

2021 Integrated Resource Plan Work Plan

**Washington Utilities and
Transportation Commission**
(revised March 20, 2020)

INTRODUCTION

In accordance with the Washington Utilities and Transportation Commission's Integrated Resource Planning (IRP) rules (WAC 480-100-238), PacifiCorp submits this work plan for its 2021 integrated resource plan (2021 IRP). PacifiCorp outlines the expected content of its 2021 IRP, the general method for assessing potential resources, and the anticipated timing and extent of public participation in this work plan.

This work plan is based on the best information available to PacifiCorp at this time, and may change for reasons including:

- During the 2021 IRP public process, PacifiCorp will consider stakeholder input and may implement methodology changes, as appropriate, to support the 2021 IRP.
- Market or regulatory developments may prompt the need for additional system modeling or impact assessment.
- The Washington Utilities and Transportation Commission's current IRP and Clean Energy Transformation rulemaking proceedings may prompt changes.

For the most updated information on the stakeholder input process, please visit:

<https://www.pacificorp.com/energy/integrated-resource-plan/public-input-process.html>

CONTENTS OF THE 2021 INTEGRATED RESOURCE PLAN

The contents of the 2021 IRP are expected to be similar to the 2019 IRP, which included two volumes: a main document and supporting appendices. As dictated by the size of the appendices, PacifiCorp may split the supporting appendices for the 2021 IRP into two volumes, which could add a third volume. The main document, or Volume I, is expected to contain the following chapters:

- Executive Summary
- Introduction: This chapter summarizes any notable planning process improvements and modeling advancements implemented in the planning cycle, summarizes significant events and accomplishments including an overview of the public process, and lists the report contents.
- The Planning Environment: This chapter profiles major external influences that impact the PacifiCorp's long-term planning (market conditions and developments, legislative and regulatory events, etc.) and summarizes activities supporting resource procurement.
- Transmission Planning: This chapter describes PacifiCorp's long-term transmission planning initiatives, focusing on activities associated with the Energy Gateway Transmission projects and other regional planning efforts.
- Load and Resource Balance: This chapter presents PacifiCorp's load and resource balance, which characterizes PacifiCorp's capacity and energy positions on a system and control area basis for the next 10 years if no incremental future resource actions were taken.
- Resource Options: This chapter provides background information on the resources considered in the IRP, detailing cost and performance attributes and current market outlook.

Resources covered include utility-scale generation technologies, demand-side management (DSM), energy storage technologies, and firm market purchases by market hub.

- **Modeling and Portfolio Evaluation Approach:** This chapter describes the modeling methods and portfolio evaluation techniques used to determine the relative portfolio cost/risk performance attributes and the overall portfolio selection process. The CEAP will require modifications (or additions) to the modeling and portfolio evaluation approach relative to meeting Washington State resource requirements. Ideally these modifications will take the form of additional modeling requirements that can be accurately and endogenously implemented into the Company's multi-state system-level modeling. If this is not possible, the Company will perform additional distinct analysis to fulfill CEAP requirements.
- **Modeling and Portfolio Selection Results:** This chapter summarizes the portfolio development and production cost modeling results, and presents PacifiCorp's preferred resource portfolio. Depending on the modeling solution(s) arrived at relative to the chapter on modeling and portfolio evaluation methodology, there may be additional portfolio selection considerations. If an accurate and endogenous modeling approach can be created incorporating CEAP requirements as a set of optimization constraints, it is possible that the portfolio selection process will not require major revisions.
- **Action Plan and Resource Procurement:** This chapter presents PacifiCorp's action plan and an acquisition path analysis that describes how resource acquisition strategies will be modified in response to changing conditions as informed by the modeling process. Other resource risk management issues are also discussed. The Action Plan also addresses state-specific requirements. CEAP-related activities will be delineated in this section to indicate necessary steps the Company will take in the short-term action planning period, and will also provide a road-map for items to be address in the Compliance appendix of the Company's 2023 IRP to be filed two years later.

Volume II (and as necessary, Volume III) is expected to contain technical data and supplemental analysis covering: (1) model results; (2) how the 2021 IRP complies with multiple state IRP requirements; (3) load forecasts developed for each state; (4) the public input process; (5) capacity planning reserve margin analysis; (6) flexible resources for needs assessment, including an assessment of integration costs; (7) plant water consumption data; (8) resource adequacy analysis; (9) analyses of potential DSM resources and distributed generation; and (10) other supplemental analysis and data supporting the 2021 IRP planning cycle.

GENERAL METHOD FOR ASSESSING POTENTIAL RESOURCES

The main elements of the 2019 IRP work plan include the following:

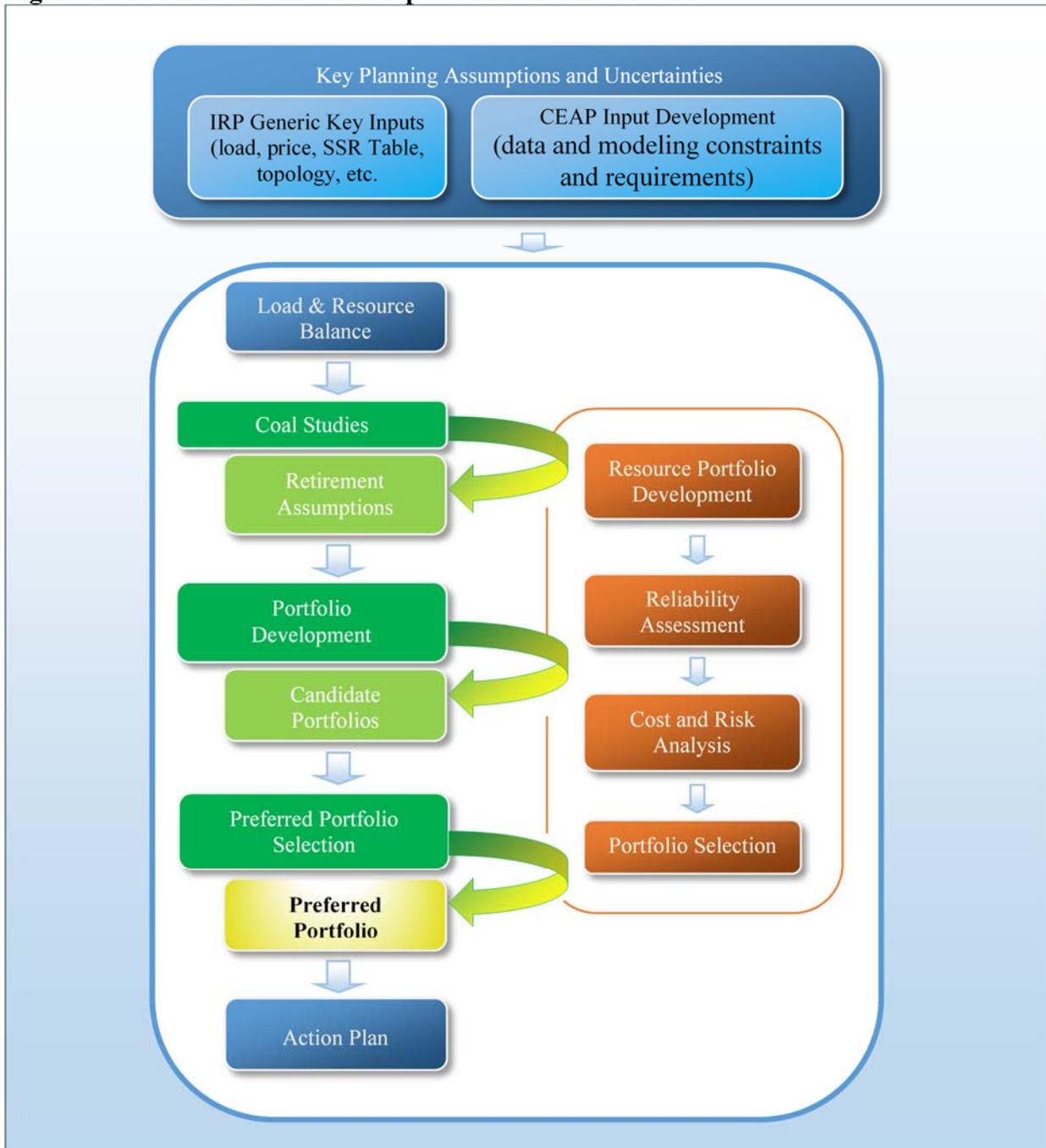
1. Revisit strategic assumptions (*i.e.*, resource adequacy, market depth, carbon dioxide regulatory scenarios and cost adders, *etc.*) and update model data appropriately.
2. Implement modeling and methodology enhancements to improve the IRP process and address new analytic requirements from state commissions or in response to public stakeholder recommendations.
3. Use PacifiCorp's modeling systems to develop a diverse set of candidate portfolios that considers known and potential costs for environmental requirements and compliance alternatives, and perform risk analysis using a stochastic production cost model. PacifiCorp

will use present value of revenue requirement (PVRR) as the main cost-effectiveness measure for comparing portfolios.

4. Apply an initial portfolio screening process that focuses on two key metrics—mean stochastic PVRR and upper-tail PVRR—followed by a final screening process based on measures such as risk-adjusted PVRR, carbon dioxide emissions, supply reliability, customer rate impact, and others.

Figure 1 summarizes the portfolio evaluation steps within the IRP process. The 2021 IRP will follow a similar approach with the potential for modifications. This plan is based on the use of two computer optimization models: a capacity expansion plan model which employs linear optimization to efficiently meet capacity needs; and a production cost simulation model with stochastic capabilities which employs unit commitment/dispatch simulation logic and risk assessment metrics. As in the 2019 IRP, both products are proprietary integrated software products from a third-party vendor.

Figure 1 – Portfolio Evaluation Steps within the IRP Process



Using existing resources and a representation of PacifiCorp’s transmission system as the starting point, the company will perform capacity expansion model runs with a set of updated proxy resource options (supply-side, demand-side, energy storage, and transmission). The resource selections may be based on specific planning strategies to be developed incorporating public input. The key input variables will include, but are not limited to, regional haze compliance, state policies, natural gas/electricity prices, and load forecasts. PacifiCorp will also develop

additional CO₂ and renewable portfolio standard regulatory compliance scenarios. The purpose of the alternative future scenario analysis is to determine how portfolios and their associated resources perform under a variety of input assumptions, serving as an indicator of portfolio robustness.

Once portfolios are developed, the production cost model will be used to implement stochastic sampling of load, electricity price, natural gas price, hydro availability, and thermal unit availability input variables. Portfolio costs are calculated as the mean PVRR of the stochastic iterations. This mean cost, along with least-favorable (or upper-tail) costs and supply reliability risk measures, constitute the main metrics for determining comparative portfolio risk performance profiles.

PacifiCorp will also evaluate the preferred portfolio and associated resource acquisition strategies in the context of potential changes to planning assumptions and procurement risks, referred to as acquisition path analysis.

PLANNED MODELING ENHANCEMENTS AND ANALYSIS PROJECTS

PacifiCorp's 2021 IRP work plan accounts for the following key modeling and analysis projects that are planned or underway:

- Update the DSM resource supply curves based on a new conservation potential assessment to be completed in 2020.
- Update the private generation study. This will incorporate costs and penetration levels for distributed resources, along with sensitivities.
- Update the storage study examining commercially viable storage technologies.
- Provide an updated flexible resource need assessment, including estimates of integration costs.
- Complete an updated loss of load probability study and planning reserve margin analysis.
- Complete an updated wind and solar capacity contribution study using loss of load probability principals. For the 2021 IRP, the Company will calculate wind and solar capacity contributions on a locational basis, meeting or exceeding the state-by-state granularity required by [UE-190666, Order 1, ¶¶22-23](#).
- Evaluate the portfolio marginal stochastic costs of alternative planning reserve margin and LOLP levels.
- Assess compliance alternatives for near-term significant emission control installation decisions applicable to certain coal generating facilities.

ANTICIPATED TIMING AND PUBLIC PARTICIPATION

The estimated timeline for the 2021 IRP public meetings is shown in Table 1. The 2021 IRP meeting schedule consists of a combination of general public meetings and may include status report conference calls, if needed. PacifiCorp is also planning to set up state-specific stakeholder meetings during late June and into July 2020 to discuss topics of regional interest—a practice used since the 2008 IRP. Although the scheduling has not yet occurred, the Company will update its online scheduling information accordingly as updated information becomes available.

The first general public meeting will take place in June 2020, and will serve as the kick-off to the 2021 IRP process. The kick-off meeting will cover the 2021 IRP schedule, public process, modeling and analysis updates, conservation potential assessment draft supply curves, and a coal studies discussion.

Table 1 also shows the high-level 2021 IRP development schedule. Filing the 2021 IRP is scheduled no later than April 1, 2021. PacifiCorp will continue to provide draft 2021 IRP analysis throughout the public process for stakeholder input. In addition, PacifiCorp will communicate remote participation options for stakeholders for each meeting. Proposed stakeholder meeting dates and topics are subject to change.

Table 1 – 2021 IRP Public Meeting and Development Schedule

Milestone	Date	Proposed Topics
Pre-IRP Technical Workshop/ Stakeholder Meeting	January 21, 2020	Conservation Potential Assessment (CPA) Overview, CPA Scope of work
Pre-IRP Technical Workshop/ Stakeholder Meeting	February 18, 2020	Energy Efficiency, Demand Response, CPA Draft Measures
Pre-IRP Technical Workshop/ Stakeholder Meeting	April 16, 2020	Energy Efficiency, Demand Response, CPA Draft Measures
IRP Stakeholder Meeting	June 18, 2020 – June 19, 2020	IRP Process Overview, Modeling Update, 2019 IRP Updates, Coal Studies Discussion, Energy Gateway South Update
IRP Stakeholder Meeting	July 30, 2020 – July 31, 2020	Load Forecast, Distribution System Planning, Supply-side Resource Study Efforts, Private Generation Study, Market Reliance Assessment, Environmental Policy update, 2019 IRP Modeling Assumptions and Updates
IRP Technical Workshop/ Stakeholder Meeting	August TBD	CPA Draft Supply Curves
IRP Stakeholder Meeting	September 17, 2020 – September 18, 2020	Draft Supply-side Resource Table, Transmission overview and updates, CPA Final Supply Curves, Flexible Reserve Study Cost Results, Planning Reserve Margin Results, Portfolio Discussion
IRP Stakeholder Meeting	October 22, 2020 – October 23, 2020	Supply-side resource table levelized costs, intra-hour flexible resource credits, Updated CO ₂ Assumptions, Modeling Improvements/ Storage, Coal Studies Discussion
IRP Stakeholder Meeting	December 3, 2020 – December 4, 2020	Coal Studies Discussion

CETA Implementation 10-year Strategy	December 31, 2020	
PacifiCorp preparation (assumptions, model maintenance, supporting studies)	February 2020 – August 2020	
Coal Studies / Portfolio and Sensitivity Planning	August 2020 – November 2020	
Portfolio Risk Analysis	November 2020 – February 2021	
Draft IRP for CEIP	January 4, 2021	
IRP Stakeholder Meeting	January 14, 2021 – January 15, 2021	Portfolio Analysis Results, Additional Portfolios under development,
IRP Stakeholder Meeting	February 24, 2021 – February 25, 2021	Preferred Portfolio and Action Plan, Portfolio Analysis Results, Transmission Gateway Results
Preferred Portfolio Selection and IRP Final Drafting	February 2021 – March 2021	
Commission Filing	April 1, 2021	
Draft CEIP Filing	June 2021	Tentative; specific to be determined
CEIP Filing	January 1, 2022	

CONCLUSION

PacifiCorp’s 2021 IRP work plan represents its current view of the processes and activities needed to file its IRP by April 1, 2021, that meets state IRP standards and guidelines and aligns with PacifiCorp’s 2021 business activities.

PacifiCorp encourages Washington stakeholders to attend public-input meetings and actively participate in this planning process. To join the 2021 IRP participants’ list, please send an email request to IRP@PacifiCorp.com or call the PacifiCorp IRP phone line at (503) 813-5245.