MAKING WAVES

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SMALL MODULAR REACTORS IN SASKATCHEWAN

Premier Moe's recent promotion of Small Modular Reactors (SMRs) in his Saskatchewan growth plan, followed up by the recent Memorandum of Understanding to cooperate on the development and deployment of SMRs signed by the Premiers of New Brunswick, Ontario and Saskatchewan has been dismissed by some as nothing more than rhetoric, part of the general politicking around provincial opposition to the federal carbon tax. They are wrong. Behind the scenes, both federal and provincial governments have spent several years putting the pieces in place for a successful SMR rollout in Canada. The Centre for the Study of Science and Innovation Policy (CSIP) has been part of the effort to understand the policy challenges posed by SMRs and, especially, the issue of public attitudes to their risks and benefits. This work has been funded by the Social Sciences and Humanities Research Council of Canada, the Sylvia Fedoruk Canadian Centre for Nuclear Innovation and through the generosity of the late Bev Robertson and his family and we now have some significant capacity on the SMR file.

What have we learned? We certainly learned a great deal about the technology itself and the difference between the larger SMRs—those generating close to the 300 MWe upper limit of the International Energy Agency's definition of a small reactor—and the small and very small ones, between 5 and 30 MWe. The markets for these reactors are likely very different, with the former being used by utilities to add flexibility to clean baseload power production, particularly in smaller jurisdictions like Saskatchewan, and the small and very small intended for community level applications, possibly in northern and remote communities. At the moment, the reactor designs themselves are different, with the larger SMRs tending to be scaled down versions of existing large reactors using the common pressurised water design, with the smaller ones based on more innovative configurations. These differences have important implications for the speed at which SMRs might actually start generating commercial electricity, since regulators are more comfortable assessing designs that they know and trust.

Speed is important. One of the first questions at the Premiers' news conference was how quickly SMRs could be developed. Premier Moe gave an estimate of five to ten years, which is broadly supported in the literature. SMRs are being promoted as a clean energy bridging technology, a solution to the urgent need to decarbonize power production at a time when intermittent renewables can destabilize power grids, are incapable of providing continuous power production, and lack power storage solutions on the appropriate scale. Eventually, we can expect that the proponents of renewables will solve these problems and a large part of the case for SMRs will have disappeared.

But SMRs can also do something that most renewables cannot – provide heat as well as electricity. This is important because deep decarbonization means getting off natural gas, too. To heat effectively, however, they will need to be located close to the communities they serve and be trusted as both safe and reliable. Our public opinion work shows that attitudes towards nuclear power remain where they have been for a decade or more. Small and vocal minorities are adamantly hostile or relentlessly optimistic. The rest are mildly supportive but feel they lack knowledge on which to base an informed decision. Our Premier's announcements are a welcome commitment to a technology that shows real promise but much work remains to be done to turn that commitment into a reality. Expect to hear more about SMRs.

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Dr. Rayner earned his Ph.D. at the University of British Columbia and was the principal investigator on a 2009 grant from the Social Sciences and Humanities Research Council that looked at using transition management theories to understand the options for sustainable power generation in Saskatchewan. His research currently focuses on governance arrangements for complex policy problems, especially at the intersection of forests, climate change and energy.