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## EverGREEN 2045: An Energy Mix to Decarbonize Washington State

The Washington State Clean Energy Transformation Act (CETA) transitions the state to 100% clean energy by 2045. We examined the potential for flexible resources, including small modular reactors (SMRs), to replace existing fossil-fuel generation. We partnered with X-energy, developer of a Gen-IV High-Temperature Gas-cooled Reactor (HTGR) –the Xe-100, to gain access to proprietary cost data and develop realistic cost estimates. We designed future resource mix scenarios compliant with CETA and included deployments of SMRs and other flexible resources. We used power systems analysis tools (production cost modeling and transient stability analysis) to examine the cost and stability of the future resource mix. We investigated the economic feasibility of SMRs using the value of services earned. With our integrated economic and engineering modeling approach, we found that revenues earned are sufficient to cover variable O&M costs, but capacity payments or power purchase agreements will likely be necessary for SMRs to participate in the future resource mix. Other benefits from incorporating SMRs in the future resource mix included reduced carbon dioxide emissions, and in some scenarios, reduced congestion, and price volatility.

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United States

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### Confirm that the work is original and has not been published anywhere else

YES

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