

International Nuclear Power Generation

Ron Lewis

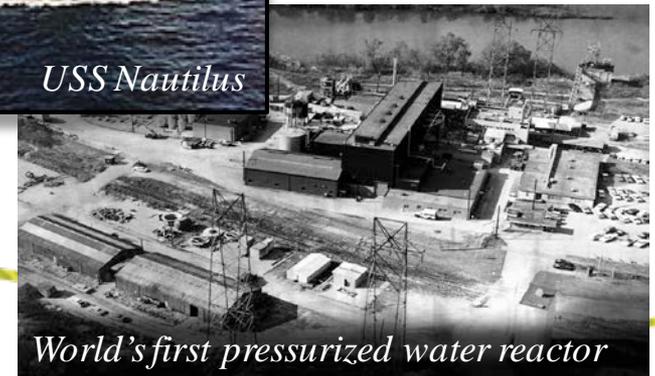
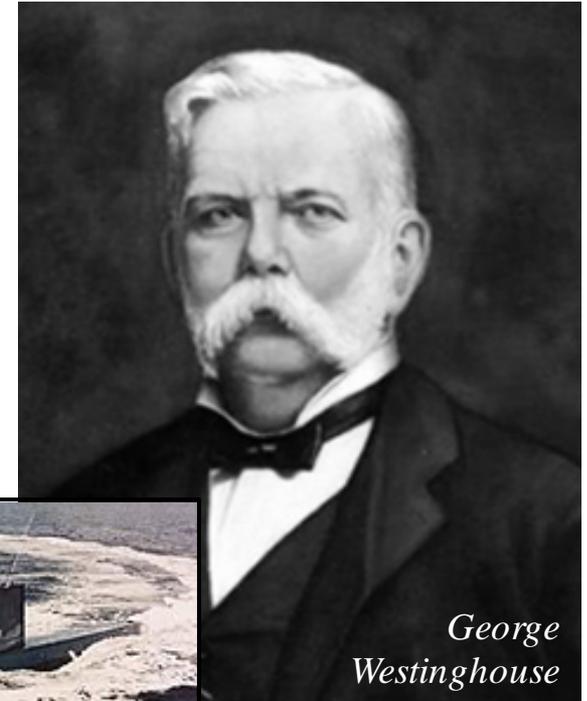
Americas Vice President

Nuclear Power Plants Business & Project Development

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Westinghouse Electric Company

- Incorporated in 1886 by George Westinghouse
- Responsible for some of the world's most important achievements:
 - AC technology
 - 1st commercial radio broadcast
 - USS Nautilus
 - 1st camera on the moon
 - **Commercial nuclear power**



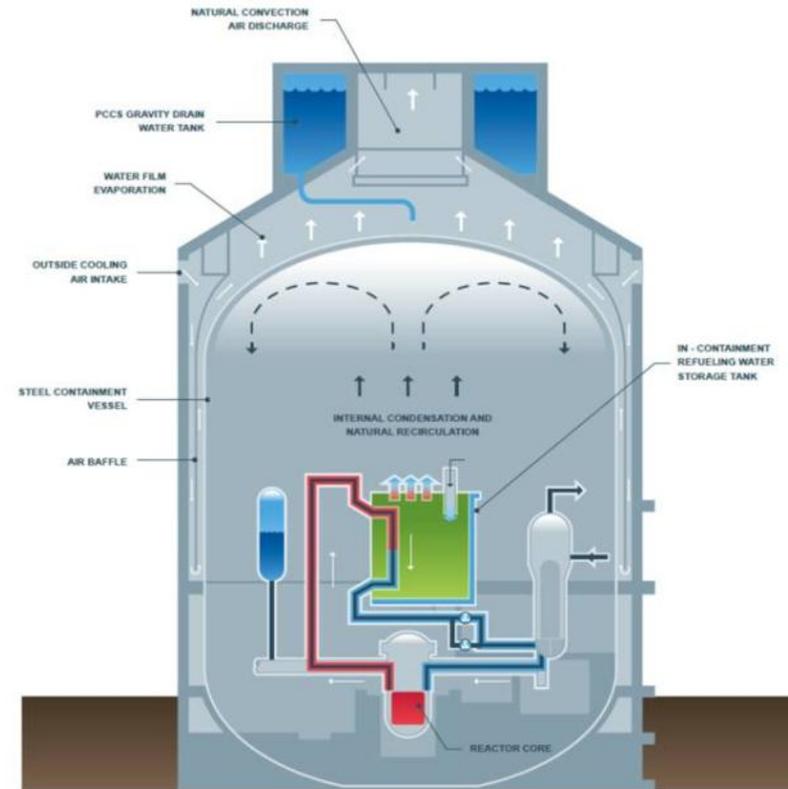
The World's Nuclear Technology Leader

- Nearly 50% of the world's nuclear power plants are based on Westinghouse technology
- 50+ years of nuclear experience, with dedicated experts in all aspects of reactor design, licensing, operations and plant maintenance
- **AP1000**[®] plant design: The first and only U.S.-licensed large passive safety reactor
- State-of-the-art patented technologies and proprietary passive safety systems and technology



AP1000 Plant's Innovative Safety Features

- Passive Safety-Related Systems
 - Use “passive” processes only; no active pumps, diesels ...
 - One-time alignment of valves
 - No support systems required after actuation
 - Greatly reduced dependency on operator actions
- Active Defense in Depth-Related Systems
 - Reliably support normal operation
 - Redundant equipment powered by onsite diesels
 - Minimize challenges to passive safety systems
 - Not necessary to mitigate design basis accidents



**All Critical Station Blackout
Response Features
FAIL SAFE**

AP1000 Plant Global Project Delivery

- Eight **AP1000** units under construction worldwide
 - Four units in China
 - Four units in the United States



V.C. SUMMER

VOGTLE

HAIYANG

SANMEN



AP1000 Plant Delivery: China Highlights

- Major equipment delivered and installed at Sanmen Unit 1 and Haiyang Unit 1 includes:
 - Reactor Vessel
 - Steam Generators
 - Reactor Vessel Internals
 - Polar Crane
 - Integrated Head Package
- Containment Vessel Top Head (CVTH) set at Sanmen Unit 1 in January 2013 and Haiyang Unit 1 in March 2013
- Digital I&C delivery in progress
- Potential Sanmen operators have completed simulator training; Haiyang operators started simulator training in July
- Technology transfer well advanced

Sanmen Site – June 2013



Haiyang Site – March 2013



Sanmen Site Progress: Time Lapse View



2009 to 2013

AP1000 Plant Delivery: U.S. Highlights

- First nuclear concrete (FNC) placement completed in March 2013 for V.C. Summer Unit 2 and Vogtle Unit 3
- CR10 module, the support structure for the Containment Vessel Bottom Head (CVBH), installed in April 2013 at V.C. Summer Unit 2 and Vogtle Unit 3
- CVBH installed May 22 at V.C. Summer Unit 2 and June 1 at Vogtle Unit 3
- Assembly of CV rings and condensers for initial units in progress at both sites
- Cooling towers under construction at both sites
- Component and module fabrication proceeding

Vogtle Unit 3 RV Delivery – April 2013



V.C. Summer Unit 2 CVBH Set – May 2013



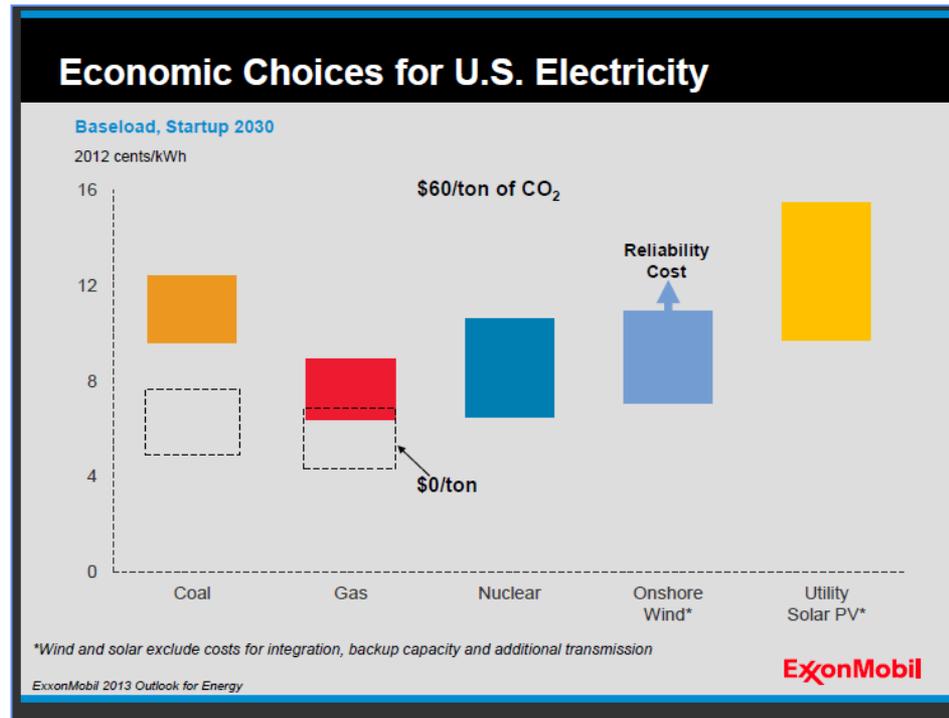
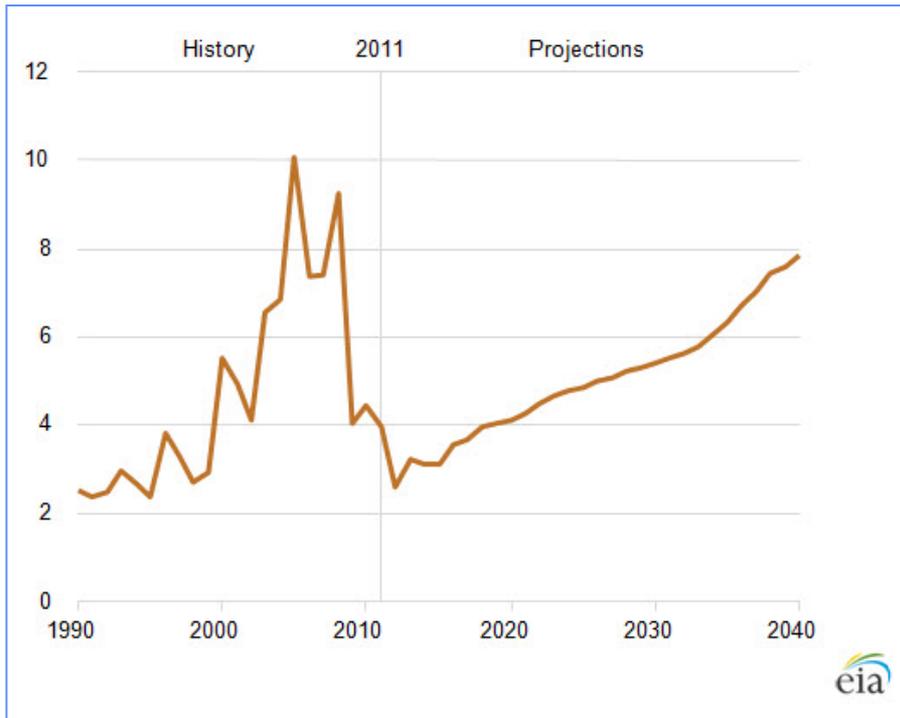
Long-Term Nuclear Market Fundamentals Are Strong

- Carbon-constrained world
- Replacement of aging infrastructure
- Development of emerging economies
- Intermittent renewable energy delivery
- Natural gas dependence and volatility



Additional 250 GW by 2030

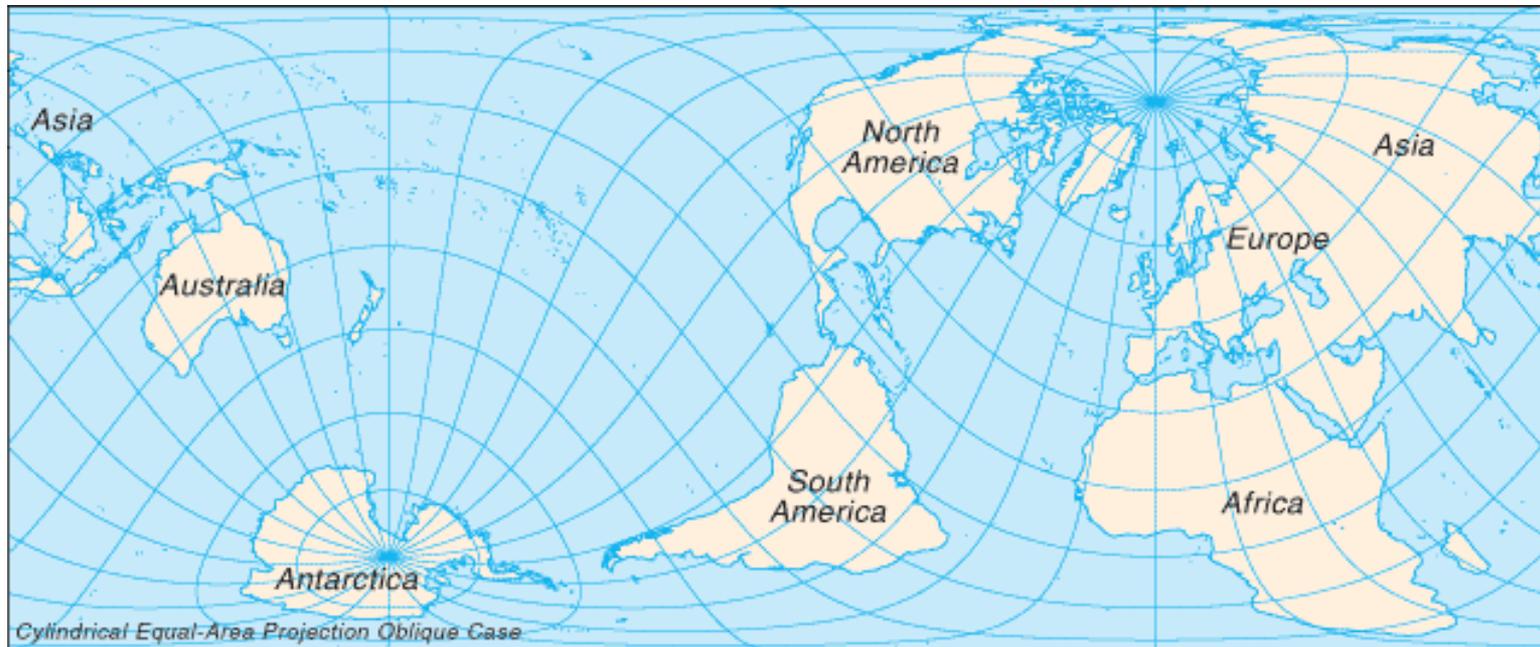
Annual Average Henry Hub Natural Gas Prices (2011 \$/MMBtu)



- Nuclear provides a hedge against traditionally volatile natural gas prices and projected increases
- Carbon and GHG legislation will drive gas plant costs higher

Challenges in the International Marketplace

- Localization content
- Financing support
- International business standards
- Becoming local (language, culture, presence)



Technology Comparison

	AP1000	VVER-1200	APR1400	ATMEA 1	EPR
Country of Technology	U.S.	Russia	South Korea	Japan / France	France
Net Output (MW _e)	1154	1082	1400	1150	1650
Units Under Construction ¹	8	5	5	0	4
Safety Systems	Fully Passive	Active & Passive	Active & Passive	Active & Passive	Active & Passive
Core Catcher	In-Vessel	Yes	In-Vessel	Yes	Yes

USG Advocacy Critical for Success

- Key competitors are state-owned / state-affiliated enterprises that often bundle other business sectors and foreign policy initiatives in competitive offerings
 - French
 - Russian
 - Korean
- U.S. Government advocacy is critical to establishing a more level playing field
- Alternate forms of financing are needed to compete against state-owned / state-affiliated nuclear providers

Thank you! Questions?

