



# **Strengthening Management of Advanced Reprocessing Technologies (SMART)**

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by

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- SMART bill summary
- Motivations

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  - Used fuel recycling
  - Temporary Storage
  - Funding
- Motivations

## The SMART bill supports the development of commercial reprocessing capacity in the U.S.

- Licensing cost share program
  - 1-2 competitive agreements
  - 50% split with industry
  - 500 MT/yr to 2,500 MT/yr facility capacity
- Long term contracting authority
  - Facilitates funding
  - Construction costs born by industry

# The SMART bill places restrictions on the reprocessing technology to be used.

- Industrial scale
  - 3,000 MT/yr overall target
  - ~\$20B facility costs
- Proliferation resistant
  - Cannot separate pure plutonium
- Resource and repository benefits
  - Reduce repository burden
  - Promote used fuel recycle
- Domestic focus
  - U.S. origin fuel
  - U.S. destination recycle



Rokkasho-Mura

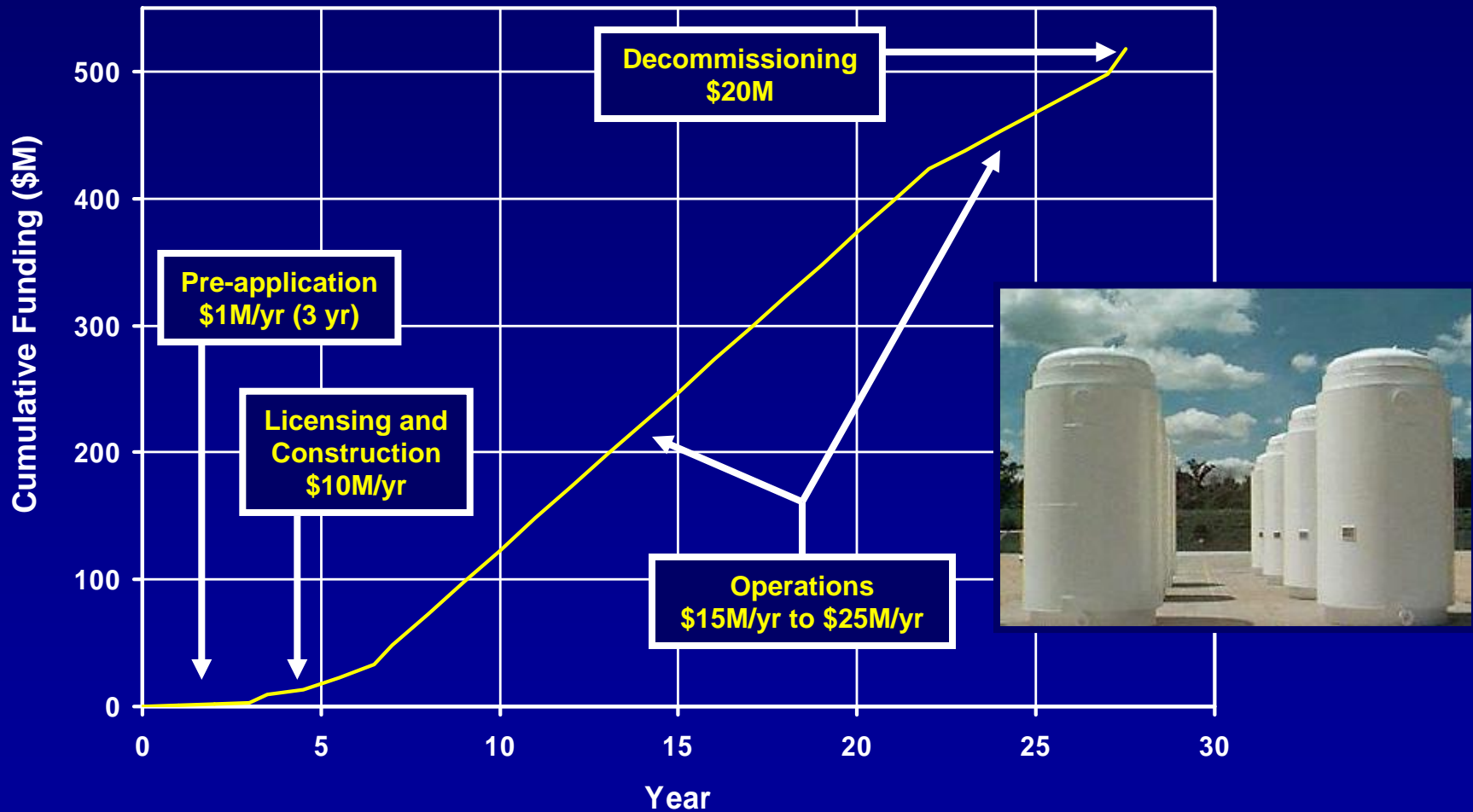


La Hague

# The SMART bill promotes the establishment of regional temporary fuel storage facilities.

- Economic impact package
  - 11 applications
  - 1-2 agreements
  - Impact payments to state and local government
- Fuel storage
  - Long term contracting authority
  - DOE provides for transportation
  - Priority given to decommissioned facilities
- Settlement of claims
  - DOE may enter into settlement agreements
  - Acceptance of fuel constitutes transfer to DOE

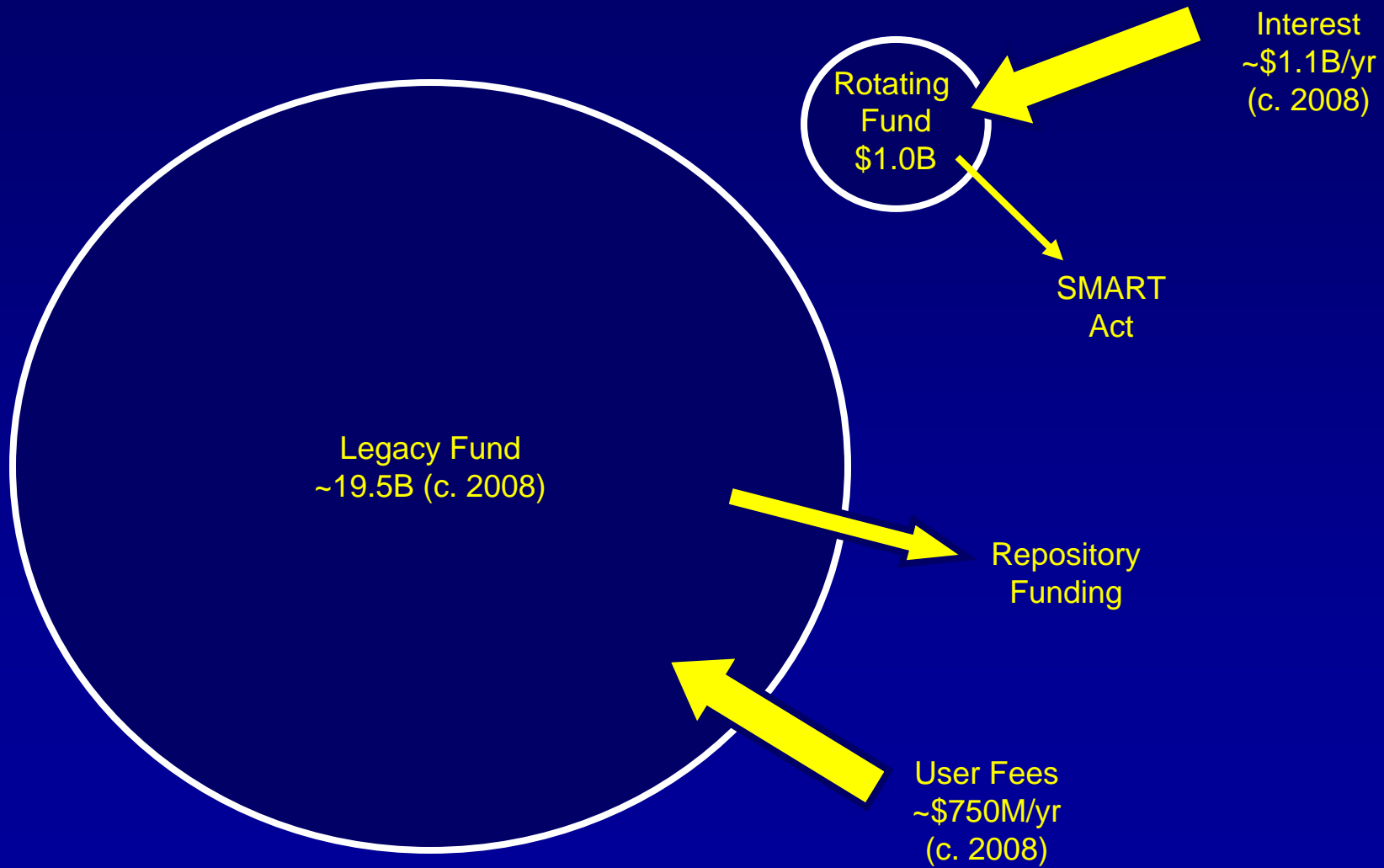
The SMART bill incentives are targeted for facilities with greater than 1,000 MT/yr capacity.



# The SMART bill leverages the interest on the current waste fund.

- Rotating fund
  - \$1B initially from current fund
  - All annual interest on both funds
- Legacy fund
  - Corpus of current fund less \$1B
  - All annual user fees
  - User fees fixed at 1 mill/kW-hr
- Expenditures
  - Legacy fund expenditures require appropriations
  - Rotating fund expenditures do not require appropriations
  - Rotating fund still subject to limitations by appropriations acts

Initial funding is obtained from 5% of the current waste fund.



The SMART bill also provides an explicit waste confidence statement.

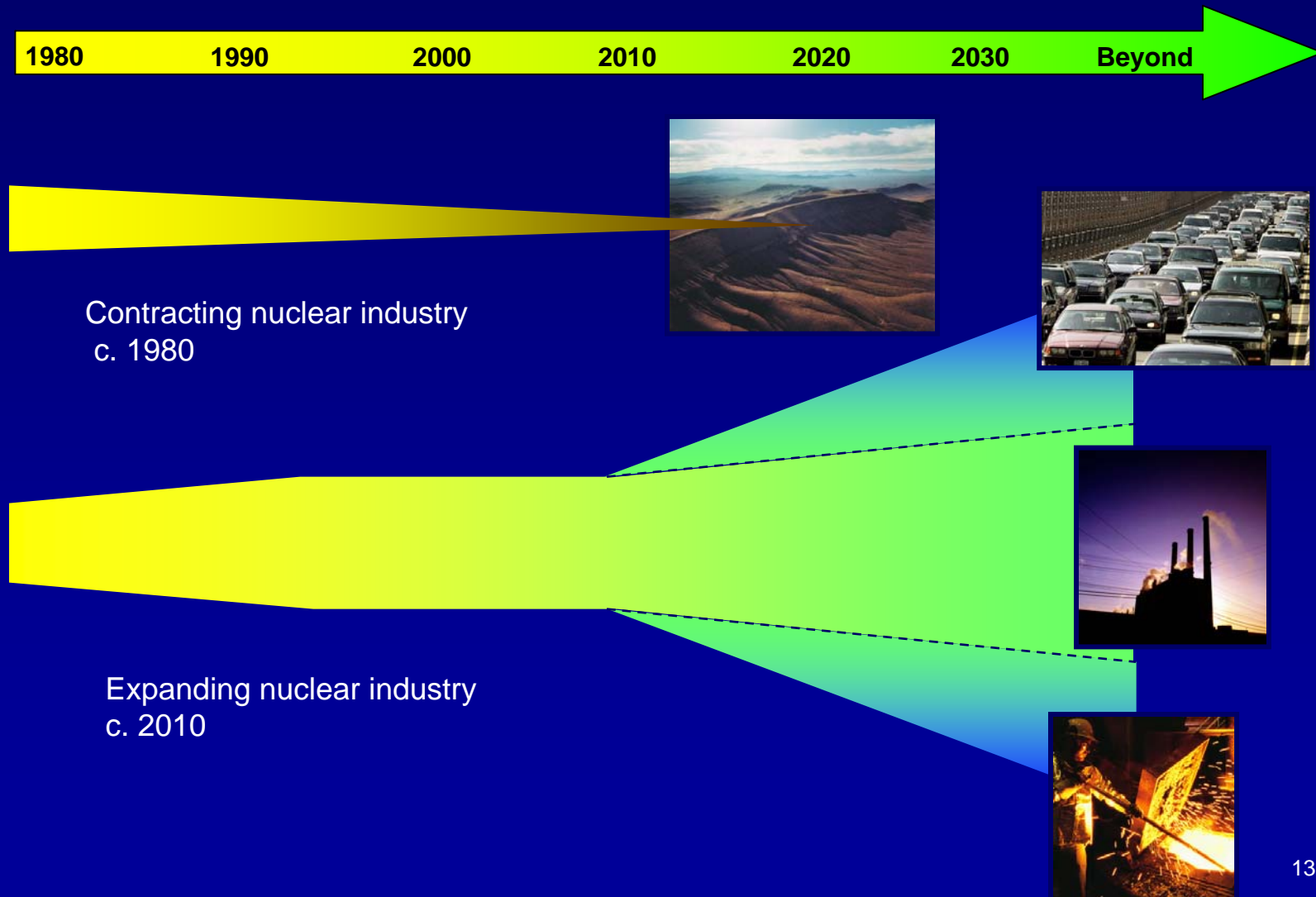
**“... the obligation of the Secretary to develop a repository in accordance with the Nuclear Waste Policy Act of 1982 ... “ [shall provide the Nuclear Regulatory Commission sufficient grounds for waste confidence]**

## There are a number of important observations regarding the SMART bill.

- Reprocessing and storage need not be co-located
  - Economic forces will likely force them together
- Reprocessing technology is not specified
  - Current technology supports limited recycling
  - Economic viability will be determining factor
- Private ownership and NRC licensing is emphasized
  - Construction and operations are left to industry
- Initially the rotating fund will grow
  - Cost of reprocessing will deplete fund in the future

- SMART bill summary
- Motivations
  - Current waste policy is short sighted
  - Deployment requires sustained effort
  - Cannot wait for 30 years to begin

# The once through fuel cycle was conceived in a different era of nuclear energy.



1980

1990

2000

2010

2020

2030

Beyond

Contracting nuclear industry  
c. 1980

Expanding nuclear industry  
c. 2010

# An expanding diversified role for nuclear energy changes the calculus of fuel recycling.

- Economics
  - Need for greater resource utilization
  - Currently 23,000 MT of  $U_3O_8$  purchased annually in U.S.
  - 77% supplied from non-domestic sources
- Proliferation
  - Global nuclear expansion is expected with or without U.S. participation
  - Economics will promote material accountability
- Risk perception
  - Global climate change
  - National security

## Economic and political incentives to develop a sustainable fuel cycle are temporarily limited.

- Waste disposition not a short term issue
  - Immediate focus is on new reactor construction
  - Dry cask storage viable for investment time horizon
  - Substantial basis for waste confidence
- Yucca Mountain license application complete
  - Significant milestone
  - License review will take more than 4 years
  - Rapid deployment is unlikely
- Advanced technology seen as an R&D effort
  - National Research Council
  - General Accounting Office

# Implementation of a sustainable fuel cycle requires development of a robust framework.

- Infrastructure
  - Transportation (repository is just the end point)
  - Workforce
  - Industrial
- Consistent and integrated governance
  - Recycling + Waste management
  - Public + private
- Viable technical options
  - Consistent and stable R&D funding
  - Engineering demonstrations

## Take Home Message

- The U.S. needs a sustainable nuclear fuel cycle
- Sustainability is more than R&D and repositories
- Must enable sustainability today

# Questions?

For thogh we slepe or wake, or rome, or ryde,  
Ay fleeth the tyme; it nil no man abyde.

- *Chaucer, c. 1390*