

Energy and Water Systems in Alberta - Geology as Destiny?

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Alberta is a major energy producing area. That energy production is forecast to grow. Energy production requires water: water for pressure maintenance in oilfields, water as steam for oil-sands production, water for refining, water for cooling at power plants, and water stored for generating hydroelectricity. Energy production also creates welcome prosperity and affluence. Prosperity attracts population, and affluent populations demand water for urban use, recreation, and environmental protection. An affluent population also uses more energy.

These factors create an intertwined energy-water-population system. Everyone on earth lives in such a system, but everyone faces different local challenges because of climate, geology, land use, resources, and history. For example, Alberta has a semi-arid environment, long cold winters, a large land area, an uneven distribution of water resources, intensive agricultural use in some areas and native vegetation in others, a growing urban population in the Edmonton-Calgary corridor and very low population density elsewhere. These factors influence the dynamics of the energy-water-population system, but the table is set by the geology.

In this talk, I will describe the energy and water system of Alberta in the context of the first decade of the 21st century, highlighting the linkages and dynamics of the stocks and flows of water in energy production, and consider how the structure of this system may already be predetermined by the geology and resource endowment of our Province.

Dr. Kevin Parks, P.Geol., is Manager of the Alberta Geological Survey of the Energy Resources Conservation Board and Provincial Geologist of Alberta. His professional training is in geology and hydrogeology, with degrees in both from the University of Alberta and University of Calgary. His professional expertise is in resource mapping and estimation, with a particular interest in the nexus of groundwater and energy production in Alberta.