

# **The Global Nuclear Energy Partnership**

*From Vision to Reality*

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# Challenges Facing Global Energy Needs

- Electricity demand is expected to increase 40% in the U.S. by 2030 and nearly 100% globally over the same period.
- Nuclear power produces nearly 20 percent of total U.S. electricity output—this 20 percent share represents 70 percent of all non-carbon emitting electricity production.
- And in the United States, 19 utility companies are currently projected to build thirty-three new reactors. When completed, these new nuclear power plants will provide over 43 GWe of electricity, enough to power 30 million homes."
- Worldwide, 34 new nuclear power plants are under construction, totaling 28 GWs of new nuclear power, with construction taking place in every major region in the world.
- Projections anticipate 55 total countries will operate 630 reactors totaling approximately 630 GWe by 2030.
- Potentially, a total of 86 countries could have nuclear reactors by 2050.



# Key GNEP Principles

- **Expand nuclear power** to help meet growing energy demand in a safe and sustainable manner.
- Establish international supply frameworks to enhance **reliable, cost-effective fuel supplies** to the world market while reducing the risk of nuclear proliferation by creating a viable alternative to acquisition of sensitive fuel cycle technologies.
- Develop, demonstrate, and in due course deploy **advanced fast reactors** that consume transuranic elements from recycled spent fuel.
- Develop and demonstrate, inter alia, **advanced technologies for recycling** spent nuclear fuel with a long term goal of ceasing separation of plutonium and eventually eliminating stocks of separated civilian plutonium.
- Promote the development of advanced, more proliferation resistant **nuclear power reactors appropriate for the power grids** of developing countries and regions.
- In cooperation with the IAEA, **continue to develop enhanced nuclear safeguards** and ensure nuclear energy systems are used only for peaceful purposes.



# THE GLOBAL NUCLEAR ENERGY PARTNERSHIP: A COMBINED MULTILARAL AND BILATERAL APPROACH

## GNEP MULTILATERAL PARTNERSHIP

- Serves as the overall mechanism for carrying out GNEP activities with the full breadth of GNEP Partners in a manner that seeks the harmonization of civil nuclear energy policies and the collective efforts of like-minded countries to work towards realizing the GNEP vision (e.g., reliable nuclear fuel services; support for safe, secure and responsible nuclear infrastructure development; development of safe, secure and more proliferation-resistant grid appropriate reactors).

## GNEP BILATERAL ACTIVITIES

- Serves as vehicles to carry out more tailored cooperation with specific countries, such as advanced fuel cycle cooperation. Examples: US-Russia; US-Japan; US-China; US-Australia.



# GNEP INTERNATIONAL ACTIVITIES: FOUR KEY ENGAGEMENT AREAS

## ▪ *POLICY*

- Partnership Development

## ▪ *TECHNICAL*

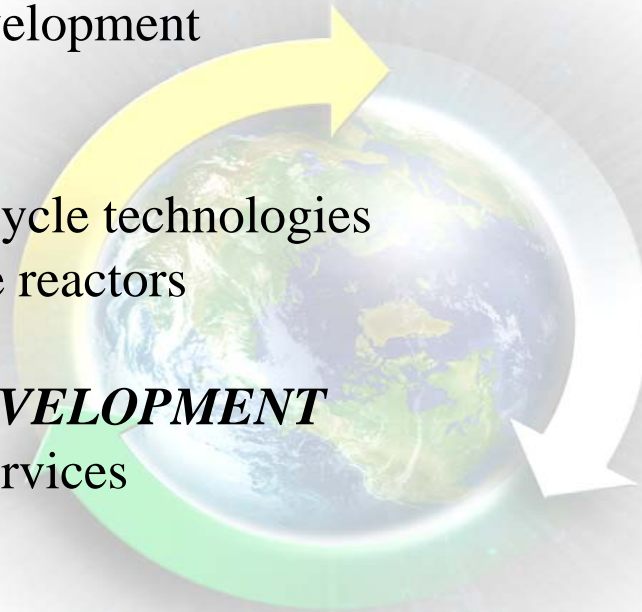
- Advanced fuel cycle technologies
- Grid appropriate reactors

## ▪ *FRAMEWORK DEVELOPMENT*

- Assured Fuel Services
- Fuel Banks
- Fuel Centers

## ▪ *INFRASTRUCTURE SUPPORT*

- For candidate reactor countries
- Grid appropriate reactors, regulatory, expertise, financial





# ***GNEP Partners, Candidate Partners and Observers***

## **GNEP Partners**

1. Australia
2. Bulgaria
3. Canada
4. China
5. France
6. Ghana
7. Hungary
8. Italy
9. Japan
10. Jordan
11. Kazakhstan
12. Lithuania
13. Poland
14. Republic of Korea
15. Romania
16. Russia
17. Senegal
18. Slovenia
19. Ukraine
20. United States
21. United Kingdom

## **GNEP Observers**

1. International Atomic Energy Agency (IAEA)
2. Generation IV International Forum (GIF)
3. Euratom



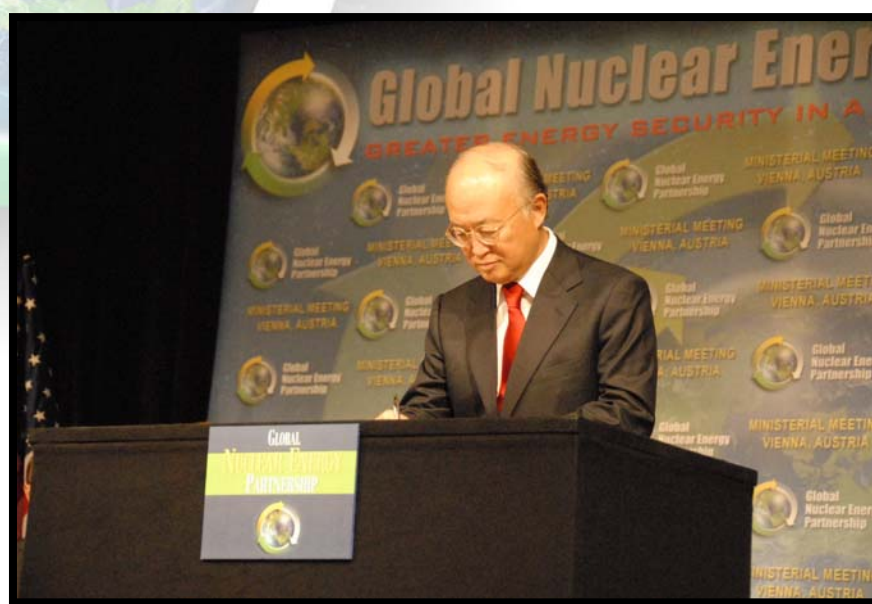
## **Candidate Partner and Observer**

### **Countries**

1. Argentina
2. Belgium
3. Brazil
4. Czech
5. Egypt
6. Finland
7. Germany
8. Libya
9. Mexico
10. Morocco
11. Netherlands
12. Slovakia
13. South Africa
14. Spain
15. Sweden
16. Switzerland
17. Turkey



***SEPTEMBER 16, 2007,  
GNEP MINISTERIAL  
MEETING***





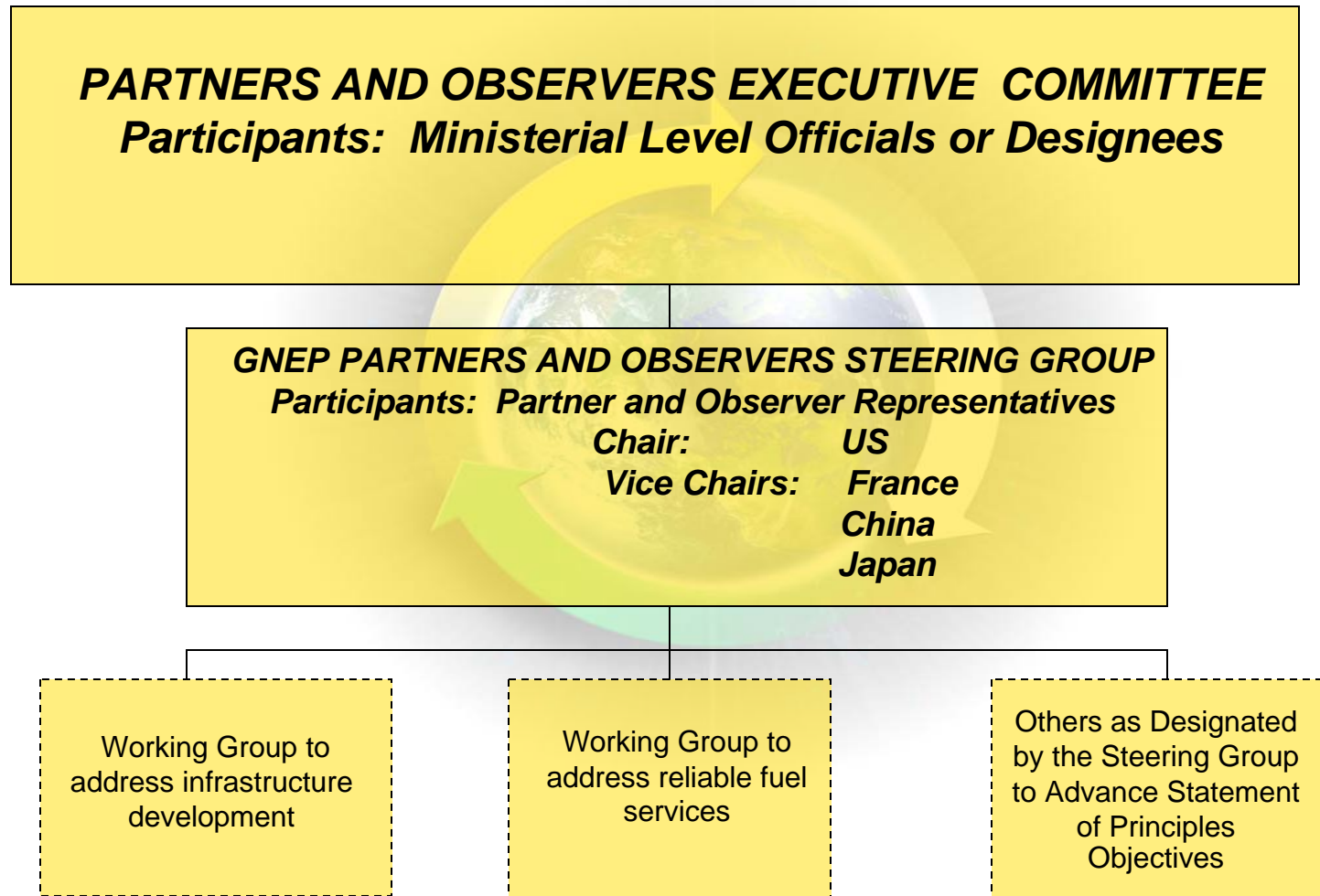
# *OPENING REMARKS OF THE SEPTEMBER 16 GNEP MINISTERIAL*





# GLOBAL NUCLEAR ENERGY PARTNERSHIP

## Structure





# THE GLOBAL NUCLEAR ENERGY PARTNERSHIP: PROGRESS MADE TO DATE BY THE PARTNERS

- **GNEP Structure Established.** Executive Committee, Steering Group, Working Groups.
- **GNEP Steering Group Action Plan.** Serves as an overarching framework document that describes objectives, scope, activities and next steps.
- **Two Expert-Based Working Groups Established.** Reliable Nuclear Fuel Services and Nuclear Infrastructure Development.
- **Terms of References (Charters).** Formally Adopted by Partners for the Working Groups.
- **Steering Group Leadership Established.** US as Chair, China, France and Japan as Vice Chairs.
- **First Steering Group Held December 11 – 13, 2007, at the IAEA in Vienna.** Second scheduled for May in Jordan.
- **First Working Group Meetings Held in March, 2008** – Infrastructure Development WG held in Vienna, Austria, and the Reliable Nuclear Fuel Services WG held in Wilmington, NC.
- **Critical Next Step:** Working Groups identify specific areas for the Partnership to apply its collective attention and resources to support the realization of GNEP.



# U.S. GNEP Bilateral and Trilateral Activities

- US-Russia Civil Nuclear Energy Cooperation (Dec 2006)
- US-Japan Civil Nuclear Energy Action Plan (April 2007)
- US-China Civil Nuclear Energy Cooperation Plan (Sept 2007)
- US-Australia Civil Nuclear Energy Cooperation (Sept 2007)
- US-France Civil Nuclear Energy Action Plan (Under Negotiation)

## Others Cooperation Touching Upon GNEP

- Generation IV International Forum (GIF)
- International Energy Research Initiative Projects (I-NERI)
- Trilateral Sodium Fast Reactor Cooperation with France and Japan
- MOUs with Jordan and Italy



# **GNEP INTERNATIONAL POLICY ENGAGEMENT: Partnership Development and Policy Harmonization**

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- A central graphic featuring a globe of the Earth. Three large, semi-transparent arrows form a circular path around the globe: a yellow arrow at the top, a white arrow at the bottom, and a green arrow on the left. The globe is slightly faded and serves as a background for the text.
- **GNEP's Multinational Partnership Now Formally Established**
    - GNEP Statement of Principles
  - **Bilateral Engagement and Other Multilateral Cooperation**
    - Civil Nuclear Energy Action Plans
    - Memoranda of Understands
  - **Other Governmental Fora**



# Reliable Nuclear Fuel Supply

- **GNEP Reliable Nuclear Fuel Services Working Group, Inaugural Meeting Held in Wilmington, N.C.**
  - **WG will address front and back end. Report will be prepared by May to identify key mechanisms and key barriers to an enhanced global reliable fuel supply and a complete global fuel services framework.**
- **US presented an assured fuel supply as a cornerstone of GNEP to over 100 nations at an IAEA Special Event in September 2006.**
- **US and 5 other supplier nations proposed the reliable fuel supply initiative at the IAEA.**
- **US declared an international nuclear fuel reserve to support the reliable fuel supply in event of disruptions**
- **US appropriated \$50M for an international fuel bank with the IAEA**
- **Other cradle-to-grave fuel service concepts being examined, including an International Advanced Recycle Reactor and an International Fuel Center**



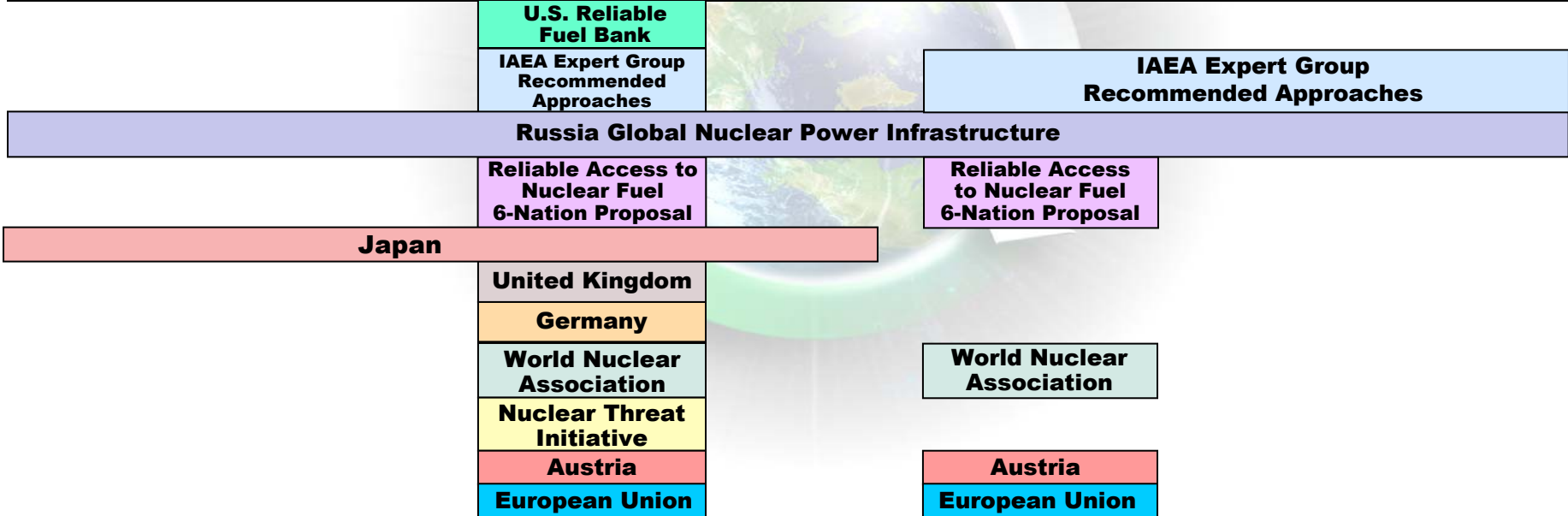
# Global Nuclear Fuel Assurance Proposals

Front End Fuel Cycle

Back End Fuel Cycle



## GNEP Assured Services



Less certain implementation path





# Infrastructure Development

- **GNEP Infrastructure Development Working Group, Inaugural Meeting March 2008**
  - **WG will submit initial report in May. Will identify key needs of countries considering nuclear for the first time or considering expansion. Will also identify key barriers.**
  
- **Close Cooperation with the IAEA**
  - **Milestones Document**
  - **Infrastructure Workshops sponsored by “Friends of Nuclear Energy” for those countries considering nuclear energy for the first time**
  - **Key take-aways: (1) a standard criteria is needed; (2) financing essential; (3) strong involvement and support from experienced nuclear countries needed.**
  
- **U.S. will continue to sponsor additional infrastructure workshops and related activities, including areas such as financing and safety**
  
- **Direct bilateral support, consistent with multilateral efforts, with candidate reactor countries where appropriate to support near-term deployment of LWRs**



# Next Steps and Conclusion

- **GNEP International Partnership**
  - *Further Expand Partnership*
  - *Further develop structure and mechanisms for Partnership*
  - *Identify specific areas for the Partners to focus its attention; identify the necessary resources; and initiate activities.*
- **International Technology Development (eg, GIF, trilateral arrangements)**
- **Enhance Engagement Multilateral Organizations (eg, IAEA) and Industry**
- **Enhance Bilateral Cooperation with Advanced Fuel Cycle, Fuel Supplier, Reactor and Candidate Reactor Countries**

FOR MORE INFORMATION ON GNEP:

- [www.gneppartnership.org](http://www.gneppartnership.org)
- [www.gnep.energy.gov](http://www.gnep.energy.gov)