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“Nuclear Power for Colorado”

Abstract

Consider nuclear power for Colorado. Designed with past lessons in mind, proved safe installations and objective regulations, Colorado will enjoy abundant, low-cost electricity to grow an electric power future. Small Modular Reactors (SMR) hold promise for the following power supply qualities: public safety, scalable, unlimited fuel, small footprint for site and waste, underground installation to minimize attacks and natural hazards, distributed power sources, and constant base load power.

The technology is 65 years old, dating from service of the first nuclear submarine, the USS Nautilus. On an early cruise in 1955, she went underwater for 1,381 miles in less than four days. In 2018, after many years of experience with crews working in proximity to nuclear power plants in submarines and aircraft carrier, the Department of Navy reported: “Personnel operating the Navy’s nuclear powered ships receive much less radiation exposure in a year than the average U.S. citizen does from natural background and medical radiation exposure.”

Colorado's nuclear history includes the Fort St. Vrain experience. From the time of first generation of electric power in 1976 to gas-fired plant conversion in 1989, the Fort St. Vrain nuclear power plant was plagued with mechanical problems and cost overruns, and did not achieve sustained electricity production at plant design. It was an experimental work-in-progress, using helium gas in place of water as a coolant. Public Service of Colorado (precursor to Excel Energy) made the decision in 1989 to abandon the nuclear plant, anticipating more expensive design repairs, though the plant had technical promise. Financial loss and legal entanglements are in Colorado's history for nuclear power in Colorado (from Cathy Proctor of the Denver Business Journal June, 2001). The example highlights problems to avoid. The dedicated men and women working at the Fort St. Vrain nuclear facility paved the way for new ways of providing a safe, non-polluting, concentrated, unlimited power supply.

Colorado has a small-scale nuclear reactor - the USGS TRIGA Reactor (GSTR) which has been safely in service since 1969, though its purpose is not for electricity power generation but for research, isotope production, and age-dating of rocks and minerals. The reactor was designed and supplied by General Atomics of San Diego. Sixty such "TRIGA" reactors are in service in the world; the first safe reactor went into operation in 1958. Therefore: there is precedent for safe operation of a small nuclear reactor in Colorado, and lessons available from the Fort St. Vrain experience. Known with certainty: 1) nuclear electric generation has by far the lowest mortality rate of energy industries, such as coal, petroleum, solar, and wind; 2) nuclear power is scalable with unlimited power, unlike solar and wind with land and environmental damage; 3) nuclear energy is a growing sector in economies competing with the USA.

Promise for a new direction toward nuclear power is in "proactive regulations" (described by Dr. Nathan Myhrvold, Vice Chairman of TerraPower, a Bill Gates backed company) and smaller

scale, tested, modular, "factory-built" reactors that are beyond prototype and process problems. Rich Powell, writing for the Wall Street Journal, lists potential builders: Oklo, Inc., TerraPower, and NuScale Power LLC . NuScale is on-track to supply nuclear power to a consortium of Utah cities, aiming at Year 2026 for commercial supply. Colorado can monitor progress of this Utah "UAMPS" project, and prepare the regulatory environment for nuclear power adoption.

Petroleum - our dominant fuel - serves humanity as the greatest transformative gift in human history. Petroleum can continue to serve as a bridge-fuel to a nuclear future. The petroleum industry can provide time and leadership for transition. Nuclear engineers can deliver dependable-power products, and more than one type of nuclear reactor design has safe, efficient prototypes in the world. The greater challenge is bureaucratic. Innovative regulations are needed to provide a framework for new kinds of power sources. To hit the mark for future generations - to keep nuclear engineering and applied geology out of a totalitarian box - write to your Colorado Senators and Representatives and urge them to protect a legal environment where electricity from nuclear energy can flourish.

Our Presenter

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