



Blue Ribbon Commission on America's Nuclear Future

September 21, 2010

“Advisory” Thoughts on America’s Nuclear Future: Opportunities for U.S. Leadership



→ Stockpile Stewardship
ASCI



→ GNEP



→ ASCI
for
Energy

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A Potential U.S. Nuclear Strategy

Postulates:

- The availability and effective use of electricity is essential to prosperity & development
- Climate change due to carbon (CO₂) emissions is real and time critical
- Nuclear power is the primary replacement for coal burning, base load electricity
- Electricity generation in the U.S. will mostly remain in the private sector
- U.S. Government – environment, safety & national security & economic well being

Postulated U.S. Nuclear Power Goals:

- Rapid Growth of Affordable, Safe, Secure Nuclear Power (reduce emissions a lot, ASAP)
- Resolve Spent Fuel Management
- Lead Global Non-proliferation

Potential U.S. Government Tools:

(Cost of Carbon Emissions)

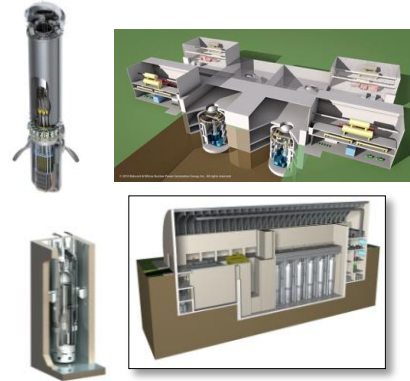
- “Large” Light Water Reactors: **Loan Guarantees**
- Small LW Modular Reactors: **Design Certification, COL, First User**
- **Sites** for Dry Cask **Interim Storage /Take Back of Leased Fuel**
- **Salt Repository for Commercial Waste**
- **International Fuel Bank(s) – supply and take back**
- **R&D** on advanced reactor, fuel and fuel cycle concepts

An
Integrated
Strategy

LEU Fueled Light Water Small Modular Reactors

Potential for increasing the rate of introduction of (emissions free), affordable nuclear power

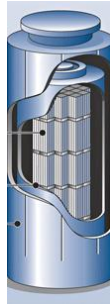
- (At least) 2 Credible LEU/LW Designs
 - mPower – 125 MW(e)
 - NuScale – 45 MW(e)
- U.S Industrial & Regulatory Base
 - Commercial – LWR, LEU fuel
 - Navy (factory built)
 - Licensable - LWR, LEU fuel, Safety, Security
- Lower early utility capital costs – reduce utility financial risk.
- **DOE Sites and Labs as “ first user” of SMR**
 - Big mission user of electricity (~ 1 GW 2020)
 - Presidential Emissions Executive Order 13514
 - Nuclear friendly/capable workforce
 - Other U.S. Agencies (DOD)



DOE “first user” of
Massively Parallel
High Performance
Computing

Spent (Used) Fuel Management

Interim Storage:
Dry Cask



Interim Storage of Spent Nuclear Fuel A Safe, Flexible, and Cost-Effective Near-Term Approach to Spent Fuel Management

A Joint Report from the Harvard University Project on Managing the Atom and the University of Tokyo Project on Sociotechnics of Nuclear Energy

Matthew Bunn, John P. Holdren, Allison Macfarlane

Susan E. Pickett, Atsuyuki Suzuki, Tatsujiro Suzuki

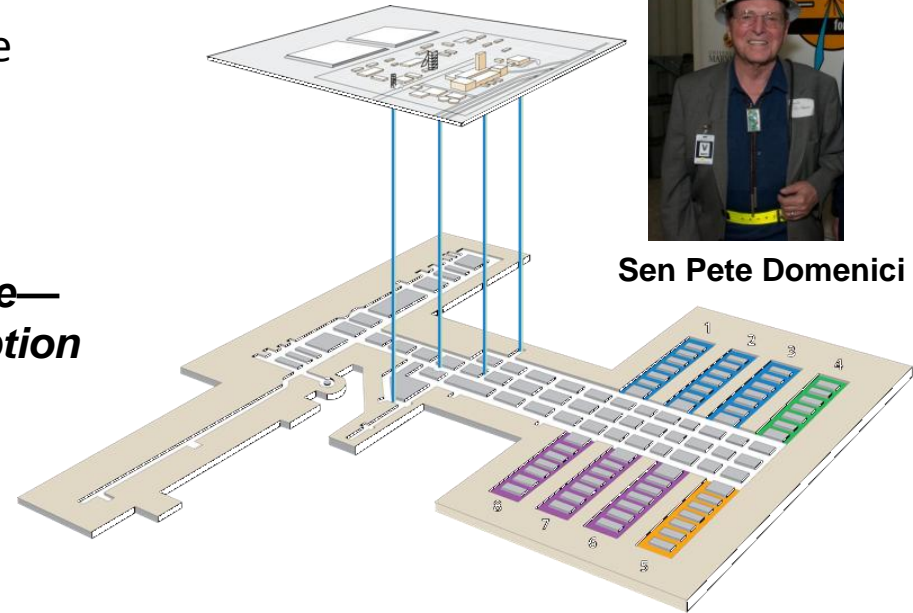
Jennifer Weeks

June, 2001

***“Interim storage is a key element of the fuel cycle—
regardless of whether the planned permanent option
is reprocessing or direct disposal.”***

Salt Repository e.g.: Waste Isolation Pilot Plant

- SALT (1957 NAS)
- WIPP
 - 11 years of successful operation
 - “Defense” Waste
 - EPA Certified (10,000 yrs)
 - Strong Local Support
 - Known Costs
- Retrievable?



Sen Pete Domenici

Non- Proliferation (A National Security Imperative)

Assured Nuclear Fuel Services -GNEP - IFNEC (Cradle to Grave)

Good Nukes, Bad Nukes

Op-Ed, [New York Times](#), page A31

December 22, 2003

[Ashton B. Carter](#), [Dr. William J. Perry](#), [Dr. Arnold Kanter](#), [General Brent Scowcroft](#)

Making the World Safe for Nuclear Energy

Survival, vol. 46, no. 4, Winter 2004–05, pp. 65–80

[John Deutch](#), [Arnold Kanter](#), [Ernest Moniz](#) and [Daniel Poneman](#)

REMARKS BY PRESIDENT BARACK OBAMA

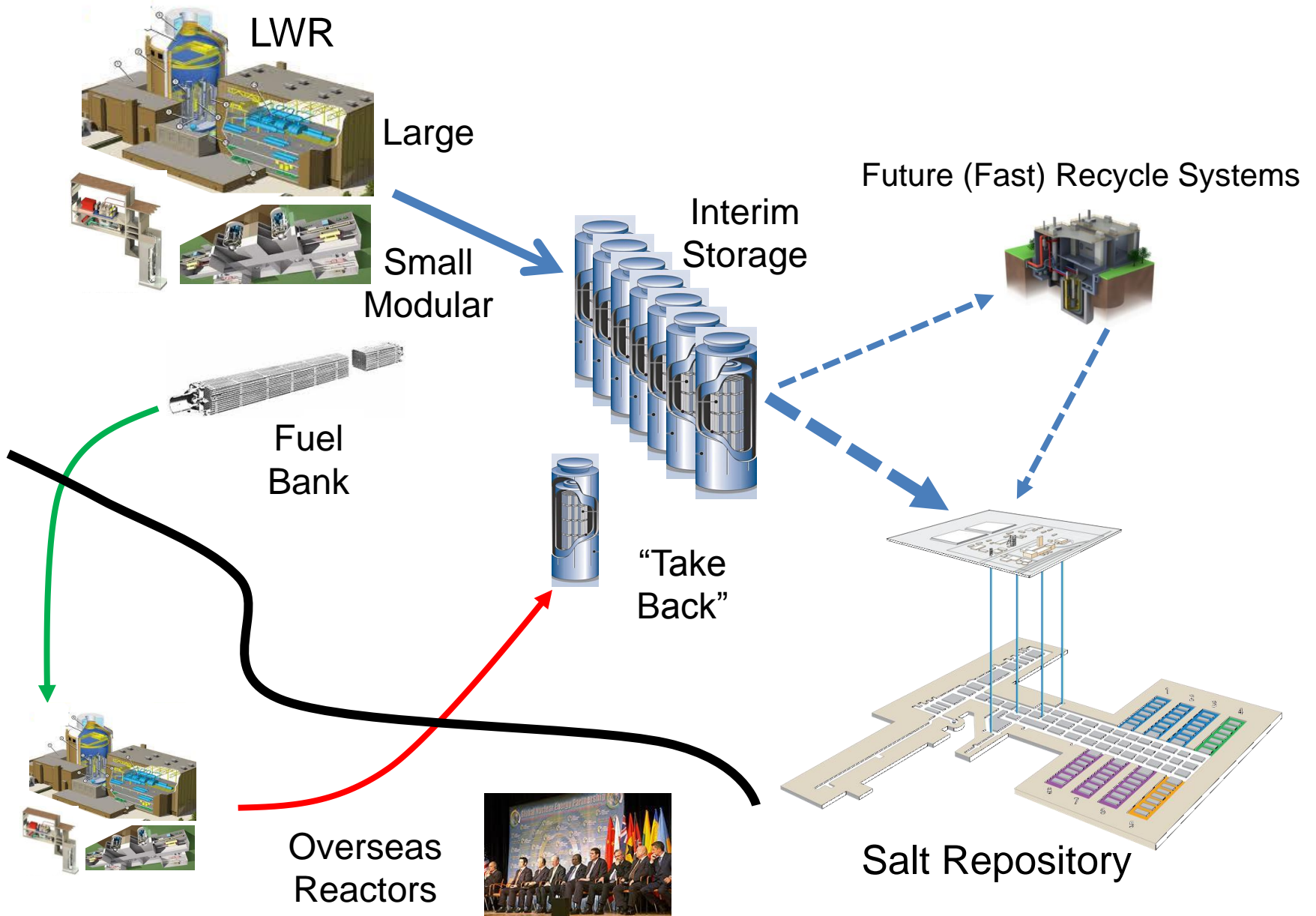
“And we should build a new framework for civil nuclear cooperation, including an international fuel bank, so that countries can access peaceful power without increasing the risks of proliferation.”

President Obama

Prague, April 5, 2009



An Envisioned U.S. Nuclear Fuel Cycle



U.S Leadership: Eisenhower - “Atoms for Peace”

Nuclear Power

“The United States knows that peaceful power from atomic energy is no dream of the future. That capability, already proved, is here--now--today. Who can doubt, if the entire body of the world's scientists and engineers had adequate amounts of fissionable material with which to test and develop their ideas, that this capability would rapidly be transformed into universal, efficient, and economic usage.”

Final Statement

“To the making of these fateful decisions, the United States pledges before you – and therefore before the world – its determination to help solve the fearful atomic dilemma –to devote its entire heart and mind to find the way by which the miraculous inventiveness of man shall not be dedicated to his death, but consecrated to his life.”



*President Eisenhower,
United Nations
December 1953*

U.S Leadership: Obama - “Atoms for Peace & Prosperity”

Nuclear Power

“We must harness the power of nuclear energy on behalf of our efforts to combat climate change, and to advance peace opportunity for all people.”



*President Obama
Prague, April 2009*

Final Statement

“Human destiny will be what we make of it. And here in Prague, let us honor our past by reaching for a better future. Let us bridge our divisions, build upon our hopes, and accept our responsibility to leave this world more prosperous and more peaceful than we found it.”