



**Atlantic Council**

GLOBAL ENERGY CENTER

# NUCLEAR ENERGY'S ROLE IN NORTH AMERICAN ENERGY SECURITY

---

Midwestern Legislative Conference | July 27, 2025

**Reed Blakemore**

*Director of Research and Programs*  
Atlantic Council Global Energy Center



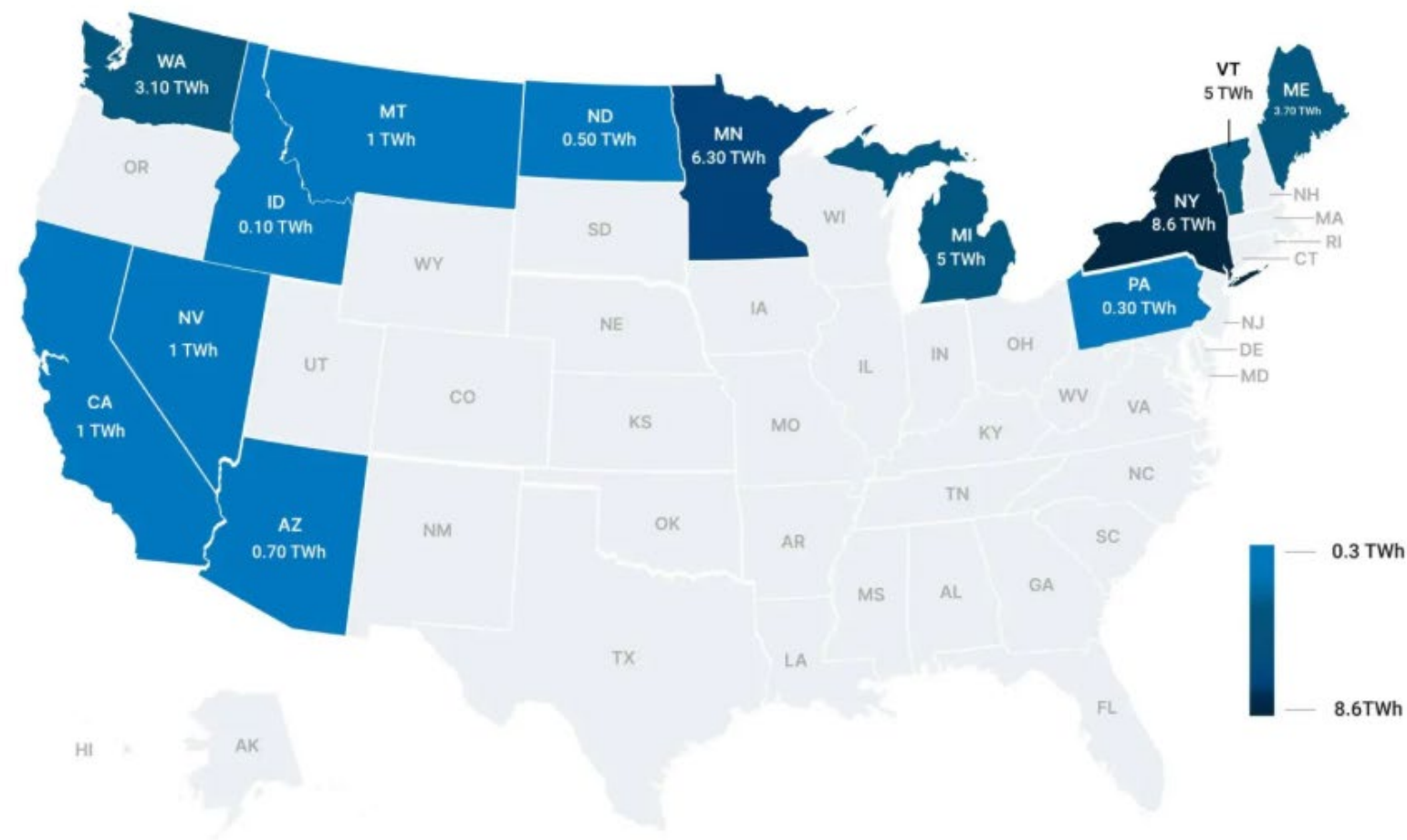
# WHY IS US-CANADA ELECTRICITY TRADE IMPORTANT TO NORTH AMERICAN ENERGY SECURITY?

---

# US-CANADA ELECTRICITY TRADE

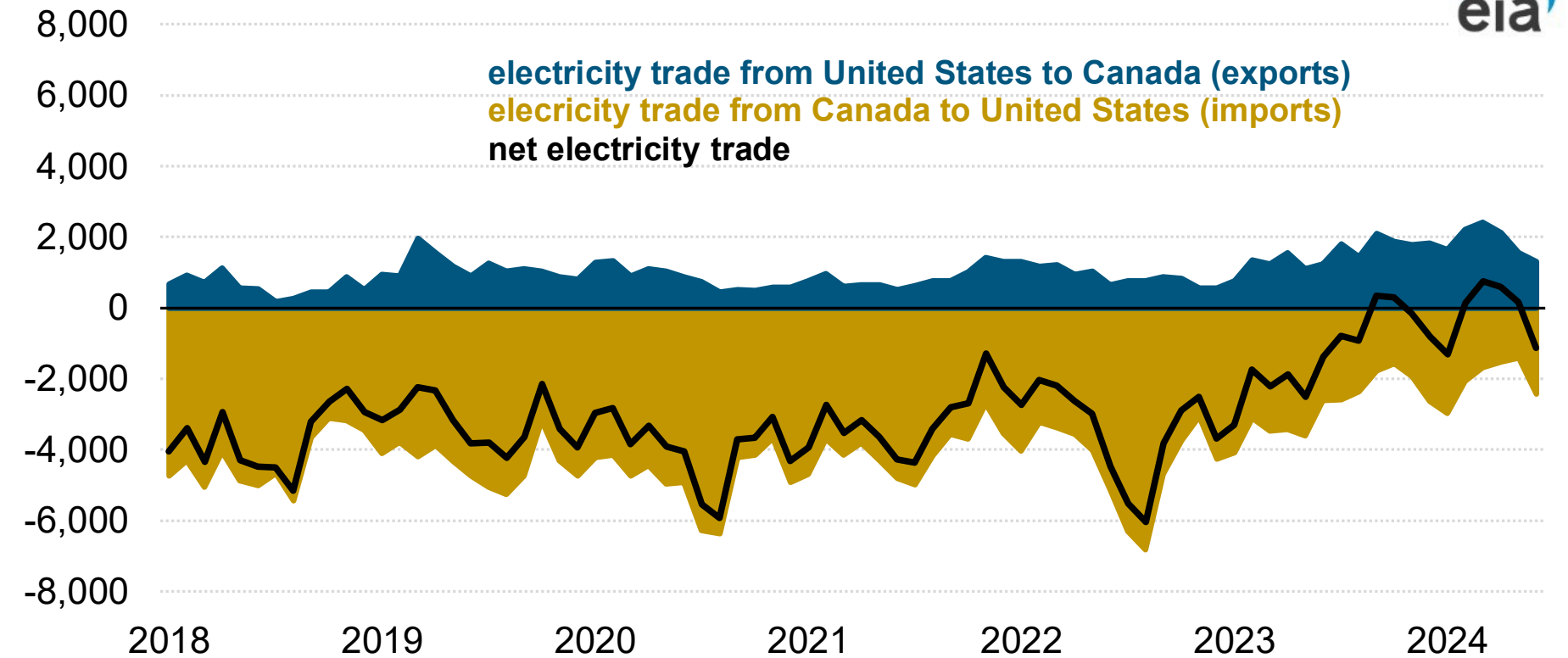
## Powering the U.S.

Canadian electricity exports to the U.S., by state (2024)



Source: Analysis of Statistics Canada data by RBC Thought Leadership

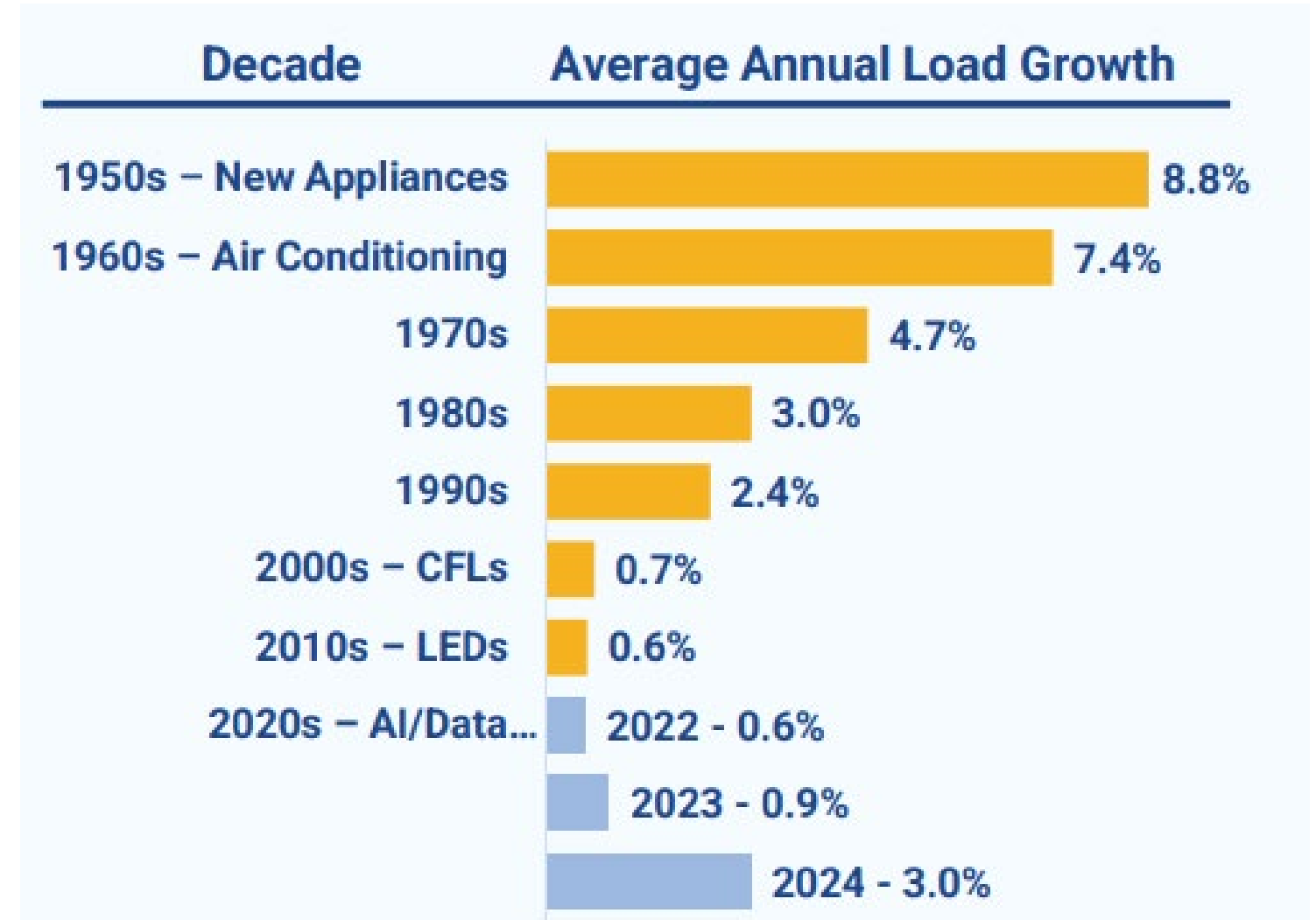
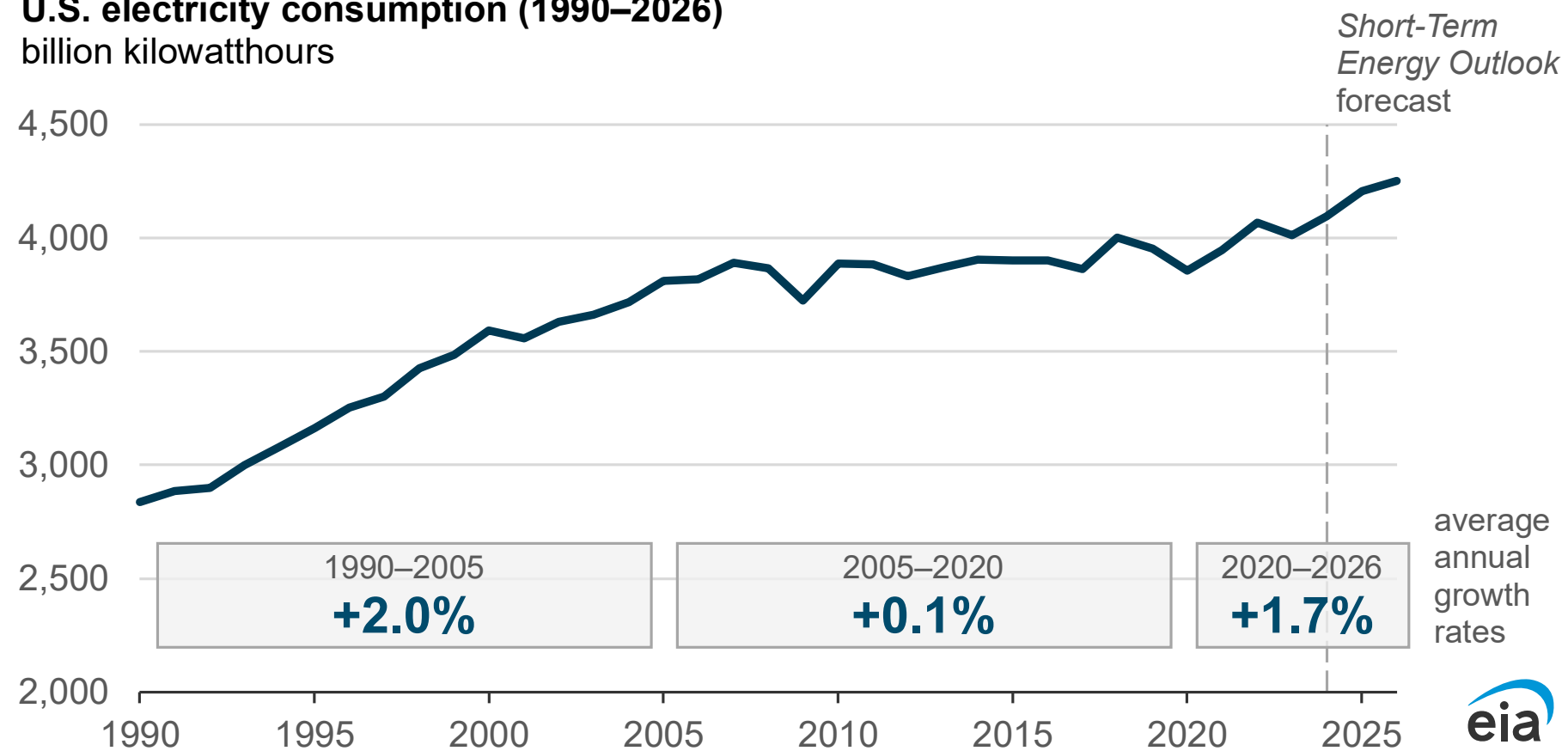
Monthly electricity trade between the United States and Canada (Jan 2018–Jun 2024)  
gigawatthours



Source: US Energy Information Administration, Form EIA-111, [Quarterly Electricity Imports and Exports Report](#)

# DEMAND GROWTH

**U.S. electricity consumption (1990–2026)**  
billion kilowatthours

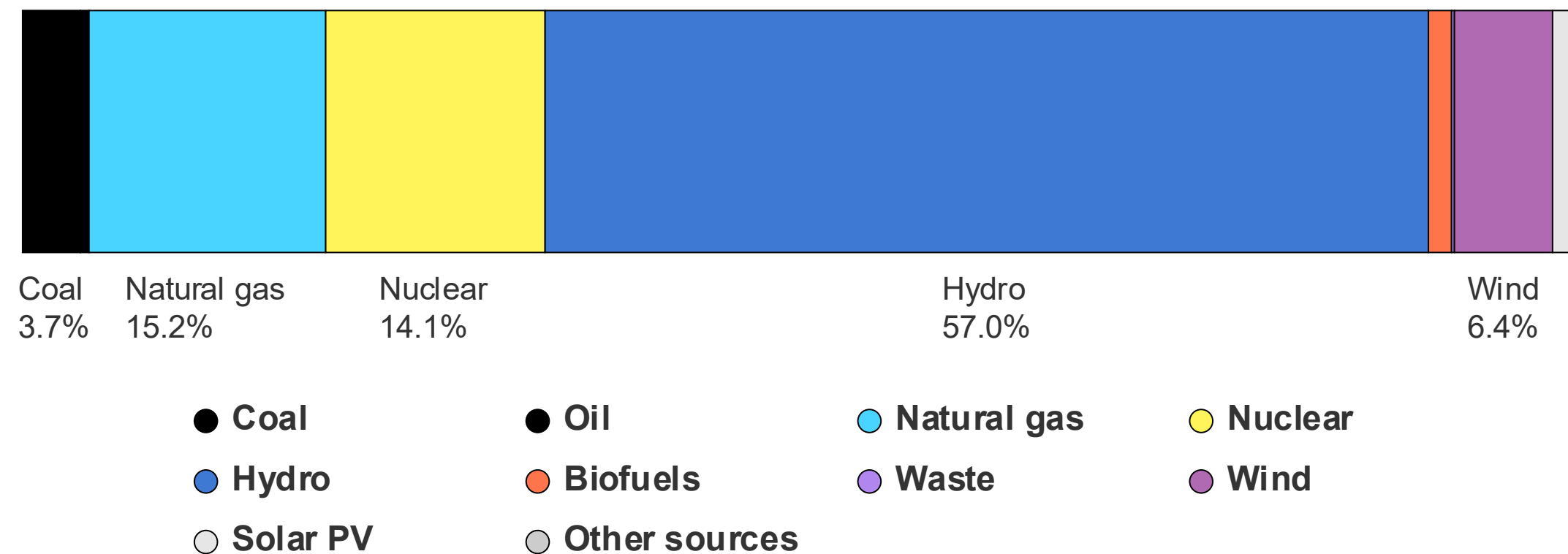


Sources: U.S. Energy Information Administration, [Monthly Energy Review](#) and [Short-Term Energy Outlook](#), (May 2025); Grid Strategies, [Strategic Industries Surging: Driving US Power Demand](#), (December 2024)

# INTEGRATION OF LOWEMISSION SOURCES

US-Canada trade is also crucial for the **integration of low-emission electricity**, notably hydropower.

Electricity generation sources, Canada, 2023



Source: International Energy Agency. Licence: CC BY 4.0

# WHY NUCLEAR?

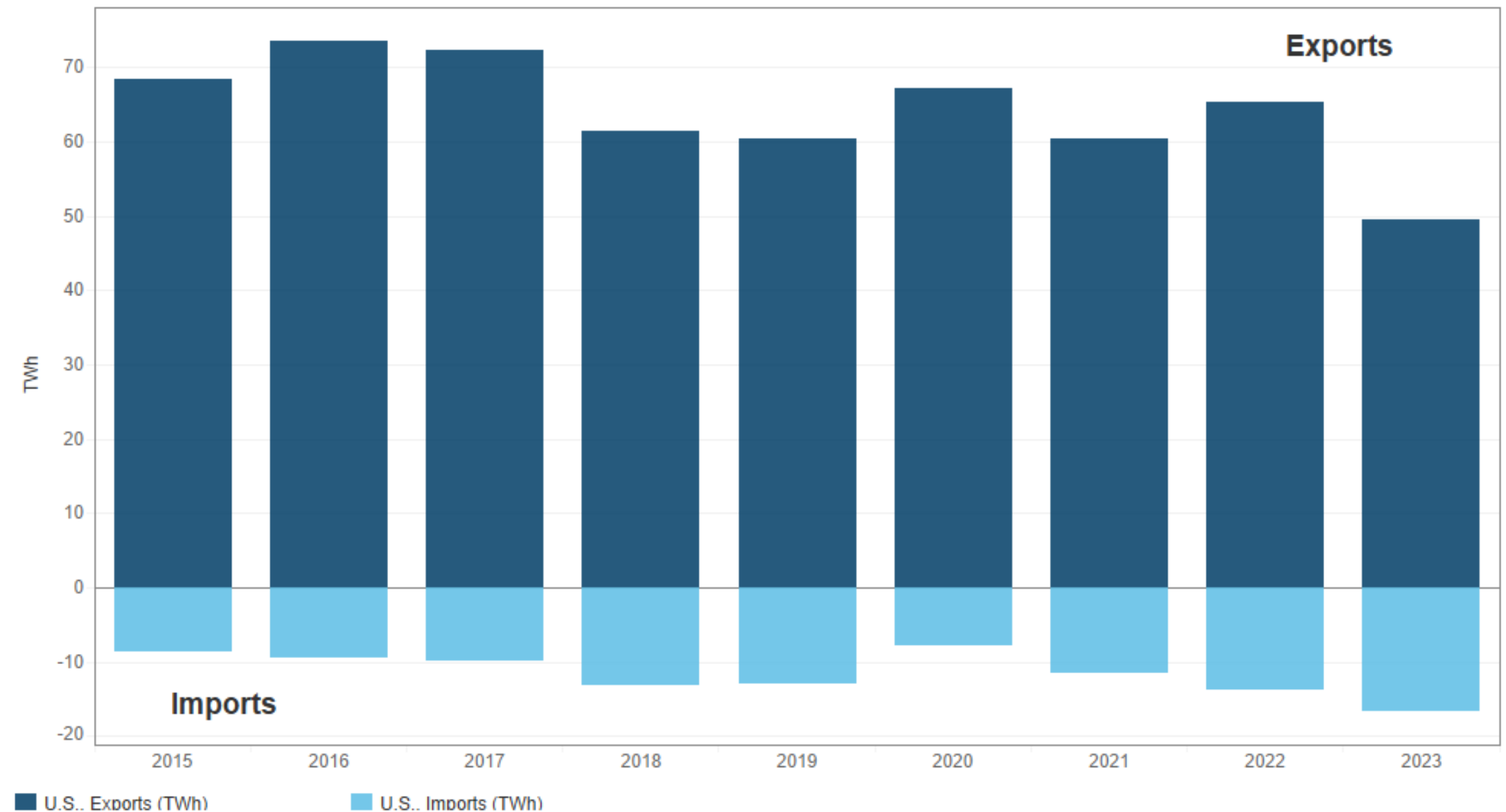
---

# DIVERSE ENERGY SOURCES

In 2023, electricity exports to the US declined by 24.4 percent year over year, due to **reduced hydropower generation** caused by drought conditions.

By diversifying the electricity mix to include expanded nuclear capacity, both the US and Canada can **enhance the resilience of their interconnected grids.**

Canada Electricity Exports to the US



# STRONG BIPARTISAN SUPPORT

Nuclear benefits from **rare bipartisan support** in the US and there is policy momentum at the state, federal, and multinational levels.

This policy congruity across borders and administrations provides a **stable foundation for long-term cooperation**, unlocking investment.

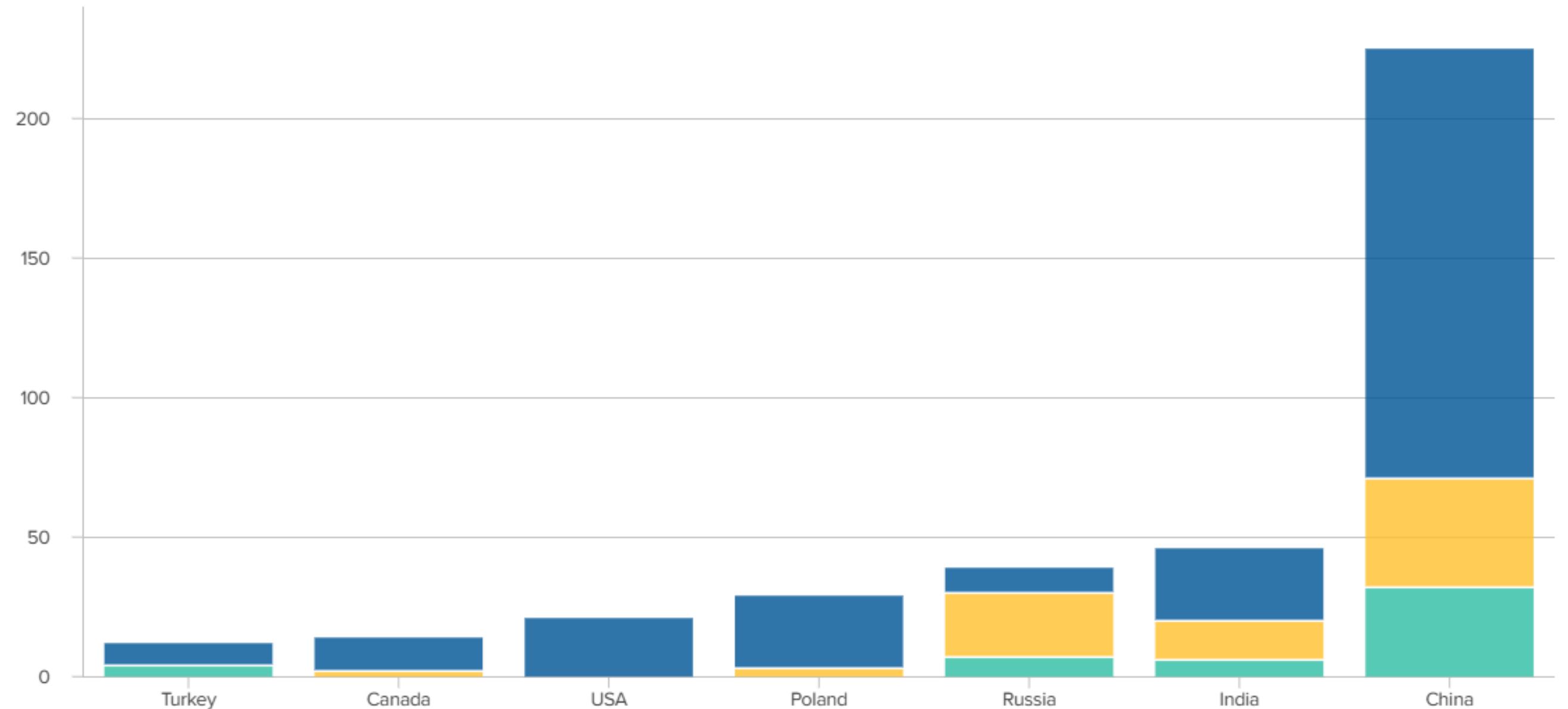


# GEOPOLITICAL INFLUENCE

Increasing American and Canadian leadership on nuclear energy **sets global standards** for safety, security, and nonproliferation.

## Planned and proposed nuclear reactors

Under construction Planned Proposed



Source: [World Nuclear Association](#) (June 2025)

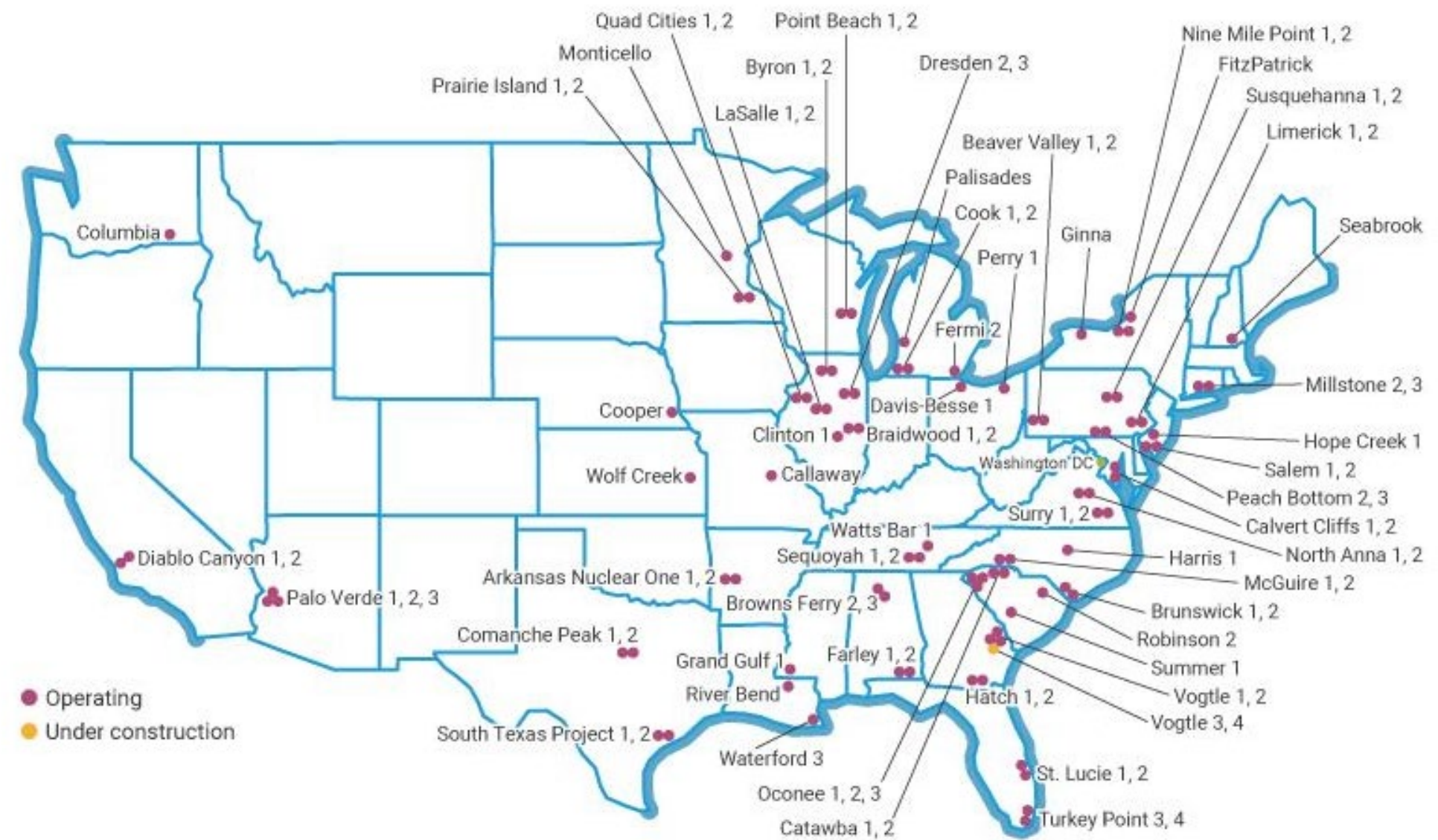
# **BUILDING A COMPETITIVE ADVANTAGE IN NUCLEAR**

---

# US NUCLEAR EXPERTISE

The US is the world's **largest producer of nuclear power**, accounting for about 30 percent of worldwide generation of nuclear electricity.

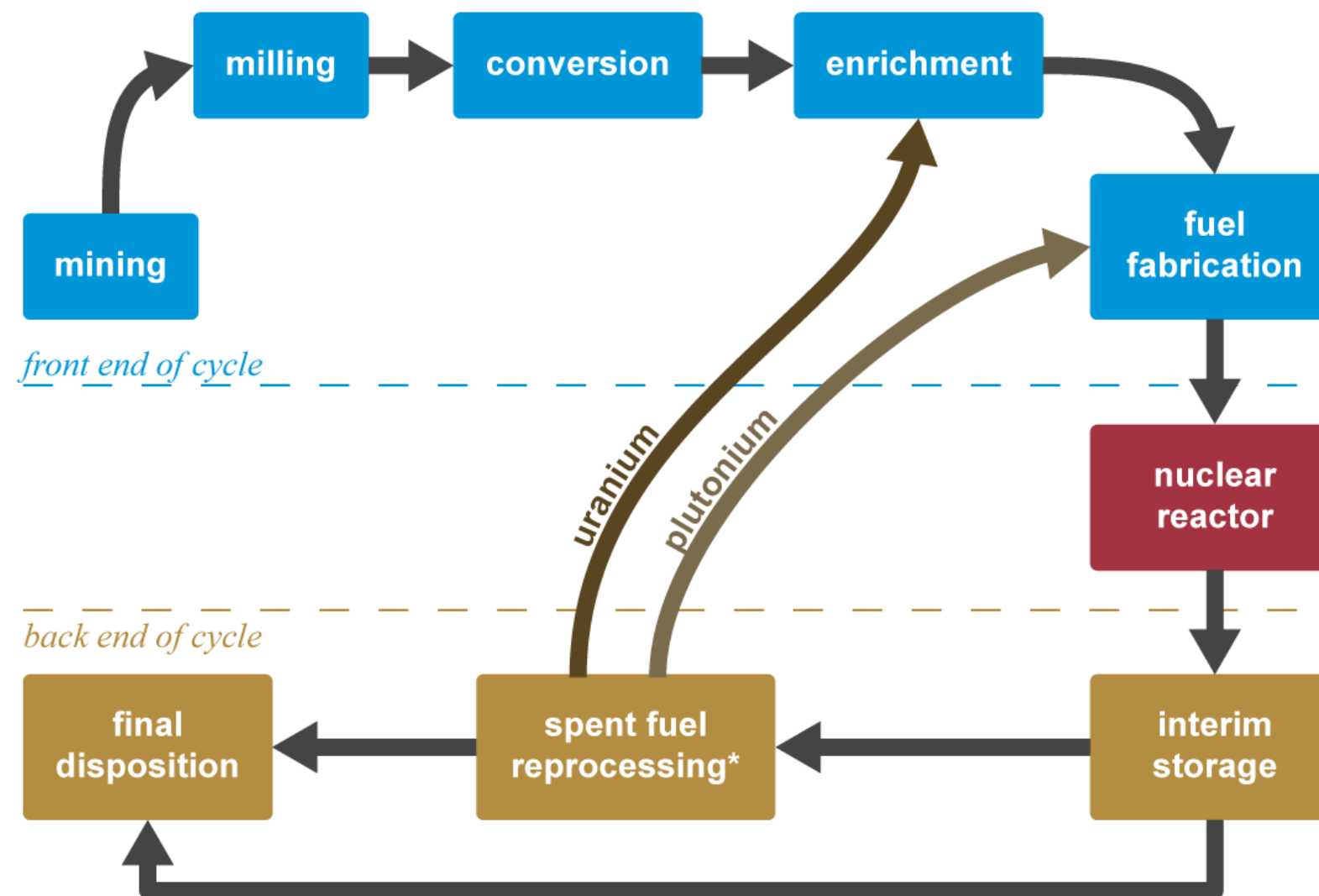
Reactors operating in the USA



# OVERVIEW OF THE FUEL CYCLE

- **Mining & milling:** Uranium ore is extracted and processed into uranium concentrate ("yellowcake").
- **Conversion:** Yellowcake is converted into uranium hexafluoride (UF<sub>6</sub>) gas.
- **Enrichment:** The concentration of uranium-235 (the fissile isotope) is increased from ~0.7% to 3–5%.
- **Fuel fabrication:** Enriched uranium is made into fuel pellets, loaded into rods, and assembled into fuel assemblies.

## Nuclear fuel cycle

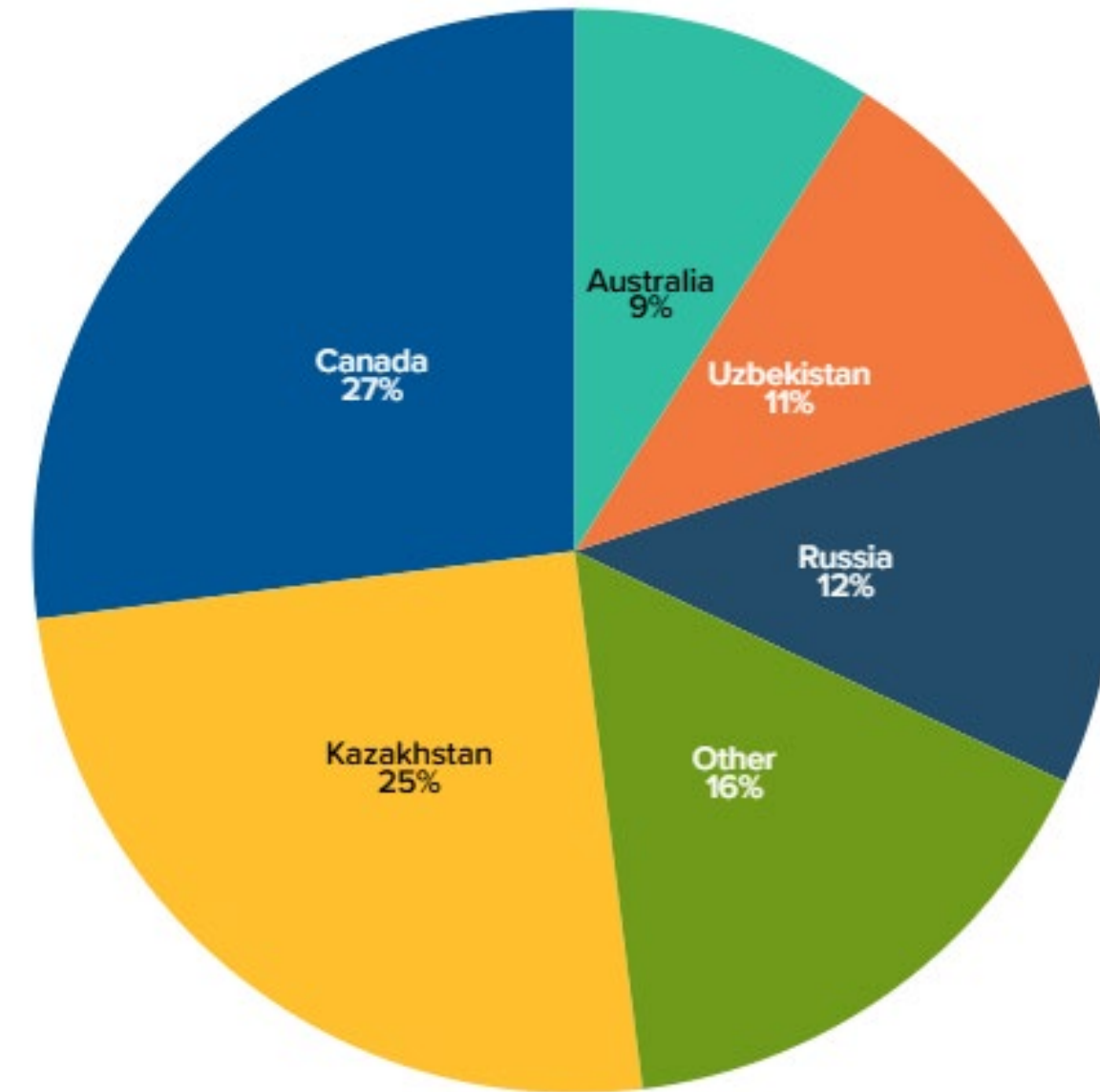


\*Spent fuel reprocessing is omitted from the cycle in most countries, including the United States.

# CANADA'S URANIUM RESOURCES



Sources of US uranium purchases (2022)



Sources: [World Nuclear Association](#); US Energy Information Administration, [Uranium Marketing Annual Report](#), Table 3, June 2023

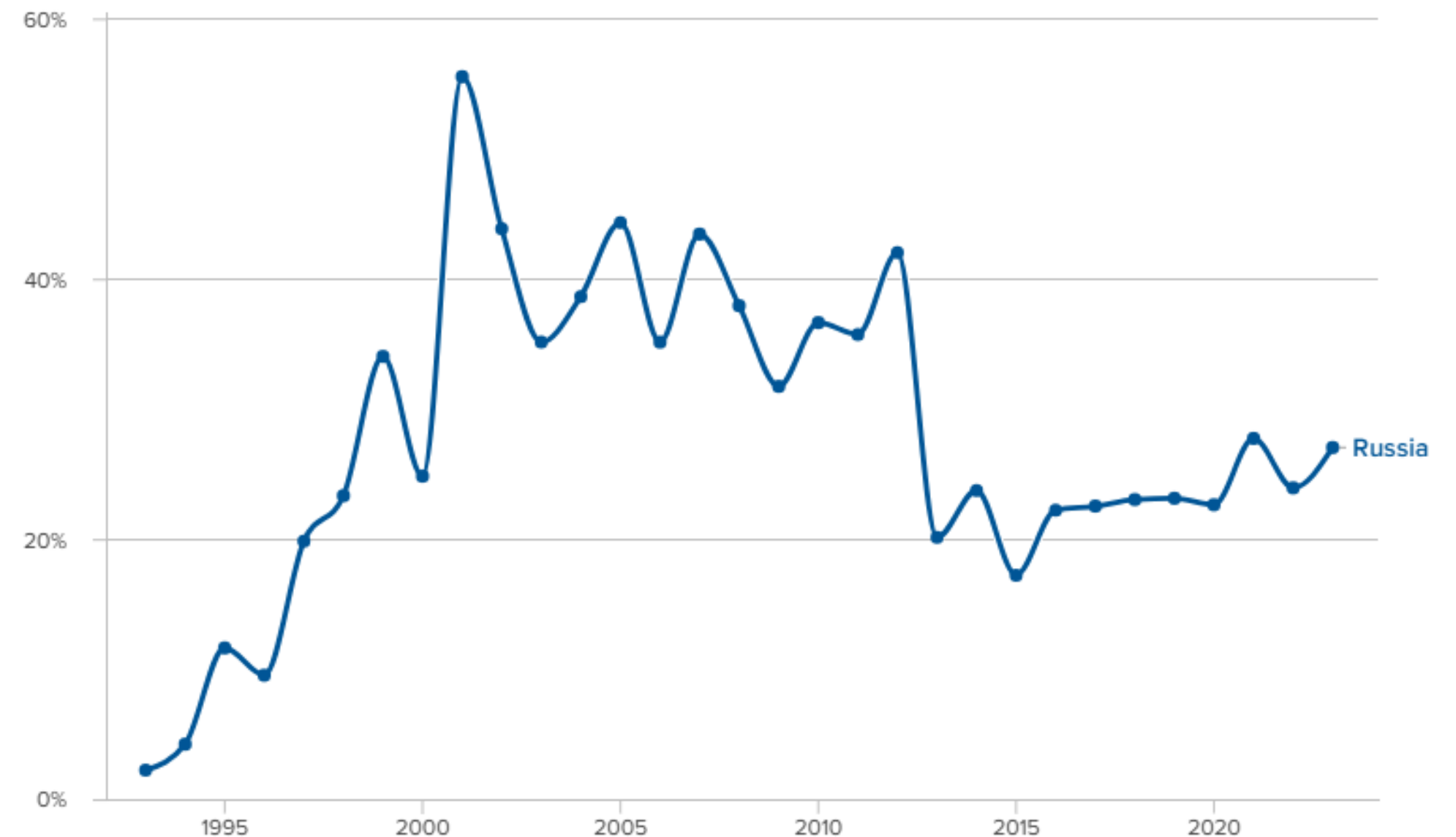
# ENRICHMENT CAPACITY

The US and Canada **lack sufficient domestic capacity** to enrich uranium to the levels and quantities needed.

The US has **historically relied heavily on foreign sources**, including Russia, for enriched uranium.

## US reliance on Russian uranium enrichment services

Russia's share of total uranium enrichment services



Source: US Energy Information Administration

# SECURING THE SUPPLY CHAIN: AREAS OF OPPORTUNITY

US	Canada	Multilateral engagement
<p><b>Inflation Reduction Act:</b> \$700 million for HALEU supply chain; tax credits for existing plants and new reactors</p> <p><b>Enrichment:</b> ~\$2.7 billion towards domestic uranium enrichment capabilities in FY24</p> <p><b>One Big Beautiful Bill Act:</b> \$125 million for SMRs for military use applications</p>	<p><b>Emerging mining projects:</b> McClean Lake, Wheeler River, and Rook1</p> <p><b>Electricity Predevelopment Program:</b> \$52.4 million for SMR and CANDU reactor projects in Saskatchewan, Alberta, and Ontario</p> <p><b>Federal Electricity Fund:</b> \$80 million for Saskpower’s SMR pre-development program; \$55 million for Darlington New Nuclear</p>	<p><b>Regulator cooperation:</b> Canadian, UK, and US nuclear regulators have signed an MOU to boost collaboration on advanced reactor and SMR reviews</p> <p><b>Allied cooperation:</b> The US, Canada, France, Japan, and the UK—known as the Sapporo 5—have committed to developing a nuclear fuel supply chain independent of Russian influence</p>

Sources: [Inflation Reduction Act of 2022](#); [US Department of Energy](#); [One Big Beautiful Bill Act](#); [Government of Canada](#); [US Nuclear Regulatory Commission](#); [US Department of Energy](#)

# KEY NEXT STEPS

---

- 1 Advance supply chain development and reactor construction **in parallel** to minimize risk.
- 2 Launch **demonstration projects** and secure **off-take agreements** to de-risk early deployment, signal market demand, and unlock investment.
- 3 Establish state and provincial nuclear targets and roadmaps to identify **opportunities for collaboration.**

# QUESTIONS?

---