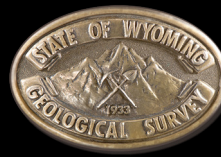


Uranium Resources Summary of 2023



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After decades of low production, optimism is growing among domestic uranium producers, particularly in Wyoming. Increasing support for nuclear energy, strengthening uranium prices, and geopolitical events are driving renewed interest in American uranium. Over the past year, Wyoming's uranium industry has been the first to react by reviving activity at existing mines, increasing staff, and pursuing further exploration and development.

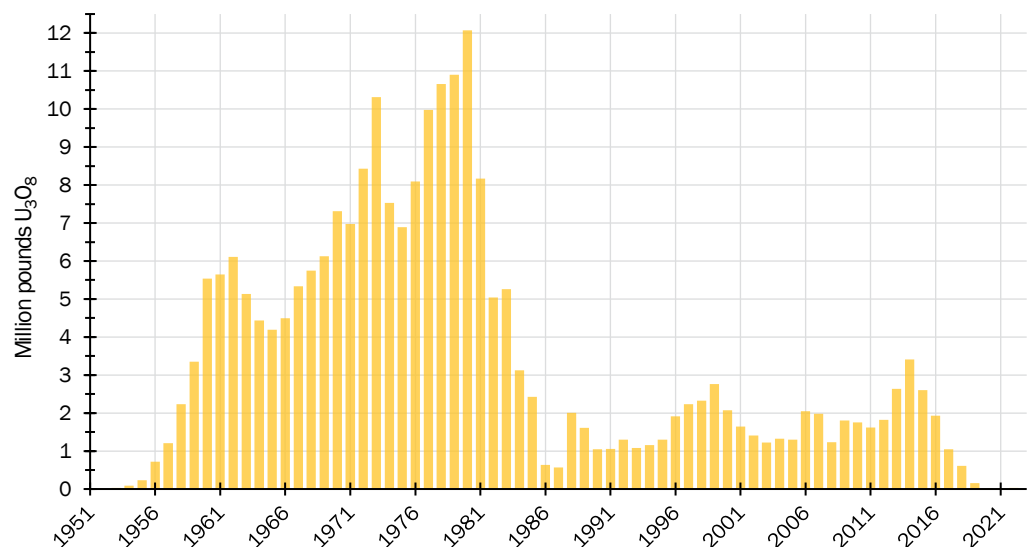
Wyoming has led the country in uranium mining since 1995, and since the first uranium mines started operating in 1951, the state has produced more than 238 million pounds of uranium concentrate (U_3O_8), also known as yellowcake. Wyoming hosts the largest-known economic uranium ore reserves in the United States, which are located across the Powder River Basin, Great Divide Basin, Shirley Basin, and Gas Hills.

Historical context

Both Wyoming and total U.S. production peaked in 1980 at 12.1 and 43.7 million pounds of yellowcake, respectively. In 2014, national domestic production reached a modern-day high of only 4.9 million pounds of yellowcake, which was produced from 10 mines: five in-situ recovery (ISR) mines in Wyoming (comprising 69 percent of domestic production),

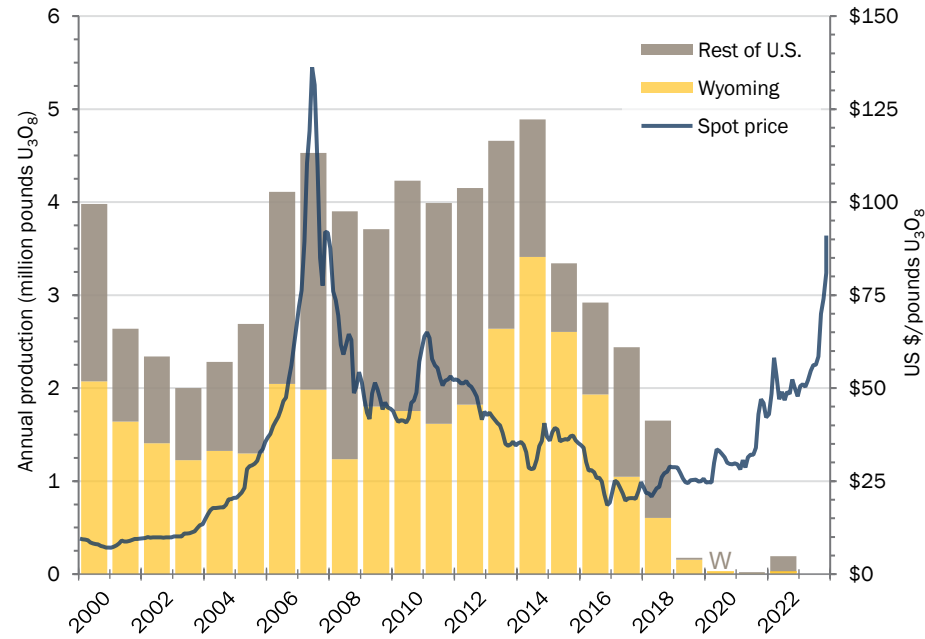
two ISR mines in Texas, one ISR mine in Nebraska, and two underground mines in Arizona. By 2021, domestic production dropped to an historic low of approximately 21,000 pounds of yellowcake. That year, of the 44 million pounds equivalent of U_3O_8 loaded as fuel in American reactors, 93 percent was of foreign origin, according to data from the Energy Information Administration.

This long-term decline in domestic uranium production was driven by low prices resulting from an abundant supply of uranium on the open market. Between 2014 and 2021, low uranium prices made many domestic deposits uneconomic, forcing operators to substantially reduce operations and



Annual yellowcake production in Wyoming since mining first began in 1951.

expenses. As a result, all U.S. mines were eventually idled or shut down entirely. In-situ recovery mines in Wyoming remained viable for longer than those in other states, and therefore are in the best position to ramp up production once prices become favorable.



Annual yellowcake production in Wyoming, the rest of the United States, and average monthly spot prices from 2000 to 2023. National production data from the Energy Information Administration; in 2021, total production was withheld (represented on the graph by a W). Wyoming production compiled from an internal database. Spot prices sourced from the International Monetary Fund and UxC, LLC.

Growing optimism

Since 2021, prices for yellowcake have shown strong growth. Spot prices made a dramatic ascent to 16-year highs, ending 2023 at \$91 per pound. Long-term prices also rose, from \$52 to \$68 per pound, in 2023. A number of global factors have aligned to drive these stronger prices, including forecast supply and demand gaps, restarts and lifetime extensions of existing nuclear power plants, unease about the reliability of global supply chains, and near-term production shortfalls from two major mines in Canada. Efforts to shift toward carbon neutral economies, competition amongst utility companies to secure long-term supply contracts, and the growth of private uranium inventories and trusts—which reduced the amount of stockpiled uranium available on the spot market—have also contributed to rising prices.

As prices strengthened and companies began signing supply contracts with nuclear utilities, activity has begun picking up across the state. Over the past two years, uranium producers have started investing more in existing projects by revamping mine infrastructure and expanding exploratory drilling programs. In 2023, the Lost Creek ISR Mine, in Carbon County, was the first mine to resume commercial production.

Ripples from global events

Just as nuclear power began gaining wider acceptance, recent geopolitical events have called into question the reliability of the nuclear fuel supply chain. Russia's invasion of Ukraine in early 2022 continues to have effects across the industry. Russia plays a major role in the nuclear fuel supply chain, in addition to producing about 5 percent of global uranium supplies. Many shipping companies have reduced or altogether stopped operating at Russian ports, delaying shipments of uranium and fuel products from both Russia and Kazakhstan. The reliance of many countries on Russia for nuclear fuel has discouraged Western countries from enacting the same sanctions on Russian uranium that have been emplaced against Russian oil, gas, and coal. This uneasy realization has led many countries to reconsider the continuing stability of their energy supplies and has encouraged new support for energy independence.

Concerns over global supplies were further heightened after the July 2023 coup in Niger, which produces about 5 percent of global uranium and is one of the top two largest suppliers to the European Union, according to the Supply Agency of the European Atomic Energy Community Market Observatory. In the months following, Nigerien uranium projects have been impacted by supply chain disruptions, causing one uranium mine to go into standby, and other mines under construction are expected to be delayed.

Federal and state incentives

In early 2023, the Department of Energy purchased domestic uranium to establish a Strategic Uranium Reserve. The program was funded with an initial \$75 million to purchase stockpiled, domestically produced, previously mined uranium. Contracts were awarded to five companies for a total of 10 million pounds of yellowcake, purchased at rates between \$60 to \$70 per pound. All five companies—Encore Energy, Energy Fuels, Peninsula, UR-Energy, and Uranium Energy Corp.—are involved in uranium projects in Wyoming. An additional \$14 million was awarded to ConverDyn for conversion of the stockpiled uranium concentrate into a form ready for enrichment, at Honeywell's Metropolis Works plant in Illinois, the only conversion plant in the United States.

In 2020, the Wyoming Legislature modified the severance tax rate for uranium in order to encourage uranium production. It was adjusted into a differential structure where the tax rate depends on the market spot price—at prices less than \$30 per pound, no severance tax is applied; as prices rise so does

the rate, topping out at 4 percent when prices exceed \$60 per pound. These changes will expire at the end of 2025.

Promising outlook for nuclear energy

Uranium’s radioactive decay, which produces heat, is a very concentrated source of energy. Mining uranium is the first step in the process of providing nuclear power. Once the uranium is separated from its host rock, it becomes nuclear fuel through a process of refinement, conversion, enrichment, and fuel fabrication before being loaded into a nuclear reactor. One nuclear fuel pellet—about the size of a grape—contains as much energy as 17,000 cubic feet of natural gas, one ton of coal, or three barrels of oil (American Nuclear Association).

The United States has the largest fleet of nuclear reactors, which provide about 20 percent of domestic electricity. Globally, nuclear power accounts for 10 percent of electrical generation, according to the Energy Information Administration, and is anticipated to continue growing. As an energy-dense power source with low greenhouse gas emissions, nuclear power can efficiently meet growing electricity demands and help governments and industries to meet decarbonization goals. Relative to wind and solar generation, it has significantly lower land-use requirements, can continuously generate electricity, and the higher energy output per nuclear plant will require fewer grid connections than energy output-equivalent wind or solar developments.

New reactors are under construction in at least 18 countries, with hundreds more planned or proposed. Support is growing to extend the lifespan of existing nuclear plants both in the United States and abroad, while countries like Japan are restarting nuclear plants that had been idle for years. A wide variety of advanced reactors are being proposed to provide not only power, but also heat for industrial processes. In Wyoming,

the Natrium advanced reactor demonstration project, which will be near the Naughton power plant at Kemmerer, continues moving forward despite challenges in the nuclear fuel supply chain. The start date was delayed by at least two years, to 2030, as the company, and many others, wait for a non-Russian fuel-supply chain to become established and increase capacity. In fall 2023, one of the soda ash producers near Green River announced a collaboration with a nuclear reactor manufacturer to study the viability of installing small-scale “microreactors” to provide heat and supplemental electricity for trona processing and soda ash production.

Activity picks up across the state

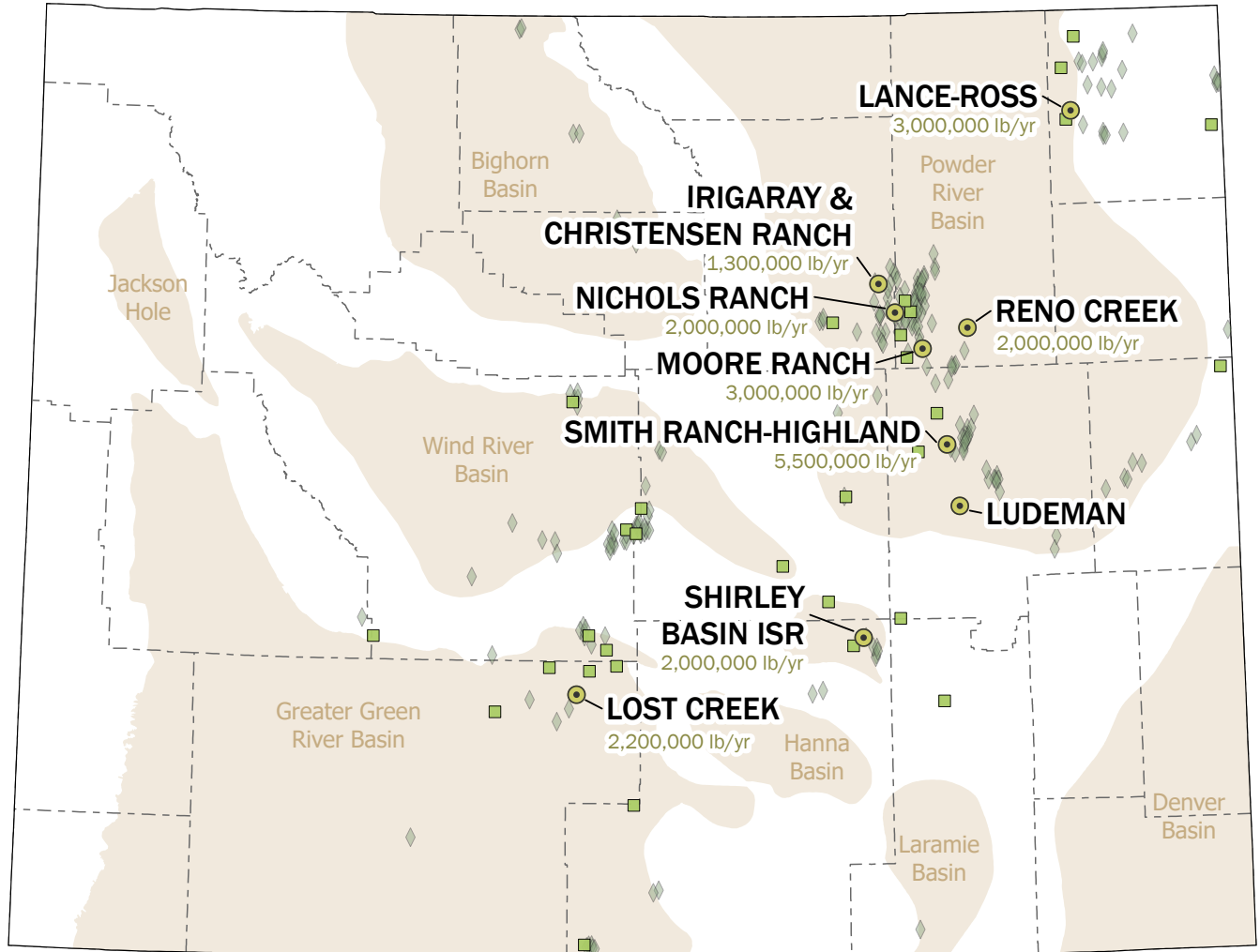
As a result of the promising national and global outlook for uranium demand and resultant successful contracting, one ISR mine in Wyoming restarted commercial operations in 2023, and two others are making preparations in anticipation of ramping up production in the next couple of years.

Twenty-four other projects in Wyoming are in various stages of exploration or planning, with a significant increase in activity over the past few years. Geophysical surveys were conducted for at least four sites, and drilling programs were carried out for at least eight projects. Many projects in Wyoming are building off of a catalogue of historic exploration data to reaffirm previous assessments, delineate known mineralization, and increase resource estimates while keeping expenditures low.

While factors such as cost and reliable supply chains remain obstacles to expansion of nuclear power and the deployment of smaller-scale advanced reactors, the strength of Wyoming’s uranium industry is heavily reliant on the price of uranium, which is driven by demand from nuclear power. As local and global demand grows, so will Wyoming’s uranium industry.

Uranium ISR operations in Wyoming with current source material and byproduct licenses.

Operation	Owner/Operator	Licensed production capacity (lb U ₃ O ₈ / year)	Status
Lance-Ross	Peninsula/Strata	3,000,000	Commercial operations expected to resume late 2024–2025, pending processing plant expansion
Lost Creek	UR-Energy/Lost Creek	2,200,000	Resumed commercial operations mid-2023
Moore Ranch	Uranium Energy Corp	3,000,000	Not yet constructed
Nichols Ranch	Energy Fuels/Uranerz	2,000,000	Standby
Reno Creek	Uranium Energy Corp/AUC	2,000,000	Not yet constructed
Shirley Basin ISR	UR-Energy/Pathfinder	2,000,000	Not yet constructed
Smith Ranch-Highland	Cameco/Power Resources	5,500,000	Standby
Willow Creek (Christensen Ranch, Irigaray, and Ludeman)	Uranium Energy Corp	1,300,000	Restart pending final decision in 2024; Ludeman site not yet constructed



- **Licensed uranium operation**
Maximum licensed production capacity, pounds (lb)
- **Exploration or development stage project**
- ◆ **Historic uranium mine**
- Sedimentary basin**

Map of Wyoming showing uranium mines and projects in 2023, including fully constructed in-situ recovery mines, early stage exploration projects, and former mines. Each licensed operation is approved to process a maximum amount of source material per year; this value is reported in green, if known.