

Connecticut Energy Advisory Board



Nuclear Innovation North America LLC

Nuclear Energy Work Session
December 7, 2009

NRG and Toshiba: A Powerful Partnership



Nuclear Innovation North America LLC



Development Capability

- Licensing Expertise
- Financing Expertise
- Partnering and Offtake Relationships
- Substantial FCF Available for Continued Funding of Development Efforts
- Additional Opportunities
- Existing Development Program
- Committed to Low-Carbon Development



TOSHIBA

EPC Capability

- 40 Years of BWR Construction Experience
- Committed Capital of \$300 million
- Existing Manufacturing Supply Chain
- Modularized Design Engineering and Construction
- Positive Subcontractor Relationships
- Strategic Interest in Developing and Promoting ABWR in U.S.



Bringing Innovation to Nuclear Generation



U.S. Nuclear Construction Legacy

The Wounds

- Substantial Cost Overruns
 - First 75 reactors built in the U.S. experienced cost overruns totaling over \$100 billion
 - Average cost overruns for a nuclear plant beginning construction between 1966 and 1977 was 300% of estimated overnight costs
- Significant Schedule Delays
 - Average construction duration of approximately 9 years from the date of construction permit issuance to COD
- Several utility bankruptcies and extremely contentious cost prudence hearings

The Causes

- Two-step Licensing
 - Until the mid-1990's, developers were required to obtain a construction permit before obtaining an operating license
- Bespoke Reactor Units
 - Non-standard designs led to numerous engineering difficulties and prevented economies of scale from being realized within the nuclear supply chain
- TMI 2
 - Extensive re-work created as a result of NRC review process from TMI incident

U.S. Nuclear Construction Legacy: The Result



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- Commercial financing markets do not exist for new nuclear construction
 - Banks will not put their balance sheets at risk
 - Recent turmoil in the banking sector has exacerbated the problem
- On-balance sheet financing will have substantial credit ratings implications
 - Ratings agencies have indicated that sheer size of nuclear projects will have meaningful impact on corporate balance sheets and liquidity requirements
 - Ratings downgrades will inevitably increase unit costs and deter sponsorship of new nuclear plants
- New nuclear construction will hinge on limited recourse financing structures backed by loan guarantees



Government assistance in the form of loan guarantees will be required to overcome the legacy left behind by the first wave of nuclear construction in the U.S.



What Has Transpired to Promote New Nuclear?

Licensing

- Implementation of the Combined Construction and Operating License process by the NRC
- Eliminates delays experienced in the last wave of nuclear construction
- Standardizes design requirements eliminating custom designed units

Energy Policy Act of 2005

- DOE Loan Guarantee Program provides for \$18.5 billion of loan guarantee authorization
 - Loan guarantees can cover up to 80% of total project costs
- Production Tax Credits
 - Provides added economic incentive to developers
- Standby Support Insurance
 - Mitigates potential licensing delay risk

State Regulatory Changes

- Favorable CWIP recovery mechanisms put in place by several state regulators

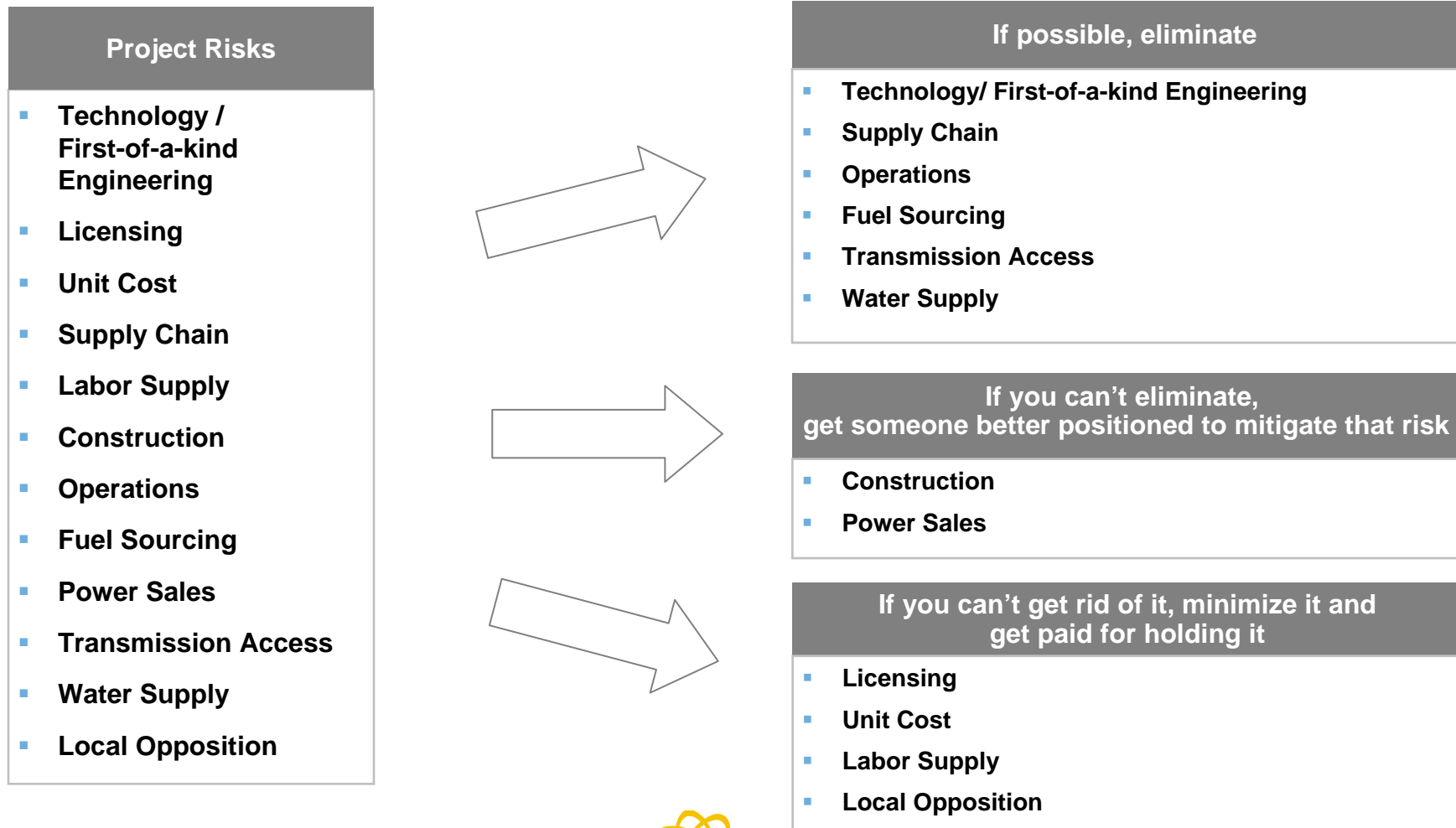


DOE Loan Guarantee Process

- DOE received 19 loan guarantee applications in December 2008 representing 21 proposed units
 - Total loan volume request amounted to \$188 billion
- DOE short-listed four projects in May 2009
 - STP 3&4 (NINA); Vogtle (Southern); Summer (SCANA); Calvert Cliffs (Unistar)
- Critical decision criteria for short listing included:
 - Strong EPC contract
 - Regulated or contracted plant vs. merchant
 - Sponsor credit and commitment to projects
 - Technology diversification
 - Licensing certainty



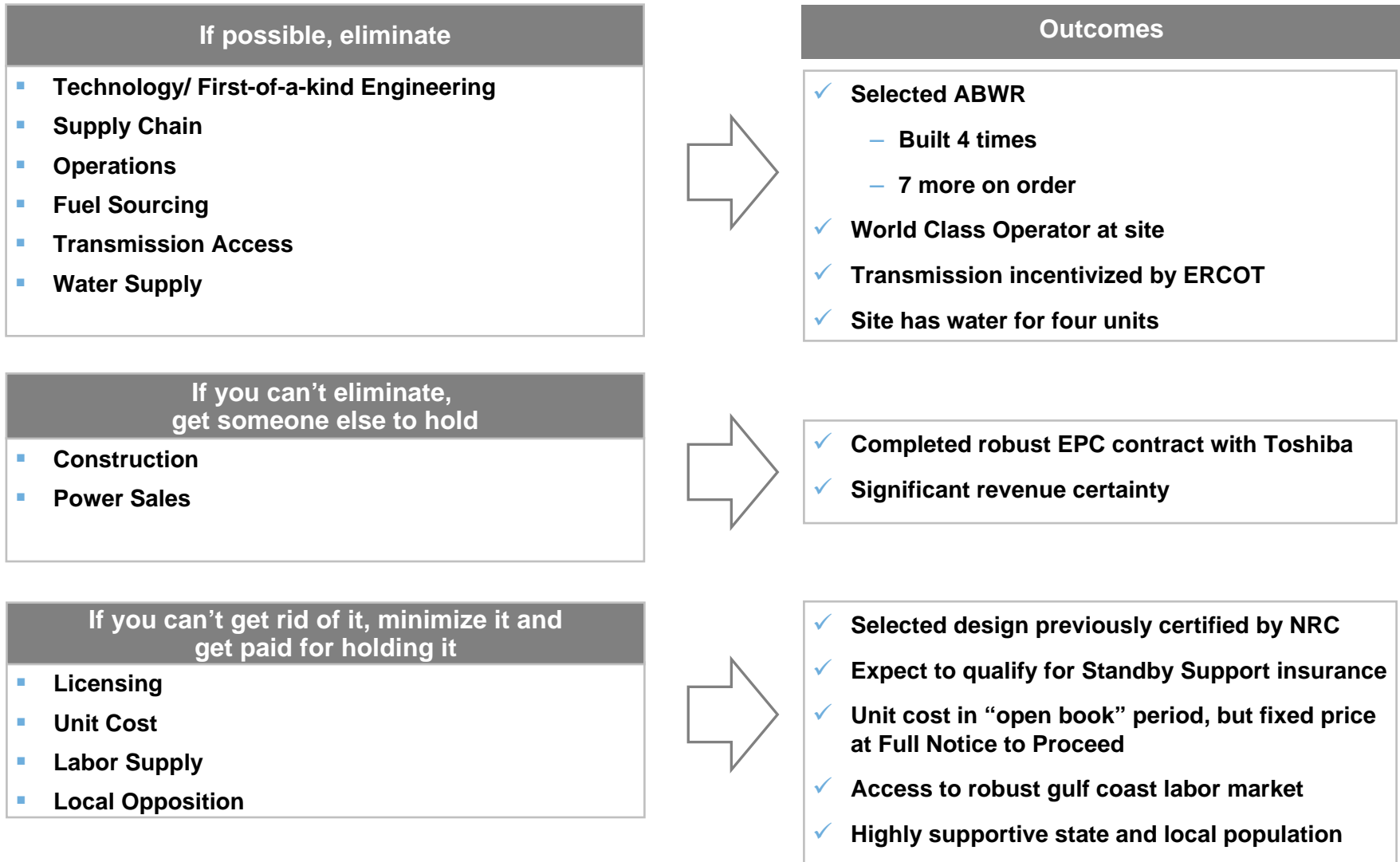
What Does the Developer Have to Worry About?



A developer must begin with assessing project risks, and developing, in many cases, multiple approaches to substantially mitigate those risks



STP 3&4: Risk Mitigation Example





What Should Connecticut Worry About?

- Additional DOE loan guarantee volume
 - Existing loan guarantee volume cannot cover the cost of all proposed nuclear plants
 - State endorsement of new nuclear will assist in procuring additional loan guarantee volume
- Local receptivity coupled with the firm commitment of politicians and regulators to new nuclear
 - Clear the path for developers in order to induce building in Connecticut
- Mechanisms providing for certainty of return to the developer
 - Power off-take structures
 - Quasi-rate base style recovery of project costs
 - Economic enhancements such as tax abatements



Connecticut can implement programs to induce developers to construct new nuclear plants in the state