



# The Global Nuclear Energy Partnership

## Program Overview

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**March 15, 2007**



# Outline

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- **GNEP Goals and Objectives**
- **GNEP Strategic Plan**
- **GNEP Program Management**
- **Schedule**





# The Global Nuclear Energy Partnership Objectives are Stated in The National Security Strategy

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- The United States “will build the Global Nuclear Energy Partnership to work with other nations to develop and deploy advanced nuclear recycling and reactor technologies.
- This initiative will help provide reliable, emission-free energy with less of the waste burden of older technologies and without making available separated plutonium that could be used by rogue states or terrorists for nuclear weapons.
- These new technologies will make possible a dramatic expansion of safe, clean nuclear energy to help meet the growing global energy demand.”

The National Security Strategy of the United States of America (March, 16, 2006): 29.





# Key Elements of the U.S. Nuclear Energy Strategy Include Domestic Efforts:

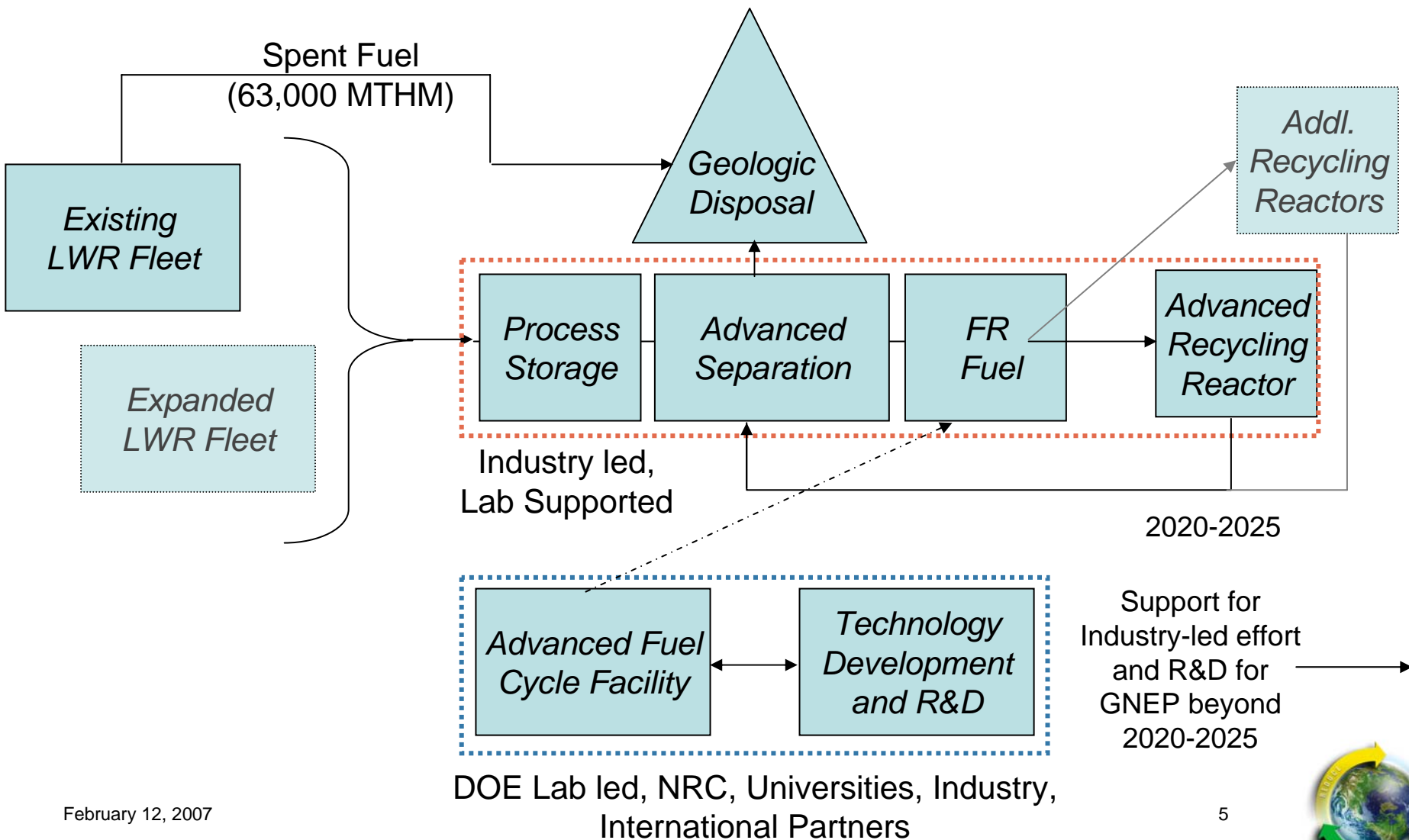
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- Expand nuclear power to help meet growing energy demand in an environmentally sustainable manner.
- Develop, demonstrate, and deploy advanced technologies for recycling spent nuclear fuel that do not separate plutonium, with the goal over time of ceasing separation of plutonium and eventually eliminating excess stocks of civilian plutonium and drawing down existing stocks of civilian spent fuel. Such advanced fuel cycle technologies will substantially reduce nuclear waste, simplify its disposition, and help to ensure the need for only one geologic repository in the United States through the end of this century.
- Develop, demonstrate, and deploy advanced reactors that consume transuranic elements from recycled spent fuel.



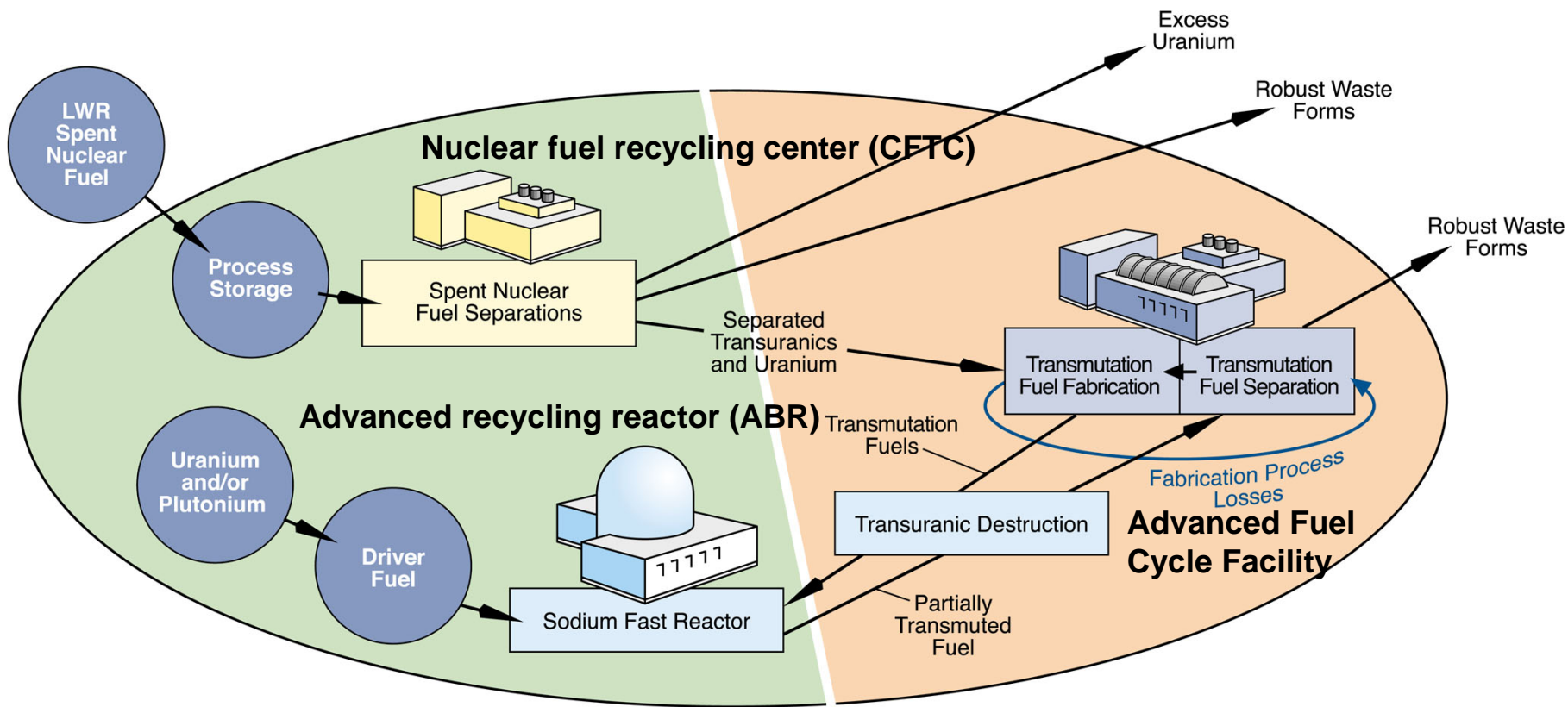


# Supporting the GNEP Strategy Requires New Facilities, Technology Development and R&D





# For the Initial GNEP Operation We Envision Three Supporting Facilities





## Key Elements of the U.S. Nuclear Energy Strategy Include International Efforts to:

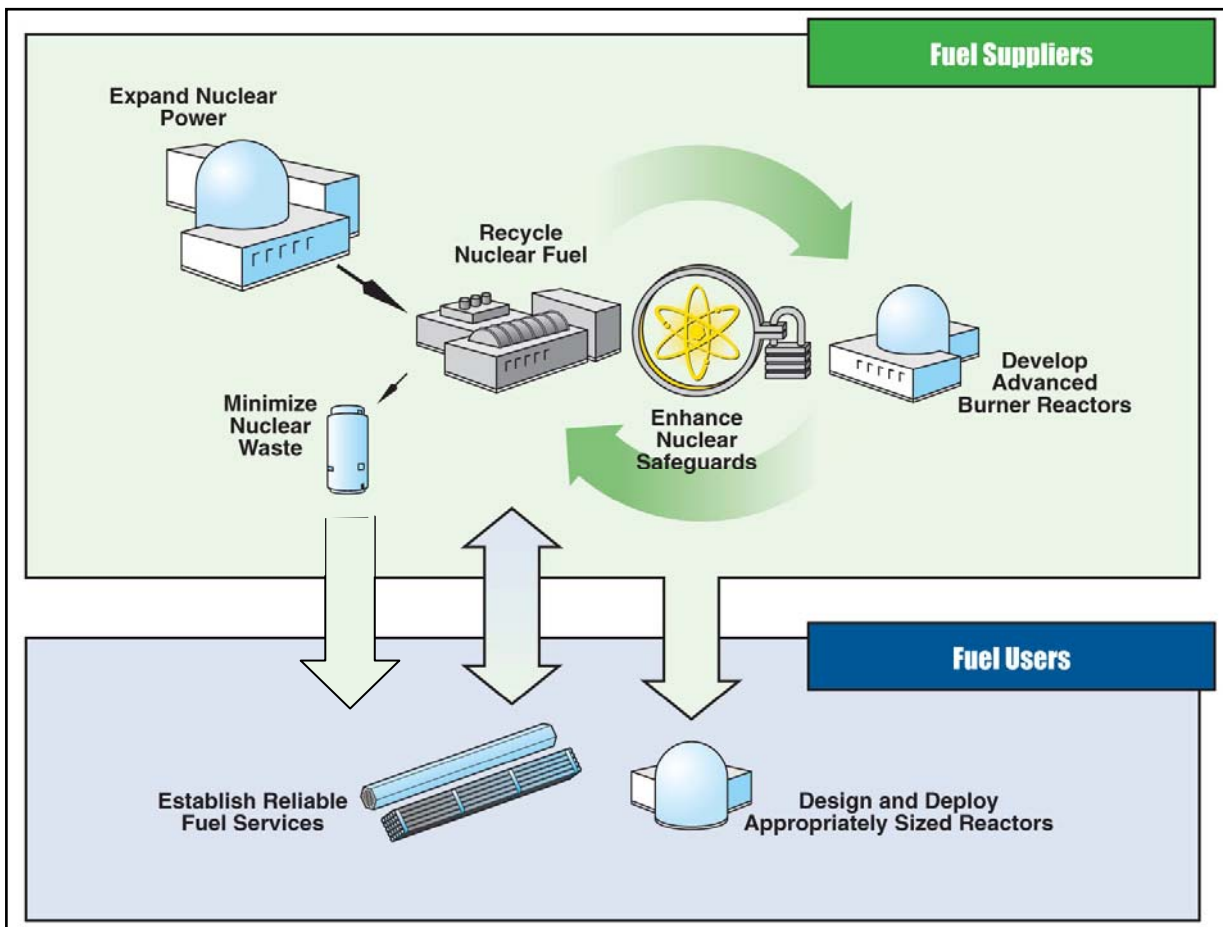
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- Establish supply arrangements among nations to provide reliable fuel services worldwide for generating nuclear energy, by providing nuclear fuel and taking back spent fuel for recycling, without spreading enrichment and reprocessing technologies.
- Develop, demonstrate, and deploy advanced, proliferation resistant nuclear power reactors appropriate for the power grids of developing countries and regions.
- Develop, in cooperation with the IAEA, enhanced nuclear safeguards to effectively and efficiently monitor nuclear materials and facilities, to ensure commercial nuclear energy systems are used only for peaceful purposes.





# An International Fuel Service is an Essential Part of Reducing Proliferation Risk



- **Fuel Suppliers:** operate reactors and fuel cycle facilities, including fast reactors to transmute the actinides from spent fuel into less toxic materials
- **Fuel Users:** operate reactors, lease and return fuel.
- **IAEA:** provide safeguards and fuel assurances, backed up with a reserve of nuclear fuel for states that do not pursue enrichment and reprocessing







# International Partnerships are Critical to GNEP Success

- Develop the basis for an assured fuel supply concept with other nations
  - IAEA or similar international organization administered mechanism to provide supply reliability in cases that could not be resolved in the commercial market, facilitation of new commercial arrangements when supply interrupted for some reason other than safeguards compliance
  - Eligibility based on
    - *safeguard compliance, nuclear safety standards, and reliance on international market without indigenous enrichment and reprocessing*
- Foster specific R&D and technology collaborations through interactions with National Laboratories to address critical areas U.S.
  - Russia agreement
- Complete international agreement on GNEP Statement of Principles
- Hold GNEP meeting for other interested nations thereafter.





# The GNEP Strategic Plan Calls for Specific Actions Supported by an Appropriate Management Structure

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- Obtain input from U.S. and international industries and governments on how best to bring the needed GNEP facilities into being, what technology and policy issues must be resolved, and what business obstacles must be overcome.
- Develop a detailed GNEP technology roadmap for demonstrating solutions to the remaining technical issues in order to support commercial GNEP facilities. Inform and adjust this roadmap with input received from industry, international partners, and the policy community.
- Pursue industry participation in the development of conceptual design and other engineering studies that support both a nuclear fuel recycling center and an advanced recycling reactor.
- Prepare a programmatic GNEP Environmental Impact Statement.
- No later than June of 2008, prepare a decision package for the Secretary of Energy to proceed with a government-industry partnership to build a nuclear fuel recycling center and a prototype advanced recycling reactor





# The GNEP Plan Requires Industry Supported by Technology Development

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- The plan is to have commercial-scale fuel recycling and demonstrate the closed fuel cycle in the U.S. as early as possible (2020 - 2025)
  - Building commercial-scale prototypes of recycle and fast reactor facilities will require Technology Development
    - *Industry led design and construction, operation*
    - *Laboratory led work to close technology gaps in fuel cycle knowledge and to develop and transmutation fuel*
    - *Expect NRC to license both facilities*
  
- Supporting this approach requires both Technology Development and R&D
  - Engineering Development will support work needed for design and construction of ABR, CFTC, and AFCF
  - R&D focus on longer-term activities supporting fuel-cycle development and implementation





# GNEP is Placing Effort on Work to Inform the 2008 Secretarial Decision

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- **Decision could take several forms, some options might be:**
  - Continue R&D only
  - Engineering scale demonstration facilities and supporting R&D
  - Commercial scale facilities with Technology Development and supporting R&D
- **Engage industry to provide:**
  - Conceptual Design Study to give Cost, Scope, Schedule, and Risk for ABR and CFTC
  - Required technology development
  - Business Plan
- **AFCF must provide Cost, Scope, and Schedule information**
- **Technology Demonstration plan and industry input must be integrated to develop technology roadmap**





# Near Term GNEP Actions

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- **Restructure to move from Advanced Fuel Cycle Initiative to GNEP management**
- **Develop and implement GNEP technology pathway using industry and national laboratories**
- **Engage international community in GNEP technology**
- **Engage international community on fuel services**
- **Develop adequate information to inform the Secretarial decision on GNEP in June of 2008**





## GNEP – “Why” and “Why NOW”

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- **There is a rapidly expanding global demand for nuclear power**
  - Without some global regime to manage this expansion many more “Iranian” situations will likely appear
- **A global regime is forming up with Russia, France, Japan and China having both the will and the means to participate.**
  - The United States, through GNEP, is leading the formation of this global regime but we do not have the means to participate in its execution.
- **Unless the United States implements the domestic aspects of the GNEP program we will suffer significant consequences in our energy security, industrial competitiveness and national security.**
- **There are potential repository benefits, but the international need for GNEP is compelling.**
- **The United States must act decisively and quickly to implement GNEP or face the real possibility of having no influence over the certain future global expansion of nuclear energy.**

