STANDARD & POOR'S

The Financial Markets' View of Western Utilities

Swami Venkataraman, CFA
Director
Standard & Poor's

Jan 18, 2007

The McGraw·Hill Companies

State of the Markets

- Well established need for baseload capacity starting in the next decade
- Past capacity additions displayed clear trends – Preponderance of Coal, Nuclear or Gas in different times
- Today, several forces are pulling in different directions
  - Volatility in international energy markets / gas prices / even coal
  - Concerns over global warming
  - Rising utility Bills
  - National Security
- Sharply Rising Construction Costs
  - Equipment costs are rising due to global demand
  - Labor availability is scarce
  - EPC Contract terms are less favorable

STANDARD
&POOR'S

Two Certainties

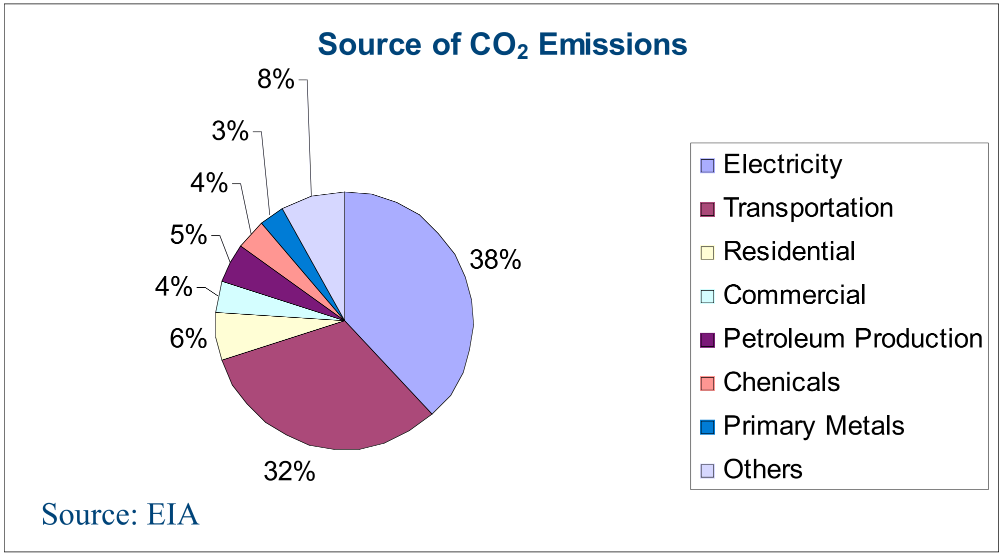
- Fuel and technology diversity is a reality
  - Coal, IGCC, Nuclear, Gas, Wind, Geothermal, Solar are all being seriously considered
  - Only the first four are contenders for baseload generation

- Cost of electricity will remain a key driver for States
  - Fiduciary duty to minimize rates for customers
  - All costs must be considered – CO2, Decommissioning etc.

STANDARD &POOR'S

Global Warming is a Growing, Overarching Concern

- Global Warming is emerging as the policy tie connecting all these technologies
- Significant potential for federal carbon regulations
  - Utilities maybe held to a 20/20 hindsight standard
- No consistent federal policy mandate
  - State-level initiatives like AB 32 and RGGI
  - Renewable Portfolio Standards
  - Subsidies for specific technologies
- The “Insurance Premium” analogy
- The power sector is the largest source of CO_2



STANDARD
&POOR’S

Technology Cost Comparison

STANDARD
&POOR'S

Technology Cost Comparison

Global Assumptions

Plant Capacity (MW)*	500
CO_2 transportation ($/ton)	6
CO_2 storage ($/ton)	4
Market price of CO_2 emission ($/ton)	30
Market price of gas ($/MMBtu)	7
Market price of coal ($/MMBtu)	1.7
Owners costs as % of EPC cost	20%
Ratio of upfront investment to annual capital recovery	9.43

*1600 MW for Nuclear

STANDARD &POOR'S

Technology Cost Comparison

Technology Cost Assumptions

	IGCC	PC	Nuclear	NGCC
EPC Cost ($/KW)*	1750	1450		
Total Plant Cost ($/KW)	2100	1740	3000	600
Capacity factor	80%	85%	85%	65%
Heat Rate (MMBtu/Mwh)	8.5	10		7.1
Variable O&M ($/Mwh)	2	2	0	1.5
Fixed O&M ($/Kw-yr)	40	60	130	20
Decommissioning Costs ($ bill)			3.0	
Carbon Capture Assumptions				
Capital Cost ($/KW)	450	940	0	470
Operating Cost ($/Mwh)	2.7	8.3	0	2.6
Energy penalty to capture CO_2	15%	25%	0	13%
Ton/MWh CO_2 emitted rate (before)	1	1	0	0.368
Ton/MWh CO_2 emitted rate (after)	0.088	0.105	0	0.042

Technology Cost Comparison

Cost of Electricity

$/MWh	IGCC	PC	Nuclear	NGCC
Plant Capital Cost	32	25	56	11
Plant Fuel Cost	14	17	5	50
Plant O&M	11	8	23	5
Production Costs	**57**	**50**	**68**	**66**
CO_2 capture capital cost	10	20	0	13
CO_2 Energy penalty	12	26	0	12
CO_2 other costs	14	21	0	7
CO_2 Related Costs	**37**	**67**	**0**	**32**
Grand Total	**94**	**117**	**68**	**98**

STANDARD & POOR'S