BEFORE THE PUBLIC UTILITY COMMISSION

OF OREGON

LC 80

In the Matter of PORTLAND GENERAL ELECTRIC CO., 2023 Integrated Resource Plan and Clean Energy Plan.	ROUND ONE COMMENTS OF THE SWAN LAKE AND GOLDENDALE ENERGY STORAGE PROJECTS ON PORTLAND GENERAL ELECTRIC CO.'s 2023 CLEAN ENERGY PLAN AND INTEGRATED RESOURCE PLAN

The companies working to develop the Swan Lake and Goldendale pumped storage projects ("Swan Lake and Goldendale" or "Projects") appreciate Portland General Electric Company's ("PGE") response to the issues raised by the Projects in their Initial Comments. The Projects' initial comments raised several concerns regarding PGE's assumptions for pumped storage in its 2023 Integrated Resource Plan and Clean Energy Plan ("IRP"), which included questioning the basis upon which PGE assumed a useful life of 38 years for pumped storage. PGE's response to the Projects' Initial Comments stated that the 38-year useful life for pumped storage was "provided by the engineering firm HDR and is the same as was used in modeling of PGE's acknowledged 2019 IRP."[1] PGE went on to state that there are a wide range of estimates of the economic life of pumped storage facilities, and that 38 years falls within the reasonable range.

[1] *In the Matter of Portland General Electric, 2023 Clean Energy Plan Integrated Resource Plan* ("PGE IRP"), PGE's Response to Initial Comments, Docket LC 80 (May 31, 2023) at Page 18, available at: https://apps.puc.state.or.us/edockets/edocs.asp?FileType=HAC&FileName=lc80hac102443.pdf&DocketID=23636&numSequence=55.

In these Round One Comments, the Projects respectfully disagree with PGE's statements. First, the 38-year useful life used by PGE is not supported by HDR in its study, nor in PGE's 2019 IRP as it asserts in its response. Second, a 38-year useful life is inconsistent with the vast majority of available literature regarding the useful life of pumped storage facilities. Third, a 38-year useful life is inconsistent with actual operating information of all pumped storage facilities currently in operation in the United States. Therefore, based on the information contained herein, the Projects request that Staff direct PGE to re-run its IRP analysis using a 50-year useful life, which is a reasonable (and conservative) estimate within the range of useful life evidence presented below. Similarly, the Projects request that Staff direct PGE to run a sensitivity analysis using a 75-year useful life, which is still a reasonable estimate, consistent with the real-world operational data of pumped storage facilities.

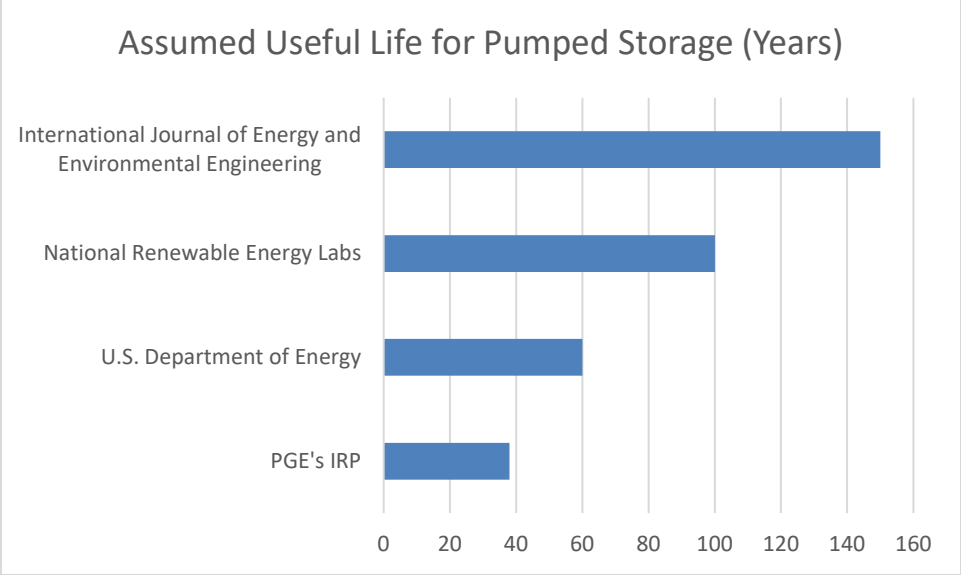
I. A 38-Year Useful Life for Pumped Storage that PGE Relies Upon in its IRP Is Not Accurate

As stated above, the Projects have concerns regarding the accuracy of PGE's 38-year useful life in this IRP. First, the 38-year useful life used by PGE is not supported by HDR in its study, nor in PGE's 2019 IRP, as PGE asserts in its response. PGE's Round 0 Comments provide no citations to the HDR study where the 38-year useful life is mentioned. Upon careful review of the HDR study used in PGE's acknowledged 2019 IRP, the Projects are unable to find where HDR states that 38 years is an appropriate useful life. In fact, the HDR study that PGE relies upon states that "[a] typical pumped storage plant is designed for more than 50 years of service life, but many projects that were constructed in the 1920's and 1930's are still operational today."[2] The Projects

[2] *In the Matter of Portland General Electric Co., 2019 Integrated Resource Plan*, Portland General Electric 2019 Integrated Resource Plan, External Study D, HDR Thermal and Pumped Storage Generation Options (July 19, 2019), Docket LC 73 at Section 6.2.

request that PGE point to the section of the study that it is relying upon to support its 38-year useful life assumption in this IRP.

Second, a 38-year useful life is inconsistent with the vast majority of available literature regarding the useful life of pumped storage facilities. To visually demonstrate the inconsistency, the Projects have created a graph to show how different sources have assumed the useful life of pumped storage, in stark contrast to the short, 38-year useful life used by PGE[3]:

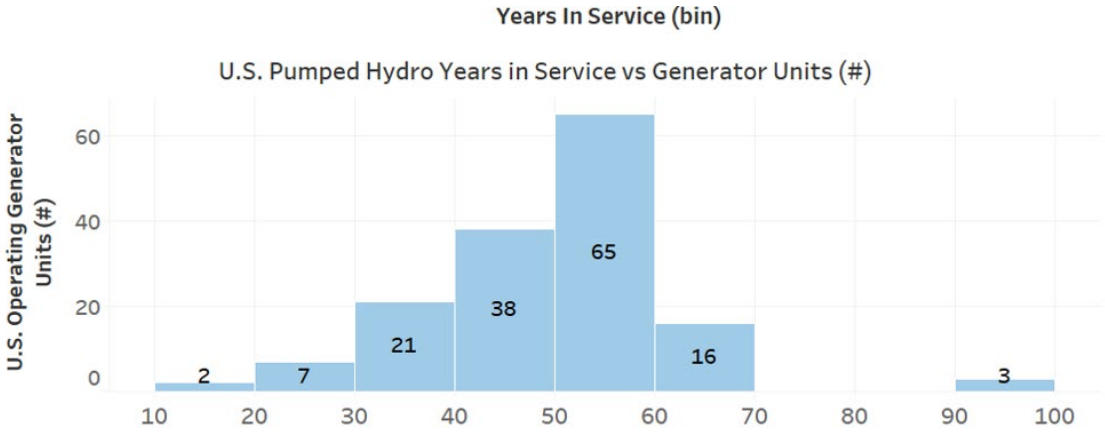


As demonstrated in the visual above, PGE's selection of 38 years is an outlier compared to the majority of highly respected sources, all of which assume a useful life for pumped storage that

[3] PGE IRP, PGE's Response to Initial Comments, Docket LC 80 (May 31, 2023) at Page 18, available at: https://apps.puc.state.or.us/edockets/edocs.asp?FileType=HAC&FileName=lc80hac102443.pdf&DocketID=23636&numSequence=55 (assuming 38 year useful life); National Renewable Energy Labs, *Life Cycle Assessment for Closed-Loop Pumped Hydropower Energy Storage in the United States* (July 14, 2022), available at: https://www.nrel.gov/docs/fy22osti/81315.pdf (assuming up to 100 year useful life); International Journal of Energy and Environmental Engineering, *Life-cycle impacts of pumped hydropower storage and battery storage* (June 1, 2017) available at: https://link.springer.com/article/10.1007/s40095-017-0237-5#Tab1 (assuming up to 150 years useful life); U.S. Department of Energy, *Technology Strategy Assessment: Findings from Storage Innovations 2030, Pumped Storage Hydropower* (July 2023), available at: https://www.energy.gov/sites/default/files/2023-07/Technology%20Strategy%20Assessment%20-%20Pumped%20Storage%20Hydropower.pdf (assuming 60 year useful life).

ranges from 60 years at the low end to 150 years at the high end. The Projects believe that given the evidence, a 38-year useful life is not justifiable and should be, at a minimum, 50 years in this IRP – which is still lower than the lowest useful life available in the literature cited above.

Third, a 38-year useful life is inconsistent with actual operating information of all pumped storage facilities currently in operation in the United States. The U.S. Energy Information Administration ("EIA") collects annual generator-level information about pumped storage facilities. In June of this year, the EIA released data, which the Projects have converted into the graph below, that shows the age distribution of the U.S. pumped storage fleet in 2022. It is notable that no unit retired in 2022 – meaning that all 150 units appear to still be operating, with over half of them operating for over 50 years:[4]



II. Conclusion

The Projects believe that a 38-year useful life is neither supportable nor reasonable for pumped storage. As demonstrated above, 38 years is well below the lowest useful life estimate in literature and operating characteristics for pumped storage – including the HDR study that PGE

[4] U.S. Energy Information Administration, *Form EIA-860 detailed data with previous form data (EIA-860-A/860B)*, June 1, 2023, available at: https://www.eia.gov/electricity/data/eia860/.

relies upon in its reply comments. The Projects believe that a 50-year useful life for pumped storage is a reasonable, supportable assumption for this IRP. As a result, the Projects request that Staff direct PGE to re-run its IRP using a 50-year useful life and run a sensitivity analysis using a 75-year useful life.

Please contact the undersigned with any questions or concerns.

Dated this 27th Day of July, 2023.

Respectfully submitted,

/s/ Michael Rooney

Vice President, Rye Development
830 NE Holladay St.
Portland, OR 97232
(412) 400-4186
michael@ryedevelopment.com