



Utility Interest in SMRs

TVA's Perspective

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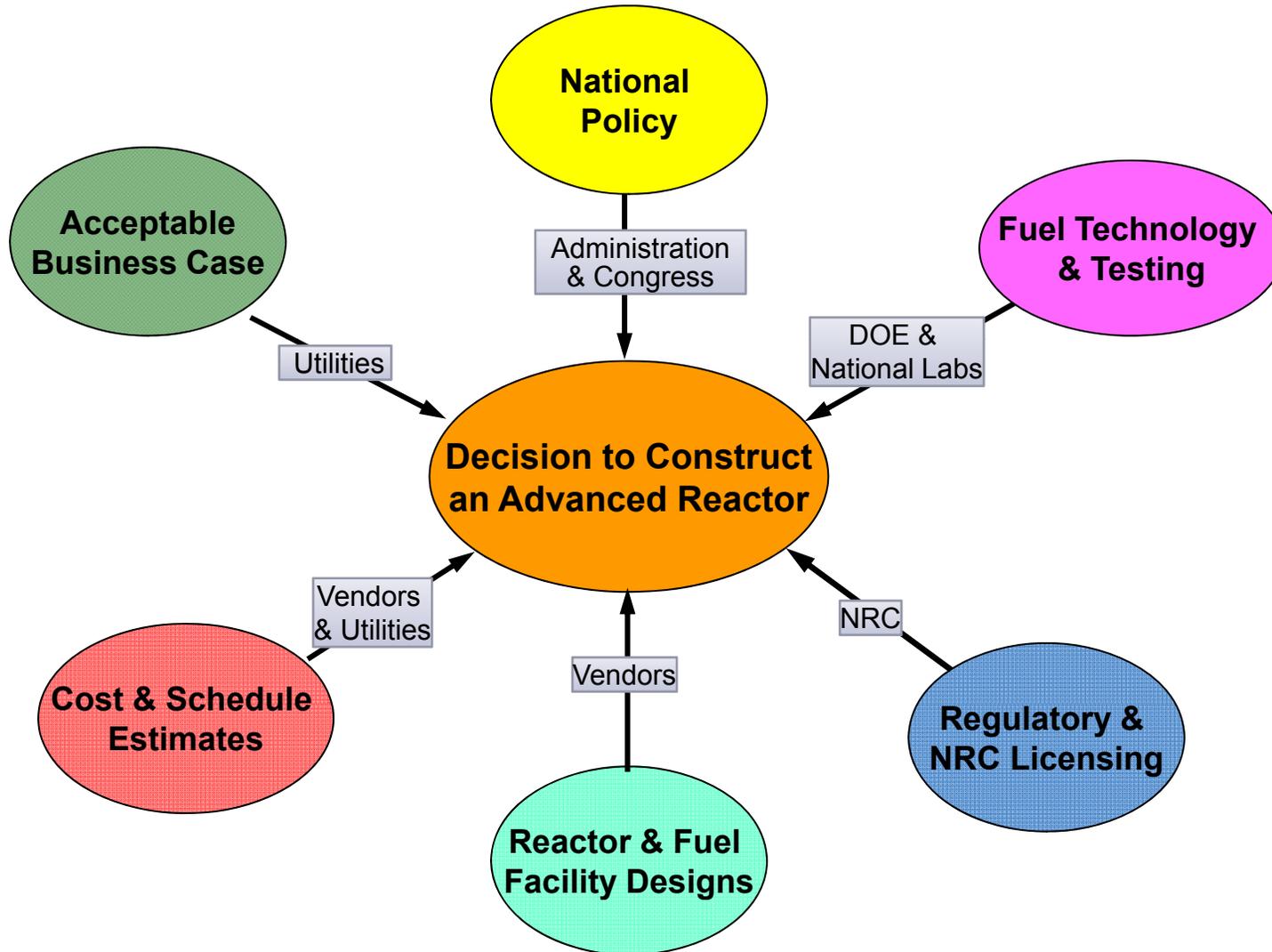
NRC-DOE Workshop on Advanced Non-Light Water Reactors

CHALLENGES FACING UTILITIES

- Demand is flat and recession recovery is slower than was predicted
- Customers have changed their electricity use behaviors and are taking advantage of energy efficiency and demand response programs
- Gas prices are cheap and expected to stay low
- Regulations are making older and smaller coal plants uneconomical
- Current policies and incentives are resulting in wide-spread deployment of renewables that change electricity generation requirements
- As coal plants are shut down and more highly-variable and distributed renewables are deployed, stresses on the transmission system increase

It is difficult to justify funding technology innovation and large capital expenditures in an uncertain demand, revenue & regulatory environment

CHALLENGES TO AN ADVANCED REACTOR BUILD DECISION



ATTRACTIVE SMR FEATURES

- Lower capital cost capacity additions
- More flexibility to meet electricity demand; more distributed and more incremental
- More operational flexibility; load-following and continued operation during loss of off-site power
- Smaller footprint and reduced EPZ lead to more siting options; opportunity to repower coal plants
- Enhanced safety and security

Option for clean and reliable energy in lower cost increments

WHAT SMR FEATURES IMPROVE SAFETY?

- Smaller reactor cores and radiological source terms
- Simplified integral designs (e.g., no large piping)
- Slower accident progression/longer coping times
- Enhanced threat protection from underground construction
- Applicable to both light-water and advanced SMRs

SMR designs significantly reduce the risk of a radiological release and offsite consequences

TVA'S APPROACH & PLANS

- TVA is developing an Early Site Permit (ESP) application for planned submittal to the NRC in Q1 of 2016
 - Plant parameter envelope bounding 4 U.S. LWR SMR designs
 - 100% of sections drafted
 - NRC readiness review underway
- TVA chooses light-water SMR technology as a next step because:
 - Lower fuel, fuel cycle and regulatory uncertainty
 - Desire to have SMR technology demonstrated by mid-2020's to provide generation build options needed in the 2030's

Nuclear is a key part of TVA's diverse generation portfolio

LWR SMR ACTIVITIES PAVE THE WAY FOR ADVANCED REACTORS

- Appropriately-sized Emergency Planning Zones
 - May 29, 2015 SECY-15-0077: Staff recommend rulemaking to establish a consequence-based Emergency Preparedness (EP) framework for SMRs and other technologies
 - August 4, 2015 Commission SRM: By a 4-0 vote Commission directs staff to revise regulations and guidance for emergency preparedness for SMRs (both light-water and advanced reactors)

Regulations and guidance should be updated in some areas to facilitate societal benefits from deployment of reactors with improved safety

CONCLUSIONS

- Utilities value the reliability and carbon-free benefits of nuclear energy and enhanced safety and security features of SMRs in particular
- SMR safety is a significant technology innovation advancement
- Regulators should facilitate deployment of safety enhancements
- Enhanced SMR safety should result in less potential impact to the public, should enable smaller Emergency Planning Zones
- Progress is being made to address policy and regulatory challenges for potential LWR SMR deployment, and in some cases advanced reactors
- Work remains on regulatory and policy, particularly for non-LWR SMRs

Options have value: near-term investment in SMR option development may reap significant future benefits!