

***GEAUX GREEN!***



***The Challenges of the  
Owner/Operator***

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**Nuclear remains the only economically viable and technically proven source for the large scale, baseload generation of clean, affordable power**



**“Key Mitigation Technology” for IPCC**

**Environmentally friendly**

**Long and outstanding track record**

**Low and stable fuel cost**

**Zero emissions with no carbon output**

# A great time to act



*Entergy ranks among cleanest U.S. utilities.*

*Named 'Best in Class' since '05 by Carbon Disclosure Project.*

*Awarded '07 Climate Protection Award by EPA.*

*Listed on Dow Jones Sustainability Index since '01.*

**New power plants are required to provide the electricity for the future.**

**Right now, no new nuclear plants are being built. It takes years to build new nuclear facilities.**

**Steps are being taken today to ensure that efficient and environmentally friendly plants can be built.**

**The sooner new power can be brought on line, the sooner businesses, consumers, and our Earth will benefit.**

# New Nuclear self supply option for 2017-2025 timeframe



*Entergy is developing new nuclear options for both Louisiana & Mississippi.*

*Our decision to build will be dependent on how well we can resolve or mitigate the project risks and overcome the challenges*

## New Nuclear Project Overview

- We are developing **options to build two** new nuclear plants in the 2017 to 2025 timeframe to meet supply planning needs
- Nuclear development will utilize a phased decision approach
- Initial phase is **submit NRC applications** for combined Construction and Operating License (COLAs) by 12/2008 for 2 sites - Grand Gulf and River Bend
- We are currently taking actions, along with NEI and the industry, **to manage and mitigate the risks** associated with the challenges the renaissance faces

# The Challenges for the Owner/Operator



**The need for New Nuclear is compelling, but the challenges must be overcome:**



- Untested Licensing Process
- EPC Terms and Conditions
- Financing
- Skilled Talent to Build and Operate
- Supply Chain
- Certainty in Cost and Schedule

# New, Untested Licensing Process



## Removing risk from the licensing process...



- Restructured process
- Stable regulatory requirements
- Defined hearing procedures
- Oversight of licensing boards
- Design-centered review groups
- Ongoing ITACC verification
- High threshold, limited window for intervention after COL approval

**Developers have regulatory approvals before significant capital spent;  
federal standby support covers delays from licensing, litigation**

# Engineering, Procurement & Construction, EPC, Contract



## EPC requirements...



- Clearly defined ownership & accountability of risk
- Cost transparency
- Cost and Schedule certainty
- Pay-for-performance
- Shared risk/reward

**To keep new nuclear renaissance moving forward, the next critical hurdle after Licensing is to structure a mutually-agreeable EPC**

# Economics and Financing



## Economics of new baseload...



- New capacity will be expensive; total costs not yet known
- Evolving costs surrounding commodities, labor
- Supportive rate policies at the state level
- Loan guarantees from the federal government
- New nuclear plants competitive with other baseload electricity



# Skilled Talent to Build and Operate

## The work force challenge...

**Now...**

- Aging nuclear workforce
- Knowledge retention
- Nuclear not on radar screens of many grads
- Challenges exist in areas of both construction and operation

# Skilled Talent to Build and Operate

## Addressing the work force challenge...



- **Nuclear engineering enrollments up dramatically**
  - *Undergraduate: from 470 in '98/'99 academic year to 1,933 in '06/'07*
  - *Graduate: from 220 in '98/'99 academic year to 1,153 in '06/'07*
- **Joint initiatives with organized labor and the Departments of Labor, Education, Defense**
- **Industry/community college programs in 14 states**
- **Skilled crafts: collaborative programs in 10 states**

# Supply Chain



## Is the supply chain adequate...

### Concerns...

- Much interest from companies, few suppliers for certain components
- New nuclear is well underway around the world, not yet in the United States
- Questions about availability of supply chain vendors add cost uncertainty to projects

## Supply chain moves to respond...



- Supply chain adequate for “first wave”
- Long-lead materials (e.g., forgings) already fabricated or ordered for first wave
- Component manufacturing will respond to sustained demand
- Early signs that suppliers are gearing up

# Long Lead Material



*Entergy  
has  
secured  
the  
ultra-large  
forgings  
for the  
reactor  
pressure  
vessel  
and the  
steam  
turbine  
generator  
rotors*



# Certainty in Cost and Schedule



**These challenges must be met  
to provide certainty...**

**Unknown?**

- Licensing, EPC, Financial, Talent, Supply Chain uncertainties all can impact cost and schedule of a new nuclear project
- Commodity availability and escalation
- Manufacturing capacity
- Labor (availability, productivity)
- EPC (risk allocation, demand, delivery)

# Cost and Schedule Certainty



## Road map for success...



- Detailed design complete before construction
- Integrated engineering, construction schedule
- Standardization
- Focus on quality assurance
- Improved planning and construction management tools
- Improved construction techniques

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