



National Nuclear Security  
Administration (NNSA)

Defense Nuclear  
Nonproliferation (DNN)

# Status of U.S. and International Production of Molybdenum-99 without Highly Enriched Uranium

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# Background on Molybdenum-99 (Mo-99)

Vital medical isotope relied on for over 40,000 U.S. procedures per day

Historically produced using highly enriched uranium (HEU)

Impossible to stockpile

U.S. uses 50% of global supply but relies on imports

Global supply chain subject to shortages



# Advantages of Domestic Mo-99 Production



More efficient – less material lost to radioactive decay



Lower risk of transportation-related disruptions



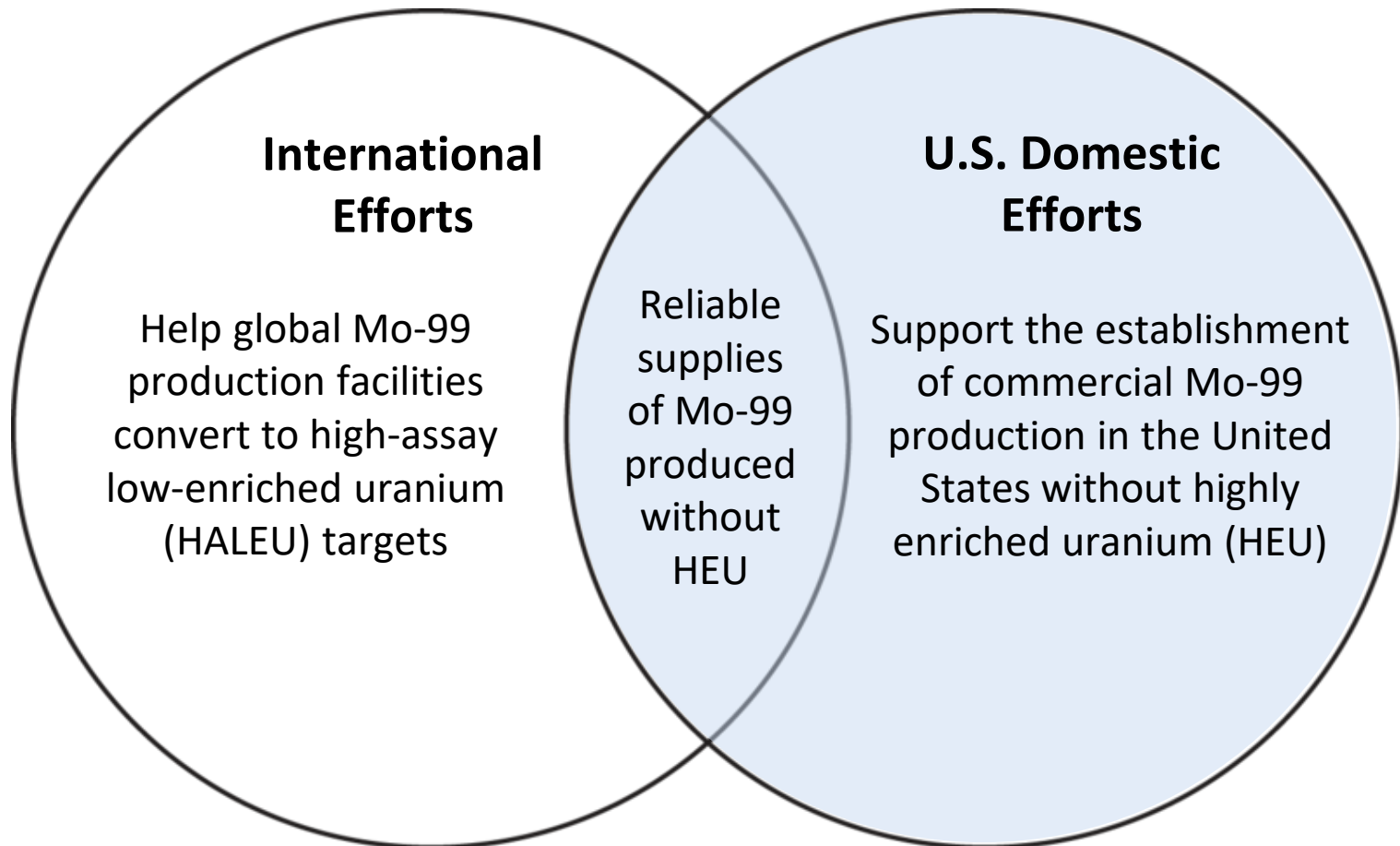
More resilient, due to diverse production technologies



Supports U.S. manufacturing and technology leadership



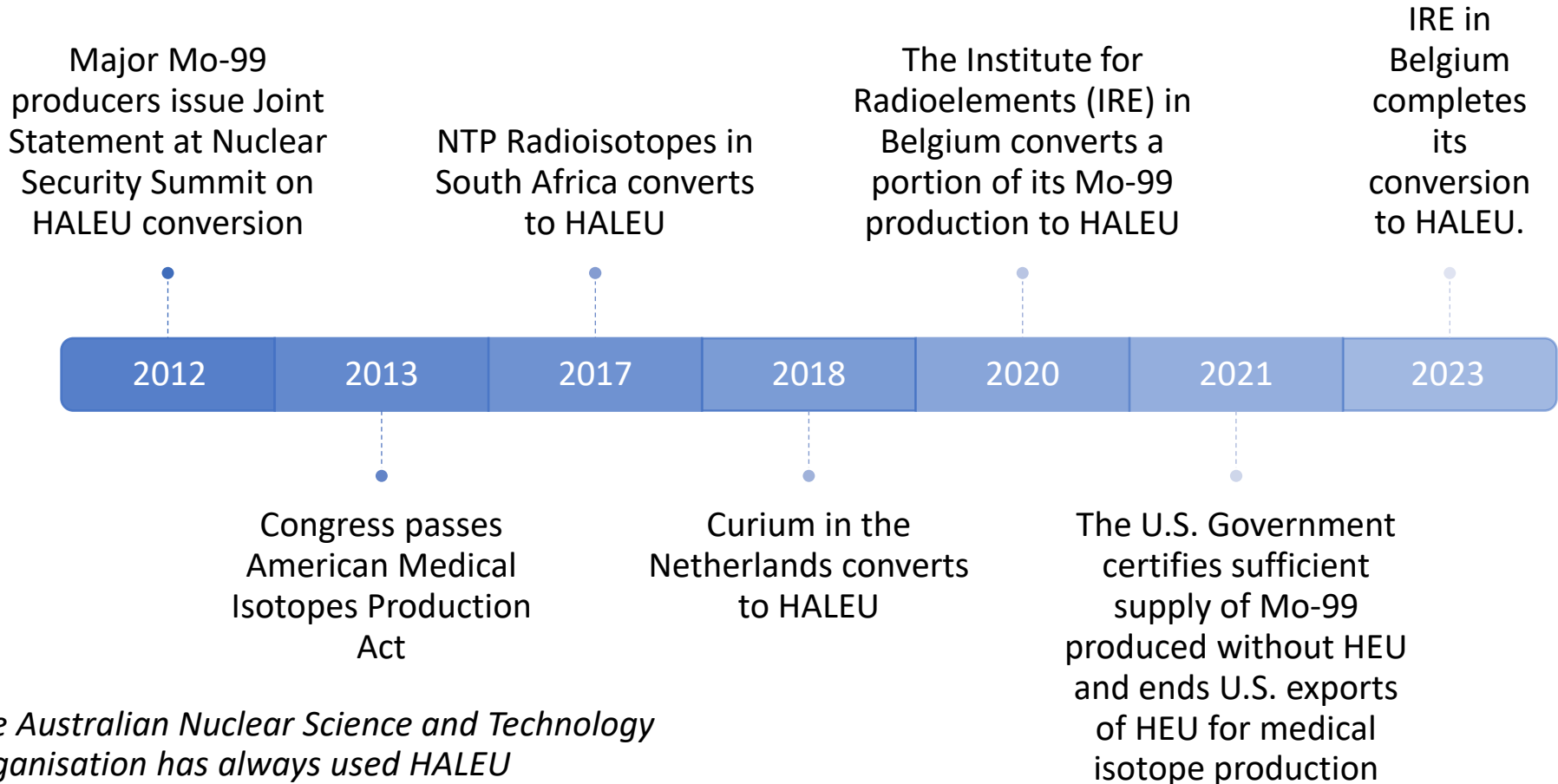
# Goals of NNSA Mo-99 Program





# Completing Conversions from HEU to HALEU

Thanks to NNSA assistance, all four major Mo-99 producers now use HALEU targets



*The Australian Nuclear Science and Technology Organisation has always used HALEU*



# Progress Towards Domestic Production

- Significant progress on Mo-99 production infrastructure:
  - NorthStar production line at Missouri University Research Reactor operated from 2018-2023
  - NorthStar accelerator facility reached hot commissioning
  - SHINE accelerator facility is 75% complete
- Major challenges with private financing and commercialization
- NNSA remains committed to supporting domestic Mo-99 production
  - Congress provided \$50M in new funding in FY 2024 budget
  - NNSA working with other agencies on commercialization challenges



# Outlook for Mo-99 Supply

## Positive Factors

Conversion to HALEU

Supply chain better coordinated and somewhat more diversified

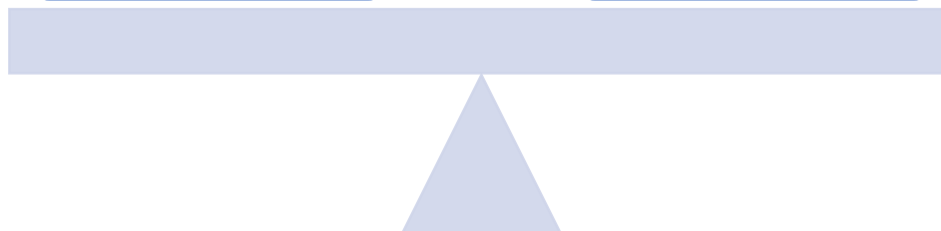
New production projects on the horizon

## Negative Factors

Continued U.S. reliance on imports

Supply chain relies on aging nuclear reactors

Market-based pricing not yet achieved





# Key Take-Aways

1. With NNSA's help, the global Mo-99 supply chain has successfully transitioned from HEU to HALEU, marking a major nuclear nonproliferation milestone.
2. U.S. companies have made significant progress in establishing Mo-99 production infrastructure but have experienced major challenges with financing and commercialization.
3. Domestic Mo-99 production remains a very important goal, especially given risks in the global Mo-99 supply chain.