

# Outline of the Global Nuclear Partnership

---



Global Nuclear Energy  
Partnership

**Jeffrey Miller**

Energy Attaché—U.S. Embassy Japan  
Director, United States Department of  
Energy Japan Office

---

Presented to the

**Atomic Energy Society of  
Japan**

July 28, 2006

# PRESENTATION OUTLINE

- Why GNEP
- Goals and Program Elements
- Current Status
- United States and Japan

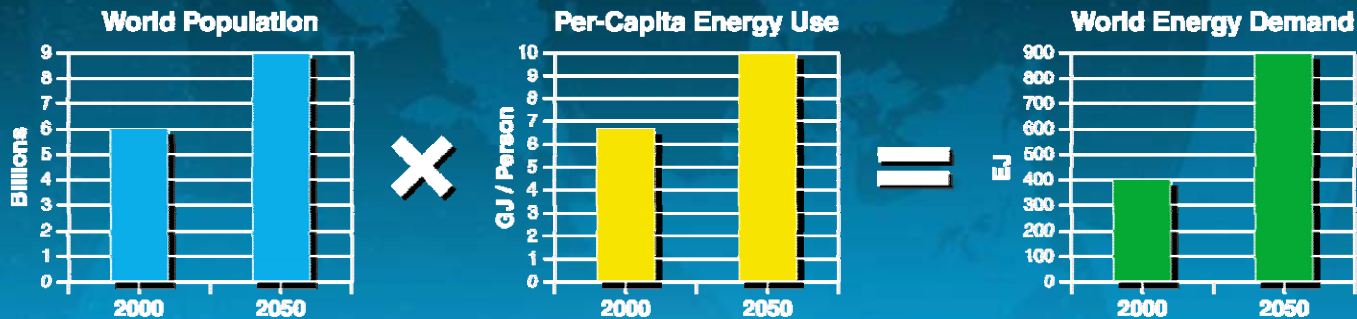
Global Nuclear



Energy Partnership

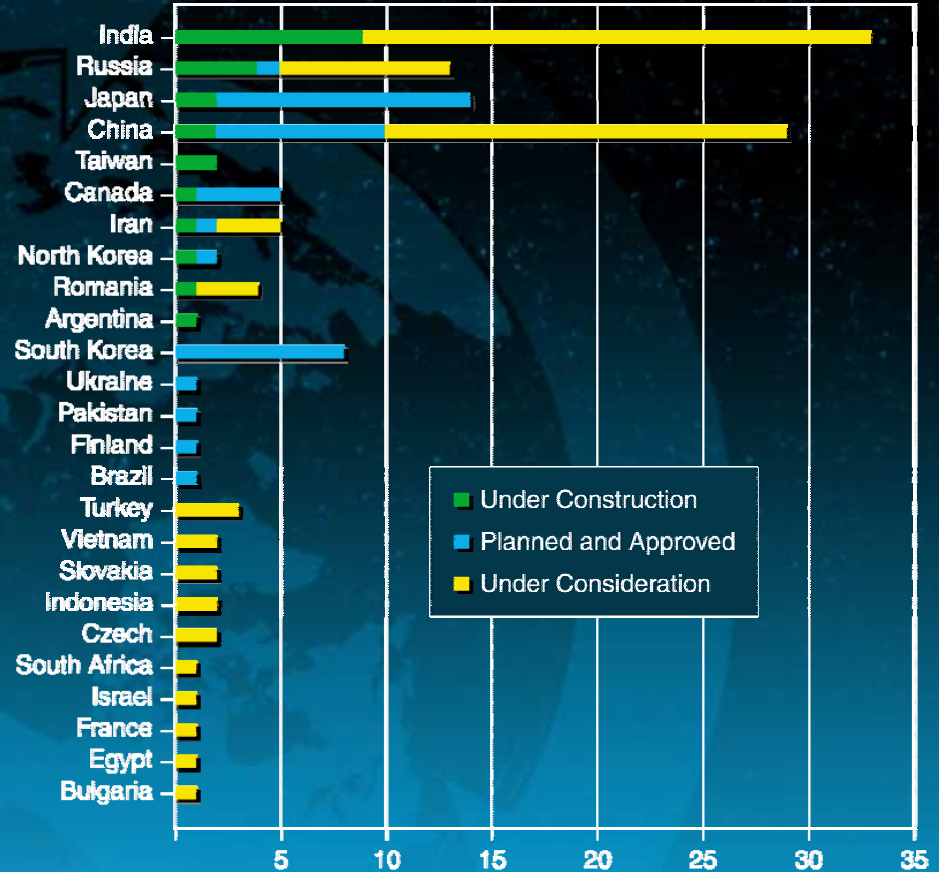
# Challenges: Global Energy Demand

- A reliable energy supply is the cornerstone of sustained economic growth and prosperity
- World energy demand is expected to more than double by 2050
- An expansion of nuclear energy is a key to meeting this demand while reducing air pollution and greenhouse gases



# World Nuclear Expansion

- Over 130 reactors are being built, planned, or under consideration world-wide
- We must act now to ensure that these facilities are designed, constructed, and operated to the best standards of:
  - Safety
  - Safeguards
  - Proliferation-resistance
  - Waste disposal



# What is GNEP?

This morning, I want to speak to you about one part of this initiative: our plans to expand the use of safe and clean nuclear power. Nuclear power generates large amounts of low-cost electricity without emitting air pollution or greenhouse gases.

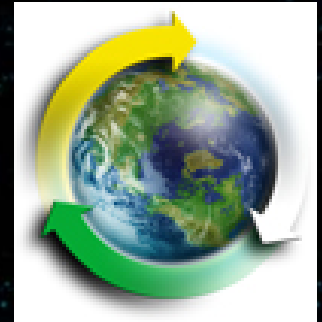


....my Administration has announced a bold new proposal called the **Global Nuclear Energy Partnership**. Under this partnership, America will work with nations that have advanced civilian nuclear energy programs, such as France, Japan, and Russia. Together, we will develop and deploy innovative, advanced reactors and new methods to recycle spent nuclear fuel. This will allow us to produce more energy, while dramatically reducing the amount of nuclear waste and eliminating the nuclear byproducts that unstable regimes or terrorists could use to make weapons.

President George W. Bush  
Radio Address: February  
18, 2006



# GNEP Has Two Simultaneous Goals



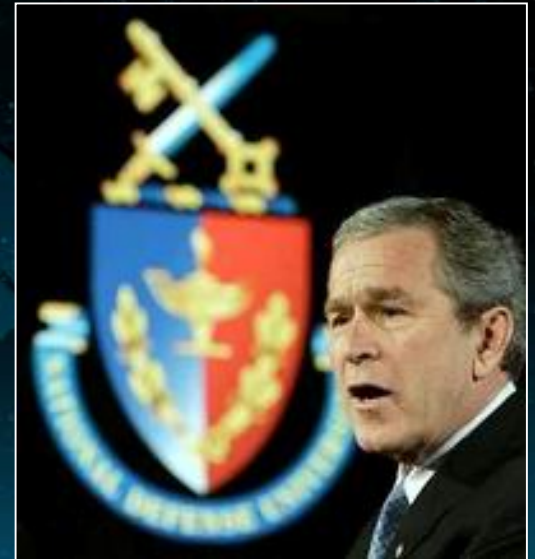
## GNEP Principles:

- Global Issues require global solutions
- Spent Fuel is an **asset** to be managed – not a waste.



# Key GNEP Program Elements

- Expand use of nuclear power
- Minimize nuclear waste
- Demonstrate recycle technology
- Demonstrate Advanced Burner Reactors
- Establish reliable fuel services
- Demonstrate small, exportable reactors
- Enhanced nuclear safeguards technology



*“To build a secure energy future for America, we need to expand production of safe, clean nuclear power”*

President Bush, 06/2004

# Expand Use of Nuclear Power

Build on advances made to encourage more nuclear power in the U.S., including the Nuclear Power 2010 program and the Energy Policy Act of 2005



*“The bill I sign today ... offers a new form of federal risk insurance for the first six builders of new nuclear power plants... We will start building nuclear power plants again by the end of this decade”*

President Bush, 08/2005





# Minimize Nuclear Waste

Significantly reduce the volume of nuclear waste to be disposed of in Yucca Mountain, making disposal less complex and minimizing the need for additional repositories



- Repository needed in all cases
- Aggressive plan to proceed
- One repository can meet U.S. needs this century with GNEP



# Advanced Recycling

Demonstrate and deploy new technologies to recycle nuclear fuel that do not result in separated plutonium

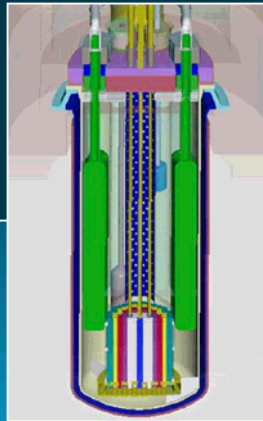


- Demonstrate with advanced fuel cycle states, not for export
- Encourage transition to a fuel cycle that does not separate plutonium
- Provides fuel for advanced reactors
- Rest of recycled products become easier to deal with for waste management



# Advanced Burner Reactors

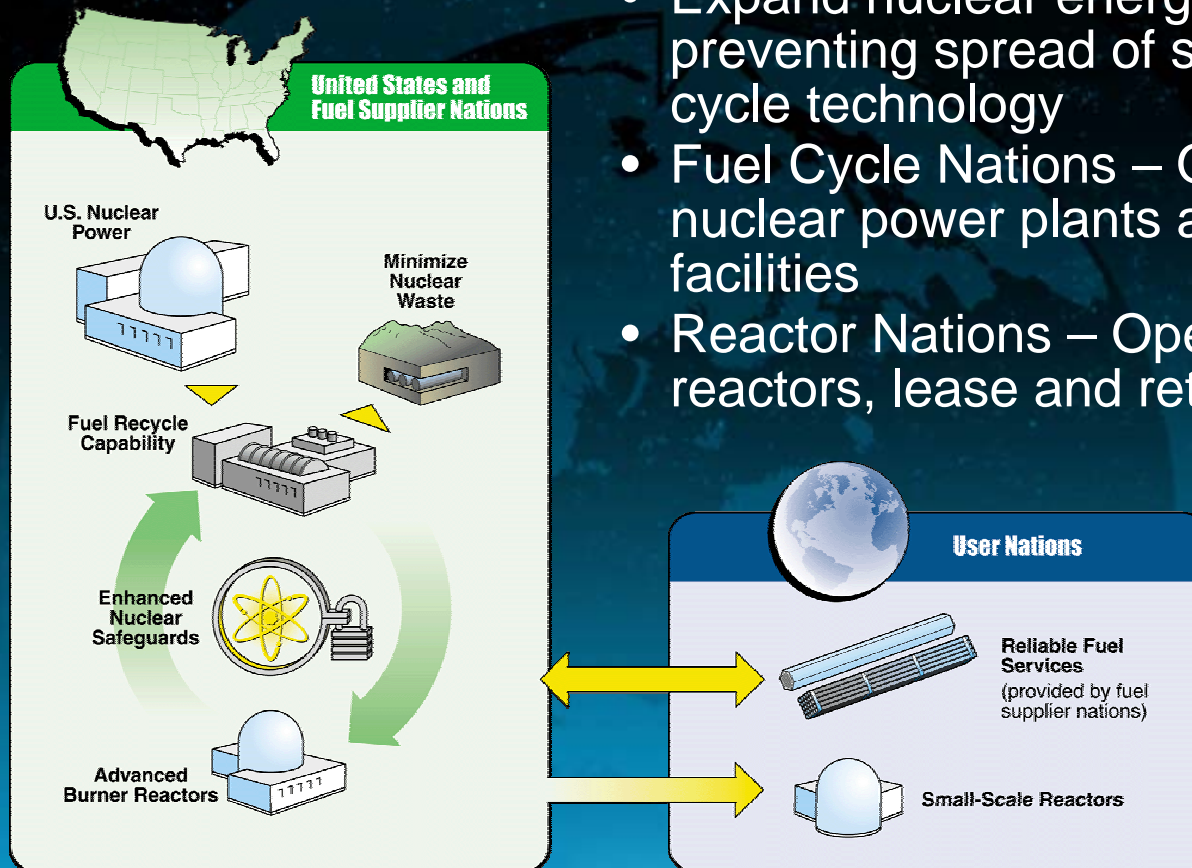
Demonstrate and deploy Advanced Burner Reactors that use the latest technology to produce energy from recycled nuclear fuel



- Fast spectrum reactor can burn plutonium & other fissile isotopes
- Recovers energy from spent fuel
- Repeated cycles transforms waste
- Build on operating experience
- Define new safeguards standards
- Prove for commercial scale



# Reliable Fuel Service Model



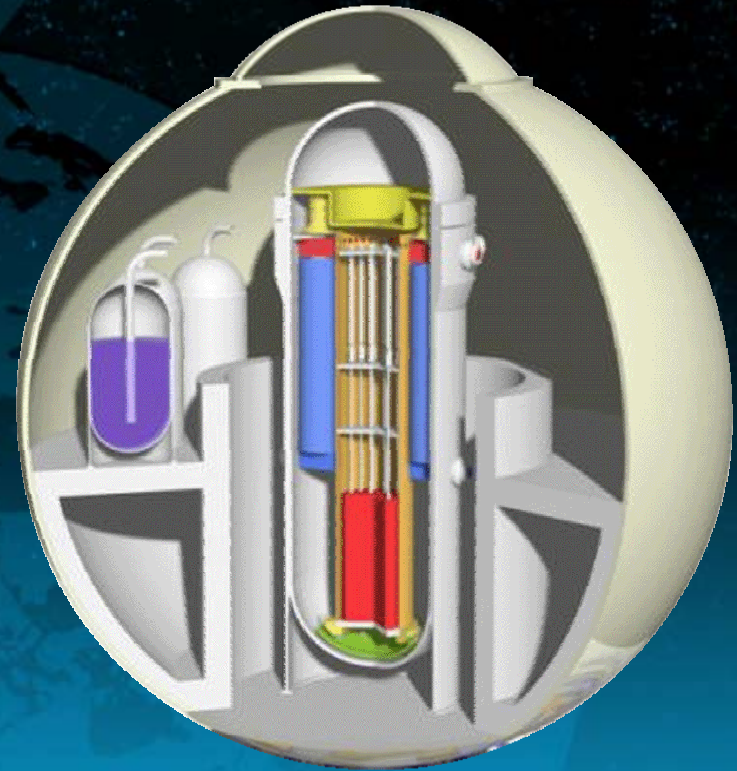
- Expand nuclear energy while preventing spread of sensitive fuel cycle technology
- Fuel Cycle Nations – Operate both nuclear power plants and fuel cycle facilities
- Reactor Nations – Operate only reactors, lease and return fuel



# Small-Scale Reactors

---

Design and deploy small-scale reactors that are cost-effective, secure, and well-suited to conditions in developing nations

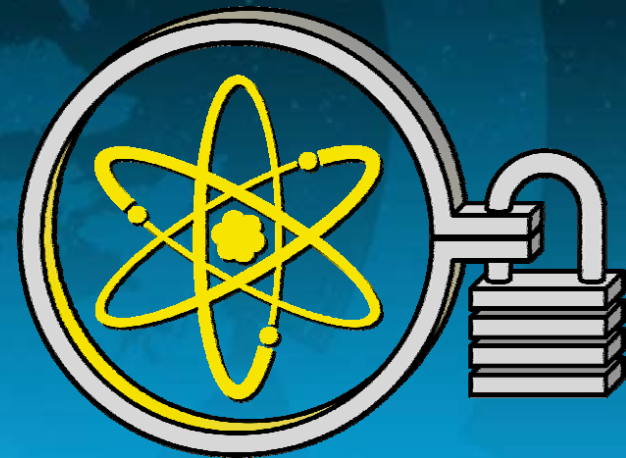


# Enhanced Nuclear Safeguards

Design advanced safeguards directly into advanced nuclear energy facilities and reactors and enhance IAEA capabilities

*“The extent of the role of nuclear power...will depend on the success of the nuclear community in developing innovative technology and new approaches to address concerns.”*

– Dr. Mohamed El Baradei



# GNEP Process Just Beginning



Countries Approached by U.S. to be possible Fuel Cycle States

Japan – active follow-up

France – active follow-up

Russia – active follow-up

United Kingdom (In midst of Government Energy Study)

China – active follow-up

~ 40 Countries briefed at International Atomic Energy Agency

Science Attaches briefed in DC

Detailed Discussion with Canada, South Korea

Open to discussions with all interested states.

## International Response Positive

Global Nuclear Energy Partnership



# United States and Japan

---

- Partnership with Japan is critical
- Active discussions since January 2006
- Details of partnership under discussion

Global Nuclear



Energy Partnership



# Different National Strategies



## Japan (current)

Maintain LWR  
Export LWR

Interim Storage

Recycle PUREX/MOX

Fast Breeder Reactors

Disposition =  
(Spent Fuel) - (U + Pu)

- Issues:
- Disposition
  - Cost of FBR
  - Human resources

## United States (planned)

Expand LWR  
Export LWR/small reactors

Spent Fuel Management

UREX+

Fast Burner Reactors  
Pyroprocessing

Disposition =  
(Spent Fuel - (U + C/S + Actinides))  
Yucca (1)

- Separations
- Actinide Fuel
- *FBUbR*



# Conclusion

---

*“...allow all peoples of all nations to see that, in this enlightened age, the great powers of the earth, both of the East and of the West, are interested in human aspirations first, rather than in building up the armaments of war.”*

**President Dwight D. Eisenhower**

*“Atoms for Peace” speech before the  
United Nations, 1953*

