



MEMORANDUM

EUGENE WATER & ELECTRIC BOARD

Rely on us.

TO: Commissioners Carlson, Barofsky, McRae, Schlossberg, and Brown
FROM: Frank Lawson, CEO & General Manager
DATE: July 1, 2023 (July 11, 2023, Board Meeting)
SUBJECT: Advanced Nuclear
OBJECTIVE: Information/Education

Issue

Guest speaker, Greg Cullen, will present information on advancements in nuclear technology, including technological overview, safety, industry trends, and projects.

Background

Greg Cullen joined Energy Northwest in 1993 and currently holds the position of Vice President for Energy Services and Development. In this capacity, Greg is responsible for the operation and maintenance of Energy Northwest's hydroelectric, wind, and solar generating projects as well as all utility support programs and services. In addition, Greg oversees the development of projects in a broad range of areas, including clean energy generation and storage, electrification, demand response and support services.

Prior to joining Energy Services and Development, Greg held a variety of individual and management roles in support of the engineering, maintenance, and operation of Columbia Generating Station, the Northwest's only operating nuclear energy facility.

Greg holds a Bachelor of Science degree in Engineering Physics from Northwest Nazarene University and a Master of Science degree in Mechanical Engineering from the University of Washington.

Discussion

Virtually all Integrated Resource Plans, including EWEB's, are identifying the need for low-carbon, dispatchable, and firm (dependable) generating resources as loads grow in the Pacific Northwest. Small Modular Reactors are a potential option to achieve these generating characteristics needed within an overall portfolio.

Beyond individual IRPs, other studies support the need for resources meeting these characteristics. A reliability study by Western Electricity Coordinating Council (WECC), the reliability coordinator for much of the Western U.S. showed that *"other emerging clean and flexible (ECF) energy resource technologies that do not produce emissions were needed in addition to BESS (Bulk Energy Storage Systems) to replace the lost resource flexibility that would otherwise*

be provided by displaced gas-fired resources. Because VRE (Variable Renewable Energy; i.e., wind and solar) output and customer loads vary significantly during any given day, and over the course of the year, and because there are limitations on BESS performance, there is a need for other clean resource types with performance characteristic similar to that of gas-fired generation resources.” (Bailey, Michael P.E., 2022)

Small modular nuclear reactors (SMR) are a nascent technology with strong support from the federal government. The U.S. Nuclear Regulatory Commission has approved initial designs, and utilities in the Western U.S. and around the world are signing contracts for SMR. SMR differs from traditional nuclear plants in key ways. The reactors are far smaller and are manufactured offsite then delivered in modular units. The reactors also contain passive safety features in which the reactor automatically shuts down if a problem arises, negating the risk of a meltdown. More information on advanced nuclear technology may be found at [Nuclear-Energy-Institute](#) and [USDept-of-Energy](#).

Advanced nuclear technology projects are already advancing. NuScale, founded in Corvallis Oregon, is working on the [Carbon Free Power Project](#) (CFPP), spearheaded by Utah Associated Municipal Power Systems (UAMPS), which will be a six-module plant in Idaho Falls, generating up to 462 megawatts of carbon-free electricity. NRC approval of the license application is expected in mid-2026, with expected initial generation power in 2029, with the remaining modules coming online for full plant operation by 2030. Additionally, Grant PUD with Energy Northwest and X-energy signed a MOU for the development of an advanced nuclear reactor demonstration project. The partners agreed to collaborate and share resources to evaluate the goal of siting, building, and operating an X-energy Xe-100 SMR plant at an existing Energy Northwest site north of Richland, Wash. The plant would have four 80-MW units and is scheduled to begin construction in 2024 and come online in 2027.

For EWEB, SMR represents a zero-carbon, on-demand energy resource that could provide significant benefits for grid reliability. In the future, other emerging technologies, such as geothermal, may fill the same roles as biomass and SMR. EWEB is also monitoring these new technologies as they develop. But the lack of accurate and pricing and other data makes it difficult to model these resources at this time.

Recommendation

Following a brief presentation, Commissioners are encouraged to provide comments and ask questions on the topic.

Requested Board Action

No Board Action is requested.

References

Bailey, Michael P.E. (2022). *2040 Clean Energy Sensitivites Study*. Western Electric Coordinating Council.