Converting Mo-99 Production

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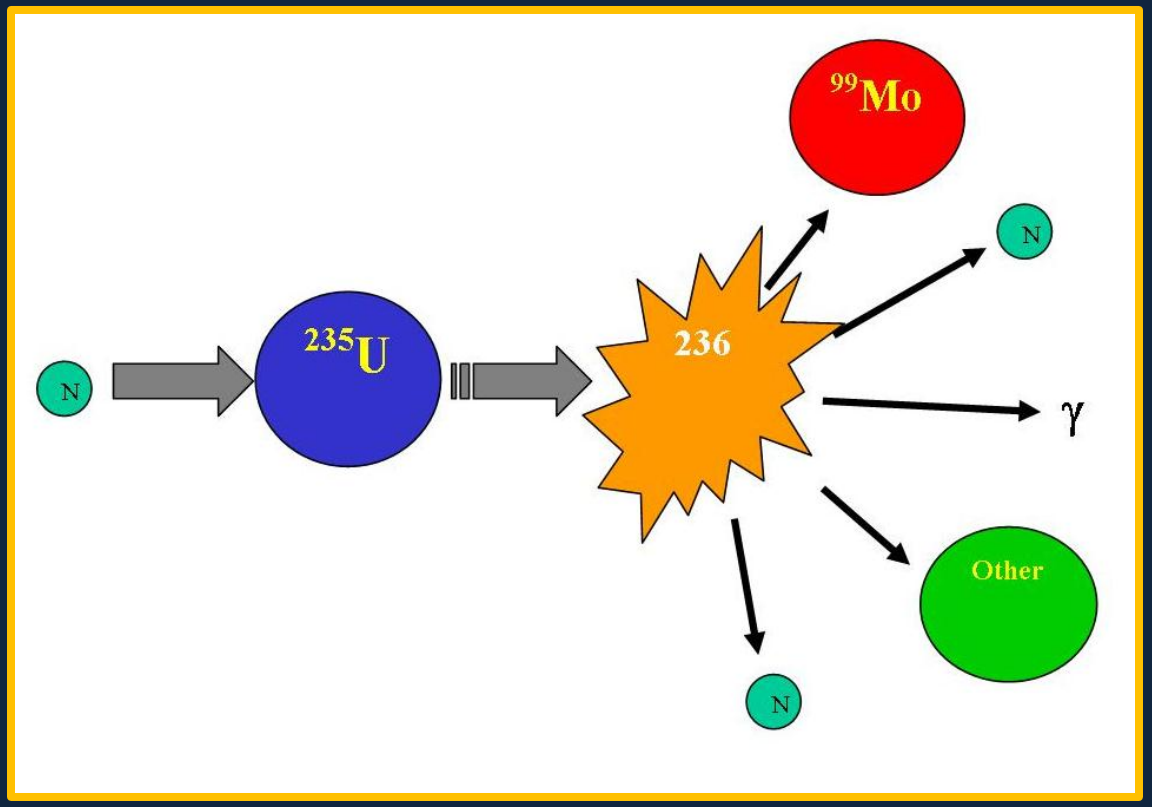
THE NATIONAL ACADEMIES
Advisers to the Nation on Science, Engineering, and Medicine

Mo-99 Production



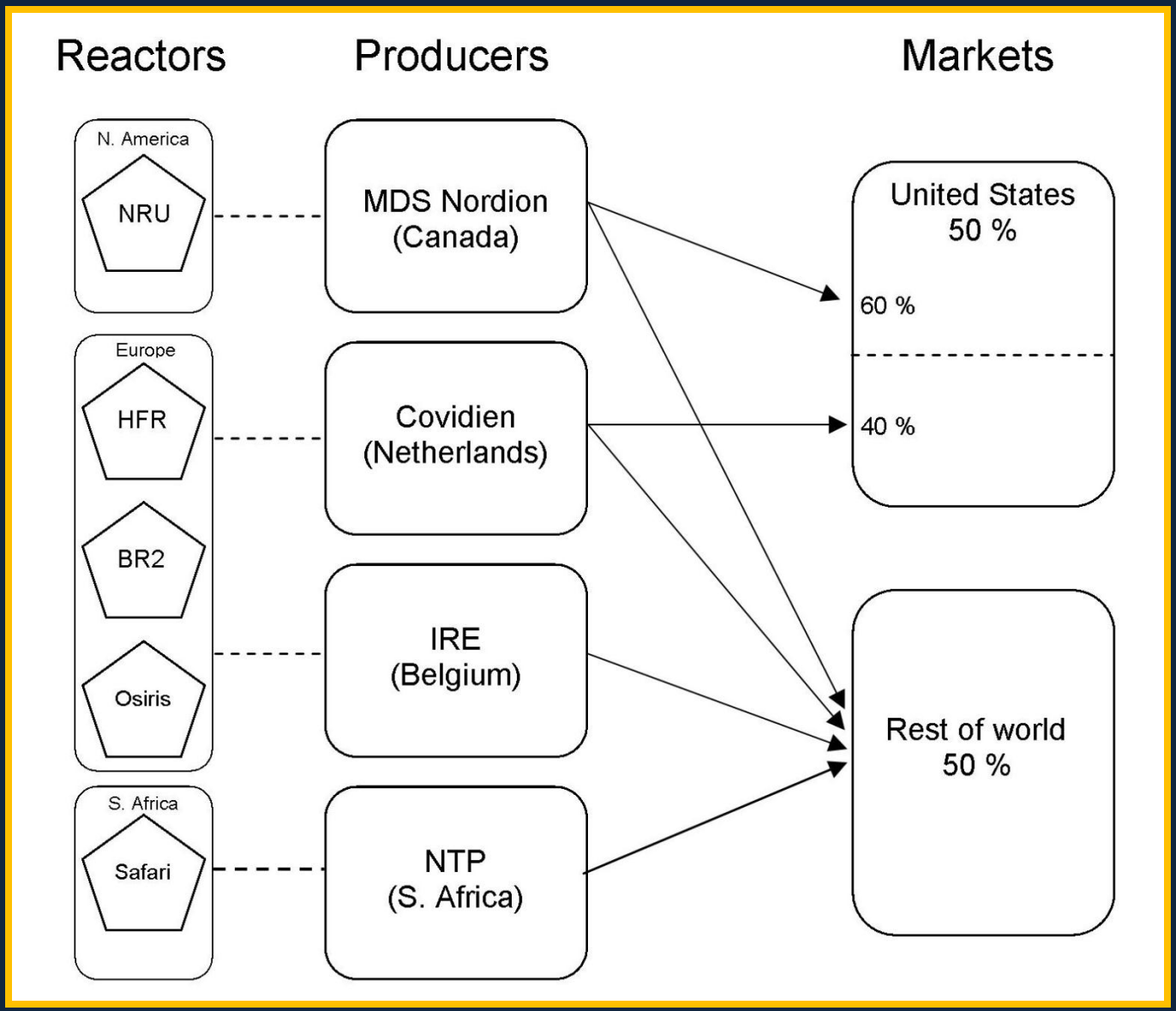
Global production: ~12,000 curies/week (2008/09)

HEU consumption: ~50 kilograms per year

HEU origin: U.S. (93% HEU)

Waste: HEU (solid and liquid)

Mo-99 Production (2008/09)



HEU Elimination Efforts

- Energy Policy Act of 1992
  - Schumer Amendment
- Energy Policy Act of 2005
  - Burr-Bond Amendment
  - National Academy of Sciences Study
- American Medical Isotopes Production Act of 2011 (S. 99)

Medical Isotope Production Without Highly Enriched Uranium (2009)

- LEU targets for Mo-99 production have been developed & demonstrated and could be used in current production facilities
- Cost increase for production likely < 10 % for at least 3 of 4 major producers
- Examine options to downblend HEU waste or encourage its return it to U.S.

Current Progress in Converting

CNEA (Argentina): Small-scale LEU production

ANSTO (Australia): Large-scale LEU production

NTP (S. Africa): Converting to LEU production

IRE/Covidien (Europe): Committed to converting to LEU production

AECL (Canada): No production after 2016

New entrants to supply chain

Five Drivers for Conversion

1. NAS study: Conversion is technically feasible & cost effective
2. Mo-99 shortages demonstrate that market will support higher prices
3. New LEU producers entering market
4. U.S. phase-out of HEU for Mo-99 production
5. U.S. government (DOE-NNSA) support
   - Technical support for conversion
   - Cost sharing for new production technologies

Parallels with Research Reactor Conversion

- Overcome resistance to conversion with consistent government policies/actions
- Use existing technology for early conversions
- Support technology development for later conversions
  - New LEU target materials (LEU foils, LEU solutions)
  - New production methods (neutron activation; photofission)
- Most conversion is yet to come