



# Utility Interest in SMRs

## *TVA's Perspective*

**Dan Stout**

**September 1, 2015**

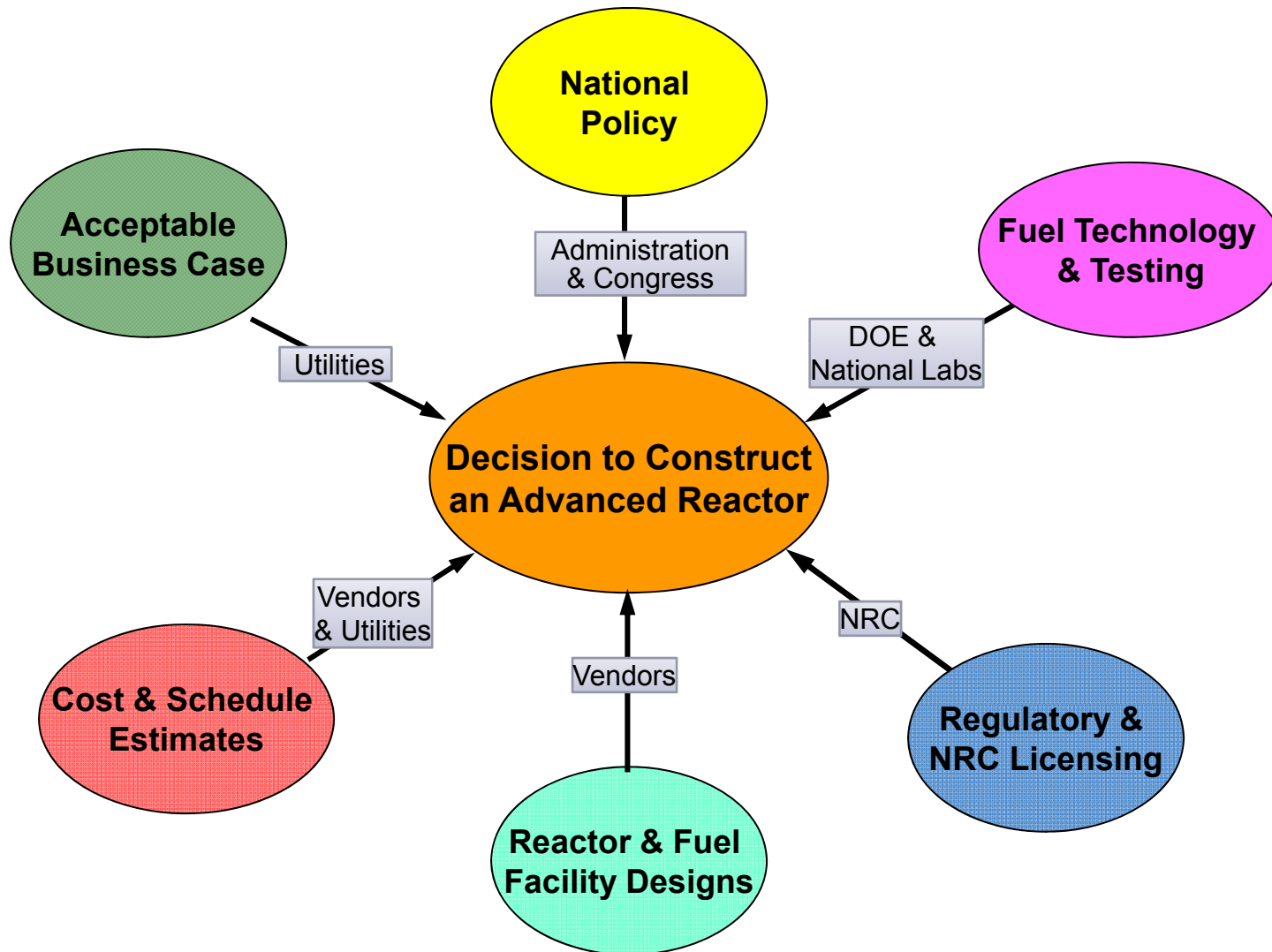
*NRC-DOE Workshop on Advanced Non-Light Water Reactors*

# 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!*