Missourians for a Balanced Energy Future

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The Arguments in Missouri for Small Module Reactors (SMR)

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Missouri faces challenges in retaining a role in manufacturing, and developing new industrial technologies. When this author moved to Jefferson City at the age of about 5, his mother worked at a factory on Industrial Drive, where there were many factories. Today most of Industrial Drive consists of warehouses, housing goods manufactured somewhere else, many times in other countries.

The Brown Shoe companies that were in many, many small Missouri towns in the 60's and 70's are unlikely ever to return or be replaced. Missouri needs to think differently about the new generation of technologies and jobs that can be created.

The new nuclear technology of Small Modular Reactors (SMR) is such a potential opportunity. Missouri has not had any new nuclear development since the opening of the Callaway Nuclear Plant in the 1980's. Part of the reason is that building a large nuclear plant such as Callaway is extraordinarily expensive, requires enormous amounts of invested capital, and has competitive risk with other forms of energy. Construction also may take four years or longer.

As noted by Moody Investor Services, new large scale nuclear generation plants are a "bet the farm" endeavor for most companies. A University of Chicago analysis shows that nuclear investor owned utilities on average have about $13 billion in annual revenues, and a large scale nuclear generation facility may cost up to $12 billion to construct. Amortizing such a large investment, and the interest cost during construction, is a challenge.

SMR on the other hand is a modular approach to nuclear energy, with shorter construction timeframes, less capital invested, and less competitive risk. The long-term plan for SMR development is to design and then construct the first of a kind SMR's on site. The lessons learned through this process would then translate into the development of one or more factories to fabricate on a larger scale the modules for subsequent SMR plants. These modules (when the industry is mature) would then be transported to the SMR construction site to be assembled at that site.

The University of Chicago, Energy Policy Institute at Chicago, study premises that when mature, SMR generated power would be competitive with the historical cost of natural gas generated power. This study is premised on a theoretical SMR of 600 megawatts (6 modules of 100 megawatts). Current designs by various companies have different module sizes (the Westinghouse module is 225 megawatts). However, since the design is modular, the important determinant is how many modules are on a site. For example, two or three of the Westinghouse modules would be equal to the Chicago study theoretical 600 megawatt site.

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Where does the energy consumer in Missouri fit into this discussion? Long term, Missouri consumers will be well served to have a competitive and sustainable energy supply. Much of Missouri's current energy supply comes from fossil fueled plants that are aging and will need to be replaced. The replacement of an aging coal powered plant may itself cost $5 to $6 billion. Ultimately energy costs are borne by the consumer, and so cost effective energy development is in the consumer's interest.

There is a legitimate argument that early SMR generated power will be at an above market rate cost, and that argument is probably correct. Those early costs will have to be borne either by the manufacturer of the SMR plant (as a cost of business development) or subsidized by federal participation, or a combination of both. We believe the Missouri Public Service Commission will not allow the purchase (and pass through to consumers) of non-market priced energy, and thus early stage SMR development should not impact Missouri consumers.

What are the economics of SMR development? It is estimated that the first few plants (like the theoretical 600 megawatt plant) will cost about $2.8 billion to construct, and that the modular factory produced plants will cost about $2 billion when the industry matures. A typical SMR site is estimated to generate employment of over 13,000 jobs.

A study by Dr. Geoffrey Black of Boise State University estimates that in the 2019 to 2030 timeframe, the annual direct sales of SMR manufacturing and installation could exceed $25 billion annually, with other economic impacts as high as an additional $12 billion annually.

The basis for these projections is that SMR technology achieves moderate to high adoption by 2030, and that United States manufacturers capture 50% of the domestic market for SMR modules, and 20% of the international market.

The early leaders in the new SMR industry will be best positioned to take advantage of this economic impact. The Westinghouse/Ameren Alliance is currently competing in a federal competition to develop the first of a kind technology and design. Missouri should not only look at the possible development of an SMR site, but should be forward looking and strive to become the site of the manufacturing facility for future SMR modules.

Locating an SMR facility in Missouri would be good for the Missouri economy, and a long term positive for Missouri energy consumers. Locating the manufacturing facility in Missouri would attract new technology and research, and make Missouri a center for export of the product throughout the United States and the world. Our geographic central location and multi-modal transportation has to be a major positive in that competition.

So the goal of Missouri should be to design and build an SMR plant, but more importantly to aggressively pursue the locating of the manufacturing facility in Missouri.