



Study Scope for Economic Study Request: Pumped Storage in Oregon

Request

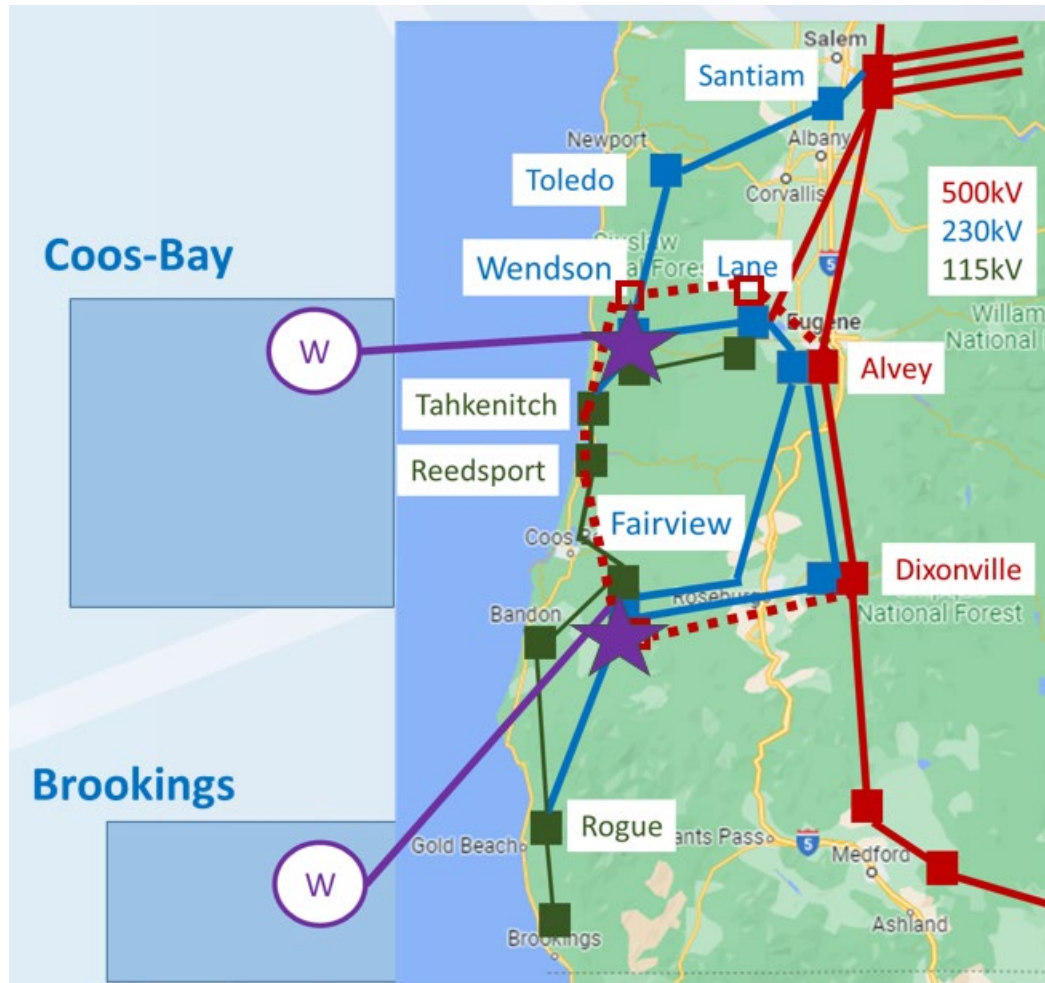
In March of 2023, Rye Development submitted to the NorthernGrid planning region a request for economic analysis of a pumped storage [project](#). The high-level details are listed below.

1. 500 MW dispatchable pumping capability; 10-hour duration at the 500 kV Wendson substation
2. 500 MW dispatchable generating capability, 10-hour duration at the 500 kV Fairview substation
3. Planned in-service date of December, 2032

From the request: “The projects could be used to integrate offshore wind in the Brookings and Coos Bay Call), provide shaping and firming of Oregon offshore wind to meet regional generation capacity needs, relieve congestion on transmission across the Coast Range and potentially relieve congestion on Cross Cascades transmission paths.”

Analysis

The analysis will build upon the [2022 Offshore Wind Economic Study Request](#).



The 3 GW of offshore wind, 1.2 GW at Wendson and 1.8 GW at Fairview as well as the “500 kV loop” are modeled into the base cases used for this ESR analysis. The pumped storage project will be modeled as two, 500 MW pumped storage projects, each connecting at the 500 kV level at the Wendson and the Fairview buses.

Production cost modeling analysis will be used to determine if the pumped storage project(s) would result in a net reduction in total production cost to supply system load or reduced congestion. The production cost analysis will consist of the following:

1. Starting with the Anchor Data Set (ADS) modified to include the “500 kV loop” as well as the Fairview 1.8 GW of offshore wind from the Brookings wind pocket and the Wendson 1.2 GW of offshore wind from the Coos Bay wind pocket from the 2022 ESR.
2. Production cost modeling will be run to establish the total production cost of the system over a year and identify spots of net congestion on the interconnected parallel system, caused by added OSW - Pumped Storage Hydro. Below are four cut planes that should be monitored in the PCM runs:
 - a. Cut-plane #1
 - i. Dixonville-Sams Valley 500 line (45095-44514)

- ii. Dixonville-GrantsPass 230 lines (45093-44996, 44996-45113, 45113-45123)
 - iii. Dixonville – Days Creek (NickeMtn) 115 line (45091-45077)
- b. Cut-plane #2
 - i. Sams Valley-Meridian 500 kV lines (44514-44540) and Meridian 500 series capacitor (44540-45197)
 - ii. Sams Valley-Whestone 230 kV line (44515-44894), Whestone-Meridian 230 kV line (44894-45195)
 - c. Cut-plane #3
 - i. Meridian-Klamath Cogen 500 line (45197-45262)
 - ii. Klamath Falls-Copco 230 line (45161-45025, 45025-45063)
 - iii. Copco-Lone Pine 230 (45063-45183)
 - d. Cut-plane #4
 - i. Klamath Cogen-Snow Goose 500 (44516-45262), Snow Goose-Captain Jack (44516-45035) 500 line
 - ii. Klamath Falls-Snow Goose 230 (45161-44517)
 - iii. Snow Goose-Malin 230 (44517-45189)
3. The pumped storage project will be modeled into the 2032 ADS most recent version (superseding V2.4.1)
 4. Three-Case Scenarios of the modified ADS case will be run:
 - a. Case 1; Base Case - - WECC 2032 ADS latest version
 - b. Case 2 - - NorthernGrid 3 GW OSW + 500 kV loop
 - c. Case 3 - - Case 2 + 1GW of pumped storage hydro

Comparisons will be made to determine potential savings to production cost and enhancements to congestion values

5. Should any hour be identified as worthy of reliability consideration; that hour will be back-transformed into a power flow case and a limited set of contingencies will be analyzed.

Report

A report of the Economic Study Request, methodology, and findings will be complete by 12/31/23. This economic study report will be a stand-alone report that will be included as an appendix to the Regional Transmission Plan. This report in no way constitutes an analysis for generation interconnection, load service, or transmission service; its findings may inform the regional transmission planning process.