Highlights From the Bureau of Business Research's Initial Analysis:

Economic Impacts of Texas SMR Industry Development, 2024–2055

The Public Utility Commission's Texas Advanced Nuclear Reactor Working Group (Working Group) invited the Bureau of Business Research (BBR) of the IC² Institute at The University of Texas at Austin to conduct a study evaluating the economic impact of the creation of a Small Modular Reactor (SMR) industry in the State of Texas as well as an analysis of the economic impact of deploying SMRs in Texas.

Types of Analyses

1. **ERCOT Grid Modeling –** To estimate necessary cost reduction to make new nuclear generation capacity competitive under current market conditions and future trends.
2. **Estimated Economic Impact –** The total employment, gross domestic product, and disposable income that would be generated by building and deploying SMRs in Texas across 3 investment scenarios (Low, Medium, and High investment). Analysis uses the leading REMI tool for dynamic impact analysis and its E3 package for analyzing specific investments in the energy sector.
3. **Supply Chain Potential** – To characterize the relative potential of Texas businesses based on the number of businesses currently present in Texas industry sectors germane to SMR manufacture and deployment in the context of numbers nationally, comparing Texas to other states with arguably similar potential in the SMR industry. Analysis uses the North American Industry Classification System or NAICS.
4. **Business Surveys** – Findings from two BBR surveys: (1) a survey of Texas Economic Development Council professionals from across the state and (2) a separate survey of manufacturing businesses in Texas. The manufacturers' survey gauged business' interest in participating in the supply chain for SMRs being built in and deployed in and beyond Texas.
5. **Workforce** – A review and findings from an analysis of whether the Texas economy currently has, or can generate in the future, the workforce necessary to manufacture, construct, and operate SMRs in the state. This analysis also presents possible next steps in filling anticipated workforce gaps that might emerge.

Highlights and Key Findings

ERCOT Grid Modeling

SMR nuclear capacity is built when capital expenditures or CAPEX are at or below $2 million per megawatt (MW) and operating expenses or OPEX (fixed) are below $90,000 per megawatt-year.

Modeling results indicate that Houston and Dallas regions are load centers, likely to receive the most SMR capacity because of their industrial needs and growing populations. (SMR deployment may avoid having to meet growing electrical demand by transporting wind and solar power across Texas at peak hours.)

Estimated Economic Impact

We modeled three economic impact scenarios using a range of estimates of 300MW units built and deployed in Texas. Considering that there are no SMRs yet in operation, we acknowledge the wide range of estimates among nuclear energy experts of SMR units expected to be deployed in the next few decades. In addition, we assume SMRs will add to the state and national energy generation mix, not replace or displace existing legacy electrical energy generation.

Of the three scenarios we model (Low, Medium, and High investment), the Medium assumes 37 300MW units built and deployed just in Texas, and 771 built in Texas and deployed across the U.S. over 26 years by 2055, representing 242 gigawatts (GW) of SMR generation in Texas and the U.S. This scenario (a mid-range number of units built and deployed, using mid-range CAPEX and OPEX estimates and a moderate learning rate) results in significant economic impacts. On average, over the next 26 years:

- An annual average of 148,000 people employed directly and indirectly by the new SMR industry (construction, operations, manufacturing).
- $50.6 billion in new economic output in Texas.
- $27.3 billion in income to Texas workers.

Supply Chain Potential in Texas

By categorizing NAICS codes into segments and subsegments, we identify existing industries with the potential to participate in the SMR supply chain in Texas, and we highlight areas of weakness at the state level. The analysis is based on business count location quotients (LQs) for 10 SMR segments and approximately 30 subsegments. Texas is strong compared to the nation across the SMR supply chain, yet there are other states that are also competitive with Texas in their ability to support an advanced nuclear energy plant supply chain.

Business Survey

Approximately 35% of participants in our survey expressed interest in participating in an SMR supply chain. Based on this survey, industrial manufacturers are more likely to participate in certain segments and subsegments of the industry (e.g., balance of plant, inputs, and support services), though incentives are necessary to realize participation of these and other industry segments. Optimistically, about half of businesses are interested in using SMR power, including from the grid or private ownership.

Texas Economic Development Council Survey

More than 90 economic development officials with the Texas Economic Development Council (TEDC) responded to our survey with approximately 80 having experience in the past five years with siting or expansion of industrial plants and facilities. We received responses from city, county, and economic development entities in all 12 regions of Texas (Comptroller's official regions).

Electric power capacity is the single most important factor currently impacting (expansion or siting of) new industrial projects in their areas with "water supply," "access to talent," "access to development ready sites," and "taxes and incentives" next in priority.

Officials rated the importance of the following characteristics of energy in this order:

- Certainty of electricity being available when facility begins operation
- 24/7 electricity without interruptions
- Amount of time before electricity would be available at the facility
- Cost of electricity
- Decarbonized source (green) of electricity

Numerous specific examples were citied of instances in their areas in which insufficient energy/electricity availability had negatively affected a siting decision.

Workforce Analysis

We utilized multiple data sources and methodologies in reviewing a range of workforce issues. The analysis collected information and data through interviews about current nuclear workforce challenges, anticipated operational and construction employment from a 300 MW SMR, and forecasts of operational and construction/manufacturing employment from the REMI economic impact model, using the medium scenario of 37 SMRs deployed in Texas and 771 manufactured in Texas. Our analysis concluded that the state should not have any major issues supplying an operational workforce. Initial employment from operations occurs in 2033 with approximately 1,000 workers, ramps up slowly, and peaks in 2055 at approximately 46,000 workers. Manufacturing and construction employment would begin in 2030 with more than 11,000 employees. The ramp-up is much faster and peaks in 2046 at approximately 250,000 workers. The major uncertainty and potential workforce challenge appears to be with a number of production-oriented occupations for manufacturing SMRs. We suggest a future monitoring function regarding workforce issues. A monitoring unit could perform a series of tasks to ensure adequately trained operational and manufacturing employees would be available if, and when, SMRs move forward.

Full Report

Despite the uncertainties inherent in estimating the economic impacts of an SMR industry that is in its earliest stages, the research team has used the most reliable modeling and other methodological approaches available to present policymakers, local leaders, and industry experts with up-to-date information about the potential economic benefits that may accrue to the state from manufacturing and deploying SMRs in Texas.

See the full report in Appendix A.