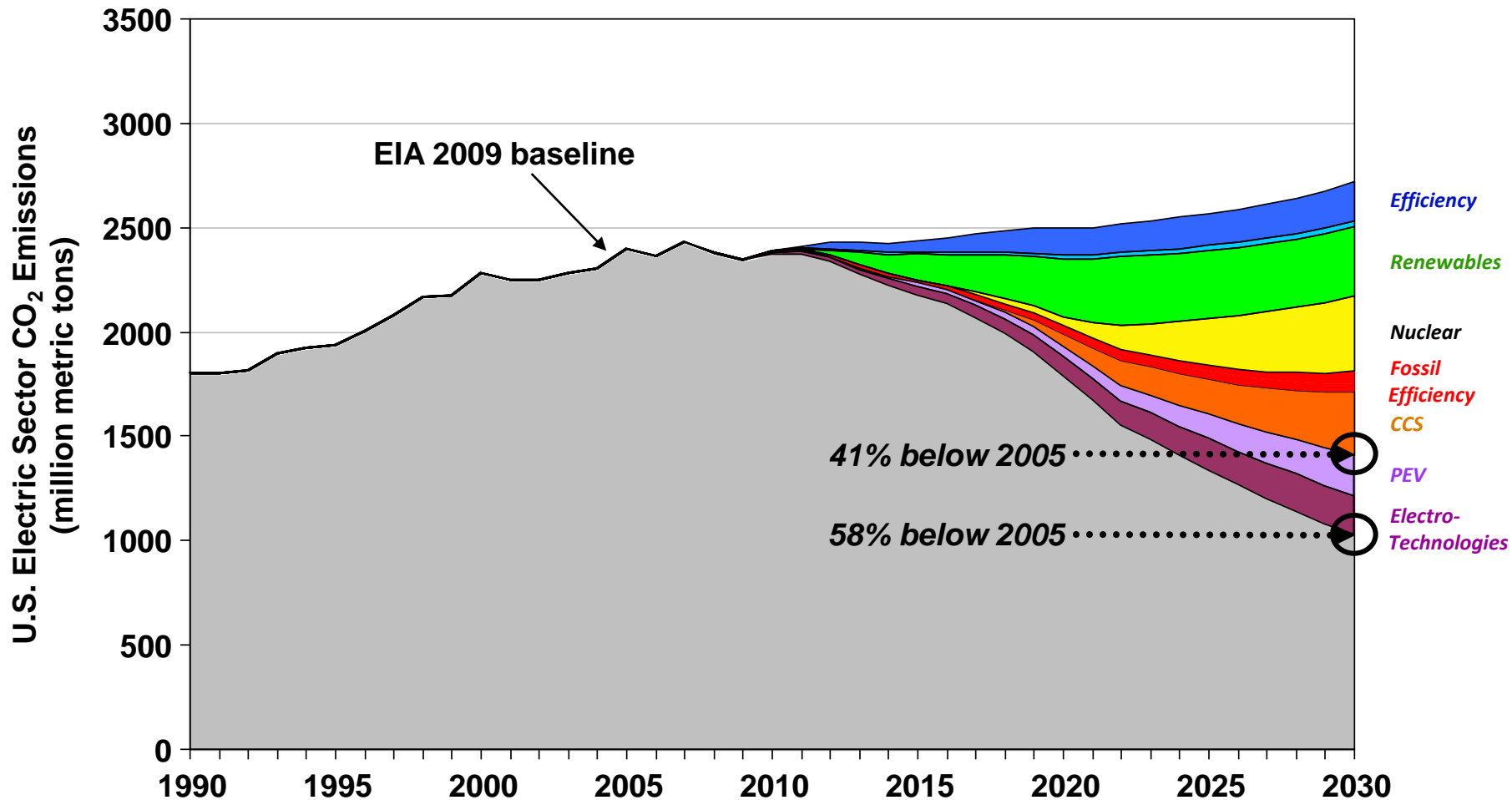


Small Modular Reactors

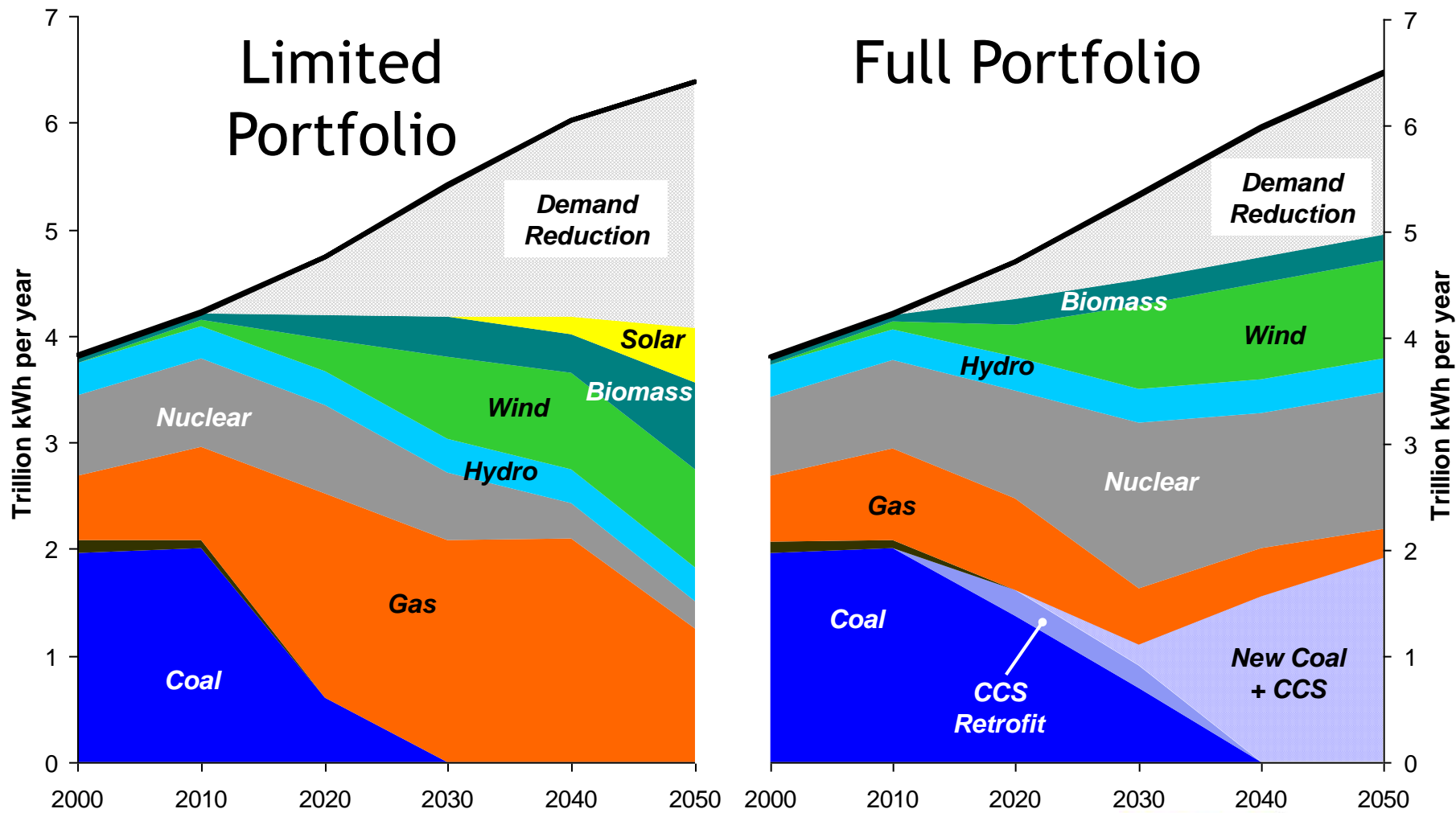
September 29, 2010

Dr. Thomas TerBush
EPRI Nuclear Sector

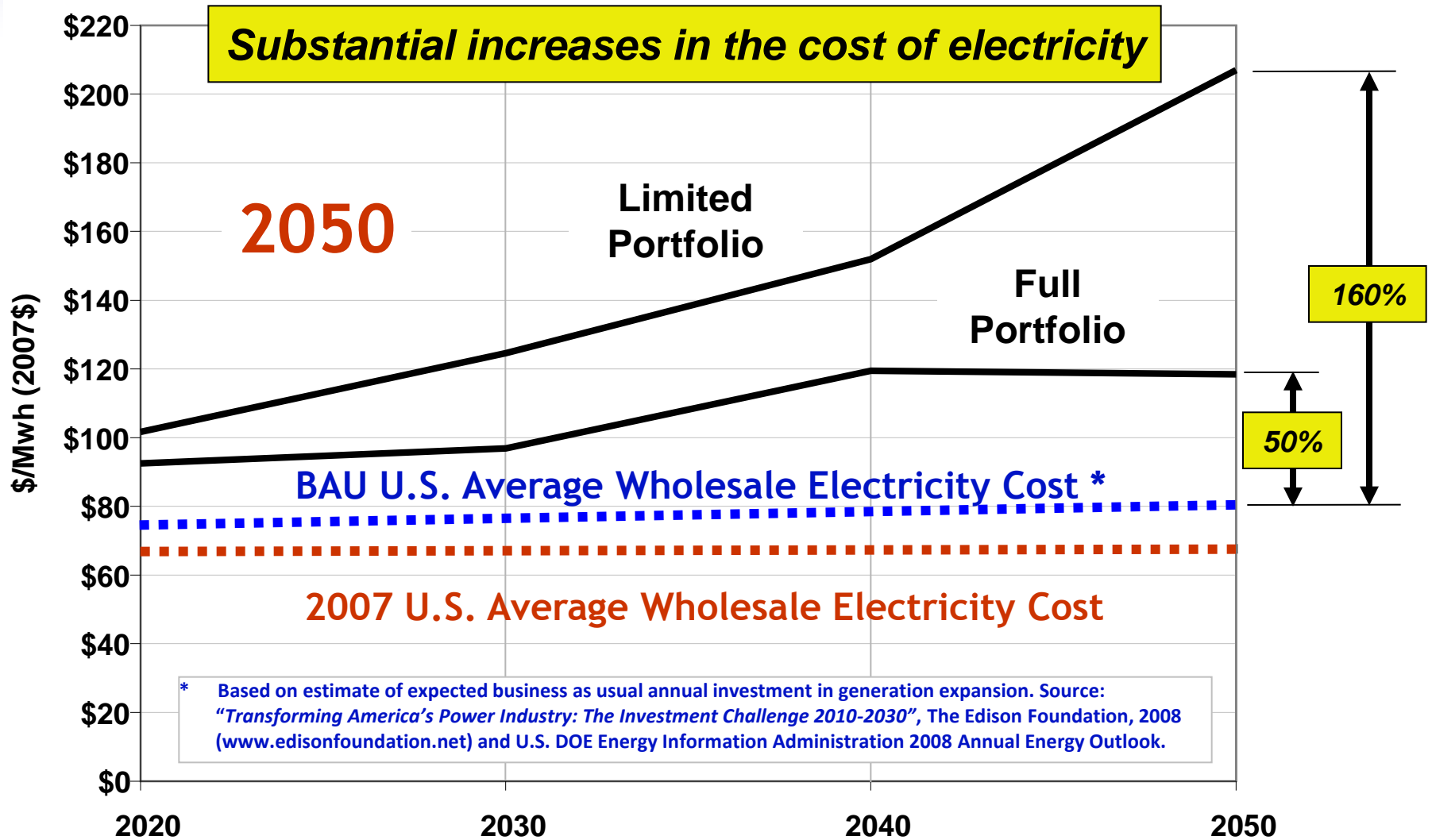
2009 Prism - U.S. Electricity Sector



MERGE U.S. Electric Generation Mix



MERGE Wholesale Electricity Cost Results

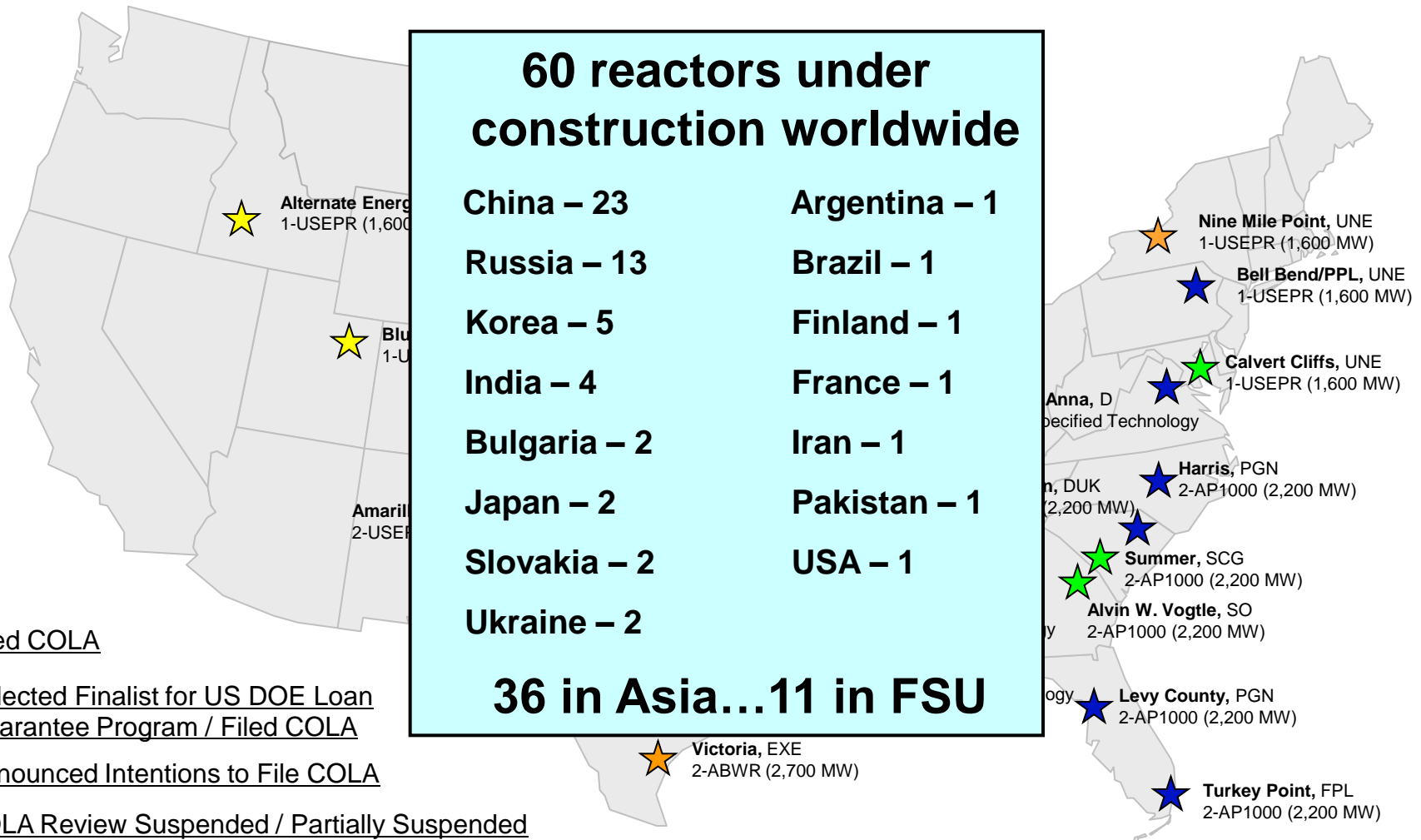






New Nuclear Plants Under Consideration

60 reactors under construction worldwide

China – 23	Argentina – 1
Russia – 13	Brazil – 1
Korea – 5	Finland – 1
India – 4	France – 1
Bulgaria – 2	Iran – 1
Japan – 2	Pakistan – 1
Slovakia – 2	USA – 1
Ukraine – 2	

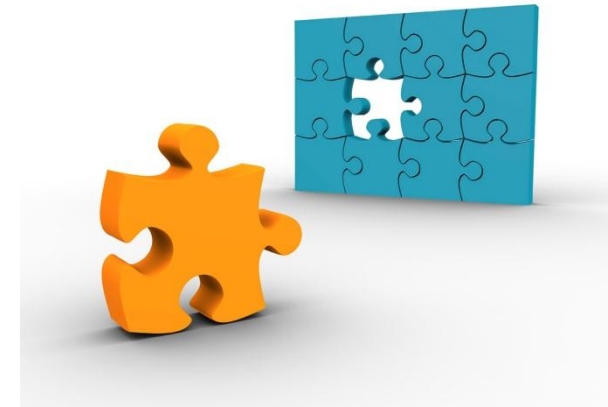
36 in Asia...11 in FSU



-  Filed COLA
-  Selected Finalist for US DOE Loan Guarantee Program / Filed COLA
-  Announced Intentions to File COLA
-  COLA Review Suspended / Partially Suspended

Where Do Small Modular Reactors Fit In?

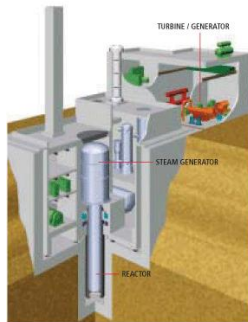
- Economic constraints
- Siting constraints
- Security and safety features
- Advanced applications



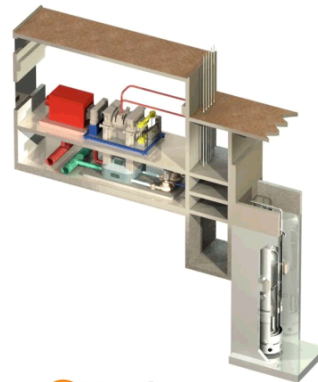
Drivers are not unique to the United States

Small Modular Reactor Designs

- Light Water Reactors
 - NuScale, B&W mPOWER, Westinghouse IRIS
- Mini, distributed & fuel-cycle applications
 - Hyperion, Toshiba 4S, GE Hitachi PRISM
- HTGR's for process heat and hydrogen
 - PBMR, AREVA and General Atomics



TOSHIBA



**NUSCALE
POWER**



HYPERION



**INTELLECTUAL
VENTURES**



B&W
babcock & wilcox
modular nuclear energy

Global Requirements

- Timing
- Resources
- Owner-Operator Support
- Generic regulatory and licensing issues
- Public-Private Coordination



Many designs present new licensing challenges and construction/operating paradigms

Building Blocks for Successful SMR Deployment



PREREQUISITES:

1. Current nuclear plant performance is maintained
2. Current COLA activities proceed as planned

Utility Lead

GENERIC REGULATIONS AND INDUSTRY STANDARDS

1. Predictable licensing and stable regulation
2. LWSMR Utility Requirements Volume
3. Siting Guide Update

NEI /EPRI Lead

PROJECT SPECIFIC ACTIVITIES:

1. NRC Design Certification
3. First-of-a-Kind R&D / Engineering

NSSS / DOE lead

INSTITUTIONAL STEPS:

1. Enhanced public acceptance
2. Clarification of Financing including DOE Loan Guarantees
3. State economic and regulatory issues
4. Enhanced Gov't support

NEI Lead

* Adapted from "Strategic Plan for Building New Nuclear Power Plants" NPOC document – Nov 1990

Some History...the EPRI ALWR Program

Initiating Events

1983 - Feedback from a survey of nuclear utility executives: nuclear power plants must be

- Safer and simpler
- Competitive
- Standardized
- Pre-licensed by the U.S. NRC

1985 - The EPRI ALWR Program is launched

ALWR Program Objectives

- Incorporate the over 5000 reactor-years of experience
- Realize significant improvements in safety
- Stabilize Regulatory basis:
 - Regulatory optimization
 - Margin to regulations
 - Resolution of state and local regulatory issues
- Promote standardization
- Reduce capital and O & M costs

Utility Requirements Document for LWSMRs

- Presents a clear, comprehensive set of design requirements
 - Match to vendor-provided designs
 - Cover complete plant out to grid connection
 - Fully integrated and consistent
 - Address all aspects of plant excellence: safety/licensing; performance; constructability; a good neighbor; low environmental effects; acceptable cost; investment protection.
- Grounded in proven technology of 40 years of commercial light water reactor (LWR) experience.
- Builds on the current LWR experience base, incorporating features which assure a simple and robust design.

Opportunity to reflect past 10 years of industry advances

Together...Shaping the Future of Electricity



EPRI

ELECTRIC POWER
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