



# ***Advanced Fuel Cycle Initiative Program***

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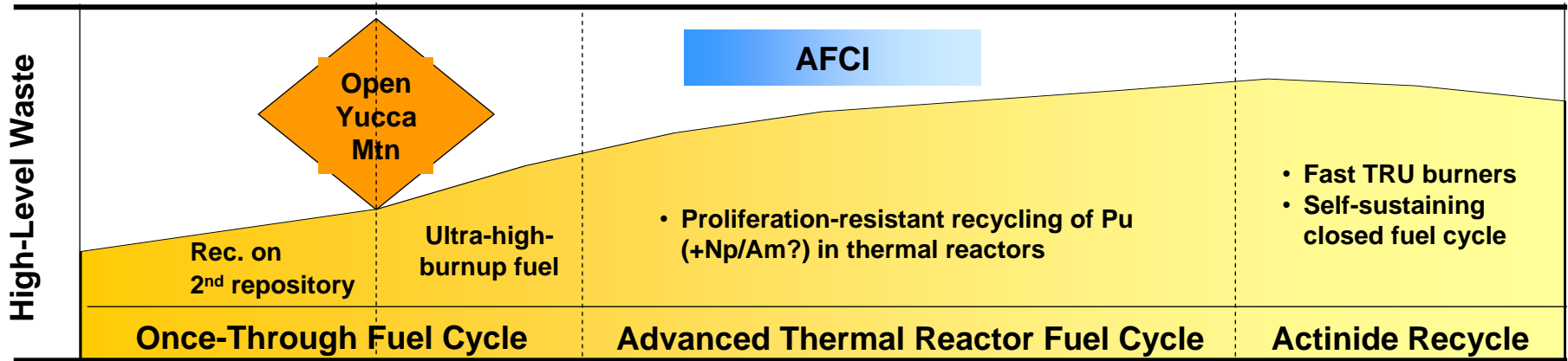
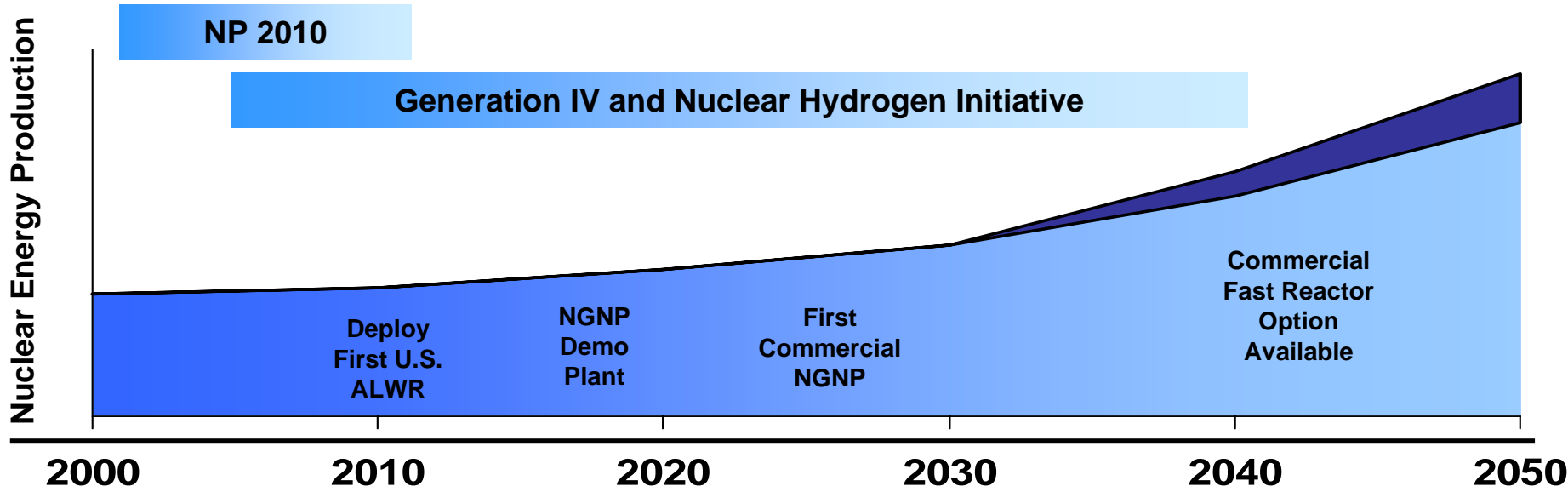
***Presentation to the IAC Workshop on ADSS  
Experiments, ISU, Pocatello, Idaho***

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# A Long-Term U.S. Vision for Nuclear Energy



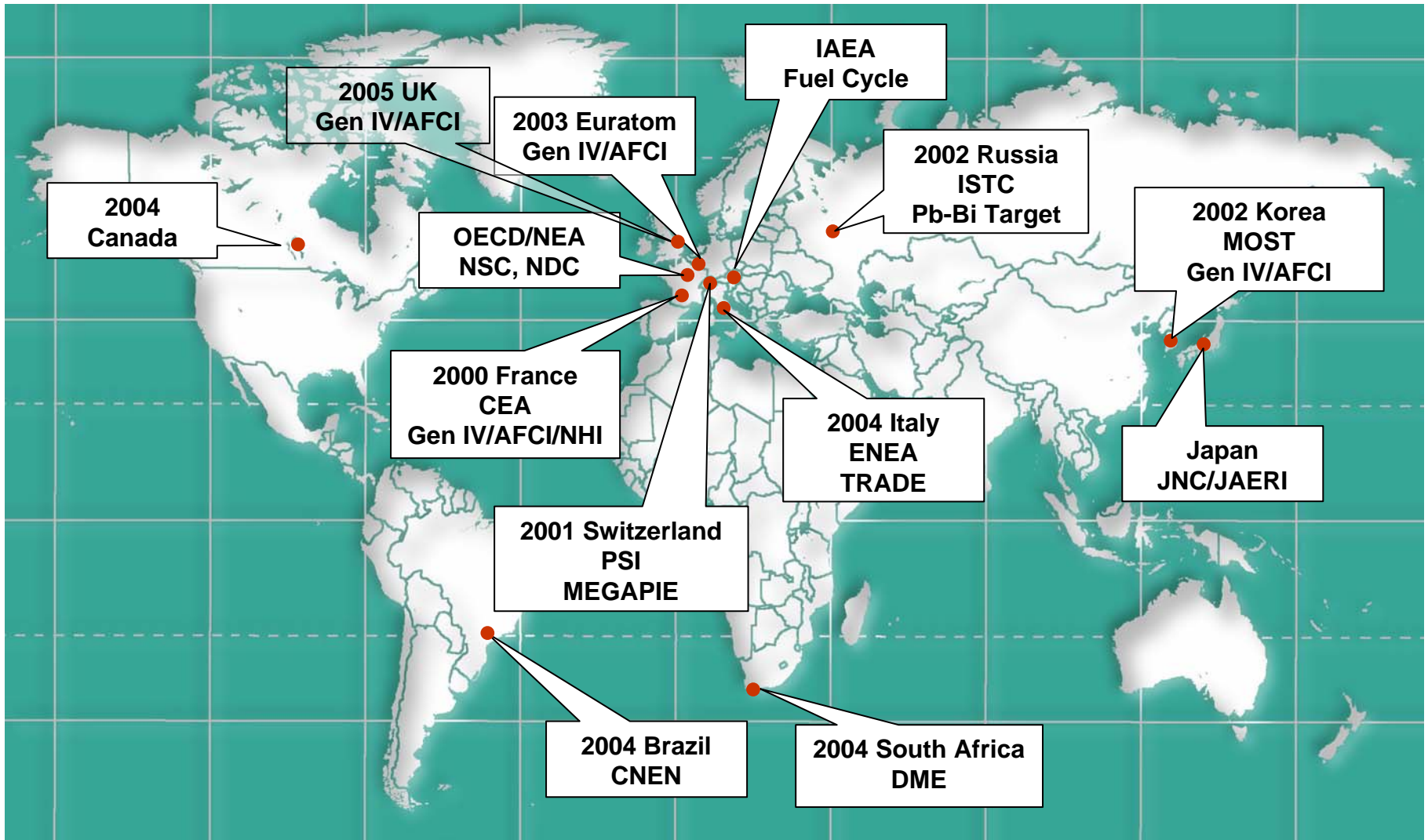


# Advanced Fuel Cycle Initiative

- ***Develops advanced, proliferation-resistant fuel cycle technologies for application to current operating commercial reactors and Generation IV reactors***
- ***Technologies will improve performance and economics of Yucca Mountain repository***
- ***Major research areas:***
  - ***Spent fuel treatment***
  - ***Advanced fuels***
  - ***Transmutation technologies***
  - ***Systems Analysis***
- ***FY 2004 Appropriation: \$68 Million***



# DOE-NE-20 International Collaborations - Overview





# Mechanisms for International Collaborations

- ◆ **International Nuclear Energy Research Initiative**
  - Since 2002, bilateral INERI agreements are main mechanism (France-CEA, S. Korea, OECD/NEA); several new agreements recently signed (Canada, Brazil, EURATOM) or close to signing (Japan, South Africa, UK)
- ◆ **AFCI cooperative agreements and “implementing arrangements”, e.g., France, Switzerland, EU**
- ◆ **Gen IV multilateral agreements (none yet in force)**



## **AFCI Program is active in OECD/NEA activities**

- ◆ **Chairing the Working Party on Partitioning and Transmutation (WPPT) (Dave Hill, ORNL)**
- ◆ **Strong participation in sub-groups on Physics, Separations, Fuels and Materials, Transmutation Systems Analysis (P. Finck, ANL, chair) and Accelerator Utilization and Reliability (Kemal Pasamehmetoglu, LANL, chair)**



## AFCI International Activities - CEA

### ◆ DOE/CEA Cooperative R&D Agreement Signed September 18, 2000 - five coordination meetings have been held to date

- Transmutation Fuels Development & Test in PHENIX Reactor (2006)
- Advanced Materials
- Transmutation Physics
- Reactor and Accelerator System Safety Analysis
- Separations Technology R&D
- System Studies and Scenarios
- Permanent U.S. Assignee at Cadarache to participate in MUSE and TRADE experiments

N.B. Accelerator Related Transmutation Coop w. CEA on Hold



## European Activities with Future Transmutation Potential

- ◆ **FUTURIX-FTA: Implementing Arrangement for irradiation of actinide bearing fuels in final PHENIX cycles – to be signed this month**
- ◆ **FUTURIX-MI: Implementing Arrangement for Gas Cooled Fast Reactor related fuel matrix material in PHENIX – under negotiation for signing this year**
- ◆ **MILE: arrangement for irradiation of U.S. origin actinide bearing fuel in a Swiss power reactor – under negotiation for possible agreement this calendar year**
- ◆ **TRADE: Transient Reactor Accelerator Driven Experiment- no cooperation agreement yet, but we support via personnel cooperation (George Imel)**
- ◆ **EURATOM 5<sup>th</sup> Framework Program EUROTRANS effort**



## Bottom Line

**Although Accelerator Driven Transmutation is not an AFCI priority development area anymore, it is seriously being pursued in many parts of the world, s.a. Europe and Japan, and therefore we welcome the interest of participants to this RACE meeting and we look forward to further development of their integrated program, including exploration as to how it can fit into the World's Accelerator Driven Transmutation Systems effort.**