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Effort to move away from Russian nuclear fuel started by nations at G7 meeting

- Joint efforts result of Ukraine invasion, climate issues
- Agreement signed during G7 energy summit in Japan
- Initiative covers mining, conversion, enrichment, fabrication

Canada, France, Japan, the UK and the US April 16 signed a cooperation agreement to work together to support the stable supply of nuclear fuel and to reduce dependence on Russian supplies for fuel fabrication and services, the governments of the countries said in a statement April 16.

The agreement, which was announced during the G7 Energy Ministers summit meeting in Sapporo, Japan, was a consequence of Russia's Feb. 24, 2022, invasion of Ukraine, the countries said. The G7 meeting took place April 15 and 16.

Russia's "unprovoked and unjustifiable war against Ukraine and the increasing impacts of climate change have fundamentally altered the global energy landscape and accelerated the need for collaboration between like-minded allies" the five countries said.

During the June 2022 G7 meeting in the UK, the leaders of the five countries had "made clear our collective intent to reduce reliance on civil nuclear and related goods from Russia, including

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Dutch expert report on 2050 energy scenario casts doubts on nuclear role

- Dutch grid may be largely decarbonized before new units added
- Grid issues may arise if new units are built at Borssele

Dutch preparations for construction of two large nuclear reactors will proceed, the Ministry for Climate and Energy has said, in spite of an expert report commissioned by the ministry highlighting a series of questions undermining the case for nuclear power and urging the government to "take no irreversible steps" in the construction of new units in the country until these questions are resolved.

The "Outlook for the Energy System in 2050" report was presented April 12 to Dutch Minister for Climate and Energy, Rob Jetten, almost a year after he had created the group of independent experts to recommend energy sector measures required to help the Netherlands achieve climate neutrality by 2050. The experts' report will be used to help the ministry draft a long-term energy strategy to 2050, which is expected to be ready by the end of 2023.

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Nuclear utilities seek to increase capacity, support hydrogen production

- Interest in power uprates a marked turnaround, lawyer says
- Constellation stepping up spending on uprates, nuclear fuel

Half of the existing nuclear reactor fleet in the US is considering capacity increases to take advantage of clean energy tax credits, while several nuclear power plant owners are working on hydrogen production demonstration projects to aid the clean energy transition, a panel of nuclear industry speakers said April 14.

Xcel Energy's Prairie Island nuclear plant in Minnesota, Constellation Energy's Nine Mile Point in New York, Arizona Public Service's Palo Verde plant in Arizona and Energy Harbor's Davis Besse in Ohio are among the nuclear stations working on hydrogen production demonstration projects, said Tim Walsh, partner at law firm Pillsbury Winthrop Shaw Pittman.

Xcel received a grant for the hydrogen production pilot project and is working with the US Department of Energy's Idaho National Lab on the project, noted Amanda Jepson, manager of nuclear strategy and regulatory policy at Xcel. Xcel, which has two nuclear power plants in Minnesota, is also working on long-duration energy storage and adding solar power on the grounds at the Sherco coal-fired power plant in the state, Jepson said April 14 at an online forum held by the Midwest chapter of the Energy Bar Association.

Xcel's plan to have a carbon-free energy mix by 2050 includes renewable resources and nuclear assets, as the company is seeking a second extension of the operating license for the Monticello nuclear plant while evaluating a possible extension at the two-unit Prairie Island plant, Jepson said.

The renewed interest in boosting the capacity at existing

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reactors through applications at the Nuclear Regulatory Commission marks "a drastic turnaround from a few years ago," when nuclear plant owners were shutting down or considering shutdowns due to economic losses and competition from cheaper generation resources, Walsh said. "We believe the retirements have essentially stopped for the time being," mainly because tax credit provisions in the Inflation Reduction Act specific to keeping current nuclear generation units operating are estimated at $30 billion before being phased out, Walsh said.

Indicative of the turnaround is Constellation's February announcement that it plans to spend $800 million on new equipment and turbine upgrades at its Braidwood and Byron nuclear plants in Illinois, which not that long ago looked like troubled assets slated for possible shutdown, Walsh noted.

Many capacity increases sought for regulatory approval are quite small; however, Constellation is planning a 135-MW jump in combined output at Braidwood and Byron, Walsh said.

Xcel's nuclear units have been operating at a capacity factor above 96%, at an average cost of less than $26/MWh, keeping power costs affordable for utility customers, Jepson said. The company has reduced operating costs at the two plants by more than 30 percent since 2015, Jepson added.

With coal plant retirements occurring with increased frequency and the development of small modular reactors showing promise, "it's a different world out there" for nuclear generation in the future, said Anne Leidich, partner at Pillsbury Winthrop. With clean electricity production tax credits geared toward "first movers" in adding new reactors between 2025 and 2032, progress on SMRs is taking place "in a manner I didn't expect to happen," Leidich said.

Additional credits for siting at retired coal plants

There are bonus tax credits for reactors to be sited at retired coal plants or brownfield sites, which could enable SMRs to be operated as "load following" units used to match output with fluctuating electricity demand, Leidich said. Such operating characteristics are not feasible with the bigger, older reactors designed to operate at full capacity on a continual basis to recover costs, Leidich said.

The increase in nuclear fuel costs since Russia's invasion of Ukraine and reduced reliance on Russian uranium supplies has been substantial, Walsh and Leidich noted. Constellation has testified before Congress, which is considering legislation to boost domestic mining and uranium supply capabilities, that it will increase spending on nuclear fuel by almost 40 percent, Walsh said. The company, which owns more nuclear reactors than any company in the US, paid $850 million for nuclear fuel in 2022 and expects that figure to reach $1.17 billion in 2023, Walsh said.

The development of advanced reactors and plans to produce high-assay, low-enriched uranium domestically hold promise for nuclear units to support the clean energy transition, the speakers noted. HALEU is uranium enriched to more than 5% but less than 20% U-235 and is proposed to be used by most advanced reactor developers. The hope is that new reactor designs and supplies of HALEU will enable nuclear units to run for longer periods before refueling, Leidich said.

— Tom Tiernan

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