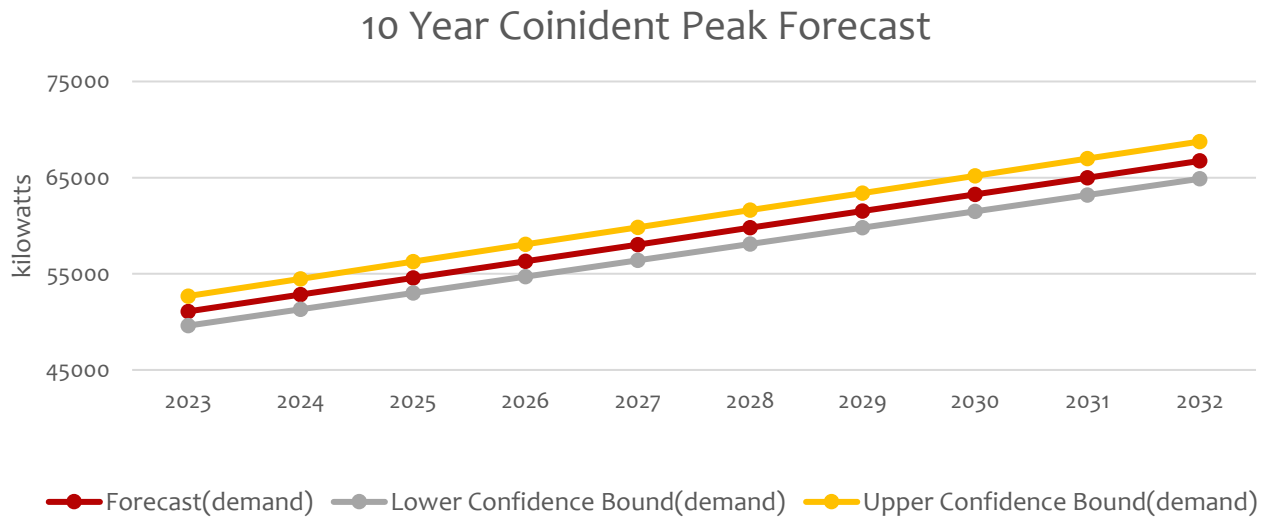


Figure 3 Demand Forecast

Planning Environment

Resource Adequacy

Resource Adequacy (R.A.) is a utility's ability to meet forecasted demand with resource capacity. There is not a single standard for R.A. in the west, nor does HL&P have a specific reliability standard to follow. In the future, a Regional Transmission Operator (RTO) or Balancing Authority (B.A.) will step in to provide oversight to load serving entities in Utah. Even without a regulatory agency's oversight, it is prudent utility practice to proactively manage risk by maintaining R.A. rather than rely on the market to supply power to meet shortfalls.

In recent years R.A. and reliability in the west are becoming more complex. During times of peak demand, the west has experienced supply shortages. The heat wave in early September 2022 left California calling for emergency power supply from otherwise unused natural gas plants and Federal Hydropower plants, leaving Utahans to buy high-dollar replacement power from the market.

Coal Retirements are listed on PacifiCorp's 2021 IRP, page 12.

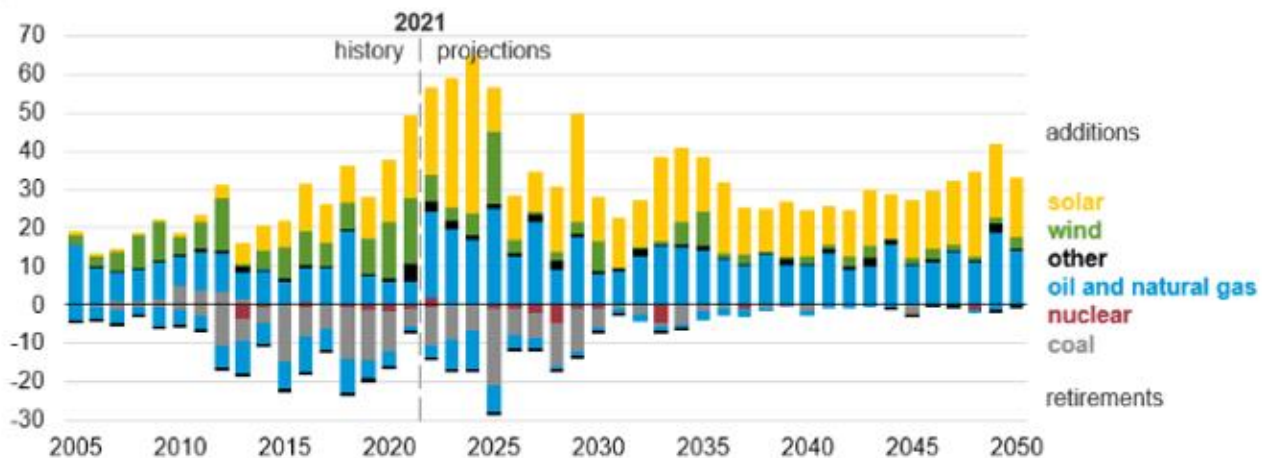
- 2023 = Jim Bridger Units 1-2, converted to natural gas peakers
- 2025 = Naughton Units 1-2
- 2025 = Craig Unit 1
- 2025 = Colstrip Units 3-4
- 2027 = Dave Johnston Units 1-4
- 2027 = Hayden Unit 2
- 2028 = Craig Unit 2
- 2028 = Hayden Unit 1
- 2036 = Huntington Units 1-2
- 2037 = Jim Bridger Units 3-4
- 2039 = Wyodak

Figure 4 Coal Plant Retirement Schedule

Renewables

The trend towards renewable energy has added another layer of complexity to maintaining R.A. As we see the country turn to renewable energy, electric vehicles, and intermittent renewables for environmental salvation, the west will turn to Regional Transmission Organizations (RTO) to ensure that power generation can support the grid despite the goals and standards that continue to downplay the need for large baseload resources to support the grid. Thirty-one states have adopted Renewable Portfolio Standards (RPS) and Clean Energy Standards (CES) with deadlines. Oregon holds an aggressive one hundred percent RPS target date of 2040, with California, New Mexico, and Washington on the fast track to being one hundred percent by 2045 and Colorado and Nevada on track for 2050. So far, Utah has only instituted a Renewables Portfolio Goal for electric utilities to be twenty percent renewable by 2025 (NCSL). In 2022, HL&P's portfolio exceeds Utah's renewable energy goal.

Annual electricity generating capacity additions and retirements
AEO2022 Reference case
gigawatts



Source: U.S. Energy Information Administration, *Annual Energy Outlook 2022 (AEO2022) Reference case*
Note: Solar includes both utility-scale and end-use photovoltaic power generation capacity.

Figure 5 Annual Capacity Additions

As baseload generation resources retire without adequate replacements, there is a gap between what is available and what the grid requires to meet load. Implementing aggressive

and unrealistic IRP goals to become one hundred percent renewable would only increase power costs and decrease reliability for HL&P. We plan to continue down the path to an all-carbon-free portfolio at a steady pace that allows us to maintain reliability and affordability.

Drought

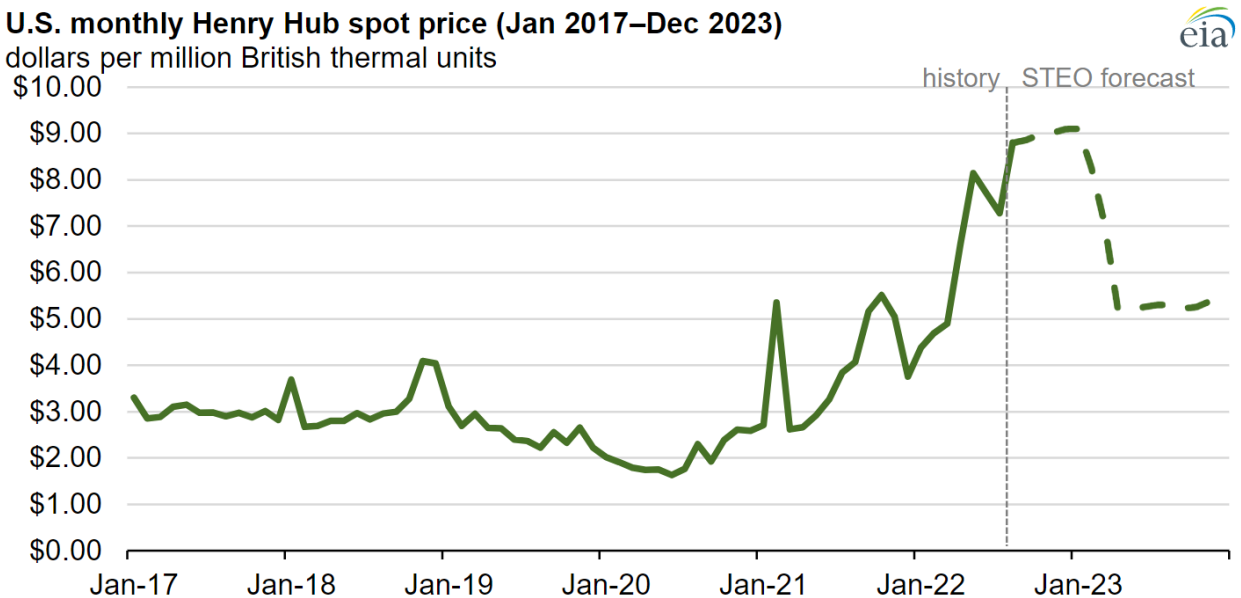
Drought conditions have and will continue to drastically reduce available hydropower, historically making up thirty percent of our energy portfolio. In 2021 and 2022, the drought severely impacted hydrology locally and throughout the Colorado River Basin. Drought has reduced the amount of water available for power generation at our Company owned run-of-stream hydropower plants. Generation from Hydropower resources including Flaming Gorge, Glen Canyon Dam, and the Jordanelle Hydropower plant continue to face uncertainty as they teeter on the edge of dead pool which marks the point at which power generation will no longer be possible.

Market

The economic fallout from the Russian invasion of Ukraine and the recovery from Covid have led us to a labor shortage, supply chain disruptions, and rising commodity prices for fuel and the critical minerals needed for renewables produced outside the U.S. Economic downturn will have some effect on power markets in any case, but this combined with fewer resources and higher loads presents new challenges. Drought affects will further impact power markets as wholesale hydropower customers scramble to replace the energy while paying over forty percent more for the hydropower that is delivered.

The average price of natural gas in 2022 at the U.S. benchmark Henry Hub in Louisiana averaged \$6.56 per million British thermal units (MMBtu) in 2022, compared with \$3.43/MMBtu in 2021 and \$1.86/MMBtu in 2020.

The EIA's Weekly Report in the third week of September 2022, has this to say, "U.S. consumption of natural gas in the electric power sector has increased in 2022 due to limitations at coal-fired power plants and weather-driven demand. Coal-fired power plants are limited in their ability to increase power generation due to historically low on-site inventories, constraints in fuel delivery to coal plants, and continued coal capacity retirements. During a cold January and hot summer, natural gas was key to meeting electricity demand peaks throughout the country" (Eia.gov, 2022). As we continue to see demand increase in the west and abroad, we could see higher than normal, natural gas prices continue until production increases.



Data source: U.S. Energy Information Administration, *Short-Term Energy Outlook* (STEO), September 2022

Figure 6 U.S. monthly Henry Hub Spot Price

Electrification & Distributed Generation

An increase in electric vehicle charging and all-electric building, combined with unregulated distributed generation and battery storage, could challenge grid stability if not effectively managed. Uncontrolled, they can create higher and steeper peak loads increasing the need

for expensive peak shaving generation. Using time-based rates and other tools like demand charges can help us manage the electrification of the grid.

Transmission

HL&P accesses the regional wholesale power market through its joint action agency membership in Utah Area Municipal Power Systems (UAMPS). Transmission paths are within the Western Interconnection's Bulk Electric System, which is regulated by the Western Electricity Coordinating Council (WECC) and operates under a Federal Regulatory Commission (FERC) agreement with the North American Electric Reliability Corporation (NERC). WECC exists to mitigate risks to the reliability and security of Western Interconnection's Bulk Power System (Wecc.org, 2020). We receive transmission service from PacifiCorp/Rocky Mountain Power under the UAMPS Transmission Service and Operating Agreement (TSOA) with PacifiCorp, which supplies a form of network transmission service to UAMPS members.

PacifiCorp's 2019 IRP includes an analysis of regional power reliability as it applies to our region (71). Future interconnects to the regional transmission system must be requested years in advance to be included in PacifiCorp's infrastructure plans. FERC requires Investor-Owned Utilities (IOUs) to participate in local and sub-regional transmission planning to identify transmission project needs and the associated costs, benefits, and risks. To utilize regional transmission systems, the California Independent System Operator and PacifiCorp established the Energy Imbalance Market (EIM) for real-time balancing of supply and demand. HL&P is subject to the EIM as it applies to the total UAMPS member's real-time energy balancing.

As load serving entities continue to look for renewable resources and as we face generation shortages, utilities in the west will seek out power pools like the Southwest Power Pool and

CAISO to bring more energy options. Additionally, a Regional Transmission Organization will be formed in the next ten years to operate the western grid. Eventually this could be beneficial, but would be highly disruptive in the near term. An RTO would remove the benefits of the transmission agreement between UAMPS and PacifiCorp and PacifiCorp and WAPA. Transmission costs would go up and managing the complexities of operating in an RTO would require massive changes to current practices.

Distribution

Completing our second point of interconnect to the western grid is critical to our ability to operate a reliable distribution system. Due to supply chain delays, this project will not be finished until 2024, so we will need to rely on our natural gas generation to keep load off our single interconnect point during peak times in 2023. Once complete, the second point of interconnect will provide reliability and redundancy to our transmission interconnection.

We have been proactive in maintaining current engineering studies that identify the maintenance and upgrades our distribution system requires to operate reliably. Our aggressive capital plan outlines the projects that will be completed over the next five years. Our Board of Directors supports the financing and progression of the needed projects. The most recent system planning study is always available on our website.

Opportunities

Our planning environment is full of challenges. Resource adequacy, the intermittency of renewable resources paired with aggressive coal retirement schedules, changes to how transmission systems are operated, drought, electrification, economic downturn, high natural gas prices and a growing system load present a multitude of challenges to creating a solid

energy resource plan that can see us through the next five to ten years, but with challenges come opportunities.

We have identified opportunities for HL&P to reduce vulnerabilities and manage risk. Implementing time-based rates will help us address any potential negative grid impacts from electrification, distributed generation, and battery storage. By investing in customer education and creating mutually beneficial programs, we can leverage distributed generation and E.V. charging to reduce our overall peak demand and flatten loads which benefits all customers. Maintaining up-to-date system studies allows us to maintain sound capital plans to ensure reliability. Continuing to invest in company-owned natural gas generation, improving our small hydropower plants, investing in local solar, biomass, and micro-turbine hydropower projects, and using market hedges where appropriate will reduce our market exposure. Maintaining memberships and relationships with organizations like UAMPS and CREDA allows us to stay updated on changes in our evolving planning environment. We are proactively managing risk and facing industry challenges with this plan.

Strengths

We support our Strategic Plan with our Risk Management Policy, Capital Plan, and Integrated Resource Plan. Our HL&P Risk Management Policy, approved by our BOD in 2021, ensures that we move forward with adequate resources assuming a level of risk that does not unnecessarily expose our customers to rate increases. We review and update our Strategic Plan and our Capital Plan annually or more frequently based on the latest information regarding load growth and growth locations. Our membership in UAMPS allows us to partner with other public power utilities on projects and problem-solving.

Resource Portfolio

HL&P's current power purchase agreements and generation facilities include market power purchases, coal, natural gas, hydroelectric power, solar, wind, and geothermal generation.

Project	Location	HL&P's Project Entitlement Capacity (MW)
Colorado River Storage Project Federal Hydro Power	Colorado River/Upper Basin States	6.085
Hunter Coal	Hunter, UT	3.783
Intermountain Power Project Coal	Delta, UT	0 - 11 entitlement based on call-back & Available Plant Capacity
Pleasant Valley Wind	Uinta County Wyoming	0.726
Horse Butte Wind	Bonneville County Idaho	1.01376
Heber Owned Nat Gas Gen	Wasatch County	15.5
Jordanelle Hydropower	Wasatch County	0 - 4.3 Available capacity based on water releases for water users
Upper & Lower Snake Creek & Lake Creek Heber Owned Hydropower	Wasatch County	1 - 4.1
Patua Geothermal / Solar	Nevada	0-8 Available Capacity based on Available Plant Generation
Market Power Purchases	Market Contract	Varies
Red Mesa Solar	Navajo Nation	5.0028
Steel One Solar	Box Elder County, Utah	6.06
Available Capacity		29 MW - 65 MW

Figure 7 HL&P Resource Portfolio

Portfolio Cost Modeling

The PacifiCorp IRP uses econometric modeling techniques for forecasting, including variables such as natural gas pricing, electricity market prices for Mid-C, COB, Four Corners, and Palo

Verde, the Official Forward Price Curve (OFPC), loads for regions including Utah, hydro generation, and short-term volatility. This IRP does not intend to delve into econometric modeling for price forecasting; instead, we rely on the work of large utilities that participate in the same EIM, specifically the price models from PacifiCorp's most recent IRP. Chapter Five of the PacifiCorp 2021 IRP includes a detailed explanation of their modeling and statistical analysis of pricing and resource mix (PacifiCorp.com, 2021). Our cost models utilize the pricing reflected in the PacifiCorp IRP, HL&P PPA's, and O&M costs for generation resources and UAMPS budgetary numbers for the short-term cost.

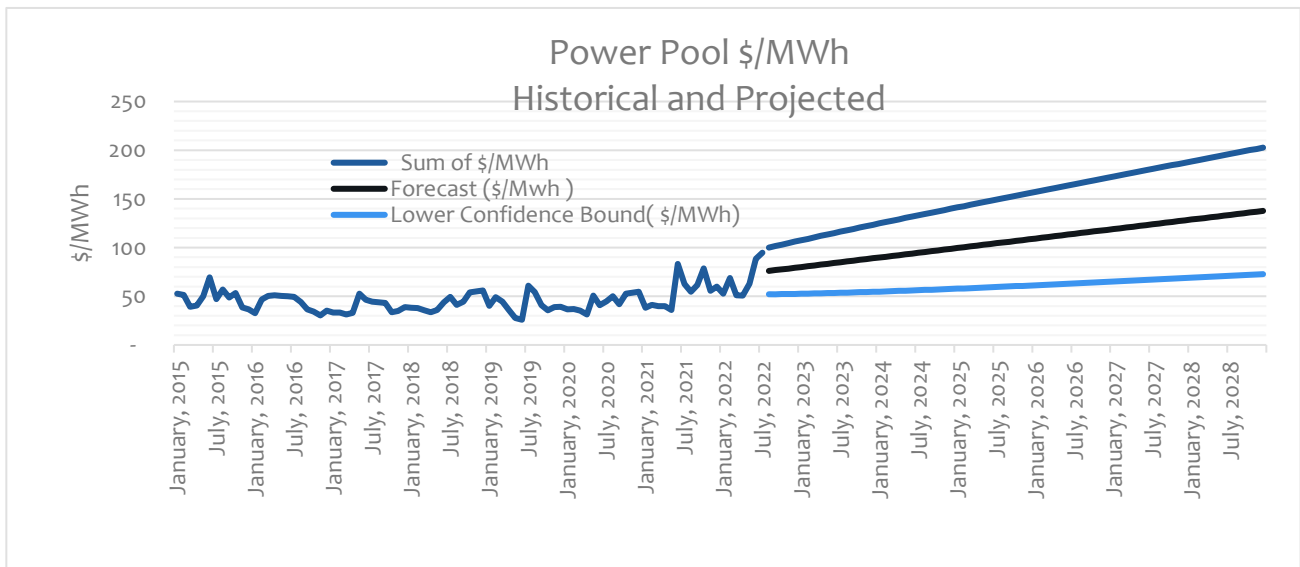


Figure 8 Power Pool Cost Projections

While electric market prices and natural gas prices are constantly fluctuating, the possibility of a carbon tax could further raise power prices. Keeping CO₂ emissions to a minimum in the HL&P portfolio will help to mitigate this risk. Other mitigation measures cannot be weighed until the timing of CO₂ reduction rules and regulations are known. Avoiding ownership in new carbon-based projects that are not eligible for carbon capture technologies should be avoided to reduce risk.

Our Energy Future

This IRP includes a short-term five-year planning horizon and a ten year planning horizon, although in less detail. We update this plan every two to five years based on changing circumstances.

Carbon Conscious

The five-year planning horizon for this IRP begins with a forty percent renewable portfolio. To maintain this level of renewable energy in the portfolio, we have added two solar power purchase agreements to our energy mix beginning in 2023.

Energy Efficient

Our Energy Efficiency Program is an essential part of our portfolio. The energy that we can avoid using is always our lowest-cost option. Our customers invest in energy-efficient appliances, load controls, and efficient cooling systems, which help reduce our load and demand. With free home energy audits, we have staff dedicated to helping our customers reduce their energy consumption levels. Customer hourly usage data is available in our Smarthub platform to help our customers understand their energy use patterns. In the future, as we see cities adopting green building codes, we hope to be a trusted advisor for our owner cities and Wasatch County if they explore green building codes. We continuously evaluate all our energy-saving offerings to ensure a high return on our investment.

Distributed Generation

Our customers continue to make substantial investments in generating renewable energy. We offer a Net Metering Program and Policy that supports our customers by providing a one-for-one kilowatt credit for their generation. With four hundred customers owning rooftop solar, there are more than two megawatts of installed rooftop solar capacity on our system. New solar installations keep daytime load growth down and increase ramp rates during peak. We intend to implement a time-of-use rate in 2023 to incent our solar customers to position solar installations to optimize the evening sun. Our challenge in the years to come is to manage a net metering program that maximizes the value of solar to our system.

Resource Plan

We have a solid energy portfolio with which to build upon over the five-year planning horizon. We are adding additional resources where needed and implementing market hedges to reduce risk. We have one market power hedge for around-the-clock energy through March 2027. We have locked in natural gas delivery of 25,000 MMBtu per month through 2027. This allows us to plan for a gas price well below the 2022 average.

Additionally, we have entered into a power purchase agreement to add five megawatts of solar energy from the Red Mesa Solar Project coming online in quarter one of 2023 and six megawatts of solar energy from the Steel One Solar project projected to go online in mid-2023.

Our current portfolio includes a power purchase agreement for energy from a geothermal and solar plant. Additionally, we have PPAs for energy from two wind farms. Multiple renewable resources make it challenging to plan hourly energy requirements. As intermittency in our portfolio increases, we will continue to rely heavily on our natural gas power plants to firm up these resources.

Our natural gas power plants operate under a minor source emissions permit from the Department of Environmental Quality Division of Air Quality. HL&P power plants are not a significant source of pollutants and work well under the permitted limits for CO and NOx, making our plants a carbon-conscious option for firming renewables. During the five-year planning period, we plan to add six MW of natural gas capacity to our fleet, allowing for more renewable firming power and peak shaving.

The purchase of a utility-scale battery is in our capital plan for 2023. In 2022, the battery project is delayed due to supply chain issues but remains in our plans. It is an important project that will provide voltage support and storage for our small hydro on the east side of our system.

HL&P is a member of the Intermountain Power Project, a coal-fired plant in Delta, Utah. Power production from the IPP plant is sent to the California entities involved in the project, but HL&P has the right to call back its share on a seasonal basis. This plant is on track for replacement with a natural gas plant allowing for hydrogen fuel supplementation in 2025. When the repowering is complete, HL&P's entitlement share will be reduced with the reduction in overall plant capacity. We have called back this energy for 2022 and 2024, and plan to call back this energy beyond these years if it makes financial sense to do so.

For the long-term, we plan to supply base load resources by partnering on power projects that can provide reliable energy twenty-four hours a day. As UAMPS members, we have access to large power generation projects and continue investigating resource options with this agency. We are participating in a geothermal feasibility study, and we continue to monitor all UAMPS resource options. As the UAMPS Carbon Free Power Project progresses, we will re-evaluate this option.

We are working with other Public Power utilities to investigate the feasibility of building a thirty-megawatt natural gas power plant with the ability to test alternative resources. This

plant could provide up to ten megawatts of energy to HL&P and includes the option to sell and buy excess generation with the other plant participants.

Additionally, we continue exploring on-system power generation and renewable resource projects with third parties. Local projects like large-scale solar, biomass, and behind the meter natural gas generation could have economic and environmental benefits.

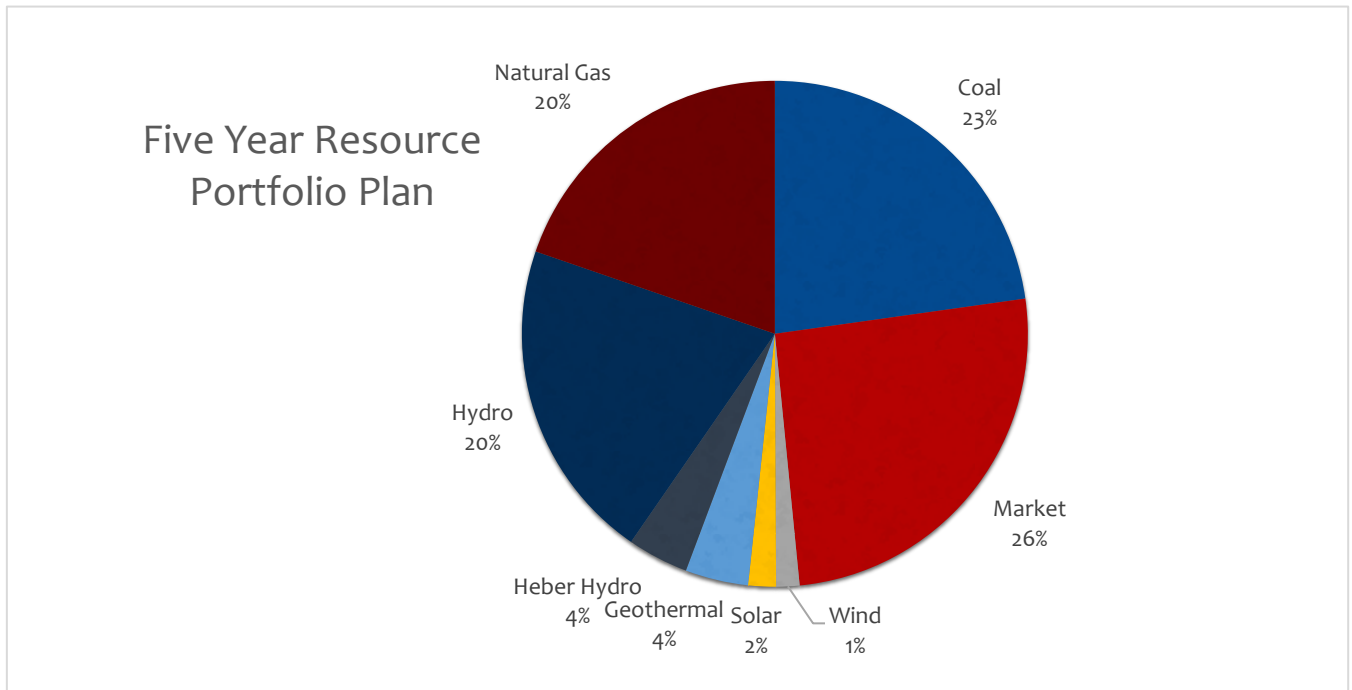


Figure 9 Resource Portfolio Plan

By following our plan to add natural gas generation, use current resource options like IPP, integrate solar, invest in energy efficiency, demand management through rate design, and upholding our risk management policy, we will maintain reliability and affordability.

Cost of Wholesale Power

Volatility in power and natural gas markets over the last few years has increased the cost of power. Blending low-cost solar into the portfolio softens the blow of high-power prices.

Additionally, on-system natural gas and hydro generation keep us out of the power market and allows us to manage our load.

In the last several years, we have experienced unexpected aggressive market pricing scenarios combined with more significant than expected load growth, which has increased our overall cost of power. We follow our risk management policy to maintain acceptable risk levels and to prevent the market from having rate impacts. As of July 2022, our weighted average cost per megawatt for wholesale power has increased by ten percent from 2022, and the average energy cost from the power pool has increased by twenty-four percent.

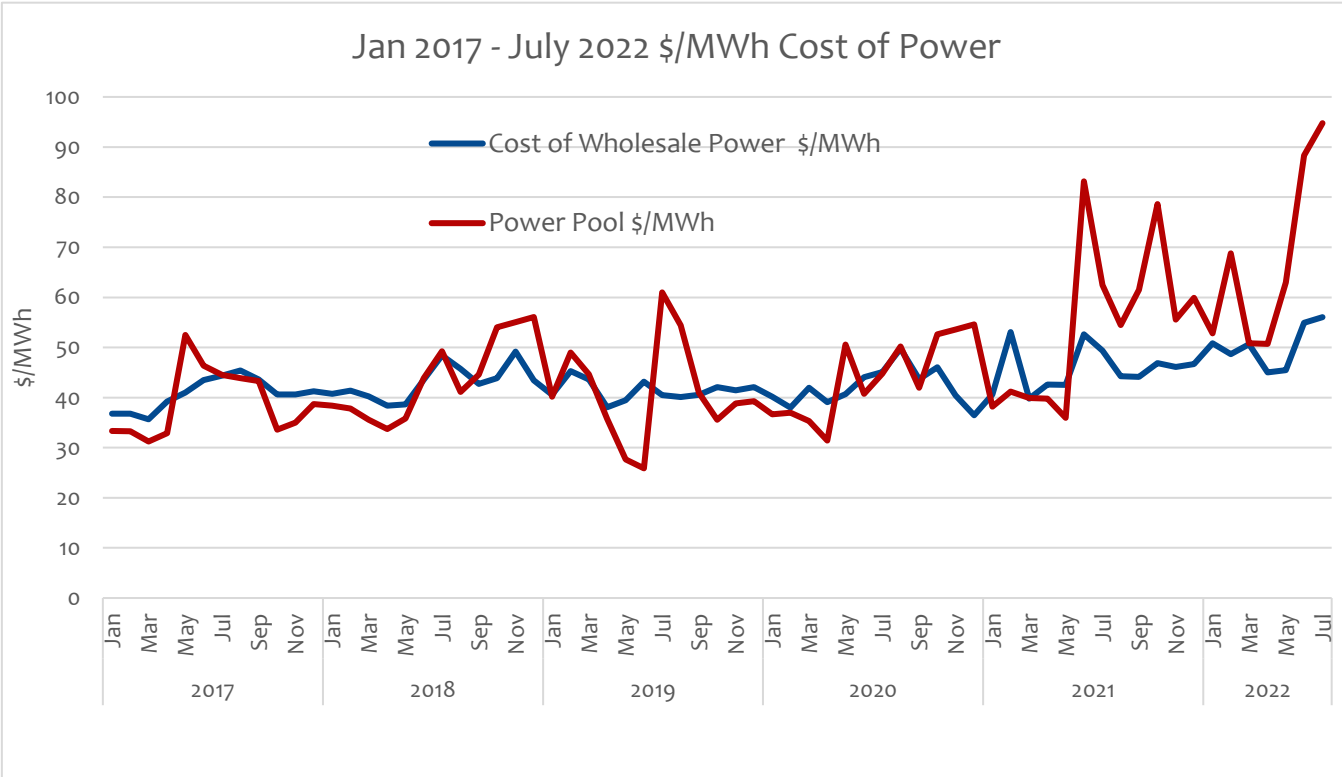


Figure 10 2017-2022 Power Prices

Near-term conditions are likely to continue to impact market prices. Drought conditions are reducing available hydropower, and demand for dispatchable capacity increases across the

west. Locking resources with fixed pricing to lower market exposure risk is crucial to setting rates for cost recovery.

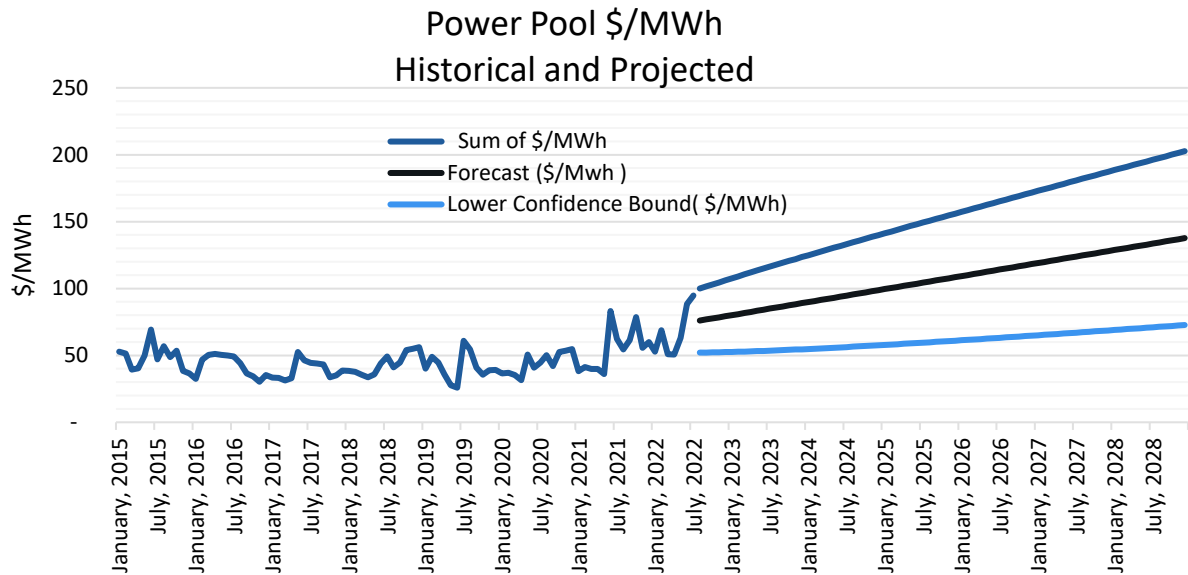


Figure 11 Supply Shortage

While we seek to add best-fit resources to our portfolio and use short-term PPAs to keep costs in check, factors could still drive prices up further. In the 2019 IRP, the worst-case scenario for the power portfolio was described as several of the following happenings at once: power costs included losing any one of our local run-of-the-river and stream hydro generation plants due to the age of the assets, continued higher than expected load growth, sustained drought conditions, poor solar generation year, loss of multiple natural gas units and an extreme weather pattern. Each of these events alone would not significantly impact our portfolio cost, but any of these events occurring at the same time could cause an increase in the cost per megawatt-hour. While this type of scenario was unlikely, we have experienced high load growth, drought, loss of generating units, and extreme weather over the last twenty four months. Despite unfavorable operating conditions, we have weathered the storm and have not needed to enact a temporary power

cost adjustment. Keeping a diverse portfolio and spreading risk across multiple generating units has proved to be a solid strategy for continued success. Going forward we will continue down the path of diversity.

Conclusion

Our energy plan prepares the path to the future. The foundation of our IRP is the diverse portfolio that allows us to be flexible as circumstances evolve. Investing in our natural gas and hydropower plants enables us to control our destiny with dispatchable resources that can firm up low-cost renewables and manage market risk. Looking to the future, we are exploring how we can partner with other public power utilities to invest in resources that will provide baseload power that can support a reliable grid. Programs that support energy efficiency and local investments in distributed generation allow us to partner with our customers in mutually beneficial ways. This IRP ensures that we can continue to provide the reliable, affordable electric service that has powered our strong community since 1909.

References

Eia.gov. (2020). *Annual Energy Outlook 2019 with Projections to 2050*. [online] Available at: <https://www.eia.gov/outlooks/aeo/pdf/aeo2019.pdf> [Accessed 21 Jan. 2020].

Eia.gov. (2022) *Weekly Outlook 2022* [online] Available at: <https://www.eia.gov/naturalgas/weekly/> [Accessed 9/21/20220].

Heberpower.com. (2020). *Document & Policy Library*. [online] Available at: <https://www.heberpower.com/wp-content/uploads/2019/09/Heber-12.47-KV-Load-Flow-Study.pdf> [Accessed 21 Jan. 2020].

Heberpower.com. (2020). *Document & Policy Library*. [online] Available at: <https://www.heberpower.com/wp-content/uploads/2019/09/Heber-46kV-Study-061118.pdf> [Accessed 21 Jan. 2020].

Heberpower.com. (2020). *Documents & Policy Library*. [online] Available at: <https://www.heberpower.com/wp-content/uploads/2019/09/UFS-Econometric-Model-for-HLP-Final-Report.pdf> [Accessed 21 Jan. 2020].

Natural Gas Weekly Update.

https://www.eia.gov/naturalgas/weekly/archivenew_ngwu/2022/09_15/

NCSL.org. (2022) *State Renewable Portfolio Standards and Goals*. [online] Available at: <https://www.ncsl.org/research/energy/renewable-portfolio-standards.aspx> [Accessed Sep. 2022].

Pacificorp.com. (2020). *IRP Volume I*. [online] Available at: https://www.pacificorp.com/content/dam/pacorp/documents/en/pacificorp/energy/integrate-d-resource-plan/2019_IRP_Volume_I.pdf [Accessed January 21 2020].

Pacificorp.com. (2021). *IRP Volume I*. [online] Available at: https://www.pacificorp.com/content/dam/pcorp/documents/en/pacificorp/energy/integrated-resource-plan/2021_IRP_Update.pdf [Accessed September 21, 2022].

Pge.com. (2020). *PG&E's 2018 Integrated Resource Plan*. [online] Available at: https://www.pge.com/en_US/for-our-business-partners/energy-supply/integrated-resource-plan/integrated-resource-plan. Page [Accessed January 21, 2020].

Portlandgeneral.com. (2020). *Integrated Resource Planning - Resource Planning | PGE*. [online] Available at: <https://www.portlandgeneral.com/our-company/energy-strategy/resource-planning/integrated-resource-planning> [Accessed 21 Jan. 2020].

Regulatory Assistance Project. (2020). *Best Practices in Electric Utility Integrated Resource Planning | Regulatory Assistance Project*. [online] Available at: <https://www.raonline.org/knowledge-center/best-practices-in-electric-utility-integrated-resource-planning/> [Accessed 21 Jan. 2020].

Uamps.com. (2020). *UAMPS*. [online] Available at: <https://www.uamps.com/> [Accessed 21 Jan. 2020].

Wecc.org. (2020). *Western Electricity Coordinating Council Home*. [online] Available at: <https://www.wecc.org/Pages/home.aspx> [Accessed 21 Jan. 2020].