Not confidential

Kansas City Power & Light
Integrated Resource Planning Review

May 12, 2004

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Date 7-12-05 Case No. EO-2005-0329
Reporter JL

Kansas City Power & Light
ENERGIZING LIFE

Agenda

- 10 Energy Industry Outlook
  - Environmental Issues
  - Natural Gas Market
- KCP&L Projected Resource Requirements
- Resource Alternatives Considered
- IRP Analysis Process
- Results and Sensitivities

KCP&L's planning process, conducted as part of the GPE strategy process developed qualitative and quantitative perspectives on the principal factors shaping the electric industry

Drivers

Commodity Markets	Environmental Regulation	Technology	Market Structure
Natural Gas Prices and Volatility	Emission Standards	Distributed Generation (Supply) Technology Innovation	Retail Market Wholesale Market

Contingencies

Commodity Markets	Macro Economics	Technology	Other
Oil Market Chaos	World-wide Economic Meltdown	Superconductor Nuclear Shut Down	Terrorist Events Catastrophic Events

Sensitivities

Macro Economics	Commodity Markets
Load Growth Interest Rates	Natural Gas Prices Coal Prices Power Prices

The generation and wholesale sector will face major uncertainties surrounding environmental regulation and natural gas prices over the next decade

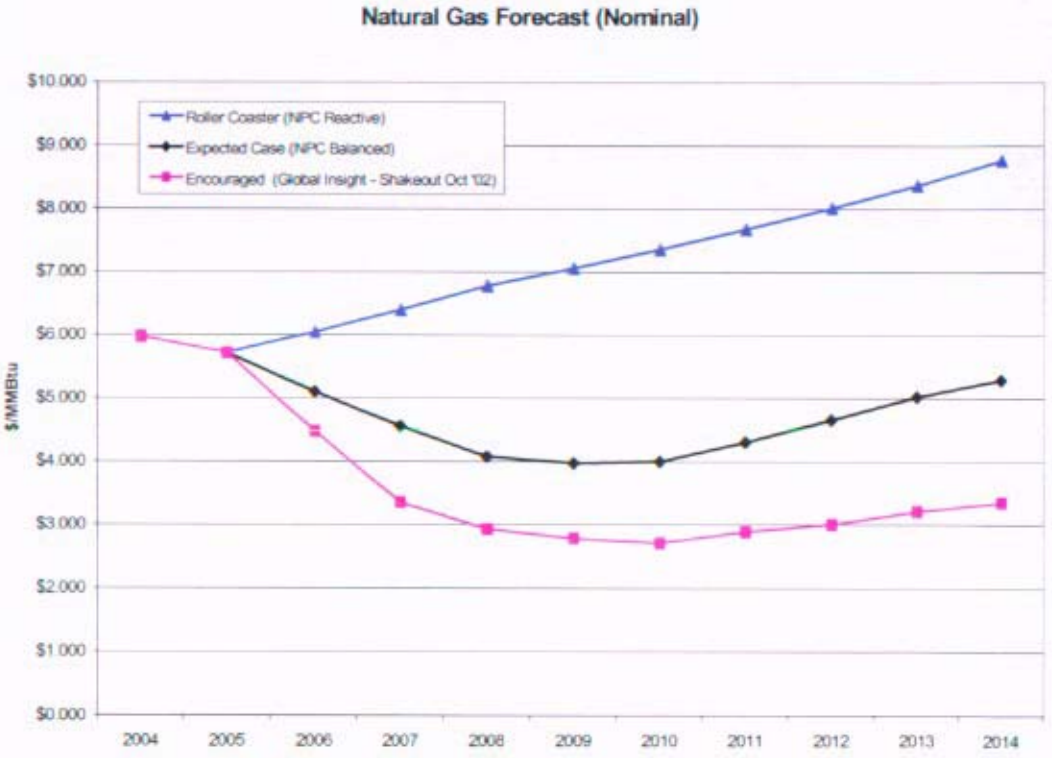
- Environmental regulation will continue to play a major role in reshaping the segment
  - U.S. posture towards green house gas regulation represents the greatest single uncertainty facing the industry
  - Consensus on aggressive but market-based treatment of contingent pollutants likely, with impact and form of mercury still uncertain
- Natural gas has played a greater role in addressing environmental concerns and for incremental power generation resources
  - Natural gas market instability in recent years has resulted in a incremental shift in price and volatility
  - Over the longer term declining production, increasing demand from the power sector and uncertainty in future supply sources are creating wide uncertainty about future prices

Environmental legislation and regulation continue to evolve and may have a significant impact on generation investment decisions

- Our industry has been profoundly impacted by environmental legislation over the past two decades with much uncertainty around future requirements
- Further reductions - driven more by regulation (i.e., Interstate Air Quality Rule) rather than new legislation (e.g., "Clear Skies") - are expected in all scenarios
  - SO_2, NOx costs are well understood
  - Technologies and costs for Mercury reduction are more uncertain
- Estimates of timing, levels, costs for reducing Global Greenhouse Gases vary widely, but may be massive
- Renewable Portfolio Standards (RPS) will be required within the timeframe
- Other potential targeted emissions are expected to have minor impacts
- Power generators can mitigate the environmental risks by purchasing allowances and/or installing pollution control technology

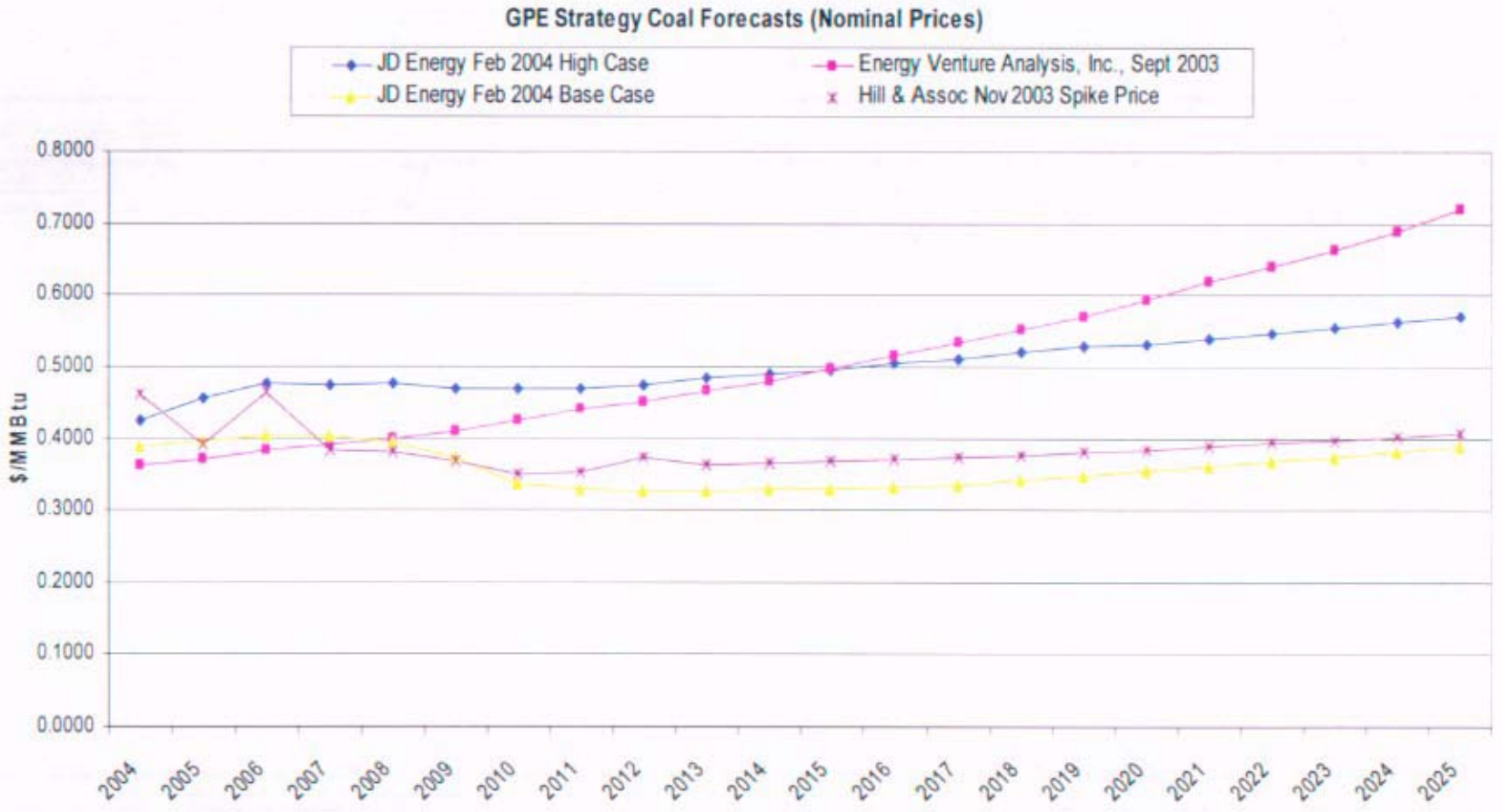
The underlying fundamentals of the US natural gas market have shifted, resulting in high and volatile power prices

- Tight natural gas supplies, combined with growing dependency on natural gas for electricity production will influence wholesale price levels and volatility
  - Growing consensus that the recent price shift will remain in place throughout the decade
  - Uncertainties focus on degree of demand declines, possibility of relaxed restrictions to domestic supply, and timing of LNG and Arctic supply, restrictions on use for power generation



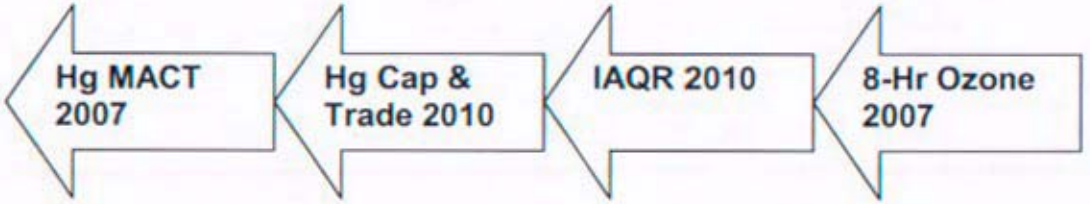
Sources: Expected – NPC Sept 2003 Balanced Future; Roller Coaster – NPC Sept 2003 Reactive Path; Gas Encouraged – Global Insight Shakeout 2002

Future coal prices are expected to remain stable due to productivity gains and no additional consolidation of producers



Source: Various, KCP&L Fuels Department

KCP&L's near term environmental compliance requirements will likely be driven by three regulations: mercury (MACT or cap & trade), Interstate Air Quality Rule, and 8-hour Ozone.



- Legislation is industry preferred approach, but unlikely in election year. As a result, EPA regulation will drive near term compliance
- Hg control has been proposed in two forms, MACT and cap & trade, both requiring bag house installations and possibly carbon injection depending on removal levels established in final rulemaking
- Hg MACT, scheduled for 2007 implementation will face litigation with the potential for tighter controls (up to 90% removal) and delayed implementation until 2009-2010. Cap & trade is scheduled for implementation in 2010
- IAQR will require scrubbers and SCR installations by 2010 with flexibility anticipated to provide for delayed capital expenditures through the use of allowances

Emission mitigation strategies converge on the use of the same technologies despite uncertainties in final rulemaking, timing and allowance price and allocation methodology

- Mercury Control
  - 70% removal with properly located Baghouse
  - 90% removal requires added carbon injection
  - Wet scrubber provides more removal than dry scrubber
- SO_2 Control = Scrubber (FGD)
  - 99% removal with Wet FGD
  - 94% removal with Dry FGD
- NOx Requires SCR

- Allowance Price Uncertainty
  - Hg projections from $35,000 to $120,000 per pound thru. 2015
  - SO_2 projections from $75 to $300 per ton thru. 2015
  - NOx has traded between $500 and $7,500 (1999-2003) and is projected from $2,000 to $5,000 thru. 2015
- Landfill Uncertainty
  - Baghouse flyash may be designated a hazardous waste (not expected)
  - Dry FGD requires flyash landfill
  - Wet FGD may provide marketable fly ash and gypsum by-products

Summary: 10 year view of the generation and wholesale market sector

- Environmental Policy will continue to require more stringent controls
- Natural gas market price volatility and supply concerns will be significant driver of power market and future costs to all rate payers
- Wholesale market structure – the focus of the past decade – is expected to become more standardized over the coming decade
  - Adoption of basic "standard market design" principals anticipated
  - Transmission market performance will improve, though more through regulatory rather than market forces
  - State and federal control and cost recovery
- Investment in transmission infrastructure to address reliability concerns is likely
- Coal markets will reflect new compliance economics, though these changes will be dwarfed by expected spread in relative price compared to gas
  - Alternative coal technologies (IGCC) are evolving but will not become viable in the near term
  - Coal will remain a viable and necessary component of the nation's energy portfolio
- Additional capacity will need to be added to meet the growing demands for electricity
- Renewables will play an increasing role, depending on regulatory treatment and less emphasis on incentives
- Nuclear's future will remain determined by negative sociopolitical attitudes towards its risks

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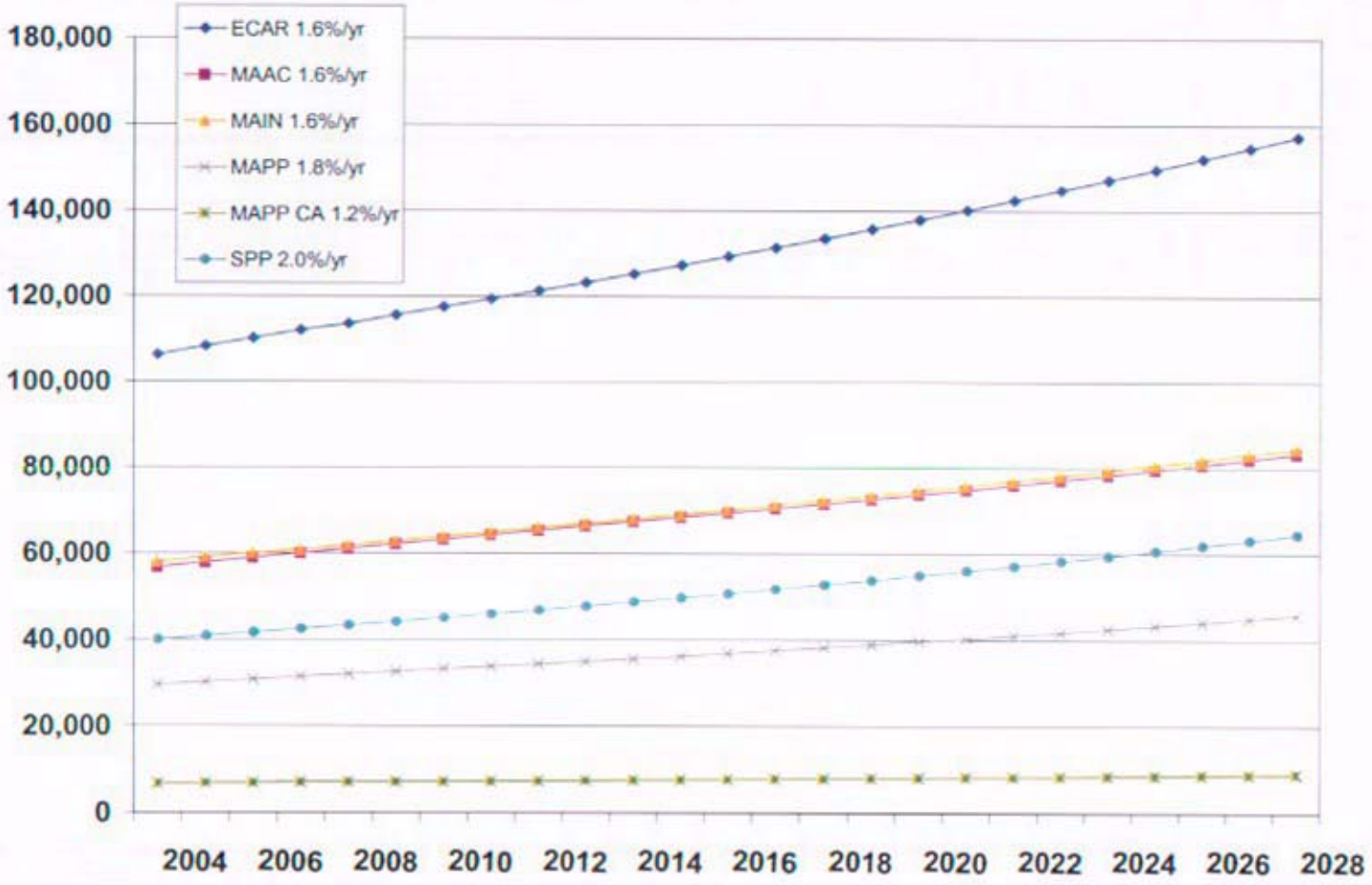
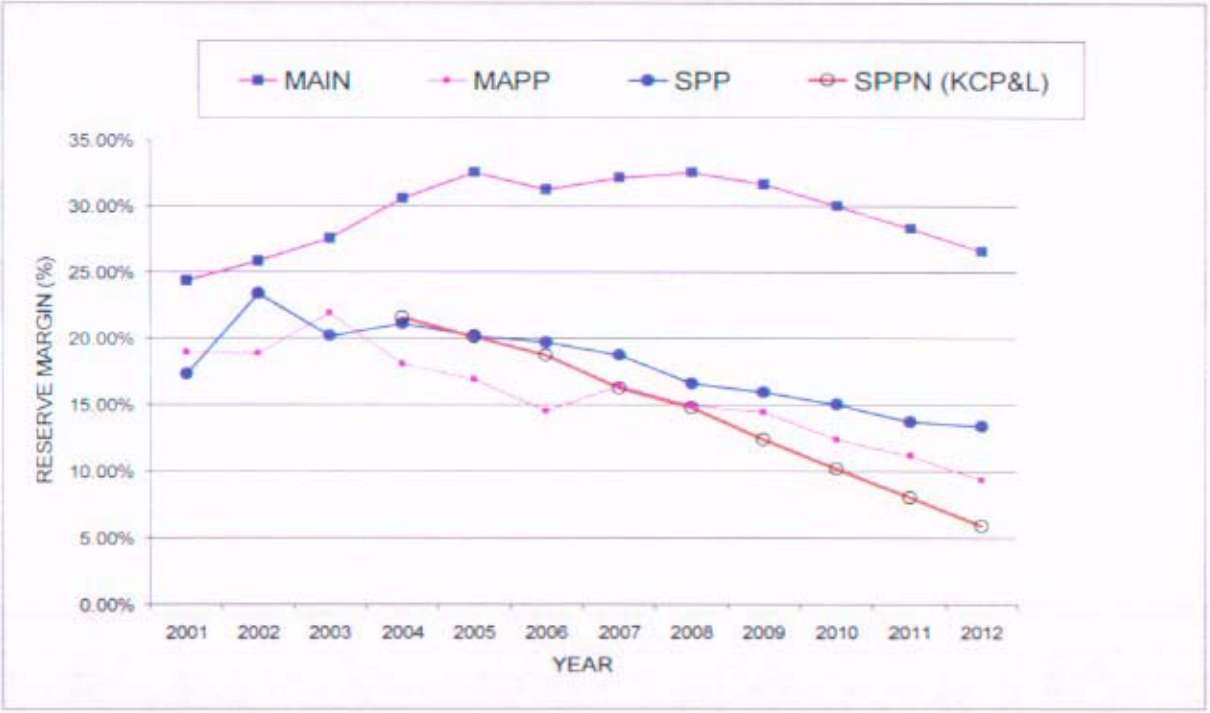
Regional demand for electricity as well as KCP&L's customer demand is expected to continue to climb



Source: Henwood 2004 Advisory Service

Within KCP&L's region, projected reserve margins are expected to continue to decline as surplus capacity is absorbed

- Reserve margin is the difference between net system capability and system maximum load requirements (peak load.)
- Due to projected growth and limited new investment, reserve margins will decrease in all regions indicating the need for capacity as early as 2006
- In KCPL's relevant wholesale regions, reserve margins vary widely
  - Some markets face supply shortages
  - Areas currently reporting high reserve margins cannot export the capacity due to transmission constraints



Source: Platts

Note: 15% reserve margin is typically viewed as a minimum requirement

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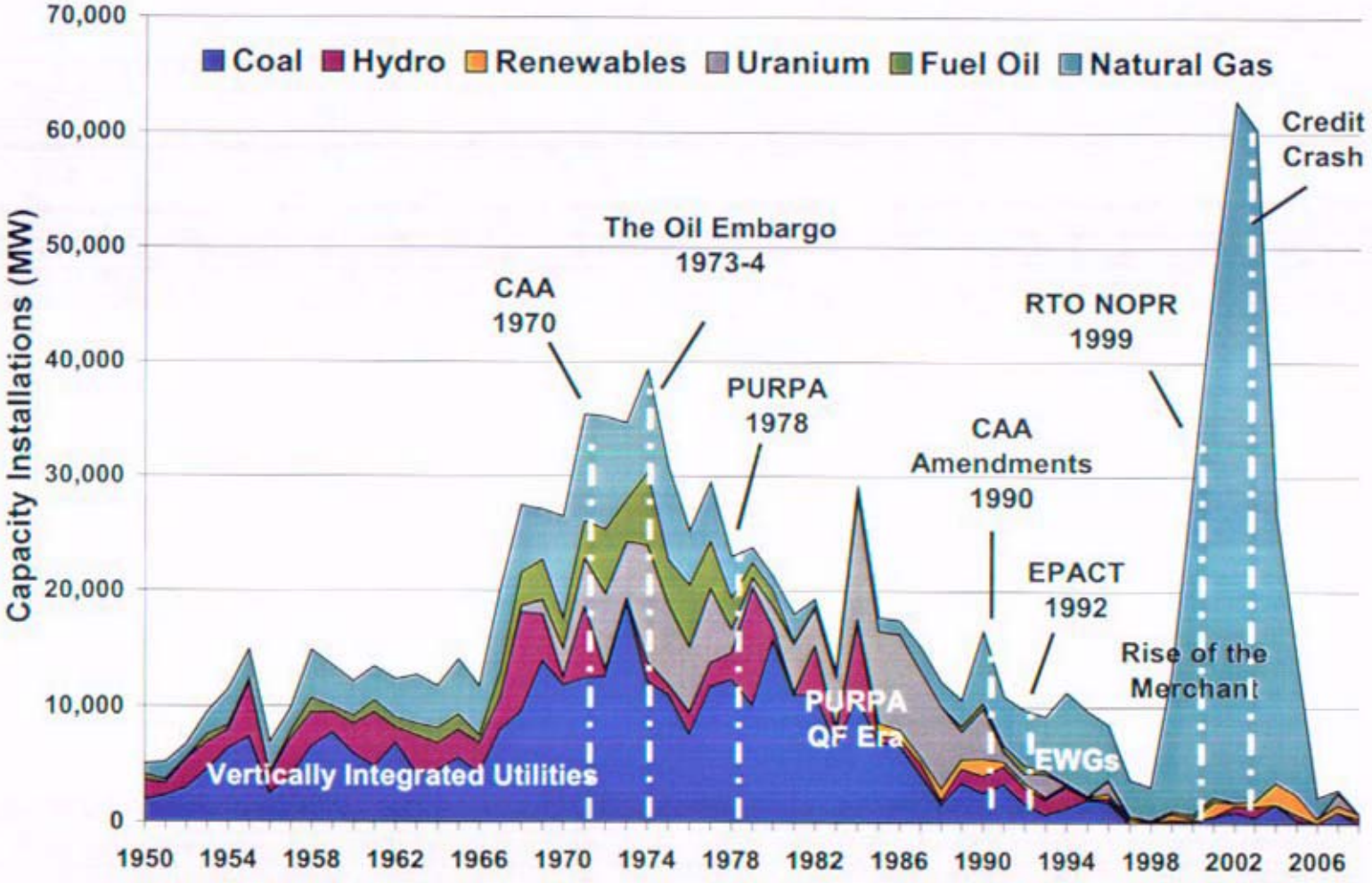
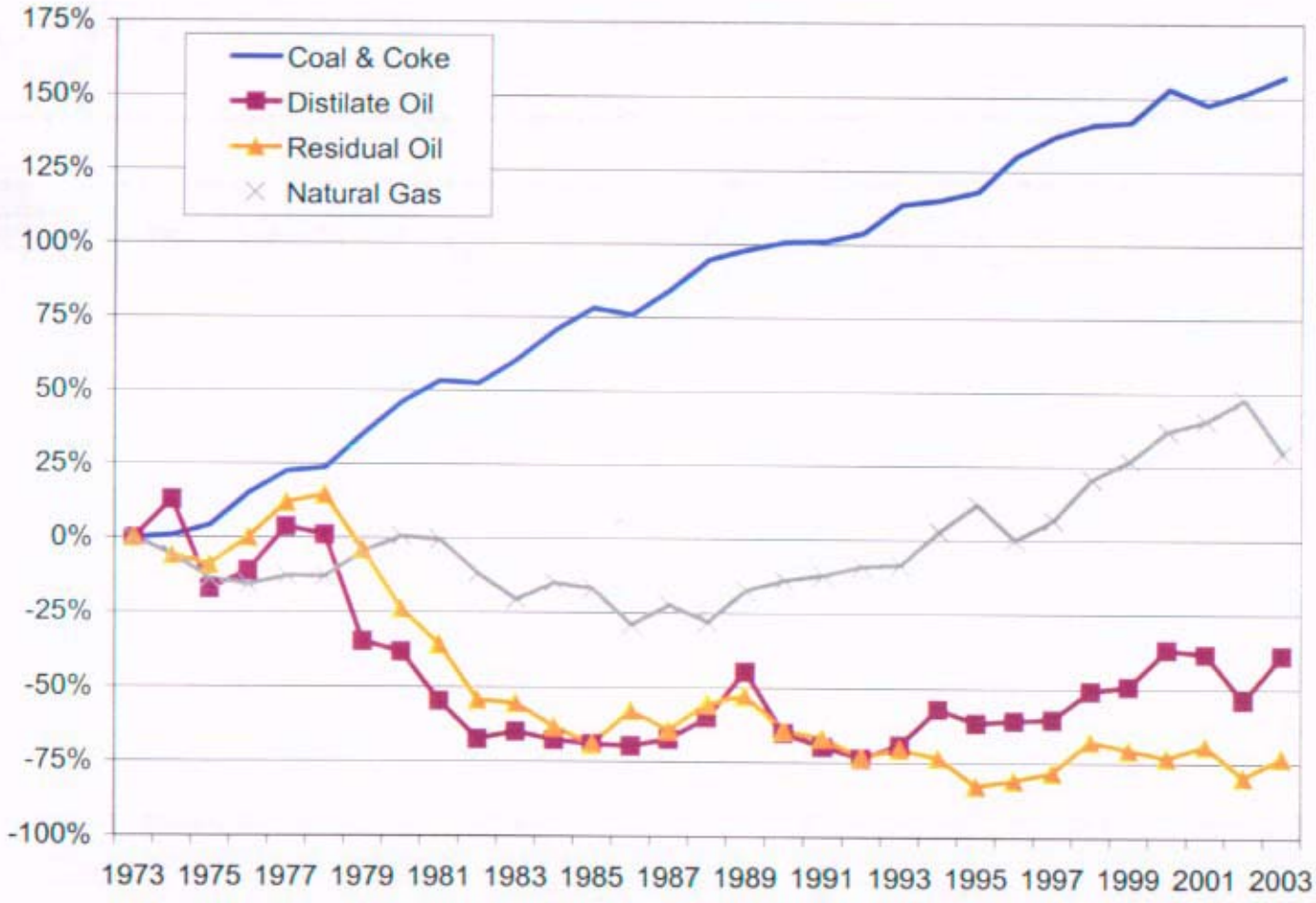
New capacity requirements over the past 15 years have been predominantly served through the addition of natural gas fired resources with no significant new coal additions since the mid-1980s



Source: Henwood 2004 Advisory Service

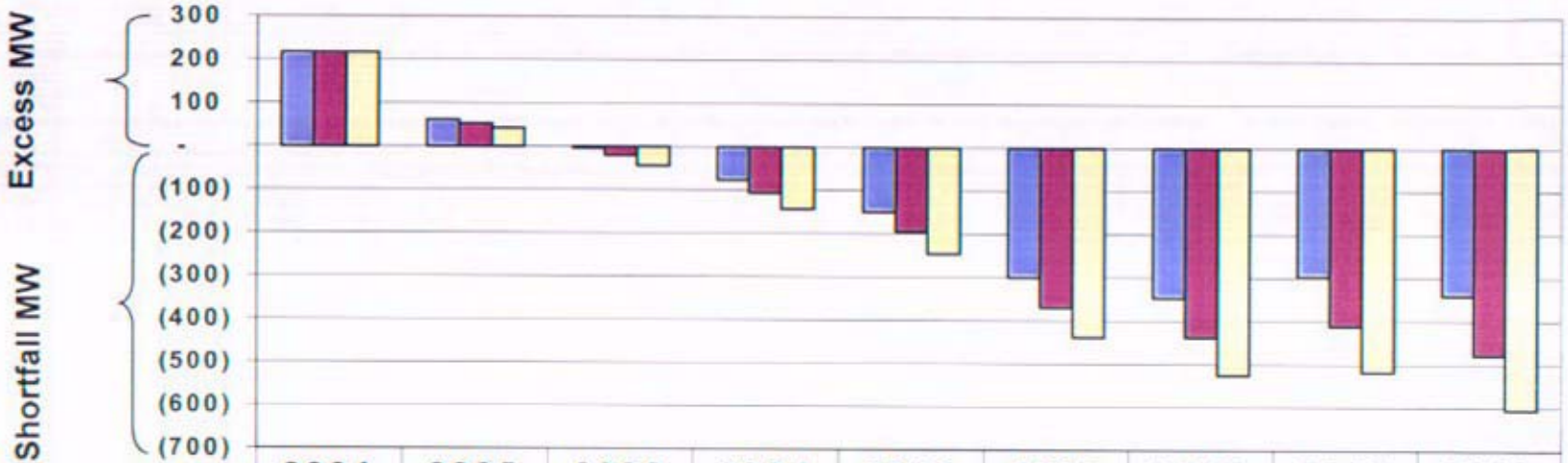
However, existing coal generation has provided the majority of incremental energy produced over the period



Source: Henwood 2004 Advisory Service

From a retail customer perspective, KCPL has the regulatory requirement to meet forecasted demand and maintain adequate reliability reserves

KCPL Required Capacity Additions 2004-2012



	2004	2005	2006	2007	2008	2009	2010	2011	2012
Low Forecast	217	61	(4)	(77)	(149)	(300)	(347)	(297)	(340)
Expected Forecast	217	53	(20)	(106)	(195)	(369)	(438)	(411)	(478)
High Forecast	217	42	(44)	(143)	(246)	(438)	(526)	(518)	(605)

Projected capacity shortfall

- KCPL is required to maintain adequate capacity
- Capacity obligations can be met with new generating assets, capacity purchases or demand reductions
- Approximately 450 MW of additional capacity is required by 2010
- Capacity construction takes 3-10 years from concept to completion

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KCP&L has evaluated a broad set of alternatives to meet the growing needs of our customers

- Generation Alternatives
  - Pulverized Coal
  - Circulating Fluidized Bed Coal
  - Natural Gas fired Combined Cycle
  - Natural Gas fired Combustion Turbine
  - Renewable resources – Primarily Wind, Biomass, Solar
  - Emerging Technologies
    - Integrated Gasification Combined Cycle
    - Fuel Cells
- Demand side management and conservation
  - Distributed Generation
  - Peak Load Curtailment Programs
  - Air conditioning and lighting controlled load
  - End use efficiency improvements

Supply-Side Resource Alternatives Considered

Resource Alternative	Type	Installed Cost $/kW	Marginal Production Cost	Technology Viability Timeline	Applicable Scale	Further Assessment
Pulverized Coal	Baseload	$1,383 $1,490	Low	Now	Large	Yes
Circulating Fludized Bed (Coal)	Baseload	$1,400 $1,900	Low	Now	Moderate	No
NG Fired Combined Cycle	Intermediate	$528 $581	Moderate to High	Now	Large	Yes
NG Fired Combustion Turbine	Peaking	$414 $460	High	Now	Moderate	Yes
Wind	Baseload	$1,000 $1,300	Very Low	Now	Moderate	Yes
Biomass	Various	$2,100 $2,700	Moderate to High	Now (DG& Cofiring)	Small	No
Solar	Inter/Peaking	$2,600 $6,000	Very Low	10+ Years	Small	No
Integrated Gasification Combined Cycle	Baseload	$1,300 $1,700	Low to Moderate	10+ Years	Large	No
Fuel Cells	Baseload	$700 $4,000	High	10+ Years	Small	No

Issues that are driving KCP&L to consider investing in wind energy: Why wind and why now?

- Growing customer and community awareness of environmental issues and renewable energy
- Improving relative economics
  - Tax Incentives are expected to be re-introduced that will apply to development through the end of 2006
  - Improving technology and support
    - More efficient design
    - Support of major players such as GE and developers with established track records
- Risk mitigation for a balanced generation portfolio
  - Fuel price volatility
  - Proposed regulatory and legislative initiatives leading to CO2 reductions would require KCPL to develop wind or other renewable resources to comply
- Availability in and around KCPL service area,
  - Kansas, and to a much lesser extent Missouri, are prime areas for wind
  - However, there is a limited number of available sites with top-quality wind profile and transmission access

KCPL customers have expressed general interest in wind power

- Our customer surveys indicate general interest in having wind as part of overall portfolio
  - 42% interested in a green power product
- There is a much lower level of interest among customers in paying more for a green product

- Nationally, green product penetration levels for residential average 3-5%
- Some progressive commercial and industrial customers have expressed an interest as part of corporate initiatives
  - DoE has a mandate to purchase 5% if available
  - Other segments (schools, hospitals) have expressed strong interest
- There is an indication that wind investment may be more favorably received as part of an overall portfolio solution across all rates
  - Aquila introduced an electable wind program in 2001. Commission limited promotional cost recovery and program resulted in low penetration levels. Wind resources subsequently rolled into general supply.

What are the issues surrounding a wind investment?

Advantages:

- Tax credits may lead to favorable shareholder value and reduced ratepayer costs
- Environmental benefits provide mitigation against expected CO_2 reduction requirements
- Mitigates higher gas prices and fuel price risk
- Builds political, social and regulatory support
- Many potential suppliers with strong balance sheets and proven designs
- Opportunity for early entry to capture highest quality sites with best transmission access
- Short lead time for development
  - Permitting process shorter than other technologies
  - Many sites already in advanced stages of permitting
- Opportunity for supporting Green products for retail and wholesale customer base

Disadvantages:

- Capacity cannot be relied upon for peak needs
- Requires additional non-renewable generation to support variable nature of wind
- Limited internal development and operational experience related to wind
- Transmission system access and adequacy limits the number of viable sites
- Limited sites available close to KCPL's control area and in Missouri

Tax incentives for wind are a key uncertainty – at both a federal and state level

- The production tax credit for renewable energy sources of $18.00/MWh **expired on December 31, 2003**
- Although legislators have expressed support of introducing legislation to renew the credits, timing and terms of the renewal are uncertain
  - A likely structure of the incentives calls for a 1.8 cents/kWh credit for projects placed into service prior to January 1, 2007. The credit would last for 10 years from the in-service date
  - We expect passage of some form of the tax credit during the mid 2004 legislative season
- Kansas currently allows 1.5 percent greater return on wind investments as well as property tax incentives

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IRP Analysis Process

- Modeling Process
  - MIDAS Model with PVRR Selection Criteria
  - Base case assumptions
- Portfolio Optimization
  - Technology
  - Timing
- Sensitivities
  - Natural Gas price
  - Load
  - Emissions Allowance Price
  - Wind on Coal Timing
  - CO2
  - Market

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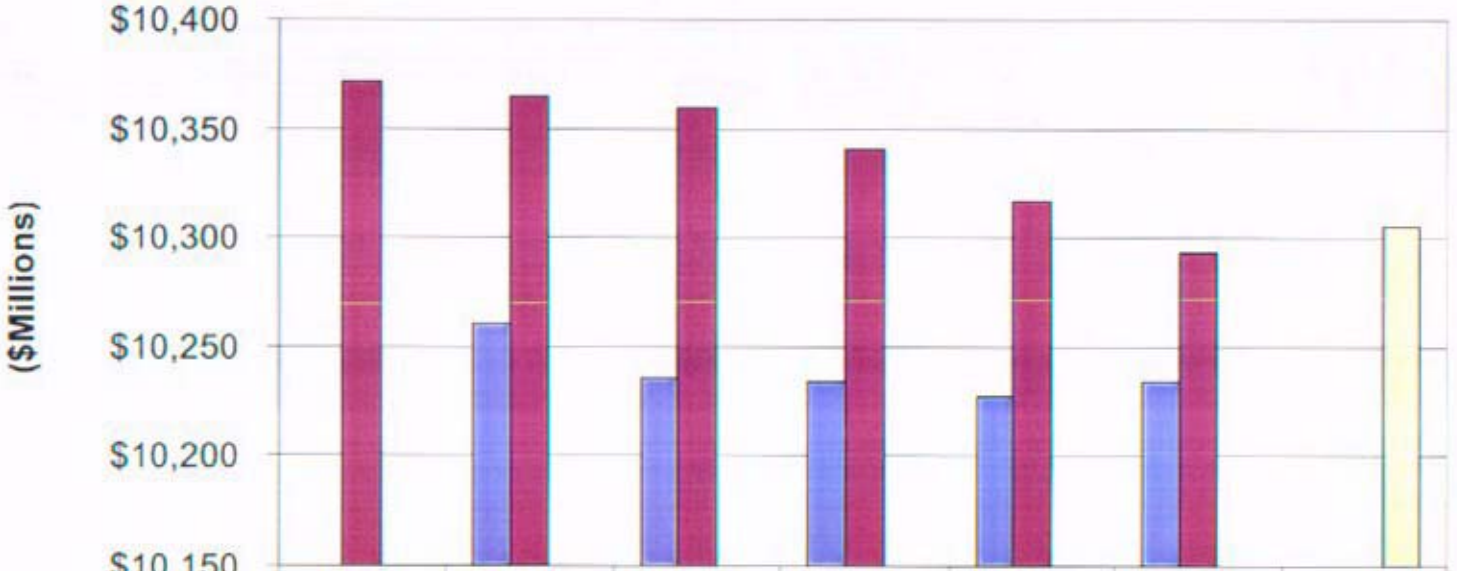
Under the base case conditions, Coal is the lowest cost resource alternative with timing optimal in the 2010 – 2012 timeframe

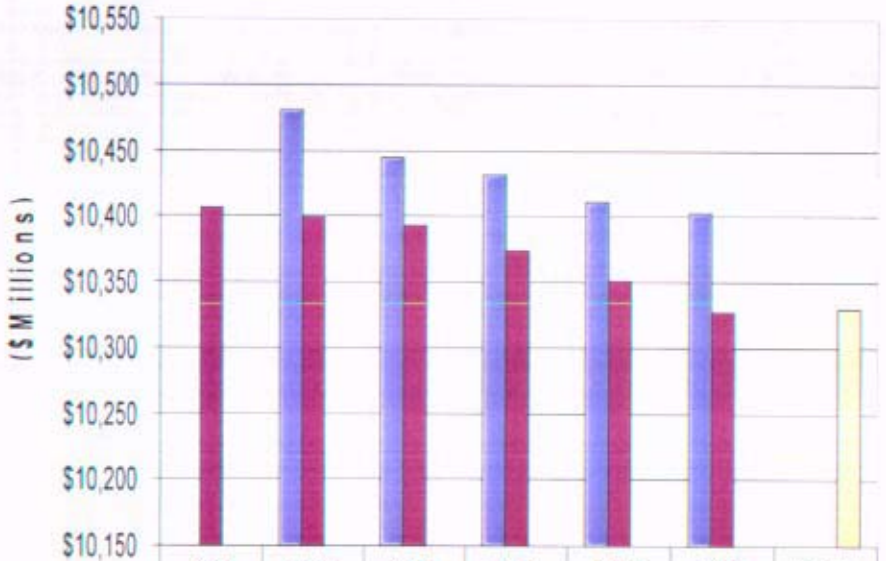
Technology & Timing
Base Assumptions



	2008	2009	2010	2011	2012	2013	Various
Coal		$10,261	$10,235	$10,234	$10,227	$10,234	
Com Cycle	$10,371	$10,364	$10,360	$10,341	$10,317	$10,293	
CTs							$10,305

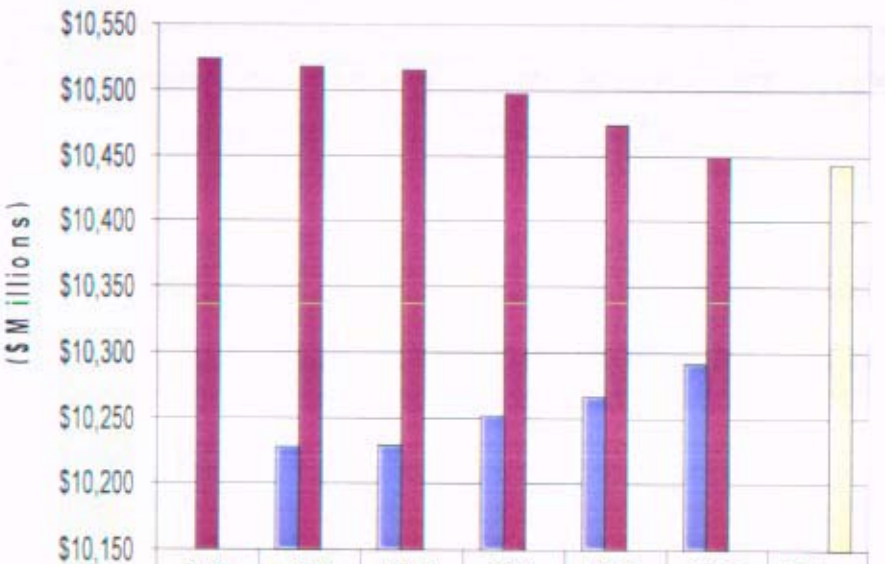
The decision is highly sensitive to natural gas price with the high gas case indicating a need for coal as soon as 2009

Technology & Timing
Low Gas Prices



	2008	2009	2010	2011	2012	2013	Various
Coal		$10,481	$10,444	$10,431	$10,411	$10,403	
Com Cycle	$10,406	$10,399	$10,394	$10,374	$10,351	$10,327	
CT's							$10,329

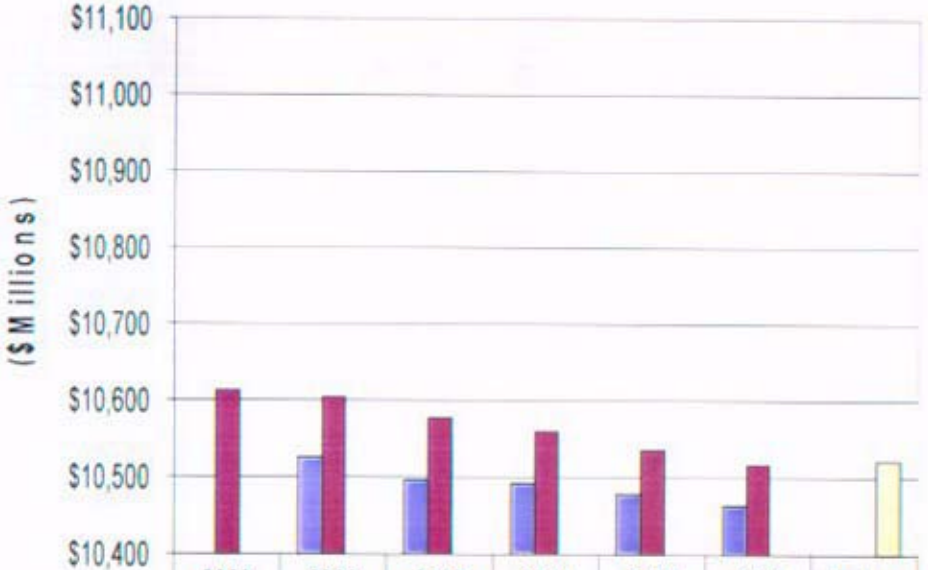
Technology & Timing
High Gas Prices



	2008	2009	2010	2011	2012	2013	Various
Coal		$10,228	$10,229	$10,252	$10,266	$10,291	
Com Cycle	$10,524	$10,518	$10,515	$10,497	$10,473	$10,449	
CT's							$10,444

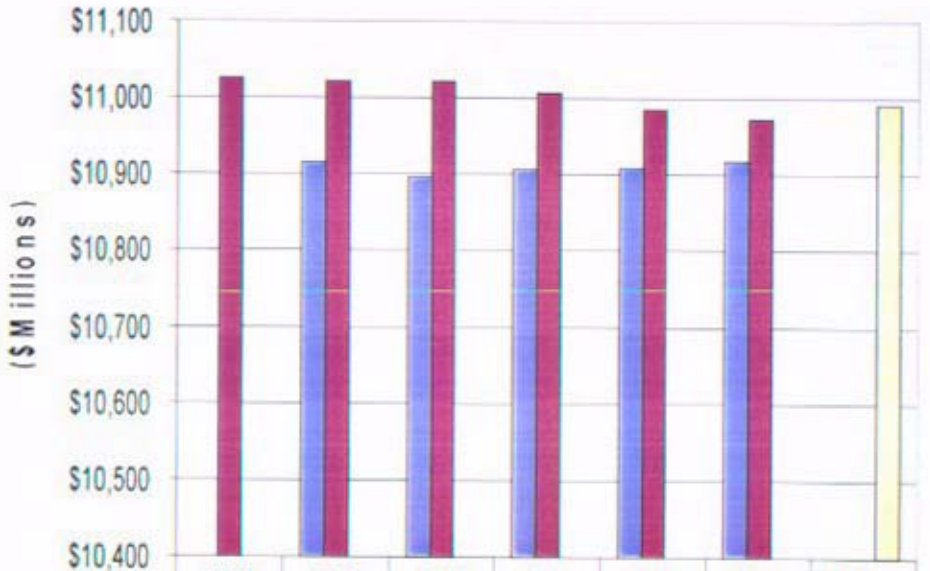
While revenue requirements are highly sensitive to load growth, the preference for coal in either case does not change

Technology & Timing
Low Load Growth



	2008	2009	2010	2011	2012	2013	Various
Coal		$10,525	$10,497	$10,492	$10,479	$10,463	
Com Cycle	$10,612	$10,604	$10,578	$10,560	$10,536	$10,517	
CTs							$10,521

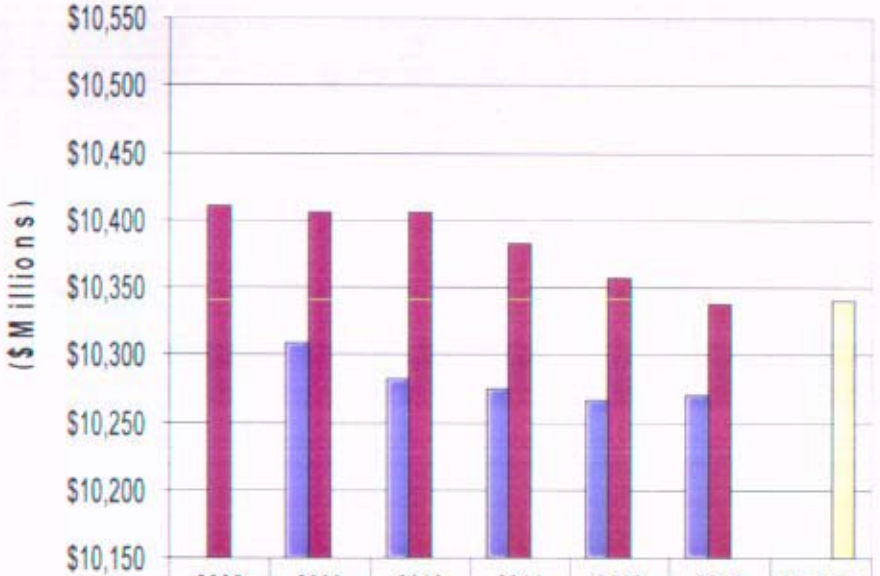
Technology & Timing
High Load Growth



	2008	2009	2010	2011	2012	2013	Various
Coal		$10,915	$10,896	$10,907	$10,910	$10,918	
Com Cycle	$11,025	$11,021	$11,022	$11,006	$10,986	$10,972	
CTs							$10,991

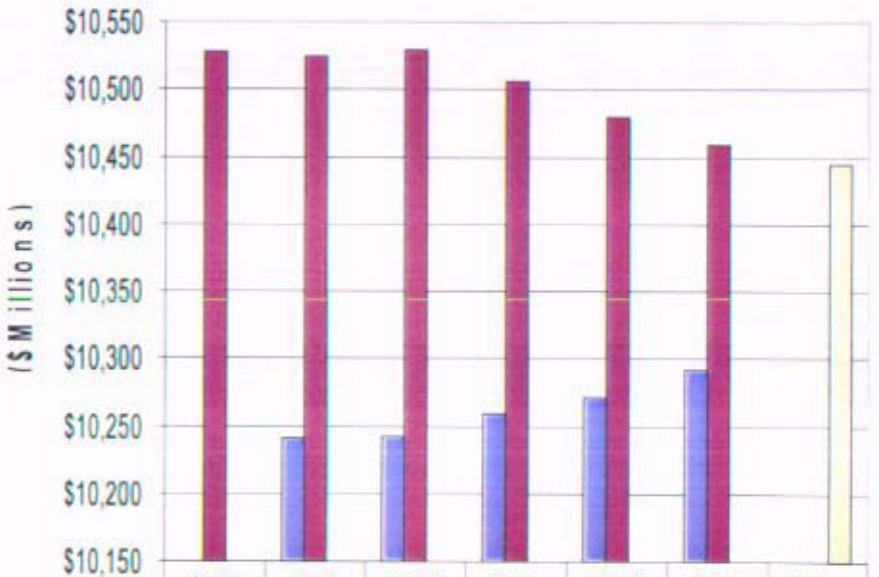
The addition of Wind in 2006 and 2008 has no material impact on the preferred technology and timing indicated in the base and high gas cases

Technology & Timing
Base Wind



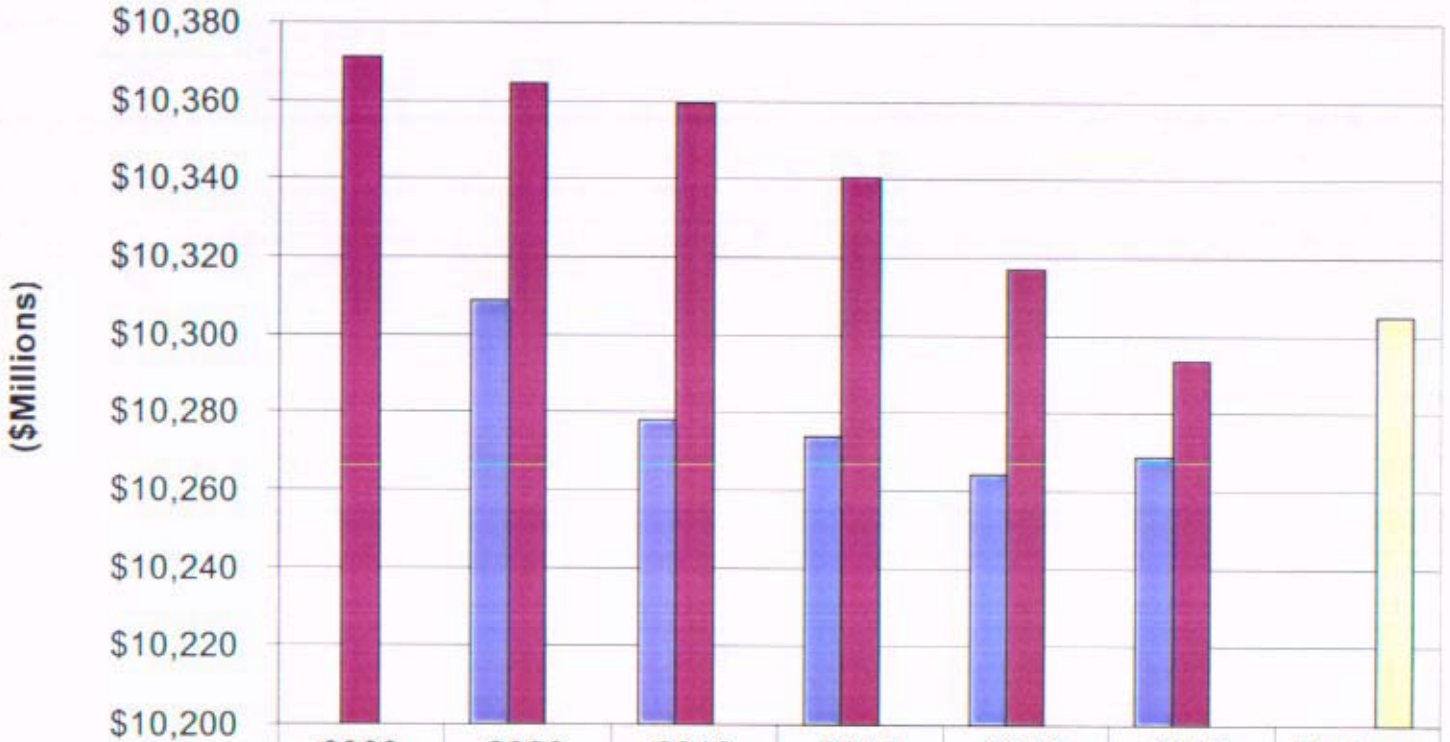
	2008	2009	2010	2011	2012	2013	Various
Coal		$10,309	$10,282	$10,275	$10,267	$10,270	
Com Cycle	$10,410	$10,406	$10,406	$10,383	$10,357	$10,337	
CTs							$10,340

Technology & Timing
Base Wind & High Gas Prices



	2008	2009	2010	2011	2012	2013	Various
Coal		$10,241	$10,242	$10,259	$10,271	$10,292	
Com Cycle	$10,528	$10,525	$10,529	$10,506	$10,479	$10,460	
CTs							$10,445

Coal maintains its competitive advantage even under the high coal capital cost estimate



	2008	2009	2010	2011	2012	2013	Various
Coal		$10,308	$10,278	$10,274	$10,264	$10,269	
Com Cycle	$10,371	$10,364	$10,360	$10,341	$10,317	$10,293	
CT's							$10,305

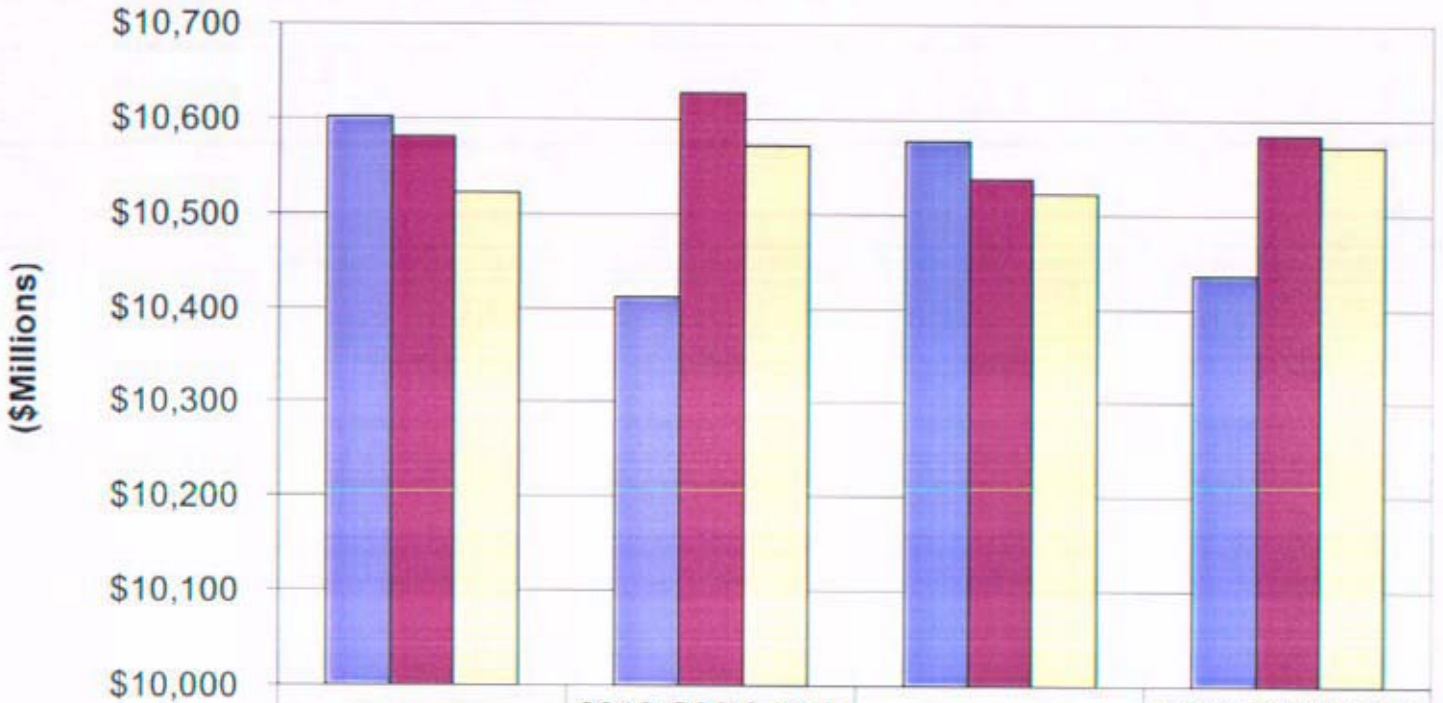
Iatan 2 high capital cost of $1490/Kw based on Burns & McDonnell assessment

IRP Analysis – Results and Sensitivities

Case Sensitivities

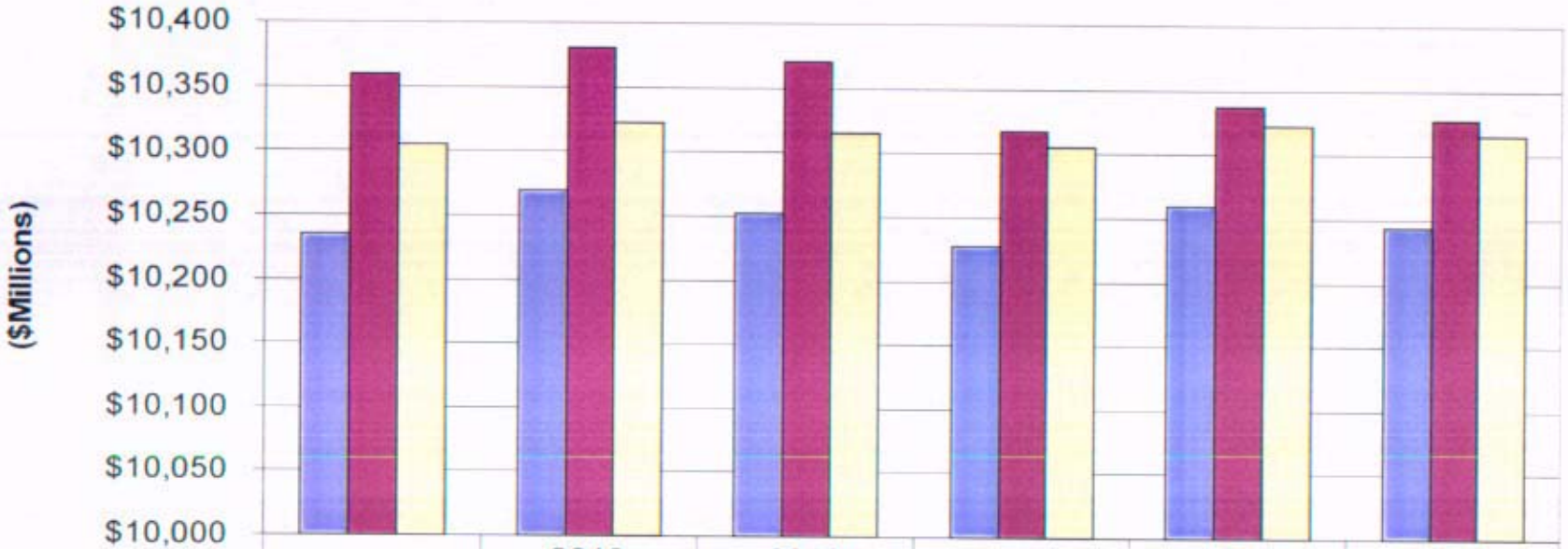
- Environmental
  - Impact of Clear Skies CO_2 reduction requirement
- Market
  - Transmission Constraints
  - Competitive Response – Too many coal units get built

The decision is sensitive to CO2 Reductions as prescribed in the proposed Clear Skies legislation



	2010 C02	2010 C02 & High Gas	2012 C02	2012 C02 & High Gas
Coal	$10,602	$10,412	$10,577	$10,435
Com Cycle	$10,580	$10,627	$10,538	$10,585
CT's	$10,522	$10,572	$10,522	$10,572

Wholesale Market Sensitivities



	2010 Base	2010 Competitor Response	2010 Transmission Constraint	2012 Base	2012 Competitor Response	2012 Transmission Constraint
Coal	$10,235	$10,270	$10,253	$10,227	$10,260	$10,243
Com Cycle	$10,360	$10,381	$10,370	$10,317	$10,338	$10,327
CT's	$10,305	$10,322	$10,315	$10,305	$10,322	$10,315

IRP Analysis – Additional Analysis

Additional sensitivity runs will be performed

- The impact of transmission constraints and LMP on wholesale market off-system sales revenue
- Environmental compliance timing and allowance price risk assessment
- Compliance vs. rebuild for Montrose and LaCygne 1
- Demand Side Management penetration
- Wind availability
- GPE strategy scenario assessment