

## MINUTES

### JOINT COMMITTEE ON ENERGY AND ENVIRONMENTAL POLICY

January 13, 2009  
Memorial Hall Auditorium

#### Members Present

Senator Carolyn McGinn, Chairperson  
Representative Carl Holmes, Vice-Chairperson  
Senator Janis Lee, Ranking Minority Member  
Senator Jay Emler  
Senator Roger Reitz  
Representative Mitch Holmes  
Representative Forrest Knox  
Representative Tom Sloan  
Representative Josh Svaty

#### Staff Present

Cindy Lash, Kansas Legislative Research Department  
Mary Galligan, Kansas Legislative Research Department  
Raney Gilliland, Kansas Legislative Research Department  
Melissa Doeblin, Office of the Revisor of Statutes  
Mike Corrigan, Office of the Revisor of Statutes  
Sean Ostrow, Office of the Revisor of Statutes  
Renaë Hansen, Committee Assistant

#### Guests

Approximately 100 people attended the meeting.

Chairperson McGinn welcomed Committee members and guests to the meeting. The Chairperson noted that members of the House and Senate committees that deal with the topics of commerce, labor, energy, and utilities were invited to the meeting.

The Chairperson introduced the speakers who will address the Committee (Attachment 1).

The Chairperson recognized Dan Chartier, Manager, Air Quality Programs, Edison Electric Institute, whose presentation to the Committee was entitled *Emissions Trading: Lessons for a Carbon Market* (Attachment 2). He also provided another document concerning the electric utility industry and global climate change (Attachment 3).

Mr. Chartier's presentation was divided into four parts, as described below.

**Cap and Trade Basics.** Mr. Chartier described the traditional "command and control" approach to emissions control, which establishes what needs to be done, and prescribes how and when each emissions source is to respond. In contrast, under a cap-and-trade program the government's focus is on setting goals and ensuring results, rather than on approving individual compliance options.

The first true emissions trading program was created as part of the Acid Rain Program in the 1990 amendments to the federal Clean Air Act. The Program established a cap, the timing of reductions, and an allowance allocation process for emissions of sulfur dioxide (SO<sub>2</sub>). The initial formula for emission allowances applied from 1995-1999, and a second formula was phased-in beginning in 2000 and is being used today. The trading system requires accurate monitoring of emissions and accurate, consistent accounting. The Environmental Protection Agency maintains a website ([www.epa.gov/airmarkets](http://www.epa.gov/airmarkets)) showing emissions that are reported, traded, and tracked.

Cap and trade programs subsequently have been used for nitrogen oxides (NO<sub>x</sub>) reduction programs in the northeast and in the Houston-Galveston area, as well as for NO<sub>x</sub> and SO<sub>2</sub> reductions under the Clean Air Interstate Rule and the RECLAIM program in the Los Angeles area.

**Existing Green House Gas Markets.** Mr. Chartier discussed the European Union Emissions Trading Scheme (EU-ETS), the Regional Greenhouse Gas Initiative (RGGI), the Midwest Greenhouse Gas Reduction Accord (MGGRA), the Western Climate Initiative (WCI), and the Chicago Climate Exchange (CCX).

The European Union's ETS is the largest emissions trading market in the world and captures 46 percent of all European emissions. It involves approximately 12,000 facilities that are involved in energy intensive industries. Lessons learned from the EU-ETS include the following: economy-wide coverage is needed, good baseline data is needed, market timelines must be designed for the long term, flexibility is important and a market infrastructure must be developed. Concerns about windfall profits were largely unfounded.

The Regional Greenhouse Gas Initiative was the first mandatory cap and trade program for greenhouse gas in the U.S. It involves a group of 10 northeastern and mid-Atlantic states, with the goal of initially stabilizing, then reducing, carbon dioxide (CO<sub>2</sub>) emissions from power plants. Emissions are to be held at current levels from 2009 to the start of 2015, then reduced by 10 percent by 2019. RGGI requires power generators to hold allowance to cover their emissions. CO<sub>2</sub> allowances issued by the member states are sold at auction, with the use of auction proceeds determined by each state. Examples of revenue uses include programs for energy efficiency, renewable and clean energy, reduced electricity consumption, and rate relief. Allowances sold for slightly more than \$3.00 per ton at the first two auctions. RGGI also provides for offset allowances to a limited extent and under certain conditions. Qualifying offsets include such things as landfill gas capture and combustion, forestation, and methane capture from animal operations.

The Midwestern Greenhouse Gas Reduction Accord was signed in November 2007. Kansas is a member, along with five other states and the Canadian province of Manitoba. The group has established a 2020 target reduction of 15 percent - 25 percent below 2005 emission levels, and a 2050 target of 60 percent - 80 percent below 2005 levels.

The Western Climate Initiative was established in February 2007. Seven states and three provinces are members. The group adopted a regional target of a 15 percent reduction from 2005 levels by 2020. Covered facilities include those with annual emissions of at least 10,000 metric tons

of CO<sub>2</sub>e (carbon dioxide equivalent) in sectors including electricity generation, industrial and commercial facilities, transportation fuel, and others. Mandatory measurement of emissions of six greenhouse gasses starts January 2010, with compliance reduction targets effective in 2012.

The Chicago Climate Exchange is a pilot project for voluntarily trading greenhouse gas credits. The project covers all six greenhouse gasses. To-date, most participants are private corporations. Members agreed that by December 2006, all would reduce emissions 4 percent below 1998-2001 baseline levels, and by the end of 2010 would reduce emissions 6 percent below baseline. The commodity traded at the Exchange is the Carbon Financial Instrument<sup>®</sup> (CFI<sup>®</sup>) contract, each of which represents 100 metric tons of CO<sub>2</sub>e.

**Federal Legislative Landscape.** Mr. Chartier discussed bills before Congress in December 2008 that contained economy-wide emission reduction targets. All plans include a 70 percent - 80 percent reduction in emissions by 2050, relative to baseline years of 1990, 2005, or 2006. To achieve these levels advanced coal generation has to be part of the solution, as well as energy efficiency, renewables, increased nuclear generation, and plug-in hybrid vehicles. The potential impacts on consumers by 2020 as a result of climate legislation, as estimated by Edison Electric Institute, are shown below. The ranges reflect differences in assumptions used. In addition, the costs assume a single federal program; costs will increase if states add fines for infractions.

Range of Potential Impacts of Climate Legislation on Consumers in or by 2020		
Overall cost per household	will increase	\$446 to \$2,927
Electricity prices	will increase	21% to 35%
Natural gas prices	will increase	20% to 39%
Gross domestic product	will decrease	0.7% to 1.74%
Employment	will decrease	1.1 to 2.78 million
Coal consumption	will decrease	42% to 66%
Permit prices (\$/ton CO <sub>2</sub> e)	will be	\$18 to \$48/ton
Total U.S. greenhouse gas emissions	will decrease	4,887 to 6,654/mmt CO <sub>2</sub> e

**Cap-and-Trade versus Tax.** Mr. Chartier identified several main differences between the two systems.

Cap-and-trade system	Tax system
Maximum emissions are known; the environmental target is met.	Emissions vary and may exceed the target because businesses decide whether to emit and pay the tax, or reduce and avoid the tax.
Cost varies based on marginal cost to control emissions to the cap level.	Cost per unit of emissions is fixed.
Cost savings from improved technologies and market efficiencies get captured.	Must determine the right tax to get the desired environmental outcome.

Most people are proposing a cap-and-trade system because it provides certainty in reduction of emissions. A hybrid approach that uses cap-and-trade to capture efficiencies while adding price protection to ensure that costs do not exceed an acceptable threshold could be key. Regardless of the system chosen, decisions will need to be made about environmental targets and timelines, the point of regulation or collection, sectors and entities covered, who is exempted and why, and the type of measurement and verification process to use. The integrity of emissions and allowance data is critical.

### **Panel Discussion of Carbon Tax and Cap and Trade Policy Options**

Participants included Amy Blankenbiller, Kansas Chamber of Commerce; Brad Harrelson, Kansas Farm Bureau; Nancy Jackson, Climate and Energy Project; Woody Moses, Kansas Cement Council; and Tom Thompson, Kansas Chapter of the Sierra Club.

The opening questions posed to the panel were as follows:

How would either a carbon tax or a cap-and-trade system impact your industry or community? What benefits would you anticipate for your industry or community resulting from either of those policies? From the perspective of your business/industry/organization, assuming no action is taken on either at the federal level, which would you rather see the Kansas Legislature pursue and why?

Amy Blankenbiller, Kansas Chamber of Commerce, said her organization is opposed to cap-and-trade on a state basis. At minimum it should be a federal action, but preferably an international policy.

Brad Harrelson, Kansas Farm Bureau, said his organization does not support either a carbon tax or cap-and-trade on a state, regional, or country basis. If either is used, it should be international. Their members would be unfairly impacted if a cap-and-trade system were put into place. The Lieberman-Warner bill would add \$6 - \$12 billion to agricultural production costs. This would result in a vast loss in income.

Nancy Jackson, Climate and Energy Project, is a member of the Midwest Governor's Association Greenhouse Gas Reduction Advisory Group that is designing a cap-and-trade system to be recommended to the federal government, should a national system be enacted. Efforts to regulate carbon are best done at a federal or global level. The costs of electricity will rise no matter what we do. There will be significant costs with cap-and-trade, as there are with all innovations. Kansas is well situated to benefit from a cap-and-trade system in the United States; the state has not fully utilized its potential for energy efficiency and for development of the wind industry.

Woody Moses, Kansas Cement Council, said his organization is opposed to a state, regional, or possibly even a federal cap-and-trade or carbon tax program. A ton of carbon is emitted for every ton of cement created. This is a particularly vexing problem in a carbon emission reduction society, and calls for a global solution. A lot of cement goes into the construction of energy efficient buildings. The debate on how to resolve this contradiction has not yet occurred.

Tom Thompson, Sierra Club, Kansas Chapter, said the primary purpose of a cap-and-trade or carbon tax system is to decrease the amount of CO<sub>2</sub> emitted and thereby reduce the effects of global warming. The Sierra Club supports a cap-and-auction system, and believes a 70 percent - 80 percent reduction in emissions can be reached by 2050. For the system to work, the funds

generated at auction should be directed to reduction of energy use, in particular to help low- and middle-income families become more energy efficient. He cited economists who stated that addressing global warming would cost the world 1 percent of its GDP a year, but the cost of doing nothing could cost the world 5 percent - 20 percent of its GDP.

Panelists also responded to a follow-up question, "if a cap-and-trade system is enacted, which sectors should it be applied to?"

Ms. Jackson noted there are myriad stakeholders involved across the country. An economy-wide cap-and-trade system would be more effective and less expensive. Certain industries have no way of making any reductions and that would have to be looked at for the separate industries.

Ms. Blankenbiller stated the Chamber has a diverse membership, and does not want to disadvantage one member to benefit another. The Chamber supports a national policy.

Mr. Moses said there is not enough data to make adequate decisions on which industries to target.

In response to questions from the audience, Mr. Chartier noted that when the U.S. began controlling emissions, the technology to remove SO<sub>2</sub> already was available. In contrast, there is a technology deficiency for other greenhouse gases, and it will take time for new technologies to be implemented in existing facilities. If the United States acts alone, or even in concert with European Union, without the involvement of the developing nations it is not possible to solve global problems.

Nancy Jackson responded that when there is regulation, industry will respond. Energy efficiency programs could provide 40 percent of the reductions needed. The benefit of regulating CO<sub>2</sub> is a point of much debate, but if the science is right, the repercussions of ignoring it are monumental. If the science is wrong, we will have lost GDP but will have diversified our sources of energy production.

*The minutes from the December 5, 2008 meeting were approved.*

The meeting adjourned at 10:40 a.m.

Representatives of Westar Energy provided a document to Joint Energy and Environmental Committee members entitled, "Meeting our Customers' Energy Needs, A Strategic Plan for Uncertain Times" (Attachment 4).

Prepared by Renae Hansen  
Edited by Cindy Lash

Approved by Committee on:

May 11, 2009

(date)

**Conferees for Joint Committee on Energy and Environmental Policy  
Committee Meeting  
January 13, 2009**

**Dan Chartier** is Manager, Air Quality Programs at the Edison Electric Institute (EEI). EEI is the association of U.S. shareholder-owned electric companies. EEI's members serve 95 percent of the ultimate customers in the shareholder-owned segment of the industry, and represent approximately 70 percent of the U.S. electric power industry. [Link to Testimony](#)

At EEI, Mr. Chartier covers traditional pollutant issues (SO<sub>2</sub>, NO<sub>x</sub>, particulate, ozone, etc.) and climate change issues. Prior to joining EEI in early-2008, Mr. Chartier worked in the Clean Air Markets Division of the U.S. Environmental Protection Agency (USEPA). He served as full-time President of the Environmental Markets Association (EMA) from 2002 through 2005. He previously held the position of Emissions Marketing Manager at PG&E's National Energy Group in Bethesda, Maryland. Prior to joining PG&E he worked at Wisconsin Electric Power Company from 1986 to 1999 in various positions including Clean Air Act Compliance Planner and Emissions Trading Manager.

Mr. Chartier is a principal co-founder and past Board Chairman of the EMA. He has testified before Congress on emissions trading and presented technical and policy papers at numerous national and international conferences. He holds a Bachelors of Science in Mechanical Engineering and a Masters in Business Administration, both from the University of Wisconsin - Milwaukee.

**Amy Blankenbiller** is the President and CEO of The Kansas Chamber of Commerce which is the leading statewide pro-business advocacy organization.

For nearly eleven years prior to her position at The Kansas Chamber, Amy was the senior associate at Waterman & Associates, a privately owned governmental consulting and lobbying firm in Washington, D.C. In that position, she managed the federal legislative and regulatory agendas and was principle advocate for two national trade associations, as well as worked with several other groups to develop their policies and legislative strategies on environmental and business issues.

In addition to her experience at Waterman & Associates, Amy was the Legislative Director for Environmental Policy the National Associate of Homebuilders, serving as the chief lobbyist in that area. Prior to working at the Home Builders, Amy received an appointment from President George H.W. Bush and was assigned as a congressional liaison at the U.S. Environmental Protection Agency. She also worked on Capitol Hill as a staff assistant to former Kansas Representative Bob Whittaker and a legislative intern to Senator Bob Dole.

Ms. Blankenbiller was also an adjunct professor at the George Washington University Graduate School of Political Management.

Amy received her undergraduate degree from the University of Kansas and has completed coursework toward a Masters Degree in environmental planning at the University of Virginia.

**Brad Harrelson** serves as state director of Governmental Relations for Kansas Farm Bureau. In this position, Harrelson advocates for Farm Bureau member-adopted policy in the halls of state and federal government.

Harrelson joined Kansas Farm Bureau from a private sector environmental compliance civil engineering firm that specializes in agricultural facilities. Harrelson managed project development and facility regulatory compliance for clients in Kansas, Colorado and Nebraska. He brings extensive regulatory affairs and volunteer association experience gained from nearly two decades of liaison and member service efforts with other agriculture trade organizations.

Harrelson is a 1987 graduate of Kansas State University. He and his wife, Cindy, are parents of two daughters, Taylor and Rylee.

**Nancy Jackson** is Executive Director of the Climate & Energy Project of the Land Institute. The Land Institute, a nonpartisan, nonprofit organization founded over 30 years ago in Salina, Kansas. Land Institute scientists are working to develop perennial versions of the world's major grain crops. The Climate and Energy Project promotes the rapid and cost-effective deployment of energy efficiency and renewable energy to reduce greenhouse gas emissions, increase energy security, and build a robust, resilient energy economy in Kansas and the Midwest.

Ms. Jackson sits on the Midwestern Greenhouse Gas Accord Advisory Group, the Kansas Energy and Environmental Policy Advisory Group, and the Kansas Wind Working Group. She holds an MA in environmental history from the University of Kansas, acquired and edited scholarly books on American culture and the Development of Western Resources for the University Press of Kansas for ten years, and brings experience in corporate finance, equities research, and development.

**Edward R. Moses** has represented the Kansas Cement Council since 1993. Prior to that he was engaged for twenty years in the Kansas Construction Industry gaining experience in the use and application of concrete & cement.

Over the years Mr. Moses has worked closely with Kansas government and policymakers on a number of policy issues regarding the cement industry including waste disposal, tire disposal and air emissions. This includes representing the industry on the Kansas Clean Air Advisory Group. The Kansas Cement Council is comprised of the Ash Grove Cement Company, Chanute & Overland Park; The Monarch Cement Company, Humboldt; and Lafarge Corporation, Fredonia.

**Tom Thompson** has been Legislative Coordinator for the Kansas Chapter of the Sierra Club for the past two years. He is a retired teacher and was State Representative to the 24th District for a term in the early '90's.



# Emissions Trading: Lessons for a Carbon Market

---

Kansas Legislature  
Joint Committee on Energy and Environmental Policy  
Topeka, KS – January 13, 2009

Daniel Chartier  
Manager, Air Quality Programs  
dchartier@eei.org  
(202) 508-5710



## Agenda

---

- Part 1 – Cap and Trade Basics
- Part 2 – Existing GHG Markets
- Part 3 – Federal Legislative Landscape
- Part 4 – Cap and Trade vs. Tax





## Part 1

---

### Cap and Trade Basics



### How Were (are) Emissions Controlled?

---

- Traditional approach
  - Command and Control
    - Established what needed to be done
    - Prescribed how and when each source was to do it
  - Significant emissions reductions achieved
  - Common Program Types
    - BART – Best Available Retrofit Technology
    - BACT – Best Available Control Technology
    - RACT – Reasonably Available Control Technology
    - MACT – Maximum Achievable Control Technology
  - Both federal and state level programs employ command and control strategies



## More Recent Approaches

---

- Averaging (bubbling), Offsets and Credits
  - Provided some flexibility within a command and control structure
  - High level of government involvement to approve actions to prevent:
    - “Anyway tons”
    - “Paper Credits”
  - Case by case determinations

January 13, 2009



5

## New Approach: Cap and Trade

---

- An alternate to traditional regulation and credit trading
  - Not simply a trading feature added to an existing program
- An incentive for innovation, early reductions, and reducing costs
- Certainty that a specified emissions level is achieved and maintained

January 13, 2009



6

## New Approach: Cap and Trade (2)

---

- More regulatory certainty, compliance flexibility, and lower permitting and transaction costs
- Fewer administrative resources needed by industry and government (if kept simple)
  - Government focus on setting goals and ensuring results, not on approving individual compliance options

January 13, 2009



7

## New Approach: Cap and Trade (3)

---

- Can be compatible with other mechanisms
  - Example:
    - Acid Rain Program
    - National Ambient Air Quality Standard (NAAQS)
- Lower costs make further improvements feasible

January 13, 2009



8



## The First Application: The Acid Rain Program

---

- The 1990 Clean Air Act Amendments established :
  - Cap levels
  - Timing of reductions
  - Allocations
- Allocations not addressed until cap was agreed upon
- Requests for increased allocations had to be balanced against losses of allowances

January 13, 2009



9

## SO<sub>2</sub> Allowance Allocations

---

- Base formulas for Phase I ('95-'99) and Phase II ('00 and beyond)
- New plants receive no allowances
  - New source reserve untapped
- Government auctions 2.8% of allowances

January 13, 2009



10

## Emissions Measurement

---

- Simple, consistent and transparent accounting
- Incentives for accuracy and improvement
- Flexibility for small sources
  - 36% of sources must use Continuous Emissions Monitors (CEMS)
  - Accounts for 96% of emissions

January 13, 2009



11

## Emissions Measurement (2)

---

- Certification of systems and data submission “under penalty of law”
- Near 100% electronic auditing of data
- Random onsite audits
- Electronic reports available to public
  - EPA’s Data and Maps System
  - <http://www.epa.gov/airmarkets/>
- Reliability and accuracy increasing

January 13, 2009



12



## Allowance Registry

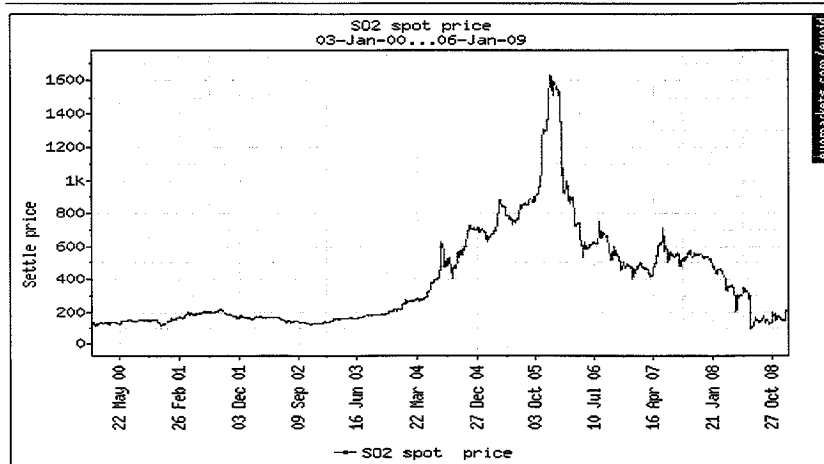
- Official record of allowance transfers
- Each allowance serialized
- Parties reach agreement on commercial terms, authorize EPA to transfer allowances (mostly online)
- Registry is not a trading platform – EPA does not collect price information

January 13, 2009



13

## Clear Price Signal

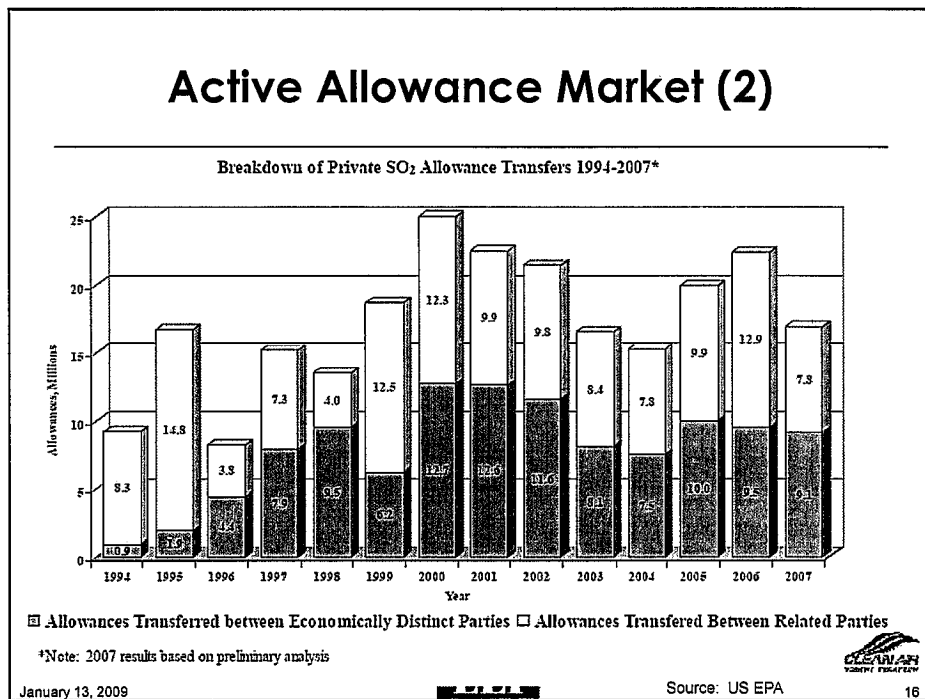
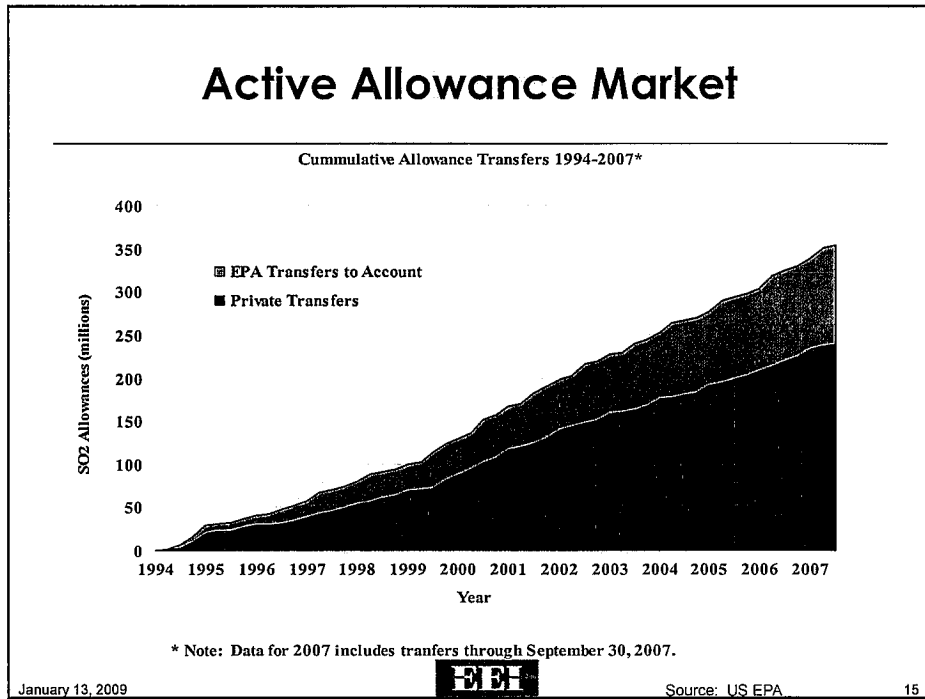


January 13, 2009



Source: Evolution Markets LLC

14





## Where Else Has Cap and Trade Been Employed?

---

- NO<sub>x</sub> Control in the Northeast
  - Ozone Transport Commission (regional – 12 states and DC)
  - NO<sub>x</sub> Budget Trading Program (federal – 22 states and DC)
  - [www.epa.gov/airmarkets](http://www.epa.gov/airmarkets)
- Clean Air Interstate Rule (CAIR)
  - 28 eastern states and DC
  - Additional reductions in NO<sub>x</sub> and SO<sub>2</sub>
  - Annual SO<sub>2</sub>; Seasonal and annual NO<sub>x</sub>

January 13, 2009



17

## Where Else Has Cap and Trade Been Employed? (2)

---

- RECLAIM
  - Los Angeles Air Basin NO<sub>x</sub> and SO<sub>2</sub> program
  - <http://www.aqmd.gov/reclaim/reclaim.html>
- Houston Galveston Area
  - NO<sub>x</sub> reduction program
  - [http://www.tceq.state.tx.us/permitting/air/banking/mass\\_ect\\_prog.html](http://www.tceq.state.tx.us/permitting/air/banking/mass_ect_prog.html)

January 13, 2009



18



## Part 2

---

### Existing GHG Markets



## The European Union Experience

---

- European Union Emissions Trading Scheme (EU-ETS)
  - Phase 1: 1995 – 1997 (learning)
  - Phase 2: 1998 – 2012 (compliance)
  - Phase 3: Design underway
  - Approx. 12,000 facilities in energy intensive industries (power, glass, iron and steel, pulp and paper, refineries)
  - Captures 46% of EU emissions



## Lessons from the EU-ETS

---

- Economy wide coverage is needed
  - Emissions in uncapped sectors grew
- Good baseline data is needed
  - Bad baseline data led to over-allocation and a significant market correction once issue became known to market
- Market timelines must be designed for the long term
  - Lack of banking impeded investment

January 13, 2009



21

## Lessons from the EU-ETS (2)

---

- Flexibility
  - Use of offsets lowered overall compliance costs
- Market Infrastructure
  - Clear price signals developed that reacted to supply and demand
  - Reasonable spot (OTC) market liquidity
  - Formation of exchanges and derivatives markets

January 13, 2009



22

### Lessons from the EU-ETS (3)

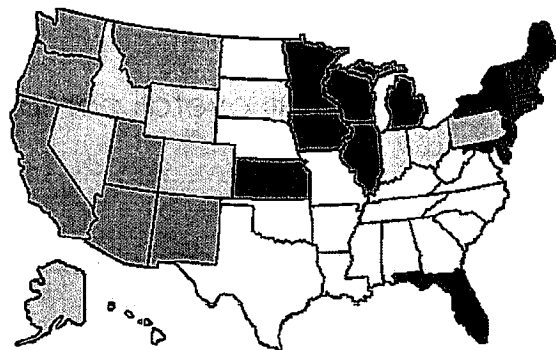
- The "Myth" of Windfall profits
  - Regulated markets
    - Offsets are an asset whose value accrues to consumers/ratepayers
    - Prudency review and recovery through rate cases or fuel clause mechanisms
  - Deregulated markets
    - Economic theory holds that in perfect competition "opportunity costs" are captured
    - Work at MIT by Denny Ellerman, et. al, concludes windfall profits were limited

January 13, 2009



23

### Regional Programs



- Regional Greenhouse Gas Initiative RGGI
- RGGI Observer
- Midwestern Regional GHG Reduction Accord
- MRHGRA Observer
- Western Climate Initiative
- Western Climate Initiative Observer
- Individual State Cap-and-Trade Program

January 13, 2009

24



## Regional Greenhouse Gas Initiative (RGGI)

- RGGI is the **first mandatory cap-and-trade program** in the United States
- Participating states
  - Connecticut
  - Delaware,
  - Maine
  - New Hampshire
  - New Jersey
  - New York
  - Vermont
  - Massachusetts
  - Rhode Island
  - Maryland
- Observers include
  - the District of Columbia
  - Pennsylvania
  - the Eastern Canadian Provinces, and New Brunswick

January 13, 2009



25

## RGGI – Overview

- Reduction targets
  - Stabilize power plant CO<sub>2</sub> emissions at current levels from 2009 to the start of 2015
  - followed by a 10% reduction in emissions by 2019.
- RGGI initially focuses on reducing carbon dioxide emissions from power plants
- Emissions offsets may be purchased and used for compliance purposes.
- Demonstration of compliance required every 3 years.

January 13, 2009



26

## RGGI – Offsets

---

- Initially, offset allowances may be issued to verified reduction projects anywhere in the USA, in the following areas:
  - Natural gas, heating oil & propane energy efficiency
  - Landfill gas capture and combustion
  - Methane capture from animal operations
  - Forestation of non-forested land
  - Reductions of sulfur hexafluoride (SF6) emissions from electricity transmission & distribution equipment
  - Reductions in fugitive emissions from natural gas transmission and distribution systems

January 13, 2009



27

## RGGI – “Safety Valve”

---

- Below \$7.00, only U.S. offsets with a 50% discount for offsets from outside the RGGI region.
  - Each generator is allowed to use offsets to cover up to 3.3% of its emissions.
- Above the \$7.00 offsets would be allowed from across North America at a 1:1 ratio
  - Each generator may use offsets to cover up to 5% of its emissions.
- At \$10 offsets to include international projects.
  - Each generator may use offsets to cover up to 20% of its emissions.

January 13, 2009



28



## RGGI – Current Auction Status

- The **initial auction was held September 10, 2008**
- The initial auction offered allowances through a **single-round, uniform-price, sealed-bid auction format**.
- A reserve price of \$1.86 per allowance will apply to the first auction
- Minimum bid size 1,000 tons
- States have identified that they **will auction 100% of allowances**, but...
  - Some states were not ready to participate in first auction (NH, DE, NY)
  - All states participated in the second auction
- A **second auction** was held December 17, 2008.

January 13, 2009



29

## RGGI Auction Results

Parameter	1 <sup>st</sup> Auction	2 <sup>nd</sup> Auction
Amount Auctioned	12,565,387	31,508,898
Vintage	2009	2009
Price (\$/ton)	\$3.07	\$3.38
Revenue	\$38.6 million	\$106.5 million
Statistics		
Reserve Price	\$1.86	\$1.86
Min. Bid	\$1.86	\$1.86
Max. Bid	\$12.00	\$7.20
Median	\$2.51	\$3.00
Mean	\$2.77	\$3.03
No. of Bidders	59	69 (of 84)
Bid Quantity	4x supply	3.5x supply
Compliance Bidders	80%	69%

January 13, 2009



30

## Where will RGGI Auction Revenues Be Used?

---

- Determined individually by each state
- Examples:
  - **New York:** Proposal to promote and implement programs for energy efficiency, renewable or non-carbon emitting technologies, and innovative carbon emissions abatement technologies with significant carbon reduction potential.
  - **Maryland:** Legislation directing proceeds to be used for energy efficiency and conservation; renewable and clean energy resources; reducing or mitigating the impacts of climate change; reduce electricity consumption; providing low-income electricity assistance; providing rate relief; and more.

January 13, 2009



31

## Midwestern Greenhouse Gas Reduction Accord (MGGRA)

---

- Accord **signed** November 15, 2007
- **Participating** states and province:
  - Illinois
  - Iowa
  - Kansas
  - Michigan
  - Minnesota
  - Manitoba
  - Wisconsin
- **Observing** states and province
  - Indiana
  - Ohio
  - Ontario
  - South Dakota
- **Subgroups** for program design
  - Model Rule
  - Scope
  - Allowances
  - Target-Setting, Data & Reporting
  - Modeling
  - Offsets





## Midwestern Greenhouse Gas Reduction Accord (2)

- **Reduction targets**
  - 2020 Target. [15, 20, or 25 percent] below 2005 levels by 2020
  - 2050 Target. [60-80 percent] below 2005 levels by 2050
- **Covered sectors**
  - Electricity generation [and imports]
  - Industrial combustion sources
  - [Industrial process sources to the extent credible measurement & monitoring protocols exist or can be developed prior to inclusion]
  - [Transportation fuels]
  - [Fuels serving residential, commercial and industrial buildings not otherwise covered]
- **Emissions threshold for coverage**
  - [10,000][25,000][100,000] metric tons of carbon equivalent on an annual basis.



## Midwestern Greenhouse Gas Reduction Accord (3)

- **Linking:** Recommends linkages to RGGI, WCI, EU-ETS, and other mandatory greenhouse gas reduction programs as appropriate.
- **Compliance Period:** The Advisory Group recommends that each compliance period should be no longer than 3 years in length.
- **Banking:** The Advisory Group recommends unlimited banking of allowances and offsets. Allowances or offsets received or purchased in one year, therefore, can be banked and used in any subsequent year of the program, even across compliance periods.
- **Borrowing:** The Advisory Group recommends that limited borrowing should be allowed, provided borrowed allowances should be paid back with some "interest".





## Western Climate Initiative (WCI)

- **Established** February 2007
  - Arizona
  - California
  - New Mexico
  - Oregon
  - Washington
  - Utah
  - Montana
  - Three Canadian provinces
- In August 2007 announced a regional, economy-wide greenhouse gas emissions target of **15 percent below 2005 levels by 2020, or approximately 33 percent below business-as-usual levels.**
- Five design issue sub-committees :
  - Scope
  - Electricity
  - Allocations
  - Reporting
  - Offsets

January 13, 2009



35

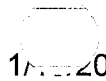
## Western Climate Initiative (2)

- Released ***Essential Requirements of Mandatory Reporting for the Western Climate Initiative - 2nd Draft*** (Sept. 08)
  - The entities and facilities subject to reporting are those with annual emissions  $\geq 10,000$  metric tons of CO<sub>2</sub>e.
- Sectors Covered
  - **Electricity generation**, including emissions from imported electricity
  - **Combustion at industrial and commercial facilities;**
  - **Industrial process emission sources**, including oil and gas process emissions;
  - **Residential, commercial, and industrial fuel combustion** at facilities with emissions below the WCI thresholds at the start of the 2<sup>nd</sup> compliance period;
  - **Transportation fuel combustion** from gasoline and diesel at start of the 2<sup>nd</sup> compliance period.

January 13, 2009



36



## Western Climate Initiative (3)

- Mandatory measurement and monitoring for the six included GHG emissions starts January 2010 .
- Compliance with reduction targets starts in 2012
  - Compliance demonstrated annually
- Initial target has been to complete design by late-Summer 2008
  - Still working on modeling and first jurisdictional deliverer approach

January 13, 2009



37

## Voluntary Reduction & Trading Program

- **Chicago Climate Exchange (CCX)**
  - Pilot project for trading voluntary GHG reductions in USA.
  - Covers all 6 GHGs.
  - Most of the participants are private corporations. However cities, counties and states have also joined.
  - Members make a **voluntary but legally binding commitment** to reduce GHG emissions.
    - By the end of Phase I (December, 2006) all Members must reduce emissions 4% below **1998-2001 "baseline" levels**.
    - By the end of Phase II, which extends through 2010, all Members must reduce GHG emissions 6% below baseline.
  - The commodity traded at CCX is the **CFI contract**, each of which represents **100 metric tons of CO<sub>2</sub> equivalent**

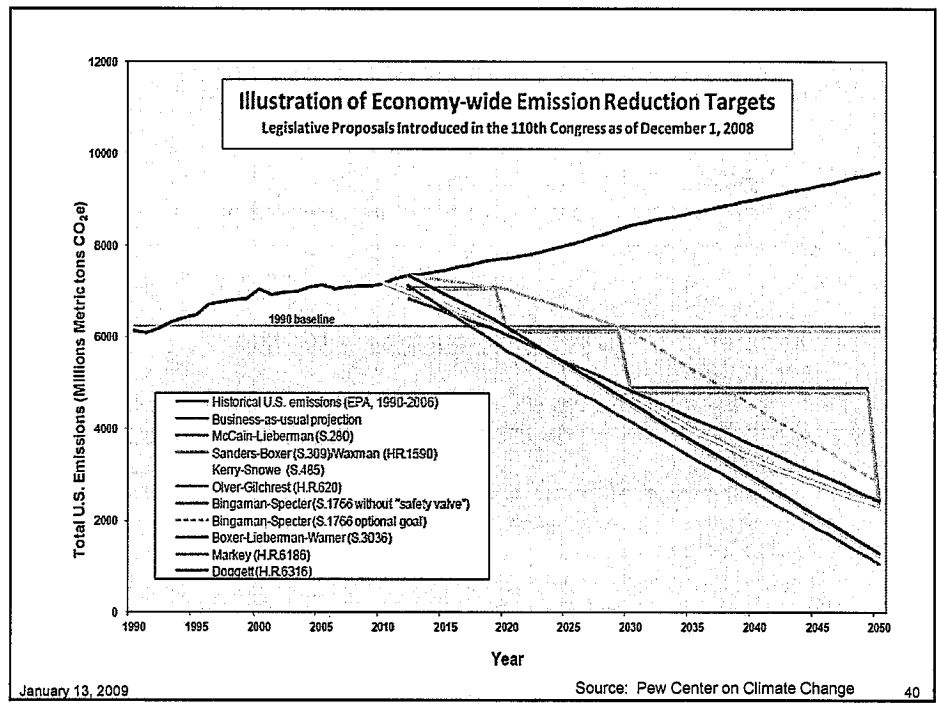
January 13, 2009

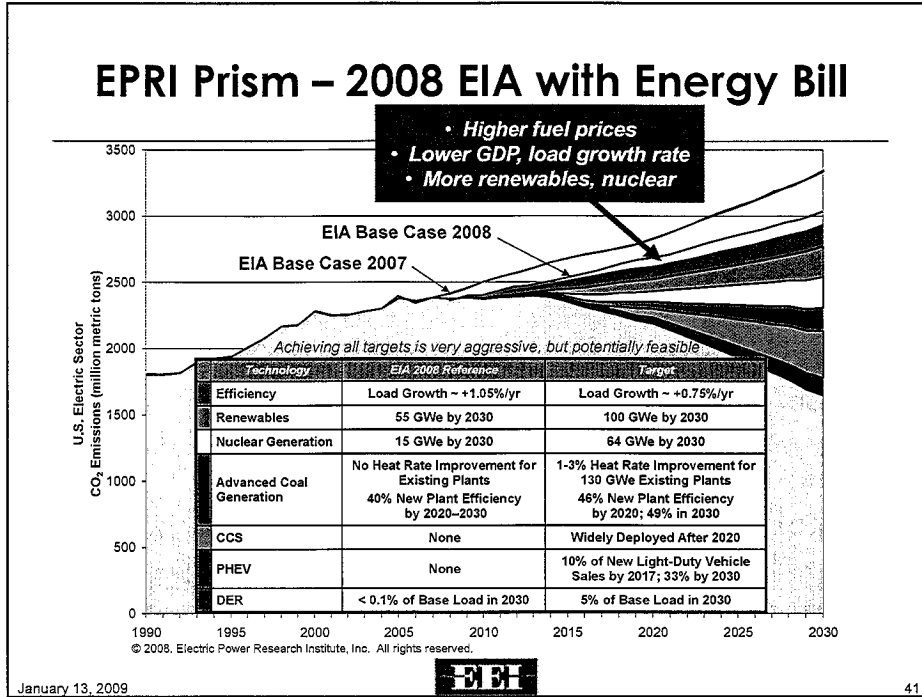


38

### Part 3

## Federal Legislative Landscape





CLIMATE LEGISLATION COMPARISON (12-15-08)					
	Dingell-Boucher Discussion Draft	Boxer Substitute to S. 3036	Waxman H.R. 1590	Markey H.R. 6186	President Obama Policy
<b>Targets</b>	6% '05 levels by '20 44% below by 2030 80% below by 2050	7% below 2006 levels by 2012 <sup>1</sup> 39% below 2006 by 2030 72% below 2006 by 2050	2009 levels by 2010 1990 levels by 2020 80% below 1990 by 2050	2005 levels by 2012 20% below 2005 by 2020 85% below 2005 by 2050	1990 levels by 2020 80% below 1990 by 2050
<b>Covered Sectors</b>	<ul style="list-style-type: none"> <li>• Electric power</li> <li>• Energy-intensive industry (oil, gas, coal, steel, alum., etc.)</li> </ul>	<ul style="list-style-type: none"> <li>• Electric power</li> <li>• Industrial (coal and gas)</li> <li>• Commercial</li> <li>• Transport (via upstream coverage of petroleum sector)</li> </ul>	TBD by EPA Administrator (cover largest sources and most cost-effective opportunities to reduce)	<ul style="list-style-type: none"> <li>• Electric power</li> <li>• Industrial (coal and gas)</li> <li>• Transport (via upstream coverage of petroleum sector)</li> </ul>	Economy-wide
<b>Allowances</b>	<u>Option A</u> (1 of 4 options) – <ul style="list-style-type: none"> <li>• 42% allocation to electric LDCs (2014-2025)</li> <li>• 4% to IPPs</li> </ul> <u>Option D</u> <ul style="list-style-type: none"> <li>• 0% allocation to electric generators or LDCs</li> </ul>	Allocation <ul style="list-style-type: none"> <li>• 18% → 2.75% for fossil-fired generators (2012-2030)</li> <li>• 9.75% to LDCs (2013-2025)</li> </ul>	100% auction	2012-2019 <ul style="list-style-type: none"> <li>• 94% auction</li> <li>• 0% allocation to electric generators</li> </ul> 2020+ <ul style="list-style-type: none"> <li>• 100% auction</li> </ul>	100% auction
<b>Cost Containment</b>	<u>Strategic Allowance Reserve</u> <ul style="list-style-type: none"> <li>• Borrow allowances from future periods</li> <li>• Allowances auctioned at floor price of \$20-30/ton in 1<sup>st</sup> year</li> <li>• Floor price increases 5%/yr + inflation for 2<sup>nd</sup> and 3<sup>rd</sup> yrs</li> <li>• Allowances auctioned at floor price of 30-100% above 36-mo. avg. spot price yrs 4 →</li> <li>• Can be supplemented w/ unsold allowances from regular auction + int'l seq. offsets credits</li> <li>• Use ltd to 10% of entity target</li> </ul>	<u>Strategic Allowance Reserve</u> <ul style="list-style-type: none"> <li>• Borrow allowances from future periods and/or increase limits on offsets use</li> <li>• Allowances auctioned at floor price of \$22-30/ton CO<sub>2</sub> in 1<sup>st</sup> year</li> <li>• Floor price increases 5%/year plus inflation</li> </ul>	<ul style="list-style-type: none"> <li>• 2009-2011 targets can be extended for 2 years</li> </ul>	None	Not addressed
<b>Offsets &amp; Other Flexibility Provisions</b>	<ul style="list-style-type: none"> <li>• Limited to ≤ 5% of target for first 5 years (dom. or int'l)</li> <li>• 15% limit for years 6-8;</li> <li>• 30% limit for years 9-11 (15% domestic &amp; 15% int'l)</li> <li>• 35% limit in years 12 → (20% domestic &amp; 15% int'l)</li> <li>• Sequestration allowed</li> <li>• Banking and borrowing</li> </ul>	<ul style="list-style-type: none"> <li>• Limited to ≤ 30% of target (15% domestic &amp; 15% int'l)</li> <li>• CMEB can increase use for cost containment</li> <li>• Qualifying criteria will likely further limit use</li> <li>• Banking and borrowing</li> </ul>	<ul style="list-style-type: none"> <li>• Offsets not included</li> <li>• Banking</li> </ul>	<ul style="list-style-type: none"> <li>• Limited to ≤ 30% of target (15% domestic &amp; 15% int'l)</li> <li>• Qualifying criteria will likely further limit use</li> <li>• Banking and borrowing</li> </ul>	Not addressed

January 13, 2009 <sup>1</sup> Reduction values based on EIA, "Energy Market and Economic Impacts of S. 2191, the Lieberman-Warner Climate Security Act of 2007" v (Apr. 2008).

42

## Range of Potential Impacts From Climate Legislation?

- **Cost per household** ↑ \$446 - \$2,927 in 2020/year
- **Electricity prices** ↑ 21% - 35% in 2020
- **Natural gas prices** ↑ 20% - 39% in 2020
- **GDP** ↓ 0.7% - 1.74% (~ \$336B out of \$~19.2T GDP)
- **Employment** ↓ 1.1 - 2.78 million in 2020
- **Coal consumption** ↓ 42% - 66% in 2020
- **Permit prices** (\$/ton CO<sub>2</sub> equivalent) \$18 - \$48/ton in 2020
- **Total US GHG emission** (mmtCO<sub>2</sub>-equivalent)  
↓ 4,887 - 6,654 in 2030 ("Business As Usual" 9,672 in 2030)

***It's All About The Assumptions!***

## Part 4

### Cap-and-Trade Vs. Tax



**EDISON ELECTRIC  
INSTITUTE**



## Cap-and-trade System Attributes

---

- Maximum emissions are known, environmental target is met
- Cost varies based on marginal cost to control emissions to the cap level
- Cost savings from improved technologies and market efficiencies get captured

January 13, 2009



45

## Tax System Attributes

---

- Cost per unit of emissions is fixed
- Emissions will vary and may exceed target
- Individuals/firms decide whether to emit and pay, or reduce and avoid
- What's the right tax to get the desired environmental outcome?

January 13, 2009



46

## A Hybrid Approach

---

- Utilize cap and trade to capture efficiencies...
- ...Add "price protection" to ensure costs don't exceed an acceptable threshold and thereby achieve some of the certainty of a tax system
  - Price cap, or price collar
  - Carbon oversight board

January 13, 2009



47

## What Decisions Are Required Regardless of Program?

---

- Environmental target and timeline
- Point of regulation (or collection)
- Covered sectors and entities
- Who to exempt and why
- Measurement and verification

January 13, 2009



48



## Conclusions

---

- Cap and trade used successfully for local, regional, national and trans-national programs
- Integrity of emissions (baseline and ongoing) and allowance data is critical
- Key to emissions trading is to allow simplicity of the market to drive marginal cost to its lowest possible level
- A hybrid approach that includes cost-containment may prove to be the key

January 13, 2009



49

## Appendix

---

### Modeling Comparison



**EDISON ELECTRIC  
INSTITUTE**



### Comparison of Modeling Results – Lieberman-Warner Bill

	AEO 2007				AEO 2008		
	BAU [1] (2005)	Clean Air Task Force (2005)	MIT [2] (2005)	NAM/ACCF [3] (2007)	EPA [4] (2005)	CRAI [5] (2008)	EIA (2005)
<b>GDP</b>	\$19.2 Trillion in 2020 \$25.4 Trillion in 2030	-0.7% in 2030	-0.78% in 2020 -0.38% in 2030	-0.8 to -1.1% in 2020 -2.6 to -2.7% in 2030	-0.7 to -2.5% in 2020 -0.9 to -3.8% in 2030	-1.2 to 2020 (\$218 B) -1.0% in 2030 (\$228 B)	-0.3% in 2020 -0.3% in 2030
<b>Employment</b>	159.9 Million in 2020 171.9 Million in 2030	N/A	N/A	-1.1 to -1.8M in 2020 -3 to -4M in 2030	N/A	-3.3 Million in 2020 -2.4 Million in 2030	-0.3 Million in 2020 -0.3 Million in 2030
<b>Cost Per Household</b>	None	N/A	N/A	\$739 – \$2927 in 2020 \$4000 – \$6750 in 2030	\$448-\$608 in 2020 \$4377 in 2030	\$1957 in 2020 \$1237 in 2030	
<b>Electricity Prices (¢/kWh)</b>	7.9 in 2020 8.1 in 2030	10 in 2030	+6% in 2020 +57% by 2030	+28% – +33% in 2020 +101% – +128% in 2030	+35% in 2020 +44% in 2030	+24.5% in 2020 +35.6% in 2030	+3.9% in 2020 +8.4% in 2030
<b>Natural Gas Prices (\$/cfd)</b>	\$7.29 in 2005 \$5.07 in 2020 \$5.90 in 2030	\$9.93 in 2005 \$10.40 in 2030	+39% by 2020 +64% in 2030	+26% – +39% in 2020 +109% – +146% in 2030	\$7.51 in 2005 \$9.09 in 2030	+22% in 2020 +17% in 2030	-7% in 2020 -15% in 2030
<b>Coal Consumption</b>	27.3 quads in 2020 34.1 quads in 2030	N/A	N/A	N/A	-5% in 2020 -44% in 2030	-40% in 2020 -59% in 2030	-20% in 2020 -74% in 2030
<b>Permit Prices (\$/ton CO<sub>2</sub>-e)</b>	None	\$18 in 2015 \$50 in 2030	\$48 in 2015 \$55 in 2030	\$55 – \$84 in 2020 \$227 – \$271 in 2030	\$29-\$40 in 2015 \$61-\$83 in 2030	\$46 – \$60 in 2020 \$86 – \$97 in 2030	\$30 in 2020 \$51 in 2030
<b>US GHG Emission (In mmtCO<sub>2</sub>-e)</b>	7147 – 2006 9672 – 2030	N/A	4987 – 2030 3780 – 2050	N/A	5217-5867 in 2030 4121-5279 in 2050	6358 in 2020 5800 in 2030	6770 in 2020 5429 in 2030
<b>Nuclear Power</b>	12.5 GW new by 2030	117 GW new by 2030	3.5 GW new by 2030	10-25 GW in 2030	44 GW new by 2025 62 GW new by 2030	40 GW new by 2030	268 GW new capacity by 2030
<b>Coal with CCS</b>	None	128 GW new by 2030	250 GW new by 2030 530 GW new by 2040	25-50 GW in 2030	175 GW new by 2030 299 GW new by 2050	44 GW new by 2030 129 GW new by 2040	64 GW new by 2030
<b>Renewable Energy</b>	4.5 GW new by 2030	100+ GW new by 2030	16 GW by 2030	6-10 GW/yr. max	61 GW by 2025	99 GW new capacity by 2030	112 GW new capacity by 2030
<b>Offsets</b>	None	*Allowed up to 30%*	15% Emit (domestic only)	15-20% (High Cost) >20% (Low Cost)	30% offsets limit (domestic & int'l)	15% Emit (domestic only)	30% offsets limit (domestic & international)
<b>Other Key Assumptions &amp; Results</b>	* 135 GW new coal (w/o CCS)	* CCS retrofits * Energy usage drops considerably * 20% drop in elec. gener. from BAU by 2030	* CCS available in 2015 * CCS bonus allowance offset "overstate" * No CMEB/borrowing	* No banking	* CCS available in 2015 * Significant reliance on offsets (66%-2015, 27%-2030) * "Significant" shift of coal to NG	* CCS available in 2015 * No CMEB/borrowing * Includes LCFs	* Does not include LCFs * CCS available in 2015 * Modeling ends in 2030

[1] BAU = business as usual. Data in the column is taken from the Energy Information Administration's Annual Energy Outlook (AEO) 2007 reference case.  
 [2] Figures shown are taken from "Lieberman-Warner, 15% Offsets and CCS Subsidy" case.  
 [3] Figures shown reflect range of results from Low Cost and High Cost cases. Figures shown are in 2007\$.  
 [4] Figures shown reflect EPA's 2191 Scenario results. The EPA reference case was based on the AEO 2006 reference case assumptions.  
 [5] Figures shown in the CRAI L-W Analysis column are from a CRAI analysis of L-W performed for NIA. CRAI bases its reference case on the AEO 2008 reference case with some modifications to near-term electricity demand, gas prices, etc.

January 13, 2009 51

### Comparison of Lieberman-Warner Bill Modeling Results – Sources

	AEO 2007				AEO 2008		
	BAU	Clean Air Task Force	MIT	NAM/ACCF	EPA	CRAI	EIA
<b>GDP</b>	AEO 2007 Table 19 converted to 2005 using 1.127 factor	CAATP presentation	Table D9, p. D21	Table 1, p. 8	Slide 61	EI LW run (10/30/07), (from rpt report – gdp)	p. 37 of report
<b>Employment</b>	AEO 2007 Table 19 (1-unemp rate) factor	NA	N/A	Table 1, p. 8	Slide 109	EI LW run (10/30/07), (from rpt report – unemp)	Compare Table 16 for ref case and S 2191 analyses
<b>Cost Per Household</b>	NA	NA	N/A	Table 1, p. 8	Slide 65 Slide 3	EI LW run (10/30/07), (from rpt report – cperh)	
<b>Electricity Prices</b>	AEO 2007 Table 8	Slide 11 converted to 2005	Table D9, p. D21	Table 1, p. 8	2020 – slide 55 (est as 1.150.85 - 1) 2030 – Slide 3	EI LW run (10/30/07), (from rpt report – electricity) (relative to BAU)	Compare Table 8 for ref case and S 2191 analyses
<b>Natural Gas Prices</b>	AEO 2007 Table 13	Slide 15 converted to 2005	Table D9, p. D21	Table 1, p. 8	Slide 58	EI LW run (10/30/07), (from rpt report – natural gas) (relative to BAU)	Compare Table 8 for ref case and S 2191 analyses
<b>Coal Consumption</b>	AEO 2007 Table 1	NA		NA	Est. from slide 172	EI LW run (10/30/07), (from CIGS_LW_nobrik.xls rpt) (all sectors relative to BAU)	Compare Table 1 for ref case and S 2191 analyses
<b>Permit Prices</b>	NA	Verified on Slide 7	Table D3, p. D6	Table 1, p. 8	Slides 24 and 27	EI LW run (10/30/07), (from ussummary, converted to \$/ton)	Table 20
<b>US GHG Emission (In mmtCO<sub>2</sub>e)</b>	S 280 base case, which is adapted from AEO2007	NA	Table D9, p. D21	NA	Slide 125	EI LW run (10/30/07), (from rpt report – GHGs)	Table 20
<b>Nuclear Power</b>	AEO Table 9 Note 2 6 GW retrofits in 2030 (not shown in EEI table)	Verified on Slide 27	Table D9, p. D21	Fig. 2, p. 6	Slides 36 and 129 2030 – from slides 129 and 38	Matches EI LW run (10/30/07)	Figure 13, p. 24 in report
<b>Coal with CCS</b>	NA	Slide 24	Table D9, p. D21 (using 65% capacity factor)	Fig. 2, p. 6	Slide 50	Matches EI LW run (10/30/07) (includes retrofit of CCGT w/ SEC) Added 2040 number.	Figure 13 in report
<b>Renewable Energy</b>	AEO 2007 Table 16, by subtraction for years 2010-2030	Verified Slide 31	Table D9, p. D21 (using 80% capacity factor)	Fig. 2, p. 6	Slides 38 and 47	Matches EI LW run (10/30/07) (includes BUL, LG, ST, newGeo)	Figure 13, p. 24 in report
<b>Offsets</b>	NA	Verified on slide 5	p. D3 Table D1, (p. D5)	Fig. 2, p. 6	Slide 29	Reduction expressed as % of the cap in a given year.	Page 11 of report
<b>Other Key Assumptions</b>	AEO 2007 Table 9, by subtraction for years 2010-2030	Slides 23-24 Verified on slide 11	p. D10 p. D9 pp. D14-15	Fig. 2, p. 6	Slide 4, 41 Slide 11 Slide 42	EI LW run (10/30/07), (compare ussummary BAU vs. scen)	

January 13, 2009 52

# The Electric Utility Industry and Global Climate Change



## **EEI supports federal action or legislation to reduce greenhouse gas (GHG) emissions that:**

- Ensures the development and cost-effective deployment of a full suite of “climate-friendly” technologies, and helps provide for their funding;
- Minimizes economic disruption to customers and avoids harm to the competitiveness of U.S. industry; and
- Ensures an economy-wide approach to GHG reductions.

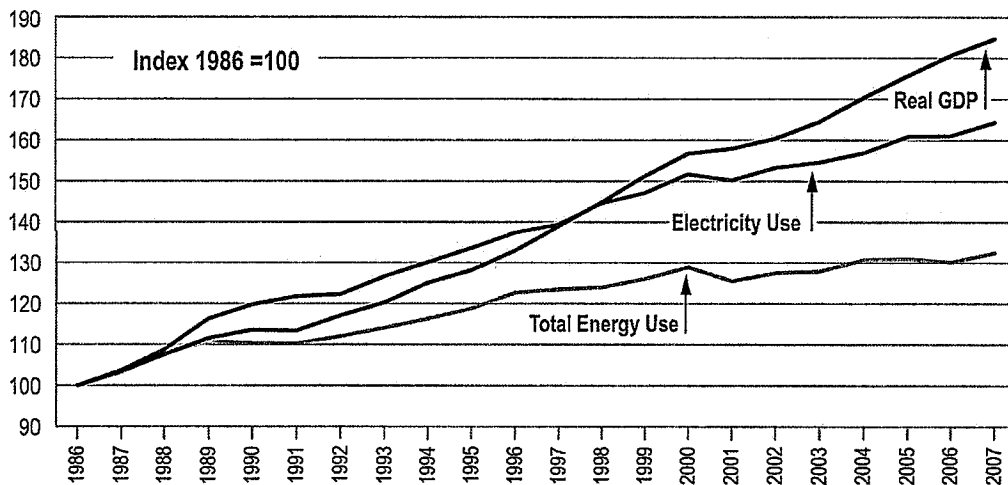
\*The full text of the EEI climate change principles is available at [www.eei.org](http://www.eei.org).

---

# The Value Of Electricity

3

## U.S. Economic Growth Is Linked To Electricity Growth



1986 represents the base year. Graph depicts increases or decreases from the base year.

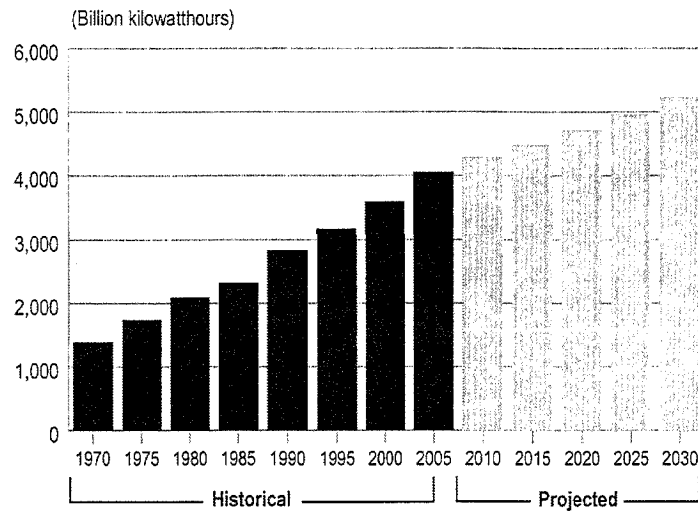
Source: U.S. Department of Energy, Energy Information Administration (EIA).

© 2008 by the Edison Electric Institute. All rights reserved.

4

3-2

# Demand for Electricity Is Projected To Increase at Least 30% by 2030



\*Electricity demand projections based on expected growth between 2006 and 2030.

Source: U.S. Department of Energy, Energy Information Administration, *Annual Energy Review 2006* and *Annual Energy Outlook 2008*.

61

## Reasons for Rising Electricity Demand

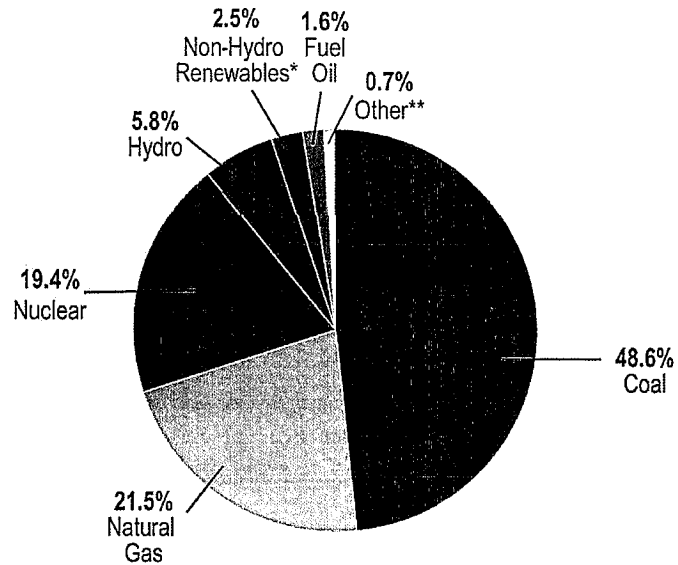
- U.S. population now exceeds 305 million people; population expected to increase more than 20% by 2030
- Average U.S. home today is nearly 50% larger than average home in 1975
- Average U.S. household owns 24 consumer electronic products
  - 99% of these products must be plugged in or recharged
  - PCs and TVs now account for 10% of a home's electricity usage

Sources: U.S. Census Bureau, National Association of Home Builders, Consumer Electronics Association

3-3

# Electric Companies Use a Diverse Mix Of Fuels to Generate Electricity

## 2007 National Fuel Mix



\*Includes generation by agricultural waste, landfill gas recovery, municipal solid waste, wood, geothermal, non-wood waste, wind, and solar.

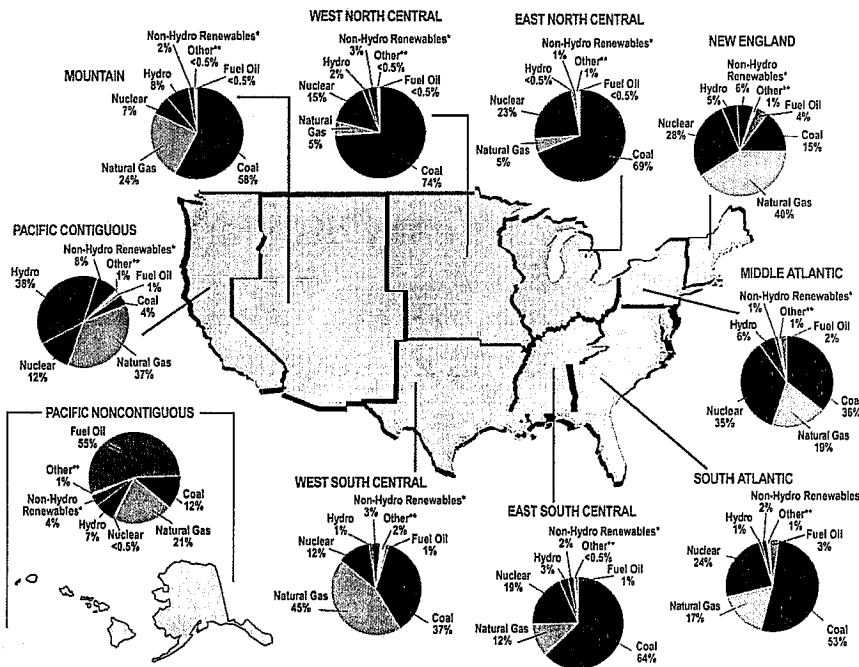
\*\* Includes generation by tires, batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.

Sum of components may not add to 100% due to independent rounding.

Sources: U.S. Department of Energy, Energy Information Administration, Power Plant Report (EIA-906), and Combined Heat and Power Plant Report (EIA-920).

© 2008 by the Edison Electric Institute. All rights reserved.

# Different Regions of the Country Use Different Fuel Mixes to Generate Electricity



\*Includes generation by agricultural waste, landfill gas recovery, municipal solid waste, wood, geothermal, non-wood waste, wind, and solar.

\*\* Includes generation by tires, batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.

Sum of components may not add to 100% due to independent rounding.

Sources: U.S. Department of Energy, Energy Information Administration, Power Plant Report (EIA-906), and Combined Heat and Power Plant Report (EIA-920).

© 2008 by the Edison Electric Institute. All rights reserved.

3-4

# Increasing Demands for Electricity Require Major Investments

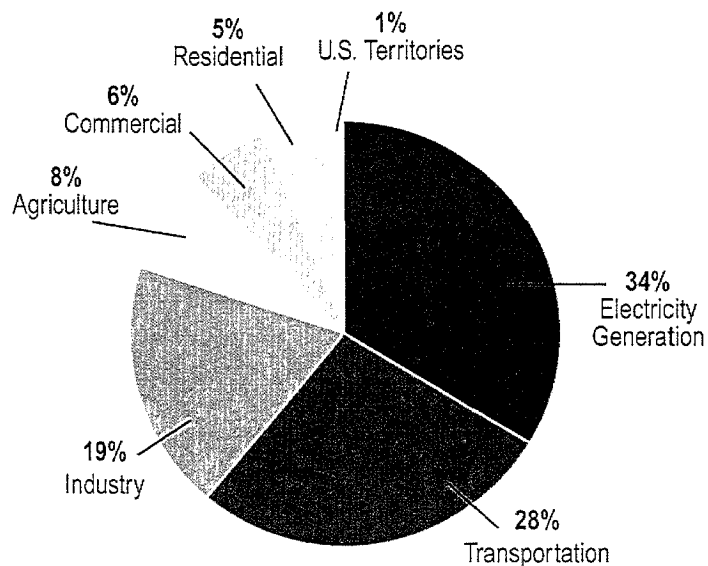
- According to *The Brattle Group*, investment in the electricity system on the order of at least \$1.5 trillion will be required from 2010 – 2030:
  - **Generation:** \$505 billion, assuming no changes in carbon policy or long-term price effects
  - **Transmission:** \$298 billion
  - **Distribution:** \$582 billion
  - **Advanced Metering Infrastructure and Energy Efficiency/Demand Response:** \$85 billion
- **Environmental Compliance:** The electric utility industry is expected to spend approximately \$12.5 billion on environmental compliance measures in 2008.
- **RDD&D:** Research, development, demonstration, and deployment costs for the clean energy technologies needed to reduce GHG emissions, as well as compliance costs for possible future carbon mandates, will require additional investments by utilities.

Sources: *The Brattle Group*, *Transforming America's Power Industry: The Investment Challenge 2010-2030*, November 2008; Edison Electric Institute, Finance and Accounting Division, 2008 Capital Expenditures Study, based on projected results for 70 U.S. shareholder-owned electric utilities, July 2008.

9

## Electricity Generation and GHG Emissions

**U.S. GHG Emissions by Sector**



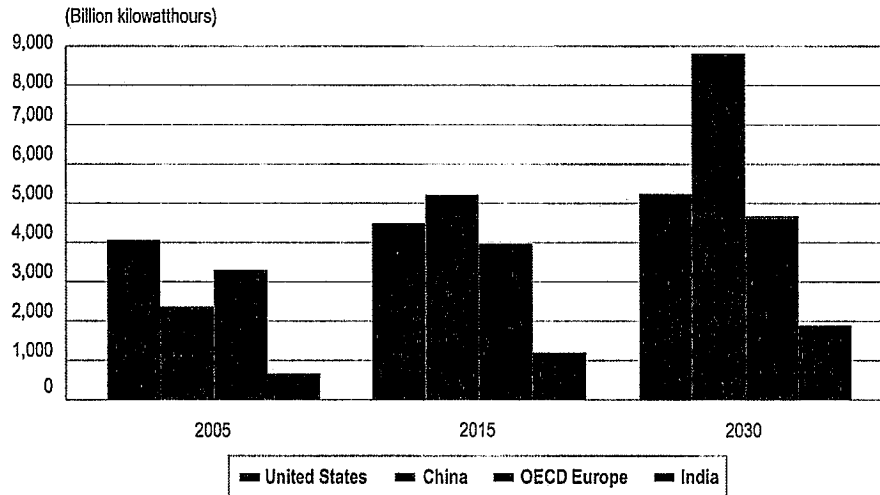
Source: U.S. Environmental Protection Agency, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2006.

© 2008 by the Edison Electric Institute. All rights reserved.

3-5

# Worldwide Electricity Demand Growth

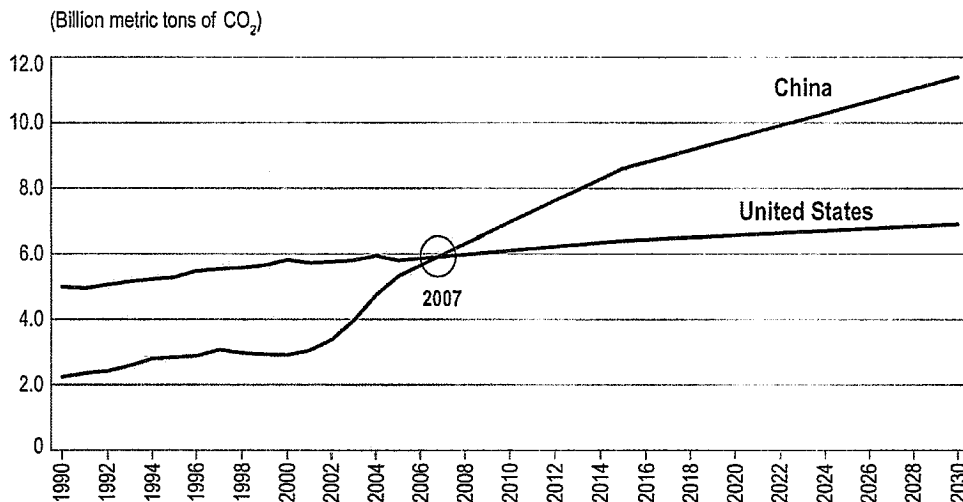
Net Electricity Consumption



Source: U.S. Department of Energy, Energy Information Administration, *International Energy Outlook 2008*.

© 2008 by the Edison Electric Institute. All rights reserved.

# China's CO<sub>2</sub> Emissions Surpass U.S. Emissions in 2007\*



Sources: 2005-2030 data from International Energy Agency, *World Energy Outlook 2007*  
1990-2004 data from U.S. Department of Energy, Energy Information Administration

\* Based on IEA's 2007 projections.

© 2008 by the Edison Electric Institute. All rights reserved.

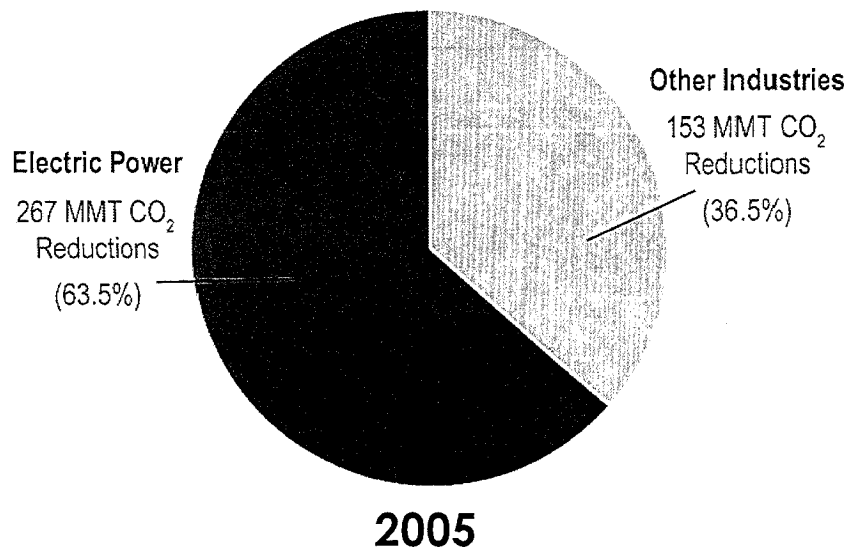
3-6

---

# Electric Utility Climate Actions: *Proven Progress*

13

## The Electric Power Sector Leads All Other Industrial Sectors in Reducing CO<sub>2</sub>



Note: million metric tons (MMT) represent the greater of project or entity amount, on a reporter-by-reporter basis.

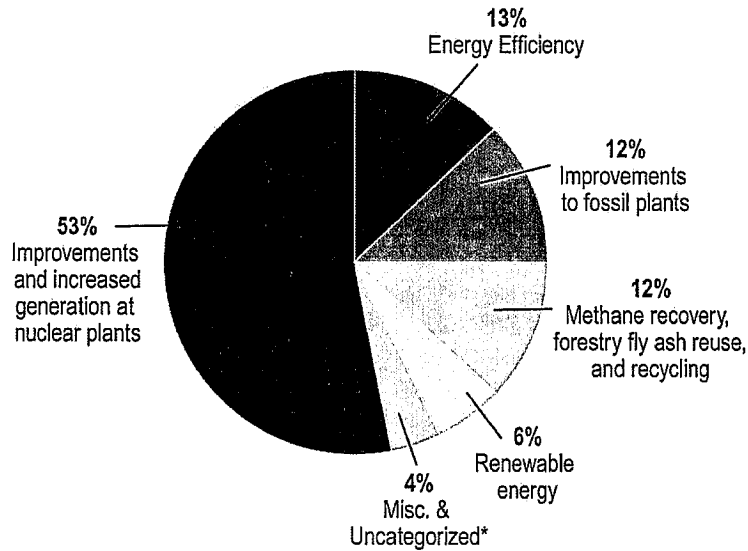
Source: EIA Voluntary Reporting of Greenhouse Gases Program, 2005 Annual Report. Analysis by Edison Electric Institute.

© 2007 by the Edison Electric Institute. All rights reserved.

3-7



# Electric Power CO<sub>2</sub> Emissions Reductions By Project Type



2005

\*Includes improvements to transmission and distribution system, transportation and off-road vehicles, and halogenated substances.

Source: U.S. Department of Energy, Energy Information Administration, Voluntary Reporting of Greenhouse Gases Program, 2005 Annual Report. Analysis by Edison Electric Institute.

© 2008 by the Edison Electric Institute. All rights reserved.

15

---

## Climate Change Solutions: *What Will It Take To Make Additional Greenhouse Gas Reductions?*

3-8

# What Will It Take?

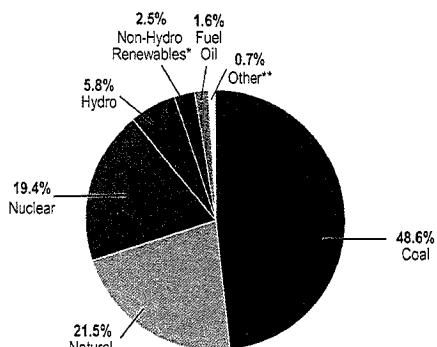
- Addressing climate change requires an aggressive and sustained commitment to a full set of technologies, including:
  - Energy Efficiency
  - Renewables
  - Clean coal technologies
  - Carbon capture and storage
  - Nuclear
  - Plug-in hybrid electric vehicles

17

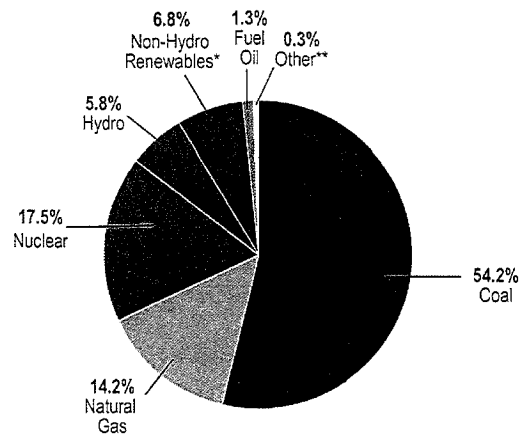
## What Will It Take?

# Current National Fuel Mix Compared To EIA's 2030 Projections

2007 National Fuel Mix



2030 Projections



\*Includes generation by agricultural waste, landfill gas recovery, municipal solid waste, wood, geothermal, non-wood waste, wind, and solar.

\*\* Includes generation by tires, batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.

Sources 2007 Actual: U.S. Department of Energy, Energy Information Administration, Power Plant Report (EIA-906), and Combined Heat and Power Plant Report (EIA-920).

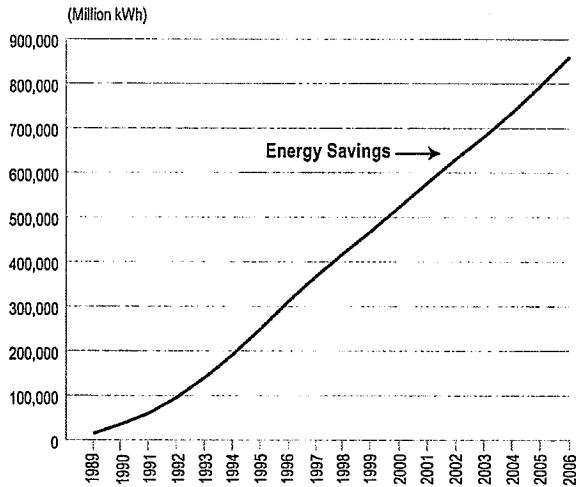
Source 2030 Forecast: U.S. Department of Energy, Energy Information Administration, Annual Energy Outlook 2008.

© 2008 by the Edison Electric Institute. All rights reserved.

3-9

## An Intensified National Commitment To Energy Efficiency

Cumulative Energy Saved by Electric Utility Demand-Side Management Programs (1989-2006)



Source: U.S. Department of Energy, Energy Information Administration. Some utilities were spending money on DSM as early as 1976. National data are not available for expenditures from 1976-1988.

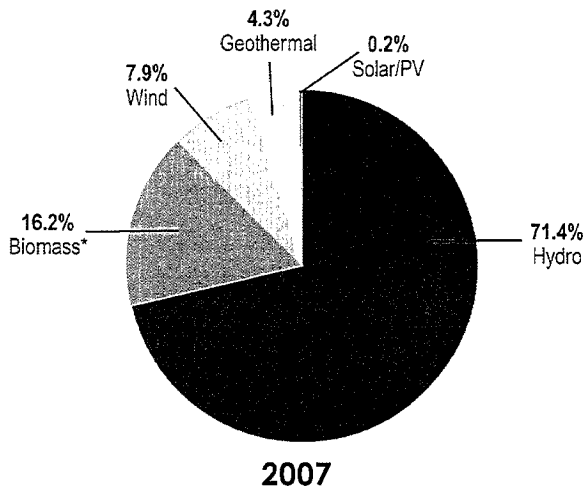
© 2007 by the Edison Electric Institute. All rights reserved.

- Between 1989 and 2006, electric company DSM programs saved almost 860 billion kilowatthours (kWh) of electricity—enough to power nearly 76 million average U.S. homes for one year.
- These savings are equal to the annual electricity output of 110 baseload power plants [rated at 800 megawatts (MW) each and operating at a 90-percent capacity factor].

## An Intensified National Commitment To Energy Efficiency

- The electric utility industry has identified five key action areas to help accelerate energy-efficiency gains:
  - increase energy efficiency of buildings
  - promote “smart” and more energy-efficient appliances and electric technologies
  - accelerate development of advanced “smart” meters and transmission grid
  - support development of innovative rate design to give customers more control over electricity bills and to encourage utility investments in energy efficiency
  - commercialize plug-in hybrid electric vehicles

# Accelerated Development and Deployment Of Renewable Energy Resources



2007

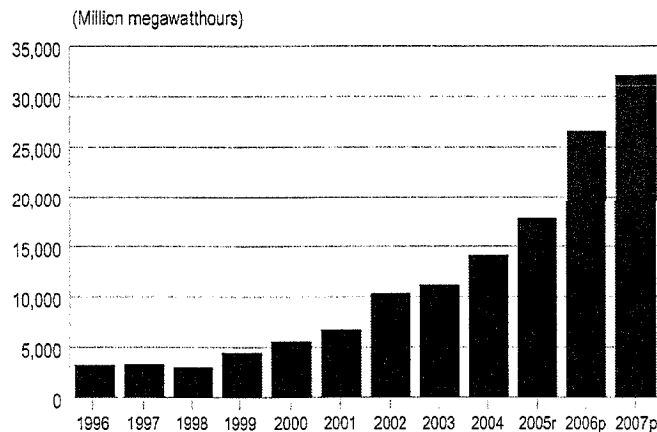
\*Biomass includes agricultural byproducts, landfill gas, municipal solid waste, sludge waste, tire-derived fuels, and wood/wood waste.

Sources: U.S. Department of Energy, Energy Information Administration, Power Plant Report (EIA-908), and Combined Heat and Power Plant Report (EIA-920); 2007 generation data.

© 2008 by the Edison Electric Institute. All rights reserved.

- The electric power industry has significantly expanded the use of non-hydro renewable energy sources for generating electricity.
- Wind power has become the fastest-growing renewable energy source in the nation. Wind farms currently operate in 36 states and produce a total generating capacity of more than 21,000 MW.
- Despite growth, non-hydro renewables still comprise only 2.5% of total generation.

# Growth of Wind As a Renewable Energy Source



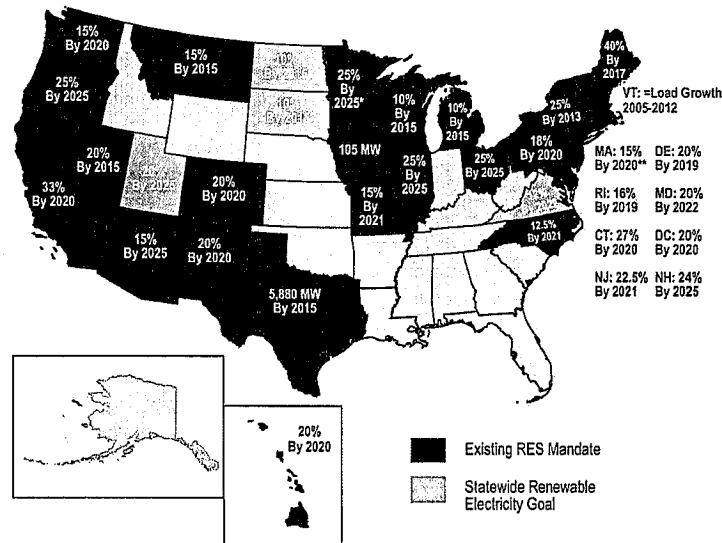
r = revised, p = preliminary

Sources: U.S. Department of Energy, Energy Information Administration, *Electric Power Monthly* and *Electric Power Annual*.

© 2008 by the Edison Electric Institute. All rights reserved.

## What Will It Take?

# 29 States and the District of Columbia Mandate Renewable Electricity Standards



\*Xcel Energy: 30% By 2020 \*\*Increasing 1% per year thereafter, with no stated expiration date

Source: Edison Electric Institute, status as of November 18, 2008.

© 2008 by the Edison Electric Institute. All rights reserved.

23

## What Will It Take?

# Advanced Clean Coal Technologies

- Advanced clean-coal technologies include supercritical, ultra-supercritical, circulating fluidized bed, and integrated gasification combined cycle (IGCC) technologies.
- The coal and electric utility industries are working with DOE and EPRI to develop clean coal power plants through:
  - The **Clean Coal Power Initiative**, a federal cost-share program to conduct demonstrations of cutting-edge, commercial-scale, advanced clean coal technologies;
  - CoalFleet for Tomorrow**, involving more than 60 companies (including most of the major equipment suppliers) working on IGCC and advanced combustion plant designs and performance;
  - The **CO<sub>2</sub> Capture Pilot**, a 5-MW test facility at We Energies' Pleasant Prairie Plant. Funding is provided by more than 25 utilities and Alstom; and
  - Advanced research and development.

3-12

## Carbon Capture And Storage (CCS)

- The ability to capture, compress, transport, and store CO<sub>2</sub> emissions is key to developing coal-based power with zero or near-zero emissions.
- There are several challenges to this technology, including permitting, transport, storage, cost, potential liabilities, and public acceptance.

## Timeframe for CCS Technologies

- EPRI estimates 2020-2025 for commercial availability at today's pace.
- Widespread deployment of CCS technology would take years after that.

## CCS Deployment Today And in 2050

- **Current CCS Deployment:**
  - 21 projects worldwide
  - Projected lifetime storage capacity for each project:  
**10 – 30 million tons CO<sub>2</sub>**
- **Future Deployment Requirements:**
  - One 1,000-MW IGCC plant operating for 50 years:  
**250 million tons CO<sub>2</sub>**
  - Cumulative U.S. CCS deployment (2005-2050):  
**8,000 million tons CO<sub>2</sub>**
  - Cumulative Global CCS deployment (2005-2050):  
**30,000 million tons CO<sub>2</sub>**

Source: Electric Power Research Institute

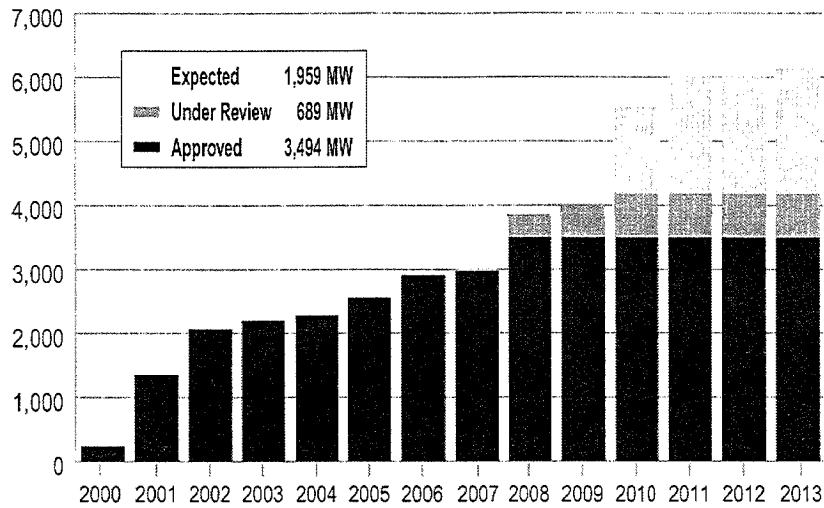
27

## Increased Nuclear Capacity and Advanced Nuclear Designs

- The average capacity factor of U.S. nuclear plants was an estimated 92 percent in 2007.
- The increase in output from U.S. nuclear plants—from 673 billion kWh in 1995 to 806 billion kWh in 2007—is roughly equivalent to bringing 17 new 1,000-MW power plants (operating at a 90-percent capacity factor) into service.
- Nuclear power-related projects accounted for nearly 142 million metric tons of CO<sub>2</sub> reductions, or about 53 percent of the power sector's total reductions in 2005.
- 22 companies and consortia are preparing license applications to build and operate as many as 34 new nuclear reactors—or approximately 43,400 MW of generating capacity.

3-14

# Cumulative U.S. Nuclear Capacity Additions at Existing Facilities

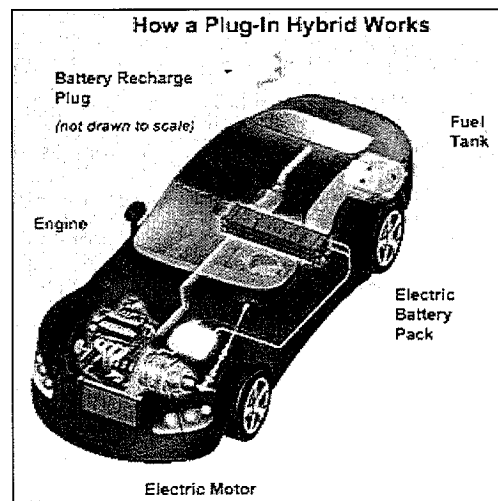


Source: Nuclear Regulatory Commission

© 2008 by the Edison Electric Institute. All rights reserved.

# Plug-In Hybrid Electric Vehicles

- PHEVs are plugged in to the existing electricity system and use an electrical outlet—not gasoline—to recharge the car batteries.
- PHEVs will use significantly less gasoline than current hybrids and standard vehicles.
- PHEVs will help to reduce emissions of CO<sub>2</sub> and other emissions such as nitrogen oxides and sulfur dioxide.
- According to EPRI, battery-powered electric vehicles produce just one-third of the greenhouse gases emitted by gasoline-fueled vehicles.



Source: National Renewable Energy Laboratory

3-15



---

# Challenges to Achieving Significant GHG Reductions

31

## Challenges to Achieving Significant GHG Reductions

### Technology Challenges

- According to EPRI, the U.S. electricity sector will need **ALL** of the following technology advancements to significantly reduce CO<sub>2</sub> emissions over the coming decades:
  1. Smart grid and communications infrastructures to enable end-use efficiency and demand response, distributed generation, and PHEVs.
  2. A grid infrastructure with the capacity and reliability to operate with 20-30% variable renewables in specific regions.
  3. Significant expansion of nuclear energy enabled by continued safe and economic operation of existing nuclear fleet; and a viable strategy for managing spent fuel.
  4. New commercial-scale coal-based generation units operating with 90+% CO<sub>2</sub> capture and storage in a variety of geologies.

Source: Electric Power Research Institute

276

# Challenges to Achieving Significant GHG Reductions

## Funding challenges

- Substantial new investments are needed to complete research, development, demonstration, and deployment of new technologies. After technology reaches the commercialization phase, continued investment will be needed to operate and maintain technologies.
- Costs of complying with any federal CO<sub>2</sub> reduction mandates would vary by program/legislative design.

33



February 8, 2007

## EI Global Climate Change Principles

### BACKGROUND

EI's member companies clearly recognize the growing concern regarding the threat of climate change. Since 1999—when EI joined the U.S. Department of Energy in the Climate Challenge—the electric utility industry has led all other industrial sectors in reducing greenhouse gas emissions. Through various programs and initiatives—such as "Power Partners", the Asia-Pacific Partnership and individual company efforts—the industry has achieved:

Today, EI's members recognize a growing imperative to make even deeper reductions in greenhouse gas emissions. No matter what the climate path is, success in that mission—while maintaining the reliable and reasonably priced electricity supply so vital to our economic well-being and national security—will require an aggressive and sustained commitment by the industry and policymakers to the development and deployment of a full suite of technology options, including:

- An intensified national commitment to energy efficiency, including advanced efficiency technologies and new regulatory and business models.
- Accelerated development and cost-effective deployment of demand-side management technologies and renewable energy resources.
- Advanced clean coal technologies (e.g. advanced pulverized coal, fluidized bed and IGCC technologies).
- Carbon capture and storage for all types of fossil-based generation.
- Increased nuclear capacity and advanced nuclear designs, and
- Plug-in electric hybrid vehicles.

Although some of these options are currently available—often at a higher cost than conventional generation sources—they are not all available simultaneously, but all are critical to our dual goals of addressing greenhouse gas emissions and maintaining a reliable, affordable electricity supply in a carbon-constrained world. Moreover, because of the global nature of the problem, solutions will require the participation of the entire world economy, including China and India.

### PUBLIC POLICY PRINCIPLES

EI will continue to emphasize the importance of

- A reliable, stable and reasonably-priced electric supply to maintain the competitiveness of the U.S. economy.
- A real-diverse generation portfolio to assure system reliability, energy security and price stability.
- Public policies and investments to accelerate the development of viable and cost-effective energy efficiency programs and technologies, zero- or low-emissions generation technologies, and carbon capture and storage technologies.
- International partnerships to address climate change as a global issue that requires global solutions, including appropriate participation by developing nations, such as China and India, and.

EI Global Climate Change Principles - February 8, 2007

- Solutions compatible with a market economy that deliver timely and reasonably priced greenhouse gas reductions.

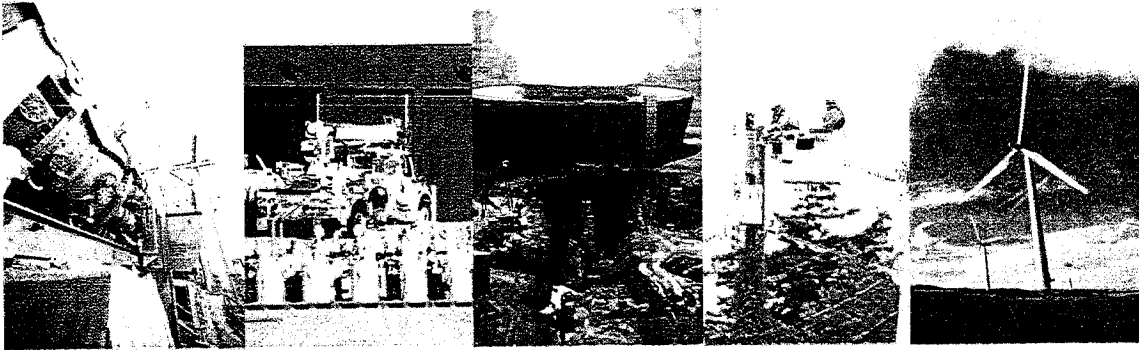
EI supports federal action or legislation to reduce greenhouse gas emissions that:

- Involves all sectors of the economy, and all sources of GHG.
- Assumes viable, long-term public-private funding to support the development and deployment of needed technology solutions.
- Assumes compliance mechanisms consistent with the expected development and deployment timelines of needed technologies.
- Employs market mechanisms to secure cost-effective GHG reductions, and provides a reasonable transition and an efficient economic order, where:
- Establishment of a long-term price signal for carbon that is moderate, does not limit the economic development, growth of U.S. industry and stimulates investment in advanced clean coal, renewable technologies and processes;
- Adjusts the regulatory or economic burden on the use of carbon capture and storage and increased nuclear, wind or other zero- or low-GHG technologies;
- Minimizes economic disruptions or disemployment impacts;
- Recognizes early serious investments made to mitigate greenhouse gas emissions;
- Develops the full "value chain" of a broad range of demand-side management (DSM) options;
- Provides certainty and a consistent national policy, and
- Recognizes the international dimension of the challenge and facilitates technology transfer.



Edison Electric Institute (EEI) is the association of U.S. electric utility companies. EEI's members are the nation's largest and most diverse group of electric utilities. EEI's members work together to advance the industry's interests and to promote the public interest. For more information, visit [www.eei.org](http://www.eei.org).

3-17



## Meeting Our Customers' Energy Needs

### A Strategic Plan For Uncertain Times

#### ***Our Mission***

*Westar Energy provides safe, reliable, high quality electric energy service at a reasonable price to all customers.*

Joint Committee on  
Energy and Environmental Policy  
January 13, 2009  
Attachment 4

## TABLE OF CONTENTS

<b>Introduction — Planning in an Uncertain Era</b>	<b>3</b>
<b>The Fundamentals of our Strategy</b>	<b>6</b>
<b>Overall Planning Approach</b>	<b>12</b>
<b>Generation</b>	<b>15</b>
<b>The Appropriate Supply Plan</b>	<b>22</b>
<b>Energy Efficiency</b>	<b>30</b>
<b>Transmission</b>	<b>40</b>
<b>Environmental Issues and Projects</b>	<b>43</b>
<b>Reliability Initiatives</b>	<b>50</b>
<b>Financing the Strategy</b>	<b>55</b>
<b>Rate Implications of Sustained Capital Investment</b>	<b>57</b>
<b>Regulatory Plan</b>	<b>59</b>
<b>The Way Forward</b>	<b>61</b>
<b>Appendix A</b>	<b>62</b>
<b>Forward-looking Statements</b>	<b>63</b>

4-2

## Introduction — Planning in an Uncertain Era

---

Westar Energy has been engaged in a comprehensive planning effort to develop and refine investment choices and operational initiatives to serve the future energy needs of our Kansas customers. We worked from the premise that any plan must (a) be consistent with our resolve to succeed as an electric-only public utility and (b) fit within the broader context of evolving public sentiment about energy and environmental policy. The velocity and magnitude of technological, market and policy change affecting the industry is unprecedented and, as a consequence, the effort has not been routine. Matters we considered include:

- Just in the last two years, the estimated price of a baseload coal plant has nearly doubled — from about \$1,200-\$1,500 per kW to as much as \$2,400-\$2,900 per kW.
- During the same period, the monthly average price of natural gas has slumped as low as \$3.65 per MMBtu and soared as high as \$15.41 per MMBtu.
- The uncertainty is not just financial; during late 2005 and much of 2006, Westar experienced serious challenges in obtaining timely coal deliveries.
- Concern that there might be a correlation between greenhouse gases (GHG) and global warming has moved from a polarizing debate to mainstream belief, leading to calls for urgent and fundamental change in energy production and consumption.
- The public increasingly is drawn to the allure of "clean coal," even though the requisite technologies have not yet proved themselves in commercial applications.
- A growing body of the public and policy-makers across the country is poised to reconsider long-held anxieties about nuclear generation in exchange for its promise of carbon-less power.
- A lack of consistency in how states and federal agencies are addressing air quality issues is creating enormous uncertainty about future operational and financial burdens on existing and future fossil-fuel generation.
- While energy efficient appliances give consumers the ability to reduce their electric usage, the ever-expanding array of energy-hungry appliances pushes demand steadily upward as electricity becomes an ever-more integral part of our modern, high-tech lives.

4-3

A utility planning process, by its very nature, is designed to achieve a reasonable level of certainty and reasonably assured outcomes. However, Westar sees seismic shifts in the assumptions shaping our industry that have convinced us that this is not a time to be satisfied with conventional thinking, nor, when so much is at stake, is it right to manufacture a clarity around these issues that does not exist. Our planning efforts have identified fundamental uncertainties affecting our business: volatility in fuel and construction costs; technological advances in how electricity is generated, delivered and metered; new imperatives for energy efficiency; and evolving environmental policies and standards. We believe what characterizes good planning is to embrace these uncertainties and to acknowledge our limited capability to predict future outcomes.

***Good utility planning traditionally has sought to minimize the variables and to make reasoned judgments based upon well-accepted rules of the game. Given the velocity and magnitude of change in our industry, what characterizes good planning now is the ability to embrace uncertainty. It is perilous to do anything less.***

Our planning efforts have identified fundamental uncertainties affecting our business: volatility in fuel and construction costs; technological advances in how electricity is generated, delivered and metered; new imperatives for energy efficiency; and evolving environmental policies and standards. We believe what characterizes good planning is to embrace these uncertainties and to acknowledge our limited capability to predict future outcomes.

Accordingly, Westar has chosen a strategy that creates and preserves as many options as possible, avoids over-commitment to a single dominant approach, and maintains diversity through flexible supply planning and cost-effective demand management.

Significant elements of our strategy have been shared publicly, presented to the Kansas Corporation Commission (Commission), and are now being reviewed or implemented. They include the environmental upgrades at the Jeffrey Energy Center and other coal plants, construction of the Emporia Energy Center, the development of major wind generation capability, and the building and upgrading of transmission facilities. Westar has also publicly advised of our intention to invest significant additional resources to enhance our distribution system, and develop multiple energy efficiency programs and supporting infrastructure. Although each project is discrete — and may be proposed in individual filings to the Commission — each is also an essential component of our overall strategy. Our intent in this paper is to lay out the rationale and context for this broader strategy and to explain the implications of various options.

---

### **Guiding Principles of Westar's Strategy**

- Be flexible, adapt as conditions change
  - Preserve options
  - Maintain diversity
  - Avoid over-commitment to one course
- 

Westar's management believes in the inherent value of openness and transparency — so that our customers, investors, and regulators know what we are doing, why we are doing it, and what we anticipate the costs and benefits to be. It is our

4-4

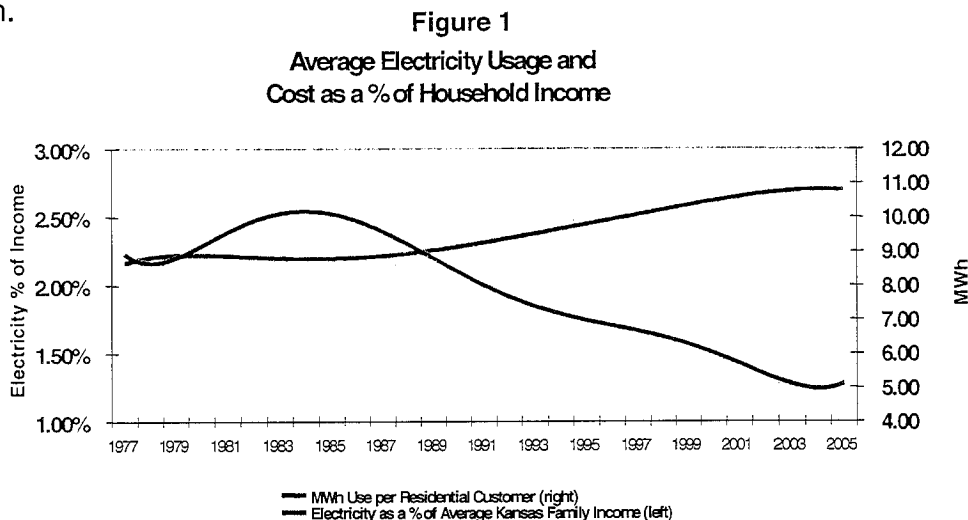
hope that this paper will facilitate the continued development of a collaborative and cooperative approach to addressing Kansas' and the industry's energy challenges.

The paper is also intended as an invitation to open discussion with the Commission and other policy-makers regarding both the uncertainties and the foundational shifts in the energy picture. While, of course, respecting the independence of the Commission in its regulation of Westar, we believe that having a shared understanding of industry conditions provides worthwhile context for future decisions.

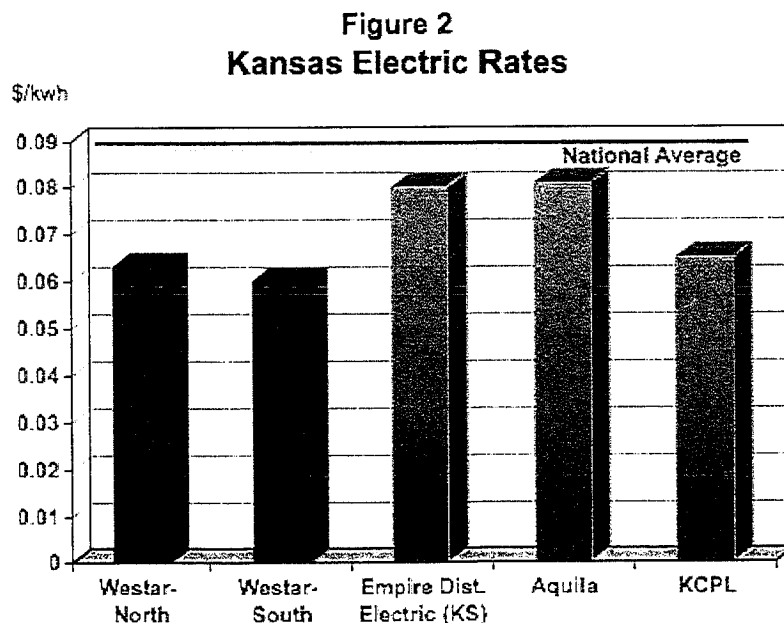
4-5

## The Fundamentals of our Strategy

Westar's customers have enjoyed reliable electric service at prices that are very low in both absolute and relative terms. Electricity cost as a percentage of household income for our residential customers has declined significantly over the last 30 years. (Figure 1) Notably, this decline has occurred in the face of rising household electricity consumption.



Westar compares very favorably with electric rates in Kansas but, even more notably, *our rates, at \$.06/kWh on average, are more than 30% below the national average of approximately \$.09/kWh.* (Figure 2) Equally important for Westar is that our customers in both our north and south regions now have virtually identical tariff structures and legacy rate differentials have been significantly narrowed.<sup>1</sup> Future cost increases and infrastructure investment will necessarily mean higher



<sup>1</sup> We are now approaching the time when the tariff structures and rate schedules for Westar North and South should be fully consolidated.

4-6



prices for customers. Nonetheless, we believe that our approach will afford a solid means to preserve a continuing relative price advantage for our customers well into the future, even as absolute prices increase.

Like many other utilities, Westar typically would be expected to meet increased customer demand by building peaking units until overall load grew to a point where baseload plant economics would prevail. If we were to follow that approach, we would be building a baseload coal plant, similar to those at LaCygne or Jeffrey, to become commercially operational in the middle of the next decade. A confluence of events, however, indicates that such an approach brings greater risk for Westar and its customers than it did in the past:

- rapidly rising costs for construction materials, equipment, and labor for baseload generating facilities;
- rapidly growing opposition to using coal to generate electricity, fueled by the intense policy debate regarding carbon dioxide emissions and GHG effects;<sup>2</sup>
- notable improvements in wind technology, coupled with abundant Kansas wind resources; and
- evolving state and federal policies encouraging the development of transmission plant, renewable energy sources, and a focus on energy efficiency.

These factors lead us to pursue a strategy that respects these uncertainties and seeks to navigate a path for the next few years that will help us control risks and continue to assess the changing landscape of our industry and its impact on our long-term strategy and investments.

The evaluation of options that once seemed either obvious or undesirable may change. For this time, however, we have concluded that Westar should:

1. ***Attempt to bridge the gap in emerging generation technologies*** and satisfy environmental concerns through a combination of:

- energy conservation and efficiency programs;
- wind generation;
- high efficiency, quick starting natural gas combined and simple cycle turbines;
- transmission network enhancements;
- enhancements to the productivity of *existing* coal plants; and
- extending the operating life of our *existing* nuclear plant.

---

<sup>2</sup> Natural gas is also a fossil fuel, but only emits about 40% of the carbon dioxide that coal generation emits.

2. Continue to make **significant investments in environmental upgrades** at existing coal plants.
3. Continue to study and **remain flexible** with respect to traditional baseload coal, nuclear, and emerging baseload technologies.
4. **Construct new (and improve existing) high-voltage transmission facilities** that will enhance reliability, improve the ability of Kansas utilities to move economic energy into and across the state, and facilitate the development of wind generation.
5. **Defer** as long as we reasonably can the addition of a **conventional baseload pulverized coal plant**.
6. Maintain focus on **improving the reliability of our distribution system** for our retail customers.
7. **Deploy advanced metering** infrastructure to:
  - Enable energy efficiency programs;
  - Improve service reliability;
  - Increase customers' service options and control over their energy service; and
  - Improve customer satisfaction.

Our plans do not mean that Westar will not need baseload plants in the future. Long-term trends in customer demand all suggest that, at some point, Westar will again have to invest in baseload generation. However, we believe there is great value to Westar and its customers from deferring a commitment to a conventional coal plant — especially at a time when the cost may be \$2 billion and there are so many questions being raised about the environmental impact of continued development of this conventional technology.<sup>3</sup> It is our expectation that, while we pursue a more diverse and flexible approach to supply planning, greater clarity will emerge regarding future environmental policy. We also expect that information regarding the commercial availability and costs of the emerging baseload technologies, particularly related to "clean coal," will become more certain.

These strategies reflect an evolution, not a departure, from our track record of ensuring Kansas has low-cost, reliable power — in fact, we believe they are consistent with our commitment to ensure that our investments are aligned with a clear view of emerging technology, market needs and public policy. The departure is the shift from the norms that have characterized our industry for decades. We are now entering an era where environmental considerations will weigh heavily in shaping the understanding

---

<sup>3</sup> Westar does not engage in climate change debate in this paper. Rather, we address that subject as an acknowledged political and social reality around which we must plan to meet our customers' needs. In September 2007, Westar issued a policy statement with regard to its position on climate change. This policy statement is attached as Appendix A.

4-8

of and policy for energy development in our country. It is still very much a work in progress.

## **What Guides us to our Strategy**

We are committed to openly sharing with policy-makers the process we went through to arrive at our strategy, as well as the considerations we weighed. We also believe the rhetoric that characterizes some of the debates in our industry should yield to thoughtful analysis and a dispassionate view of the facts. In that spirit, we will outline here the overall planning approach we employed, followed by our evaluation of possible energy supply and demand resources. In this evaluation, we categorize options as core or complementary elements of our comprehensive strategy — and also identify options that are not now part of our strategy, but should continue to be studied. We will detail how we evaluated each supply and demand resource and how we arrived at the core and complementary elements of our strategy. Finally, we will discuss why we believe we should not eliminate some potential options that could become more viable as circumstances change.

In preparing our strategy, we have continued to work with experts from Black & Veatch, LLP (B&V) regarding generation needs and alternatives. The B&V studies provided a foundation for our decisions and the associated Commission filings for the Emporia Energy Center and wind generation. The studies also constituted important inputs into our development of an overall supply and demand strategy. The forecast peak demand used in our current planning studies utilizes a methodology that was jointly developed by KCC staff and Westar.

Following are the key areas of our planning addressed in this paper:

### **Generation Considerations**

The generation component of our plan now contemplates:

- completion of the natural gas peaking units at the Emporia Energy Center;
- development of wind generation by year end 2008;
- when necessary, reliance on an additional natural gas peaking unit; and
- the subsequent construction of an intermediate duty combined cycle natural gas-fired plant.

There are several factors that will influence our plans for these generation additions:

- customer response to our energy efficiency and demand side initiatives;
- the availability of options to acquire existing generating capacity in the region;

4-9

- the future status of long-term wholesale power supply sales contracts;
- our ability to contract for and import power over the transmission grid;
- the results of turbine and other upgrade efforts undertaken in conjunction with environmental investments at our coal plants; and
- our ability to extend the operating life of the Wolf Creek nuclear plant.

A significant contribution to our ability to defer a new baseload plant and aggressively pursue wind generation is the existence and continued long-term use of our high quality and highly reliable baseload coal and nuclear stations, and our plans to continue to improve the productive capability of these stations.

Generation planning is a continuing process, however, so we fully expect to make adjustments to our construction schedule as conditions change and we revise our assumptions accordingly.

### **Energy Efficiency and Demand Side Management Initiatives**

Westar will propose several energy efficiency initiatives and the enabling technologies that can be deployed to make energy efficiency a more integral part of the Kansas energy mix. We will explain how these technologies, including what are referred to as advanced metering infrastructure and meter data management systems (AMI/MDM), can assist customers in using energy more efficiently and in reducing peak demands on our system. These technologies also offer service-related benefits such as improved outage responses, better-informed reliability planning, and enhanced customer satisfaction.

### **Transmission Enhancements**

The transmission section of this paper will show how major transmission enhancements are integral to our strategy. Our focus will be to improve the capability and efficiency of our system. This will permit us to maximize access to generation resources, as well as to prepare for the greater integration of wind power into the state's generation mix.

### **Environmental Issues and Projects**

Continuing our focus on ensuring our existing assets are operating in an environmentally responsible way, we will discuss the environmental considerations in our plan, including environmental retrofits at the Jeffrey, Lawrence and Tecumseh Energy Centers and LaCygne Station, and anticipated additional costs necessary to ensure compliance with applicable government requirements.

4-10

## **Reliability Initiatives**

The reliability of our distribution system is another essential part of our plan, and in this section we will detail the initiatives such as performance measures and objectives and associated programs and plans (e.g., vegetation management and preventive maintenance) we are undertaking to assure reliable service to customers.

## **Financing and Rate Implications**

The magnitude of, and the risks associated with, the investments being discussed here carry implications for rates and the credit standing of the company. We will address long-term financing plans and rate implications associated with these significant infrastructure investments. We start from a position of a very strong price advantage for our customers and a restored credit standing for the company. Our intent is to preserve those foundations at a time when increasing energy costs are a fact of life and the climate for investment is uncertain.

## **Regulatory Plan**

The final section of the report provides an overview of anticipated regulatory filings and approvals associated with implementation of the various components of our strategy.

4-11

## Overall Planning Approach

---

Starting in late 2006, it became apparent that in almost any direction we focused, we saw unprecedented change. At first it was subtle: rising materials prices; contractors seemingly less hungry for business; the hiring of skilled labor taking a bit longer. Then we saw others in the industry announcing upward revisions to their cost estimates on major projects. Almost immediately after we agreed to purchase the Spring Creek peaking plant in Oklahoma, we noticed that prices paid to purchase existing merchant power plants starting to increase — making our effective cost of \$175/kW a tremendous bargain compared with the rising tide of the market.<sup>4</sup> We then experienced rising costs for our environmental retrofit projects at LaCygne Station and Jeffrey Energy Center. We also observed much higher demands being placed on the rail system, including incidences of longer cycle times for coal deliveries continuing from late 2005.

In recent years, public interest in utility-related environmental matters has grown significantly. Until recently, announcements pertaining to new coal plants did not attract much opposition.<sup>5</sup> Now, an announcement of a coal plant anywhere in the United States seems to attract vigorous opposition and intense scrutiny. At the same time, national policy leadership began to project a more urgent and concerned tone about climate change and the role the United States ought to play in addressing it. Today, the debate seemingly is no longer about whether climate change is happening, but rather about who pays for supposed remedies.

Today, we see proposed coal plants either being postponed or canceled. Examples of this are the eight TXU coal plants canceled in Texas, the rejection of the Florida Power and Light Company's (FPL) proposed Glades County coal plants by the Florida Public Service Commission and the North Carolina decision to scale back Duke Energy's planned coal expansion from two to one unit. It was in this still-developing context that Westar announced in December 2006 that it was deferring a decision on its potential plans and possible sites for a future baseload coal plant. Of course, closer to Westar, regulators have more recently denied coal plants in Oklahoma and western Kansas.

These events — coming in such swift succession and with such mounting force — caused us to step back from our traditional approach to planning. No longer could we count on the market following a sustained direction for any reasonable period of time. No longer could we count on predictable costs for labor or materials. In fact, there are

---

<sup>4</sup> Recent reports indicate that construction costs for a new gas turbine peaking unit may exceed \$550/kW — approximately three times the acquisition cost of Spring Creek.

<sup>5</sup> Indeed, when Westar announced in May 2005 that it was initiating a search for the site of a future coal plant, reaction was generally supportive. Proponents from several areas of the Kansas enthusiastically sought to have a coal plant located in their vicinity.

4-12

now so many influential and uncontrollable variables — including public and political sentiments about the choices we face as a society on energy and climate concerns — we concluded that we must start finding a way to reflect them in our thinking.

First, we determined that we must look at the potential impact of these variables, including evolving public opinion, on our future investments in generation. When we objectively considered these influences, our analysis led us to conclude that these debates would inject significant uncertainty into the normally more stable planning process. We determined that the right path was not to try to predict the outcome of such turmoil, but rather to embrace the uncertainty as a reality and use it as context — rather than as a threat — to our planning. Accordingly, we approached our strategy with the aim of preserving flexibility and options as long as possible, maintaining diversity in our energy supply portfolio, and avoiding the over-commitment to what could turn out to be "fragile" or even "bet-the-company" energy supply strategies that might also harm our customers' interests.

In our planning process, we looked at the attributes of potential elements of an energy supply portfolio under various scenarios. We then classified each potential supply source:

CLASSIFICATION	DEFINITION
<b>Robust</b>	useful and valuable in almost any imaginable circumstance
<b>Flexible</b>	likely can be added, deleted, or adapted to fit many changing circumstances
<b>Fragile</b>	while potentially valuable in a narrow set of circumstances, might create huge liabilities in other circumstances

## The Planning Landscape

As an initial step in the planning process, we considered the reasons behind the advantages that our customers presently enjoy: reliable service and low prices. Those benefits stem largely from long-term decisions made with regard to our power portfolio, namely the decisions to build baseload coal plants, a nuclear plant, and to use natural gas sparingly. We also considered our use of wholesale sales as a means of balancing the economies of energy supply with changing demand, both over the short and long run. We then looked at the overall landscape to determine what might be the best way to maintain (and even extend) these advantages for our customers, and to consider the heightened concerns about environmental stewardship, which we now believe take on a level of importance

***We believe environmental stewardship has now taken on a level of importance akin to that of reliability and price.***

akin to that of reliability and price. Would the best approach be to do more of the same? Or would advantage come from doing something different?

The drivers in these analyses included such things as natural gas supplies and price volatility. We considered evolving environmental regulations; opportunities for us and the industry to increase production from existing plants; and the developmental state of generation technologies. In particular, we looked at generating technologies in the context of environmental concerns and the degree to which emerging technologies have been proved and commercially demonstrated. An economic overlay included factors such as the global demand and price trends for industrial materials, engineering services and skilled labor. We researched the potential for conservation and energy efficiency. We also considered assumptions about variability in future customer demand. Our conclusions follow.

4-14



## Generation

---

### Natural Gas Generation

---

Natural gas is a proven fuel source for peak generation — it is generally efficient, its capital costs are relatively low and it has lower carbon emissions than coal-fired baseload generation. While natural gas serves well for peak generation, it is a poor substitute for baseload generation for the industry as a whole. The significant negatives we observed included rapidly declining production curves and high and volatile prices. Moreover, if there are delays in the construction of baseload coal or nuclear plants, the demand for natural gas likely will be even greater than it is today, driving prices higher still.

But when we looked specifically at Westar, we saw another factor. Because of our prior management's decisions to build baseload plants in the 1970s and 1980s, only a small portion of Westar's electric generation — about 3%-6% — is fueled with natural gas. This compares with 19% on average for the nation. Accordingly, where other utilities might be putting their customers at undue risk to take on any more exposure to natural gas prices, Westar could generate additional electricity from natural gas and still use proportionately far less gas than many other utilities.<sup>6</sup> For example, FPL has stated that if it has to build natural gas fired plants in lieu of its proposed, but recently rejected, coal plants, FPL will be 70% dependent on gas-fired generation by 2016.

From these observations we drew four conclusions:

1. Our existing gas fleet, even though having been in service for many years, performs well and serves as a dependable base giving us great flexibility in choosing ways to expand our generation resources.
2. The use of our existing gas plants, coupled with new turbines, can be an effective complement to intermittent wind generation.
3. The combination of gas and wind provides a hedge to mitigate potential carbon taxes and other related costs.
4. Although not a substitute for long-term baseload plants, more reliance on natural gas, when combined with wind generation over the next few years, should allow us to span the present period of uncertainty with respect to developing technologies and environmental policy.

---

<sup>6</sup> While there may be narrow circumstances in which more reliance on natural gas is appropriate, *i.e.*, the unique circumstances Westar describes in this report, Westar believes that due to the decreasing availability of supplies and the cost and volatility of natural gas, it should not be considered widely as a regional or national substitute for needed baseload generation.

Our proposed plan suggests that we may increase our percentage of generation from natural gas from approximately 6.0% in 2007 to 10% or 11% in 2017. Although this likely will cause our costs to rise from their current levels, other new sources of generation also would cause prices to rise, and perhaps by much more. Moreover, we believe using a bit more natural gas is a responsible trade-off when one considers the huge and unknowable risks associated with alternative strategies to meet customer demand — particularly the risks of moving ahead on a conventional coal or nuclear plant or on a commercially unproven technology.

### **Existing Baseload Coal**

We concluded that our existing baseload coal assets must continue to be a core element of our supply strategy. Our coal fleet today provides about 79% of our electric generation. With solid predictive maintenance practices, coal generation will continue to be an essential resource for Westar and its customers. We believe maintaining and maximizing the use of these existing assets is a prudent course of action. Accordingly, we are upgrading the environmental controls at these existing plants, and, as provided in the permit application we recently submitted to the Kansas Department of Health and Environment (KDHE), we are seeking to make environmental modifications that also allow us to increase the production and efficiency of these assets. It is important to note that one factor enabling Westar to pursue wind generation as aggressively as we have is the existence of our highly reliable baseload coal and nuclear plants and our plans to use them well into the future.

### **New Baseload Coal**

Even though so much of our electricity already comes from coal, given cost and environmental concerns about additional coal plants, we concluded that deferring (for as long as we responsibly can) a commitment to a new baseload coal plant was a prudent course of action.

In arriving at this conclusion, we considered a number of factors. The first was cost uncertainty as to both fixed and variable costs. Although the cost of coal as a fuel source has been much less volatile than natural gas or purchased power prices, because coal plants emit more than twice the CO<sub>2</sub> of modern natural gas-fueled plants, a carbon tax or cap and trade program could make the variable cost of producing electricity from coal much less attractive.

There were also the capital costs to consider. The size and complexity of coal stations, coupled with the global demand for engineering services, industrial material and skilled labor have driven the cost of building coal plants to record high levels. As stated in our opening of this paper, we estimate that the cost of constructing a baseload coal plant has about doubled in just the last couple of years. Moreover, given that the optimum economic size of such a plant is as much as 800 MW or more, a single generating plant can cost as much as \$2 billion. This exceeds the \$1.9 billion combined

4-16

net book value of all of Westar's existing generating plants. We also considered the enormous concentration of risk associated with having \$2 billion of investment concentrated in a single generating unit.

If one considers the possibility of having to extract and sequester carbon from such a plant with technology that does not yet exist (at least on a commercially-proven basis for utility-scale applications), the risks are magnified. Moreover, it is possible that emerging carbon regulations may provide some relief relating to existing assets through a "grandfathering" protocol. It seems less likely that new plants would be afforded any such relief. In our planning we considered the possibility of having to make extensive and expensive modifications to a brand new \$2 billion plant to equip it with some as yet unknown form of carbon capture and storage capability.

Accordingly, we came to the conclusion that it is prudent to avoid a commitment to a new baseload coal plant for as long as we can without impairing reliability. This does not mean that we will never need to build another baseload coal plant or that a baseload plant will not clearly be in the best interests of our customers. Our decision is to defer, not to completely avoid, construction of such a plant. Moreover, circumstances will change, and they could potentially change quickly in the direction of an opposite conclusion. Nevertheless, we see deferral, for as long as is responsible, as the appropriate course of action at this time.

With regard to the future of baseload capacity in our plan, our approach is to remain flexible.<sup>7</sup> An illustration of what this means is that we will continue to study the feasibility of constructing a coal plant, or potentially acquiring rights in a plant that might be developed by another. We may ask the Commission in a future application to approve the cost recovery of such ongoing studies, even if they do not result in the actual construction of a new plant. Our studies to date suggest that there may be only a very few suitable sites in Kansas for a new coal plant. It is prudent for us to spend modest amounts to preserve this option for the future. In addition, we remain flexible with regard to potentially co-owning coal capacity developed by another utility or even acquiring capacity in an existing coal plant.

## Nuclear Power

If carbon dioxide and other greenhouse gases continue to be the concern they are today, and absent some unforeseen break-through technology, the United States must again embrace nuclear power. Nuclear power produces virtually no greenhouse gases. Today, approximately 19% of our nation's electricity comes from nuclear power.

---

<sup>7</sup> For example, in the event of significant customer response to our energy efficiency initiatives that actually reduces demand and leaves Westar with excess generating capacity, our current plan would permit us to address this circumstance by retiring our older, less efficient gas-fired generating facilities. If, instead of maintaining this flexibility we had moved ahead to construct a large baseload plant, then we and our customers would be confronting more constrained and much more expensive options for addressing such an eventuality.

4-17

Over the past 15 years, the improvements in the output of existing United States nuclear plants have provided the energy equivalent of building about 20 more plants. Wolf Creek is an example of this type of improvement. During its first five fuel cycles, it operated at an average capacity factor of 74%. For the last five fuel cycles, it has operated at an average capacity factor of 91%. Moreover, Wolf Creek's owners and Wolf Creek Nuclear Operating Corporation have undertaken efforts to increase the plant's peak capacity from 1,150 MW to 1,200 MW. Combined, the improvements in operations and capacity reflect the equivalent of about a 28% increase in annual MWh production. Westar has benefited to the extent of its 47% share of the plant. In addition, every nuclear plant that has sought re-licensing has had its petition granted. Westar and its co-owners have requested a 20-year life extension and expect a ruling from the Nuclear Regulatory Commission late this year. Unfortunately, the achievement of these remarkable gains in productive output means that further gains of such magnitude cannot be replicated.

Simply replacing existing nuclear plants as they are retired will require a huge commitment to nuclear power. If we are to meet new demand, or supplant existing demand that today is met by fossil fuels, a much greater commitment to nuclear power is required.

Nevertheless, there are tremendous obstacles to any renaissance in nuclear power. First, until October 2007, no license for a new nuclear power plant had been sought in the United States for over 30 years. Second, there exist substantial obstacles to long-term spent fuel storage. Finally, because no nuclear plant has been built in the past decades in the United States, no one knows what a plant will cost or how long it will take to bring one on-line.

We believe the appropriate place in our supply plan for nuclear energy is to maintain, and where possible, expand Wolf Creek's productive capability, and to remain vigilant and flexible with regard to potential interest in another station — some day. Wolf Creek is on a site originally designed for two units.<sup>8</sup> It is possible that another unit might some day be developed along side of it. It is also possible that the current owners of Wolf Creek might seek to own some or all of such a unit. Until some important questions are answered, however, we believe it is more prudent for us and our customers to be in a position of being a "fast follower" rather than an "early adopter" with regard to new nuclear plants.

As indicated in the case of new baseload coal, we believe a responsible approach to new nuclear power is to continue to study it and maintain a position of readiness. It is possible that in a future application Westar might request Commission authority to recover costs associated with the ongoing study related to expanding Wolf Creek's present capacity, or potentially acquiring an interest in additional nuclear capacity at the Wolf Creek site or elsewhere.

---

<sup>8</sup> Because Wolf Creek operates at substantially higher capacity factors than originally anticipated, it also requires more cooling water than originally anticipated. Accordingly, Wolf Creek's existing water rights are not likely to be adequate for two units of Wolf Creek's design, size, type, and performance.

4-18

## Clean Coal Technologies

Westar is keenly interested in the prospects for "clean coal" technologies, but it is important to our discussions that there be a shared understanding of what "clean coal" is — the term is not very definitive in the public debate, nor even in the industry. The term can embrace a range of technologies – Rankine-style<sup>9</sup> super-critical or ultra super-critical steam, oxy-fired coal, CO<sub>2</sub> capture and sequestration and coal gasification.

Type of System	Characteristics	Benefits/issues
<b>Rankine Super-critical or Ultra super-critical steam</b>	A variation on the conventional steam power cycle in which system pressure operates in excess of the critical point (3300 psi).	Rankine Supercritical/ Ultra supercritical cycle is more efficient than conventional subcritical Rankine cycle. A 3500 psi supercritical unit with double reheat is about 4% more efficient than the subcritical Rankine.
<b>Oxy-fired coal</b>	Oxygen-firing of pulverized fuel (PF) in boilers involves the combustion of pulverized coal in a mixture of oxygen and recirculated flue gas in order to reduce the net volume of flue gases – compared with the normal pulverized coal combustion in air.	Increases the CO <sub>2</sub> concentration in the off-gases from about 15% for PF up to a theoretical 95% and thus creates a gas stream thought to be more conducive to capturing and sequestering carbon.
<b>Flue gas carbon capture and sequestration</b>	Processes by which CO <sub>2</sub> is extracted from the flue gas as it exits the boiler or turbine (i.e., post-firing), with the CO <sub>2</sub> subsequently transmitted to a place or state in which it can be stored.	CO <sub>2</sub> is prevented from becoming a GHG; a challenge is extracting the CO <sub>2</sub> from a low-pressure gas stream in which it reflects only about 10%-15% of the volume.
<b>Coal gasification with carbon capture and sequestration</b>	Extracts and sequesters the carbon dioxide before combustion, leaving more pure "syngas" to be burned in traditional combined cycle gas turbine.	Seeks to capture carbon, before it is combusted, from a gas stream in which CO <sub>2</sub> may represent about 50% of the gas volume.

Unfortunately, with the exception of the Rankine system, the discussion of these technologies is well ahead of commercial reality. For example, for all of the talk about

<sup>9</sup> This involves a thermodynamic process by which heat is converted into work through the production of steam that is then used to drive a turbine. The steam is produced by applying an external heat source to a working fluid in a closed loop.

4-19

carbon capture and sequestration, there exists no utility-scale flue gas carbon capture from a coal-fired electric power plant anywhere in North America. As for utility-scale integrated coal gasification combined cycle plants, only two of them exist in the entire United States, both of which required years of effort to achieve reasonable capacity factors, burn primarily pet coke rather than coal, and do not sequester any carbon. As evidence of the challenges of building new coal plants, Tampa Electric Company (TECO) and PacifiCorp (a subsidiary of MidAmerican Energy Holdings), both recently announced the withdrawal or deferral of plans to construct integrated gasification combined-cycle technology (IGCC) plants. In making its announcement, TECO cited continued uncertainty related to CO<sub>2</sub> regulations, particularly capture and sequestration issues, and the potential for related project cost increases. Even with \$133.5 million in federal tax credits available to TECO for the project, TECO stated that with regulatory uncertainty and related potential cost increases, IGCC "may not be the most cost-effective technology to use at this time."<sup>10</sup>

As appealing as these technologies may be — and as much as they may be the focus of media attention and public and political fascination in the global warming debate — they are no panacea in their current form. We believe it prudent to insulate our customers from risky ventures, which may be better suited to larger companies with greater financial resources and with larger customer bases over which to recover the potentially ballooning costs. While some may characterize companies exercising such caution as "dragging their feet" in the future, we believe a "fast follower" approach is reasonable, prudent and best serves the long-range interests of our state. We are committed to remain active in our study of these developments, and nimble enough that we can quickly adopt technologies once they are commercially proven. It is possible that at some future date we would propose specific projects or research and development efforts for which we would seek appropriate cost recovery in rates, including participating in broad-scale research with other utilities or the Electric Power Research Institute. In the interim, we welcome confirmation of our plan to continue to study clean coal technology, and, for the time being, to avoid major commitments to it.

## **Wind Power**

Wind is the most readily available renewable generation resource in Kansas — and with a new generation of technology and a wave of popular support, it has come into its own as a viable option for utilities seeking to close the gap between growing electricity usage and the pressures on traditional fossil fuel power plants. With the right understanding of how wind can augment the supply of power — and appreciating its practical limitations — wind can play a valuable and essential role in our future energy resources in Kansas.

---

<sup>10</sup> On January 30, 2008, the U.S. Department of Energy announced that it was abandoning the FutureGen project. FutureGen was intended to be an experimental clean-coal project employing carbon capture and sequestration technology. The 275 MW plant was estimated to cost \$1.8 billion at the time of abandonment or over \$6,500/kW.

4-20

In its favor, wind power has been propelled most recently by significant advances in the size and efficiency of wind turbines — from less than a megawatt each only a few years ago to 3 MW or more today. Additionally, there is greater confidence that new turbine designs and materials can lead to better long-term reliability (although because of the technology's relative infancy, that optimism has not yet been established in long-term applications).

The availability of wind compared with other forms of renewable energy in Kansas is supported by Westar's experience with the request for proposals (RFP) we issued in February 2007. Our RFP was open to all forms of renewable energy. However, all the responses we received were for wind energy.

At the same time, we must recognize that wind cannot supplant baseload generation over the long term. Baseload power is controllable and — absent a forced outage — can be relied upon to consistently deliver electricity when needed. By contrast, wind production may founder in the still air of a hot summer day. Where wind works best is when it is matched with a controllable peak power source like natural gas combustion turbines that can be ramped up or down to respond to the vicissitudes of nature.

Although wind power still carries risks (some of which are often overlooked in the public debate), we are confident that wind power has earned a place in the mix of power resources in Kansas. We are committed to move forward with investments in this area and anticipate the commercial operation of three Kansas wind farms totaling nearly 300 MW of generation by year-end 2008.

4-21

## **The Appropriate Supply Plan**

A number of significant factors can influence the propriety of a supply plan — among them are social considerations, geopolitical influences, regulation, technology, and economic conditions. These factors and others, working together and against one another, create an endless number of possible outcomes and conditions that can create both modest and extreme, and sometimes unpredictable, results.

Given the nature of Westar, its investor base, and the essential nature of the public service we provide, we set about developing a strategy that we expect will substantially reduce the probability of extreme outcomes. In essence, instead of focusing all of our efforts in an area that might have a huge payoff (for us and/or our customers) in very limited circumstances — but could put the company and its service at risk if those narrow circumstances do not occur — we instead focused on maintaining more diversity in our planning. This approach decreases the likelihood of extreme outcomes — essentially by trading off the chance for very positive (but improbable) outcomes for the assurance that we were not putting our customers or investors at undue risk. We believe this approach to be fully consistent with our strategy of being a pure electric utility; a strategy that we announced five years ago and one that we have continued to execute.

In forming Westar's strategy, we looked comprehensively at potential supply and demand resources. This included a review of our existing resources: coal plants; Wolf Creek; transmission investments; gas steam plants; gas turbines; purchased power; and demand side management. We also looked at resources we do not presently have in our portfolio, including: wind; potential new baseload or nuclear plants; emerging clean coal technologies; advanced metering and meter data management systems; new energy efficiency programs; and other forms of renewable energy.

## **Evaluation of Potential Supply and Demand Resources**

We evaluated the fitness of each resource for our supply plan by considering whether the resource held a position of advantage, disadvantage, or uncertainty with regard to important factors. From that, we determined a recommended course of action with respect to the resource. As described earlier in this report, we sought to gauge in what ways each resource was robust, flexible or fragile — and assess how each option would allow us to achieve our "bridging" strategy in a way that had the least cost impact on our customers while delivering the highest value and reliability. (Table 1 set below) Following is our assessment of the advantages, disadvantages and uncertainties of each resource option:

4-22



**Table 1**

	ADVANTAGE	DISADVANTAGE	BOTH/NEITHER/ UNCERTAIN
<b>Wind Power</b>			
Political acceptance	•		
Path to cost recovery	•		
Portfolio diversity	•		
Synergy with transmission and gas generation	•		
Mitigates potential for more costly, less logical renewable mandates	•		
Cost		•	
Stability of technology/risk of rapid technological obsolescence		•	
Ability to estimate future costs			•
Purchased Power agreement (PPA) or ownership options			•
Operational learning curve			•
Future of production tax credits			•
<b>New Baseload (pulverized coal)</b>			
Proven, familiar technology	•		
Fits baseload profile	•		
Reliable	•		
Low operating cost (absent extreme carbon penalty)	•		
Local acceptance	•		
Emissions (carbon, sulfur, NOx, mercury)		•	
Water use		•	
Fuel delivery risk		•	
International public opposition		•	
Seen as "old" technology		•	
Rapidly rising costs		•	
Huge single shaft capital commitment		•	
<b>Clean Coal (IGCC, Oxy-Carbon capture)</b>			
Policy support (at least initially)	•		
No meaningful utility-scale experience		•	
Uncertain cost/impact on rates		•	
Uncertain development time		•	
Unproven carbon capture		•	
Unknown carbon penalty			•

4-23

Table 1 (continued)

	ADVANTAGE	DISADVANTAGE	BOTH/NEITHER/ UNCERTAIN
<b>Smart Grid</b>			
Scalable/modular	•		
Likely path to cost recovery	•		
Political acceptance	•		
Operational efficiency and excellence	•		
Customer education and acceptance		•	
Ability to firm up financial business case			•
Completing and changing technology/risk of obsolescence			•
Effectiveness			•
<b>Existing Gas Steam Plants</b>			
Very low net investment	•		
Pipeline access	•		
Lower carbon emissions	•		
Public acceptance	•		
Current under-utilized capacity	•		
Load following flexibility	•		
Exposure to gas prices		•	
High operating cost		•	
Age		•	
Thermal efficiency		•	
Ability to burn oil			•
<b>Gas Turbines (Existing &amp; Future)</b>			
Average age	•		
Pipeline access	•		
Geographical diversity	•		
Operational flexibility	•		
Modularity/shaft risk	•		
Lower carbon and water usage	•		
High availability to complement wind	•		
High operating costs		•	
High exposure to gas price volatility		•	
Thermal efficiency			•

4-24

Table 1 (continued)

	ADVANTAGE	DISADVANTAGE	BOTH/NEITHER/ UNCERTAIN
<b>Energy Efficiency</b>			
Political acceptance	•		
Flexible/scalable/ability to pilot test	•		
Internal (self help; e.g., heat rate projects) as well as external (customer) opportunities	•		
Ability to predict outcomes		•	
Path to cost recovery (e.g., customer investment and lost sales volumes)			•
Cost			•
Effectiveness as a generation substitute			•
Customer expectations			•
<b>Existing Coal Fleet</b>			
Low operating cost	•		
Reliable	•		
Retrofitting to latest environmental requirements	•		
Local political acceptance and support	•		
No present call to shorten their lives or curtail production	•		
Well-established proven technology	•		
Heavy carbon emitters		•	
Heavy water users		•	
Fuel delivery risk/cost of transportation		•	
JEC site suitable for future expansion			•
Age			•
PRB coal			•
<b>New Nuclear</b>			
Zero carbon emissions	•		
Growing public acceptance	•		
Low marginal cost	•		
Heavy water user		•	
Extreme capital commitment		•	
Lack of modularity/scalability		•	
Uncertain costs		•	
No long-term waste storage solution		•	
Uncertain construction schedule		•	
Operational flexibility		•	
Site suitability for another unit at Wolf Creek			•

4-25

**Table 1 (continued)**

	ADVANTAGE	DISADVANTAGE	BOTH/NEITHER/ UNCERTAIN
<b>Transmission Expansion</b>			
Consistency with policy mandates/directives	•		
Known technology	•		
Path to cost recovery	•		
Core competency	•		
Synergy with wind	•		
Degree of outside influence and control		•	
Lack of scalability/high cost		•	
Competition			•
<b>Purchased Power</b>			
Smaller on-balance sheet capital commitment	•		
Ability to plan with smaller or shorter term increments	•		
Discourages Kansas energy independence		•	
Exposure to sharp price volatility at the end of contracts		•	
Inability to earn a return on investment		•	
Impact on creditworthiness		•	
Less subject to oversight of KCC			•
Creditworthiness of counter parties			•
Reliability of counter parties			•
Flexibility			•
<b>Other Renewables (Solar/Landfill Gas/Hydrogen/Biomass)</b>			
Ability to pilot small scale	•		
Lack of meaningful scale		•	
No industry standards		•	
Immature technology		•	
Cost		•	
Geographic limitations of solar		•	
Future mandates			•

We concluded from the analysis of each resource type that:

- Wind generation, conservation and efficiency, new transmission investments, continued reliance on our existing baseload plants, and enhanced use of gas turbines should be core elements of our supply strategy — elements that we intend to pursue wholeheartedly.
- Implementation of smart grid technology, continued use of our older gas steam turbines, and purchased power have advantages, but that they also

4-26

have prevalent weaknesses or limitations. However, because they are flexible, we include them in our strategy as complements to the core items.

- With respect to new baseload coal plants, new nuclear plants, emerging clean-coal technologies or forms of renewable energy other than wind, we believe the appropriate course of action is to study them further, but not to pursue them today as part of our supply strategy.

The summary of our strategic assessment of options for meeting customer demand appears in Table 2.

**Table 2**

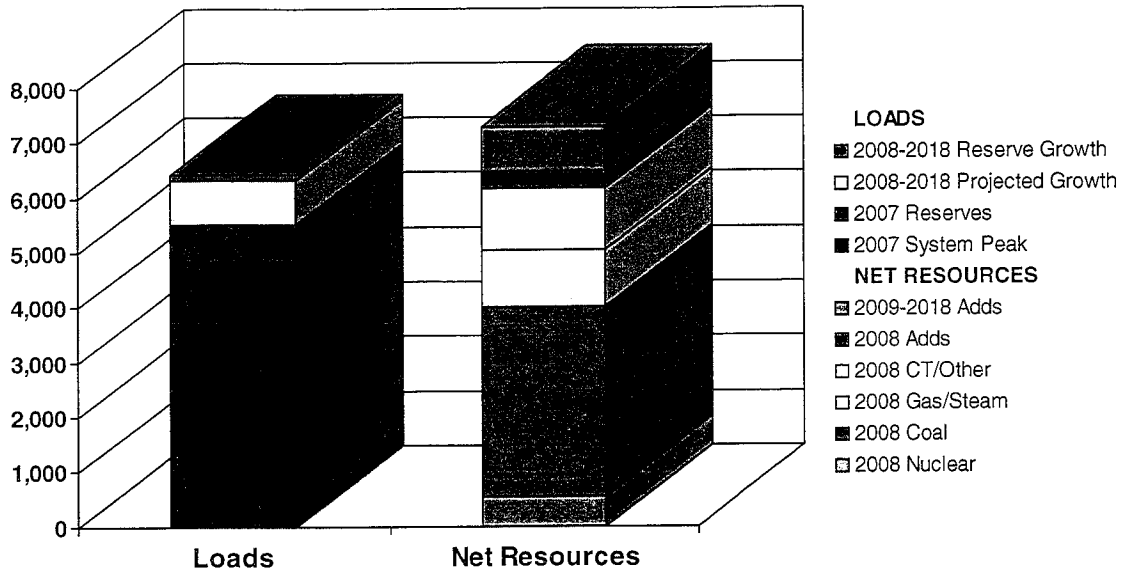
	<b>Robust</b>	<b>Flexible</b>	<b>Fragile</b>
<b>Wind</b>	✓		
<b>Consumer energy efficiency</b>	✓		
<b>Smart grid</b>		✓	
<b>Transmission expansion</b>	✓		
<b>Existing coal fleet</b>	✓		
<b>Wolf Creek</b>	✓		
<b>Gas/steam plants</b>		✓	
<b>Gas turbine (peaking/mid-duty)</b>	✓		
<b>Purchased power</b>		✓	
<b>New conventional coal baseload</b>			✓
<b>New nuclear</b>			✓
<b>Other renewables</b>			✓

### Electric Loads & Resources Modeling

The long life of many of our generating resources requires that we consider a planning horizon of decades. However, because circumstances change dramatically over time, and because the nearer term has the greatest weight in terms of present value to our customers and us, we have focused our attention on the first 10-year period.

4-27

**Figure 3**  
**Loads (2007) and Resources**  
**(in MWs)**



The left side of Figure 3 above shows our 2007-system peak and reserves, as well as reflecting load and reserve growth through 2018. It reflects an annual growth rate in electrical demand of approximately 1.5%.<sup>11</sup> Our 2007 peak demand was 4,836 MW.<sup>12</sup> For planning purposes, we project the peak to be 5,648 MW in 2018. We are required by the SPP to maintain a 12% capacity margin above peak demand. The right side of Figure 3 shows net resources that we expect to be available by 2018.

Table 3 shows the baseline assumptions we used to estimate the cost of different types of capacity, fuel and other variable costs/benefits, availability factor and capacity factor.

Another factor is customer demand. While our customer base has been growing steadily, and demand for energy along with it, we know that customer demand might also change. In fact, some of our efficiency programs are specifically designed to change customer demand. Accordingly, scalability of the resource is an important factor. If we can flex the resource to meet changing customer demand, it presents an advantage. An inflexible resource would score poorly in that regard. The programs designed to reduce demand are described in the next section of this report.

<sup>11</sup> Westar and Commission Staff have finalized a collaborative forecast demand model. Westar has incorporated results produced by that model into its supply planning and decision-making.

<sup>12</sup> By contract, we also currently provide significant generating capacity to other distribution utilities, primarily in Kansas.

4-28

**Table 3**  
**Baseline Assumptions (500 MW)**

	Coal	Wind	Natural Gas Combustion Turbines	Natural Gas Combined Cycle
Capital \$/kW	\$2,400-\$2,900	\$1,650-\$2,200	\$500	\$800
Fuel Cost (Tax Credit) \$/MWh	\$14.50	(\$19.00)	\$83.81	\$55.25
Non-Fuel Variable O&M \$/MWh	\$2.20	N/A	\$2.00	\$2.50
Non-Fuel Fixed O&M \$/kW-yr	\$17	\$30	\$6	\$13
Capital Cost	\$1,325M	\$963M	\$250M	\$400M
Availability Factor	85% - 95%	N/A	95% - 100%	95% - 100%
Planned Capacity Factor	85% - 95%	36% - 45%	5% - 15%	25% - 60%

### Present Supply Plan

Table 4 below shows our present supply plan, including the MW we intend to install and the years in which the plan shows the additional generation is needed. Our plan includes building or acquiring 300 MW of wind generation to be commercially operational in 2008. For reasons that we described in detail in our wind generation predetermination filing, the Southwest Power Pool, Inc. (SPP) credits capacity to wind at only a fraction of the installed nameplate rating. Although Westar is developing almost 300 MW of wind generation through ownership or power purchase agreements, it is assigned a 10% capacity recognition because of its intermittent characteristics and the SPP policy.

**Table 4**

	Incremental MW			Total without Wind	Wind	Total with Wind
	CT/CC/Aero	Coal	Nuclear			
2007	300	175		475		475
2008	310			310	30	340
2009	300			300		300
2010						
2011			16	16		16
2012						
2013	150			150		150
2014						
2015	350			350		350
2016			4	4		4
<b>Total</b>	<b>1,410</b>	<b>175</b>	<b>20</b>	<b>1,605</b>	<b>30</b>	<b>1,635</b>

4-29

## Energy Efficiency

---

Westar is a microcosm of what is happening nationally in the electric energy sector. Consider first the national appetite for electricity. The Energy Information Administration (EIA) forecasts electricity consumption to increase at an average annual rate of 1.3% through 2030. It is reasonable to assume the electricity usage by Westar customers will largely parallel this growth trend.

Energy efficiency is important to Westar's plan. Many energy efficiency technologies can be deployed faster and at lower cost than supply-side options. Accordingly, we view energy efficiency as a high priority energy resource.<sup>13</sup> Another benefit of energy efficiency is that it reduces GHG emissions, first through direct load reduction and second by deferring the need for new generation. If we are entering a carbon-constrained future, energy efficiency's value will rise. The virtues of energy efficiency elevate it to a preferred option for electric utilities. Westar is no exception. In our educational and communications plans, we are promoting energy efficiency as "the first thing to do." It cannot answer the entire electric resource need, either nationally or for our customers, but it is the best first step. Energy efficiency holds great promise.

### Paradox #1

*Although customers endorse energy efficiency and express a desire for it, there is little evidence that they have curbed their ever-increasing consumption of energy. The challenge is not one of technology, but rather how to match technology with a broader public acceptance of the need for a change in behavior.*

What is the rub? Although customers endorse energy efficiency and express a desire for it, there is little evidence that they have curbed their ever-increasing consumption of energy. The challenge is not so much one of technology, but rather how to match technology with a broader public acceptance of the need for a change in behavior. For this reason, and probably others, opinions vary widely on energy efficiency's potential effect on demand and savings associated with it. Much depends on accurately predicting the vagaries of human behavior and, harder yet, changing consumer behavior.

---

<sup>13</sup> Some argue that "negawatts" of energy efficiency are of equal value to megawatts. Even if this were true and we attained a degree of energy efficiency such that every additional megawatt of load was offset by a negawatt of energy efficiency, we would still eventually have to add generation because existing facilities will wear out. Nevertheless, energy efficiency is a high priority resource. For example, a well-designed demand response program could be treated as a resource in Westar's dispatch order; the demand response program would be triggered when it became the most economic increment in the generation dispatch order to meet customer demand.

4-30



Energy efficiency is not achieved merely by the actions of electric utilities. To succeed, policymakers will have to align incentives for utilities and their customers — and begin to take a visible role in convincing the public that energy efficiency is now a public priority. This means that serious consideration must be given to regulatory mechanisms to make energy efficiency a sustainable business model for utilities. That includes determining the potential of demand response options like real-time pricing. Electric rates are low compared with income,<sup>14</sup> and in Westar's case this is particularly so. Moreover, longstanding rate setting practices disguise price signals and sometimes maintain rates at artificially low levels. As a result, consumers have few prompts to change their behaviors — or perceptions. Innovative ratemaking approaches for implementing energy efficiency programs such as real-time or time of use pricing, decoupling, targeted incentives and incorporating demand side management (DSM) in rate base all merit Commission evaluation. These approaches are not exclusive of one another — nor is this list exhaustive.

On October 10, 2007, the Commission issued an order in its generic docket on energy efficiency in which it recognized that Kansas' two largest electric utilities already have energy efficiency programs under way or planned. We are pleased that the Commission wishes to promote energy efficiency through a collaborative process among utilities, consumers and government agencies. Clearly, the Commission has ample authority over investor-owned utilities to approve energy efficiency programs and adopt innovative ratemaking mechanisms, including increases in rates of return or other incentives, to advance the interests of both customers and utilities.<sup>15</sup> Given the Commission's express findings and clear statements of intention, it appears to us that no statutory hindrances exist. Westar will be participating actively and constructively in the two parallel investigations the Commission has initiated to evaluate costs and benefits of energy efficiency programs and to examine how the Commission will address ratemaking treatment of energy efficiency programs.

**Paradox #2**

***With Westar's relatively low electricity prices and without technology to receive price signals, consumers have few prompts and little economic incentive to be more efficient in their use of electricity.***

---

<sup>14</sup> See Figure 1, page 6.

<sup>15</sup> In the same order, the Commission noted its limited jurisdiction over retail rates of municipal and small cooperative utilities. Westar has engaged in wholesale business with many Kansas municipal utilities and rural electric cooperatives, and plans, whenever practical, to invite those same wholesale customers to participate in our energy efficiency programs. For example, though it will not be practical to include them in a retail real-time pricing program, they could participate in a Westar direct load control (DLC) thermostat program or in several Westar demand response initiatives, provided they reimburse Westar's costs and agree to the terms the Commission sets forth for the programs. If their costs and contribution to Westar's margins match those borne by our retail customers, we will avoid any cross-subsidization.

4-31

On July 1, 2007, Westar announced the creation of an energy efficiency department. It was not created from thin air or a radical departure from our usual business. Rather it was a natural development borne of our customers' expectations, technological advances, long-term investment planning, and public policy and environmental concerns.

The new energy efficiency department will have responsibility for:

- consumer education;
- implementation of direct load control (DLC) and DSM programs; and
- developing alliances with heating, ventilating and air conditioning dealers, builders, architects, and others to encourage use of high efficiency equipment and building practices.

Customers have expressed a desire, in various ways, but particularly in our customer satisfaction surveys, for Westar to help them get more value out of their energy dollars.<sup>16</sup> Technology now enables energy efficient practices that are convenient to customers, practices that do not connote a pejorative significance of "sacrifice" or "self-denial." Westar faces requirements for unprecedented investment in new sources of power to meet growing electricity demands and in our "wires" infrastructure to continue to provide reliable service. Given these investment requirements, it is imperative to pursue energy efficiency so customers can make choices that enable them to extract more value from their energy purchases. At national, state and local levels of government, the policy environment is ripe for energy efficiency initiatives, even those that may cause higher costs but are deemed worthwhile to protect the environment. The wisest energy choices may also lead to higher reliance on electricity than on other energy sources.

**Paradox #3**

***Energy efficiency programs sometimes are considered expenses, when in fact they really function as investment in that they help avoid or delay much more costly investments in new generation.***

Westar has identified several energy efficiency programs and described them previously to the KCC, first in the filing requesting predetermination of ratemaking principles of Emporia Energy Center and then again in the similar filing for our wind power initiatives. To review, those programs are:

---

<sup>16</sup> This phenomenon is counter-intuitive. Customers seem to understand that if we help them consume less electricity, our profits fall and their rates could increase. Nonetheless, they desire or even expect that we, as the energy expert, can help them become more energy efficient. Their expectation bodes well for customer acceptance of a new regulatory policy that allows utilities to earn on energy efficiency programs.

4-32

1. Residential and commercial Direct Load Control (DLC) for central air conditioning, electric water heaters, swimming pool pumps, and other interruptible devices;
2. High efficiency heat pumps with mandatory DLC;
3. High efficiency residential and commercial water heating heat pumps with mandatory DLC;
4. Energy efficiency assistance to low-income households;
5. Targeted energy audits to identify energy efficiency opportunities for commercial and large residential customers.

### **DLC and DSM Programs**

The technology for DLC and DSM is commercially available, and firms that provide deployment of these services are already actively soliciting business. For example, DLC thermostats<sup>17</sup> can be offered to our residential customers on a "turn-key" contract basis by several firms. Likewise, several firms contract with utilities to provide demand response services for commercial and industrial customers. This type of service is also known as peak shaving or demand response. In some instances, it also involves customer-owned distributed generation that the utility may dispatch remotely.

In April 2007, Westar issued a request for proposals to vendors of DLC and DSM. Three firms responded in May 2007. The responses included proposals to provide demand response services for commercial and industrial customers and

install DLC thermostats in residential customers' homes. The load control thermostats typically have an internal communications device that the utility can signal to adjust the thermostat during periods of peak demand in order to shave peak. The thermostats are also programmable, allowing customers to use energy more efficiently year round.

Westar has already begun testing the thermostats in a small employee pilot program before we roll it out to our customer base. Once satisfied that the program will

---

#### **Westar's DLC & DSM Initiatives**

- Employee test of residential DLC thermostats
  - Voluntary program to measure efficiency gains
  - Extend DLC peak shaving to commercial and industrial customers
- 

<sup>17</sup> We plan to market these thermostats by some other description, perhaps as "smart" thermostats. Focus group research has shown that "direct load control" may not be an appealing description to customers. We use the expression "direct load control" in this filing because it is common usage in the utility industry and to ensure clarity.

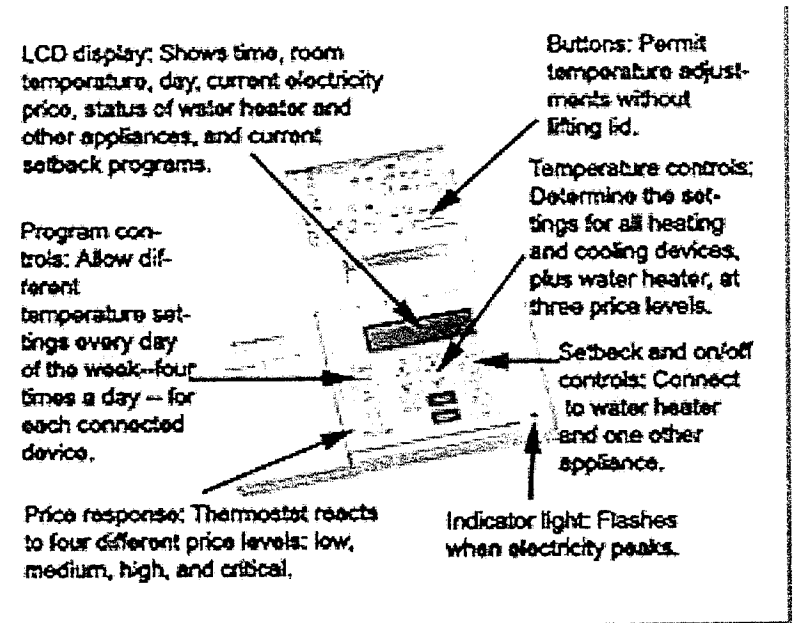
work, gain consumer acceptance and not harm customer satisfaction, Westar plans to deploy the program in Spring 2008. Assuming successful completion of contract negotiations, Westar plans to deploy a demand response program in 2008. Prior to deployment, Westar will seek the Commission's approval of these DLC and DSM programs and an accounting authority order to defer their costs for recovery in accordance with the KCC's rulings in its generic dockets on energy efficiency.

For the DLC thermostat program, we expect to retain a firm to install 5,000 thermostats in 2008. Willing residential customers would receive the thermostat and installation for free, and would benefit for participating through the savings they derive by using less electricity during peak periods.

In order to monitor our peak shaving results, we will randomly install recording meters on several homes that have the DLC thermostat. This will allow us to follow a customer's load profile to verify load reduction after thermostats are activated during peak periods. We preliminarily estimate that on average each thermostat installation will yield slightly more than 1 kW of demand response.

In addition to the residential DLC thermostat program in 2008, we plan to retain a firm to help achieve peak shaving for our small and medium sized commercial and industrial customers. The vendors we are evaluating have near real-time monitoring that can verify actual load reduction during curtailment at peak conditions. This demand response initiative will be in addition to our existing interruptible program discussed below. The actual annual costs and amount of peak shaving from this initiative are still being determined.

**Programmable thermostat with direct load control capability**



## Energy Efficient HVAC Equipment

The installation of HVAC equipment for consumers involves a large relative investment, complex decision-making and involvement by contractors or homebuilders. As a result, efficiency programs for HVAC demand much more customer education, building of alliances and a longer planning horizon. For example, in the retrofit arena, when such equipment fails (as it has an uncanny habit of doing on the worst, hot summer day!) the homeowner will want it replaced quickly and is likely to give little

4-34

thought to what would be the most efficient and cost effective equipment for the next 20 years. Rarely does a residential customer replace fully functioning HVAC equipment, even if it is old and inefficient. We need to find ways to reach these consumers well in advance of the replacement decisions as well as at the moment of decision.

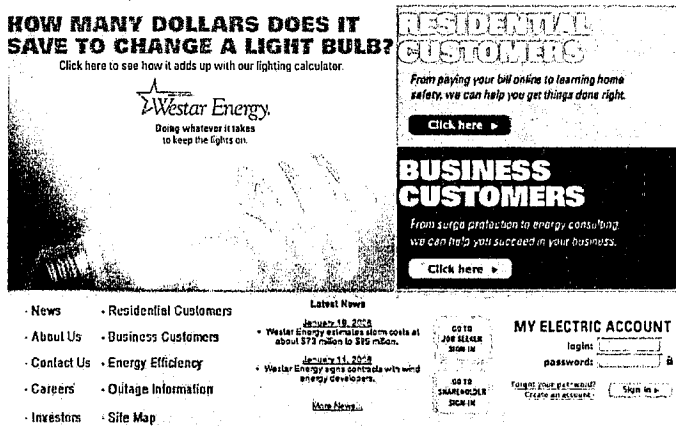
It requires that we develop alliances with HVAC dealers, builders and architects. Effective programs may need to include financing packages, extended warranties, performance guarantees, government grants, tax credits and other similar programs. To make more rapid progress, it may also be necessary to encourage legislation or ordinances that require more energy efficient building codes and standards for equipment and appliances.

## Customer Education

To begin the process of education, we have added extensive educational information to Westar's website and have distributed educational materials. As well, our experience has shown that our employees and retirees can be effective educators of our customers. Most of them live in the communities we serve at retail, and it is natural for many of our customers to consult them on energy matters. We launched an

employee and retiree program to offer rebates for them to install high efficiency HVAC equipment. We are also hiring new employees to develop alliances with HVAC dealers, builders, architects, realtors and others who can influence consumer choices of equipment.

Another challenge is customers' limited awareness of resources available to them. Our initiatives include:



- School Connections, which offers schools age-appropriate energy efficiency curricula.
- Westar's website has "calculators" for customers so that they can estimate savings from potential energy efficiency investments, information for children and an energy efficiency library for adults.
- Westar is also collaborating with other utilities, environmental groups and the Kansas Energy Office to develop consistent, accurate customer education materials.

4-35

- Media plans are being developed to utilize TV, newspapers and other media with interesting, practical stories about energy efficiency methods and "success stories."
- An instructional DVD for residential customers to advise them how to make their homes more energy efficient. A similar video for commercial customers is in production.
- "Weatherization kits," to be given to low-income customers, will have such basic products as compact fluorescent light bulbs (CFLs), weather stripping, caulking, insulation-wrap for water heaters, and other energy-saving materials.
- Working with landlords on ways to make rental properties more energy efficient.

### Improvements to Westar's System

Energy efficiency starts at home, and in our case we have made a commitment to apply energy saving practices throughout our company (given the size of our business, these savings may even rival what we can expect from some of our customer-focused initiatives.)<sup>18</sup> For example, we recently filed an application with the Kansas Department of Health and Environment seeking permission to improve Jeffrey Energy Center's thermal efficiency and modestly increase its output.

As discussed in subsequent sections of this report, we are also seeking ways to improve the efficiency of our transmission and distribution systems. An example is the use of infrared imaging to inspect distribution equipment. These inspections not only can detect likely failures before they occur (clearly a benefit to customer satisfaction), but we are also able to identify and change out equipment that is causing line losses. Another effort under way by our transmission department is to rewire many sections of our oldest transmission lines. Besides improving reliability, these new conductors reduce line losses as well, thus improving efficiency.

In order to lead by example, Westar also recently adopted a policy to adhere to the LEED<sup>19</sup> standards for energy efficiency when it builds a new facility or makes major renovations to existing space. For instance, we are renovating and expanding Westar's service center in Lawrence to standards that will qualify for LEED certification. We intend to invite customers, builders, architects, HVAC dealers, media and others to the site to witness how LEED standards are practically applied.

<sup>18</sup> Typically when we think of inefficiency we have retail customers in mind, but the greatest potential for efficiency gains is in power plants.

<sup>19</sup> LEED stands for Leadership in Energy and Environmental Design, also referred to as "Green Building Rating," and designates the state-of-the art in energy efficient, environmentally sound construction. Refer to [www.usgbc.org/LEED](http://www.usgbc.org/LEED), the official website address for LEED.

4-36

## Compact Fluorescent Lights

Westar has distributed more than 20,000 compact fluorescent lights (CFLs) over the last year. Comparatively low-watt CFLs produce as much light (lumens) as higher-watt incandescent bulbs (a 15-watt CFL produces approximately 900 lumens, the same as a 60-watt incandescent bulb). CFLs use about 75% less electricity than incandescent bulbs. By simply replacing their incandescent bulbs with CFLs, customers can make substantial progress in becoming more energy efficient consumers. In addition, because CFLs expend far less energy on "wasted" heat, CFLs can also reduce air conditioning demand.

## Real-Time Pricing

Price signals are the most effective means of stimulating energy efficient and DSM behaviors. Although price elasticity may be muted because of Westar's relatively low rates and because our customers' electricity bills have dropped as a percentage of their income, we are nonetheless committed to testing real-time pricing. If real time pricing demonstrates significant price elasticity among our customers, then we can offer (or the Commission may require) widespread real-time pricing tariffs. On the other hand, if most customers participating in the pilot do so because their circumstances make it nearly certain they will benefit by doing nothing except opting into the program,<sup>20</sup> then the pilot will fail. Nonetheless, even if we do not gain energy efficiency by price signals, we may still attract enough customers to at least be able to accomplish an appreciable demand response, and thereby defer the need to build additional peaking generation.

### Real-time Pricing Initiative

- Westar collaborating with KCC Staff on real-time pricing pilot program
- Pilot to test consumer price elasticity

## Summer/Winter Pricing Differences and Interruptible Program

Westar, like most utilities in the United States is a "summer peaking" utility, meaning that demand is highest during hot summer weather. Because we must size our resources to meet the peak demand, it means that those same resources may go unused during off-peak periods. By carefully designing rates we can encourage customers to reduce their peak demand, which keeps investment down, but we also can encourage off-peak use, which allows more efficient use of our facilities and keeps our unit costs lower. For example, the winter residential rate encourages wise use of

<sup>20</sup> Economists sometimes refer to such consumers as "free-riders." These are customers who already have an off-peak demand profile and would shift little or no demand because of the pricing plan.

4-37

energy, particularly for customers who are willing to supplement natural gas space heating with high-efficiency add-on electric heat pumps. The summer residential rate is higher than the winter rate thereby encouraging energy conservation during those months when demand for electricity is highest. The non-residential rate schedules have seasonally differentiated prices but also use demand ratchets to encourage off-peak usage and provide an incentive to avoid establishing high peak demands in the summer period. Pricing of the overall cost of energy designed to encourage the wise use of energy can be found throughout Westar's tariffs.

Westar also has an active interruptible program with 73 customers participating. While it is an inexact science to attribute momentary demand reductions to specific calls for interruption, our best estimate is that our program has resulted in reductions of approximately 200 MW. We called on our interruptible customers four days this past summer during high demand periods, and also were able to call on cogeneration units of two of our industrial customers. On those days, we estimate the peak demand reductions from interruption ranged from 201 MW to 206 MW.

### Advanced Metering Infrastructure (AMI)

Advanced meter reading (AMR) has come a long way since Westar ventured into the technology fifteen years ago. Our initial AMR installations allowed a motor vehicle driving slowly through a neighborhood to receive a signal from a meter giving a reading. It was passive. The new generation of technology — AMI — is two-way communication technology that engages the consumer for the first time, offering many more options for customizing billing, controlling usage by triggering DLC systems, and eventually providing real-time information on pricing. A companion technology — meter data management system (MDM) — stores time-stamped consumption data and additional data gathered by automated meters.

AMI offers inherent benefits to its stakeholders:

<b>Regulators</b>	<ul style="list-style-type: none"> <li>• Ability to precisely monitor and evaluate effects of energy efficiency initiatives (real-time pricing or demand response programs)</li> </ul>
<b>Customers</b>	<ul style="list-style-type: none"> <li>• Choice of date to be billed</li> <li>• Option for twice-a-month billing</li> <li>• Pre-payment for electricity (and alerts for approaching limit)</li> <li>• Remote adjustment of thermostats over the Internet</li> <li>• Review usage patterns</li> </ul>
<b>Utility managers</b>	<ul style="list-style-type: none"> <li>• Remote meter reading (with no meter readers in the field)</li> <li>• Remote service connection and disconnection</li> <li>• Faster restoration of service from outages and better intelligence about operating conditions</li> </ul>

4-38



Although they have many additional business applications and benefits, AMI and MDM are necessary antecedents for broad deployment of real-time pricing strategies and extensive DSM programs. Eventually AMI/MDM becomes the foundation for a "smart grid," which has computer-programmed "intelligence" to take automatic action on a transmission and distribution system, and can even go "behind the meter" to help customers use electricity more wisely.

Our approach on all these programs and technologies is to provide sufficient incentives — whether they are economical, practical or simply intriguing — to stimulate a change in behavior that is essential to a real reduction in the growth of electricity usage.

4-39

## Transmission

---

The electric industry generally is entering a period requiring significant increases in transmission development. Over the period 2007-2010, our projections indicate a total transmission investment of \$613 million, or about \$153 million per year. This compares to the total \$93.5 million – or an annual average of \$18.7 million – Westar invested in transmission plant over the five-year period 2002-2006.

In Westar's case, the increase is being driven by three main factors:

1. **The need for new high capacity transmission lines.** There has not been a new high capacity transmission line built in the Westar service territory since the mid-1980s when lines were constructed to accommodate generation additions at Wolf Creek and Jeffrey Energy Center. The construction of these and other 345 kV lines at that time provided a robust 345 kV network with ample capacity to handle our customers' needs for decades. However, as a result of FERC's Order No. 888 requiring shared use of the transmission system, the creation of competitive wholesale power markets and the corresponding increase in demand on the transmission system, the available transfer capability of the 345 kV network is all but gone. We have now reached a point where new high capacity lines are needed to relieve growing incidences of congestion.
2. **FERC's creation of Regional Transmission Organizations (RTOs),** which in this region resulted in the Southwest Power Pool Regional Transmission Organization (SPP). In 2006, the SPP became a certificated public utility in Kansas. (Docket No. 06-SPPE-202-COC). The SPP now has functional control of Westar's and other regional utilities' transmission systems and oversees regional planning and requests for all new transmission service. The SPP can direct Westar to build needed transmission projects to provide transmission service not only for Westar's native load customers but also for any transmission customer in the SPP region. See, SPP Electric Transmission Tariff, Attachment O, Section 4.0(a), (b).
3. **The aging of our existing transmission infrastructure.** A substantial amount of our transmission system is 60 to 80 years old. Both physical obsolescence and the inability of these lines to handle higher load require us to rebuild local infrastructure to meet customer demand. Illustrations of this are in the region of Junction City and Manhattan, as a result of expansions to Fort Riley.

4-40

## High Capacity Transmission Line Projects

Currently, Westar has two high capacity transmission projects under development, with others being analyzed. The Commission recently granted siting authority for a new 345 kV transmission line from the Wichita area to Hutchinson and on to Salina — the Wichita-Reno-Summit project. The project is being constructed in two phases:

- **Phase I** A 345-kV line approximately 44 miles in length will be constructed from the existing Wichita 345 kV Substation near the Gordon Evans Energy Center to a new 345 kV substation just east of Hutchinson in Reno County, Kansas (the "Reno County Substation"). Construction of the Reno County Substation is included in Phase 1.
- **Phase II** A 345-kV line approximately 54 miles in length will be constructed from the new Reno County Substation to the existing Summit Substation just southeast of Salina.

We estimate this line will cost approximately \$150 million to construct. We selected a route largely along existing rights-of-way. This will expedite construction, save costs, and also afford us an economic opportunity to rebuild aging 115 and 138 kV lines still needed to serve the local areas. We expect Phase 1 to be completed by the end of 2008 and Phase 2 to be completed by the end of 2009.

The second high capacity transmission project is a 345 kV line to link our Rose Hill Substation southeast of Wichita with the Sooner Substation in Oklahoma Gas and Electric Company's territory just south of Ponca City, Oklahoma. Westar will construct the Kansas portion of the line of about 50 miles. Based on preliminary pre-design estimates, Westar estimates its portion will cost \$60 million to \$70 million. Actual construction costs will be affected by numerous factors, including the final route, engineering design, changes in the prices of transformers, conductor and structures, labor costs and the ultimate cost to acquire necessary rights-of-way. A siting application is now pending before the Commission.

Construction of the line will allow Westar more reliable (i.e., "firm") import capability from its recently acquired Spring Creek Energy Center to meet customer demand. SPP has authorized us to construct this line. Under SPP protocols, the line will receive base plan funding treatment. Base plan funding allows one-third of the cost of the line to be borne by users of the broader SPP regional transmission system with the remaining two-thirds of the cost to be allocated to the zones that benefit.

Both projects will provide substantial benefits to Westar's customers, Kansas and the SPP region. The resultant elimination of two key congestion points will allow the sale of additional transmission capacity thereby allowing additional wholesale transactions and more efficient use of existing and new generating sources.

4-41

Additionally, a high voltage line will need to be built to:

- substantially increase the bulk power transfer capability between Western and Eastern Kansas;
- reduce transmission constraints that result in higher imposed generation expenses (i.e., inefficient generator dispatch);
- improve local area reliability; and
- allow for the interconnection of new wind production expected in the region.

Westar has expressed its interest in participating in the development of this major project.

### **SPP Required Projects**

In determining how long-term firm transmission service requests can be fulfilled, the SPP identifies additions and upgrades to existing infrastructure that may be required. Westar's five-year forecast includes numerous projects needed to meet long-term firm requests for transmission service. Most of these projects consist of rebuilding lower voltage lines and/or making improvements to existing substations.

### **Aging Infrastructure, New Load and Reliability Projects**

The final group of transmission projects relates to rebuilding lower voltage lines and making improvements to substations to replace aging infrastructure, meet new load requirements and improve reliability. An example of a substation reliability project is the addition of breakers at a substation to minimize the number of customers affected by a single outage. Westar is targeting the addition of breakers at substations where a substation outage would affect 10,000 or more customers.

4-42

## Environmental Issues and Projects

### Current Requirements

The principal air emission regulations that affect Westar's power plants are the National Ambient Air Quality Standards (NAAQS), the Acid Rain Program, and the Clean Air Visibility Rule (CAVR) requirements.

#### **NAAQS**

The Clean Air Act (CAA) empowers the Environmental Protection Agency (EPA) to establish NAAQS for controlled emissions. EPA, using information supplied by the states, classifies areas of the country as "attainment" areas – locations in which air quality is in compliance with NAAQS – and "non-attainment" areas – where air quality fails to meet the standard for one or more pollutants. A finding that an area is in non-attainment requires development of a plan to bring the area into compliance with the NAAQS standards.

The CAA also delegates to the states the responsibility for developing and implementing compliance plans. In Kansas, the administering agency is the Kansas Department of Health and Environment (KDHE). Under the CAA, plans for construction of new plants and major modifications to existing plants may trigger New Source Review (NSR) requirements; essentially these are rules that require modified plants to meet new plant specifications. In attainment areas, the NSR pre-construction review is made pursuant to the Prevention of Significant Deterioration (PSD) provisions of the CAA. If pre-construction review of a proposed project indicates that the project would increase emissions of one or more regulated pollutants in an amount above specified major source thresholds, the source would be required to install control equipment which uses the best available control technology (BACT).

In a non-attainment area, a state implementation plan must be developed that requires the installation of reasonably available control technology (RACT) at major emission sources as soon as practicable. EPA has defined RACT as "the lowest emission limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility."<sup>21</sup>

This past summer, the Kansas City metropolitan area exceeded the 85 ppb (parts per billion) eight-hour ozone standard at three air quality monitoring stations. These exceedences caused the three-year average of readings at those monitoring

---

<sup>21</sup> Memo from Roger Strelow, EPA Assistant Administrator for Air and Waste to EPA Regional Administrators December 9, 1976, 7 BNA Environmental Reporter, Current Developments 1210 col. 2 (1976).

4-43

stations to equal or exceed the EPA action level of 85 ppb for ozone, based on preliminary data reported at the September 11, 2007 Mid-America Regional Council (MARC) meeting. MARC serves as the coordinating agency for air monitoring and other purposes for Kansas City area local governments, the KDHE, the Missouri Department of Natural Resources and other entities. When the air quality data are confirmed, it is expected that "Contingency Measures" previously prepared by MARC will go into effect to reduce ozone. According to MARC, the Contingency Measures will include new air quality emission controls on some Kansas City-area power plants in Johnson and Wyandotte Counties, and regulations on idling engines in commercial heavy-duty diesel trucks. According to MARC, EPA has indicated that it does not anticipate redesignation of the Kansas City Air Quality area as non-attainment for ozone in the foreseeable future if Kansas and Missouri implement the contingency plan for the Kansas City Air Quality Region and the contingency plan measures bring the region back into compliance with the eight-hour ozone standard.

This sequence of events was expected and is a significant reason why Kansas City Power & Light Company (KCPL) recently installed selective catalytic reduction equipment on Unit 1 at the LaCygne Station. Westar has a 50% interest in the LaCygne Station, but the plant is operated by KCPL. One of the major factors contributing to ozone is nitrogen oxide (NO<sub>x</sub>) emissions. Due to its design, LaCygne Unit 1 emits more NO<sub>x</sub> than other coal plants of similar size and vintage. Reductions of NO<sub>x</sub> emissions at LaCygne 1 will contribute to ozone compliance in Kansas City and is a part of the Kansas City contingency plan.

### **Acid Rain Program**

Acid rain occurs when sulfur dioxide (SO<sub>2</sub>) and NO<sub>x</sub> emissions are transformed into acids in the atmosphere and are returned to the ground in the form of low pH moisture. The Acid Rain Program was established in Title IV of the 1990 amendments to the Clean Air Act to reduce emissions that cause this phenomenon. Title IV establishes a nationwide cap on electric utility SO<sub>2</sub> emissions, implemented through an emission trading system.

Under this system, EPA annually assigns a specified number of SO<sub>2</sub> allowances to each emitter that can be used each year or any year thereafter. For each such allowance, the holder has the right to emit one ton of SO<sub>2</sub>. Allowances are fixed in quantity, but are tradable among participants in a fairly active secondary market.

At the end of each year, each emitting unit must have enough allowances to cover its emissions for that year. Operators of units that emit SO<sub>2</sub> in excess of their allowances must acquire additional allowances to meet the excess or pay a penalty to EPA.

In addition to the cap on SO<sub>2</sub> emissions, the Acid Rain Program requires extensive monitoring and reporting of plant emissions; requires Acid Rain Permits; establishes a system-wide NO<sub>x</sub> emission rate limit for coal-fired generating units; and requires installation, operation, calibration, and annual certification of continuous emission monitors.

4-44

## Clean Air Visibility Rule

Acting under the CAA, EPA has issued rules to address emissions that cause regional haze to form over what are known as Class I national parks and wilderness areas. The targeted emissions are primarily SO<sub>2</sub> and NO<sub>x</sub>. The goal of this program is to reduce haze in Class I areas to natural conditions by 2064.

Five generating units we operate and two co-owned units have been identified as potentially impacting Class I areas. The affected units are Jeffrey Energy Center Units 1 and 2, Lawrence Energy Center Unit 5, Gordon Evans Energy Center Unit 2, Hutchinson Energy Center Unit 4, and LaCygne Station Units 1 and 2.

EPA issued its final Clean Air Visibility Rule on July 15, 2005. KDHE is working to complete its implementation plan that must outline the details of how the State of Kansas will comply with the rule. The EPA must rule within one year of receiving KDHE's implementation plan and the Clean Air Visibility Rule will take full effect after that date. On August 31, 2007, Westar submitted a proposed consent agreement to KDHE that outlines how Westar intends to comply with the Clean Air Visibility Rule. Details of the projects are discussed below.

Under the proposed Consent Decree Westar agrees that, within five years of EPA's approval of the Kansas Regional Haze State Implementation Plan, Westar will install emission controls and equipment and/or implement operating modifications in order to achieve air pollutant emission limits similar to the EPA Regional Haze Rule and Best Available Retrofit Technology (BART) requirements, for the following units subject to regional haze rule and related requirements which KDHE indicated are necessary to protect air quality, as the units may contribute to regional haze. Those units include:

Gordon Evans Energy Center Unit 1	Gordon Evans Energy Center Unit 2
Hutchinson Energy Center Unit 4	Jeffrey Energy Center Unit 1
Jeffrey Energy Center Unit 2	Jeffrey Energy Center Unit 3
Lawrence Energy Center Unit 3	Lawrence Energy Center Unit 4
Lawrence Energy Center Unit 5	Murray Gill Energy Center Unit 1
Murray Gill Energy Center Unit 2	Murray Gill Energy Center Unit 3
Murray Gill Energy Center Unit 4	Neosho Energy Center Unit 7
Tecumseh Energy Center Unit 7/9	Tecumseh Energy Center Unit 8/10

Additional terms stated in the proposed KDHE agreement are:

- For Jeffrey Energy Center Units 1, 2 and 3, Westar will install equipment and implement operating practices to meet "presumptive

4-45

emission limits" for NO<sub>x</sub> and SO<sub>2</sub> within three years of EPA approval of the Kansas Regional Haze State Implementation Plan.

- For Gordon Evans Energy Center Unit 2, Westar will implement control strategies to achieve visibility improvement superior to best available retrofit technology. This will be accomplished by switching from Number 6 fuel oil to natural gas, with an exception.
- The exception for Gordon Evans Energy Center Unit 2 is that when the natural gas supplier to Gordon Evans Energy Center Unit 2 takes emergency action which could result in an impact to electric system reliability, Westar may combust Number 6 fuel oil for the duration of that condition.

Actions proposed to be taken in connection with the proposed Consent Agreement would significantly reduce emissions from Westar Energy's energy centers. Sulfur dioxide emissions from our energy centers would fall more than 60,000 tons per year, a more than 70% reduction. Nitrous oxide emissions would fall more than 20,000 tons per year, a nearly 50% reduction. Particulate emissions would fall nearly 3,000 tons per year, a reduction of more than 60%.<sup>22</sup>

KDHE has not yet taken action to give final approval to the proposed Consent Agreement, or to submit the Consent Agreement to EPA for inclusion in a proposed amendment to the Kansas Implementation Plan for regional haze New Regulations and Pending Legislation.

### **Clean Air Mercury Rule**

On March 15, 2005, EPA published air quality rules referred to as the "Clean Air Mercury Rule" (CAMR). The CAMR requires all coal-fired power plants to reduce mercury emissions. The reductions must occur in two phases starting January 1, 2010 with the second round of reductions occurring in 2018. We are also required to install continuous emission mercury-monitoring equipment at each of our coal-fired units by January 1, 2009. On February 8, 2008, the DC Circuit Court vacated the Clean Air Mercury Rule (CAMR). To date we have not been able to analyze the impact of this ruling on our operations.

Other current or pending laws may require us to further reduce emissions of SO<sub>2</sub>, NO<sub>x</sub>, particulate matter, mercury and carbon dioxide (CO<sub>2</sub>). These include:

- Proposed revisions to the routine maintenance, repair and replacement (RMRR) exclusion and impact on New Source Review (NSR) requirements, and

---

<sup>22</sup> Operation of emissions reduction equipment consumes power generated at a plant that otherwise would be available to meet customer demands. The load imposed by this equipment is referred to as "auxiliary" or "parasitic load."

4-46



- Legislation introduced in Congress, such as the various "multi-pollutant" and climate change bills requiring reductions of CO<sub>2</sub>, NO<sub>x</sub>, SO<sub>2</sub> and mercury.

## Compliance with Existing Regulations

Under current law, our principal compliance concerns relate to Acid Rain (SO<sub>2</sub> and NO<sub>x</sub>), particulates, and mercury. We have been proactive in addressing environmental concerns in all of these areas.

We comply with the Acid Rain requirements by burning low-sulfur coal and to further reduce SO<sub>2</sub> and NO<sub>x</sub>, we are operating SO<sub>2</sub> scrubbers at Lawrence Energy Center (LEC) 4 and 5, upgrading SO<sub>2</sub> scrubbers at Jeffrey Energy Center and the Lawrence Energy Center and installing low NO<sub>x</sub> systems on the balance of our coal-fired units.

To further reduce particulates, we are upgrading the electrostatic precipitators (ESPs) at JEC 1, 2, and 3, LEC 3, and Tecumseh Energy Center (TEC) 7 and 8. We also plan to enhance particulate controls on both LEC 4 and 5 in the next few years.

Although the D.C. Circuit Court of Appeals recently vacated the CAMR, it is likely that mercury emission controls will be required in the next few years. We anticipate that EPA will issue a new rule requiring more stringent controls on mercury than were required by the CAMR. The current proven technology for removing mercury is activated carbon injection which will likely be the technology of choice for our application.

Mercury emission measurement and monitoring efforts continue throughout our coal fleet providing the technical data necessary to meet future mercury requirements effectively and efficiently. KCPL is taking similar measures on our behalf at LaCygne Station.

## Project Status and Plans

We have numerous emission control projects in various stages of planning and construction with some already completed. Below is a short summary of significant emission control projects on our coal fleet and the current status of each project.

### **Jeffrey Energy Center**

All three units will have low NO<sub>x</sub> systems, which include the installation of low NO<sub>x</sub> burners, over-fired air and neural net controls; control systems designed to reduce the formation of nitrous oxides and thereby reduce NO<sub>x</sub> emissions. To date one system has been installed on Unit 3 and is currently undergoing tuning with the other two

4.47

systems in-service dates (Units 1 and 2) scheduled for May 2008 and May 2009, respectively.

Existing SO<sub>2</sub> scrubbers are being upgraded from the original design of 60% removal to systems capable of removing over 90%. Projected in-service dates are Unit 1, spring 2008; Unit 2, spring 2009; and Unit 3, fall 2008. The current estimated cost of each scrubber upgrade is \$120 million.

The existing electrostatic precipitators (ESP) will be rebuilt using the latest ESP technology for particulate control. The Unit 1 ESP rebuild is scheduled for fall 2009 and Unit 3 will be rebuilt in the fall of 2008. Unit 2 ESP was partially rebuilt earlier but recent operating experience indicates performance has degraded and a more complete rebuild is scheduled for spring 2009.

### **Lawrence Energy Center**

All three units will be fitted with low NO<sub>x</sub> systems, which may include low NO<sub>x</sub> burners, over-fired air and a neural net control system. The installation dates and engineering are incomplete and therefore good cost estimates are unavailable.

The particulate removal systems on Units 4 and 5 are old and inefficient technology that was integrated with the existing SO<sub>2</sub> scrubbers. We plan to replace the particulate section of the existing scrubber with up-to-date fabric filter/bag house particulate removal technology. Unit 3 contains a standard electrostatic precipitator for particulate removal which will also be rebuilt. The costs of the projects at this time are uncertain, as engineering is incomplete.

### **Tecumseh Energy Center**

Low NO<sub>x</sub> systems will be installed on both units at Tecumseh Energy Center. This may include low NO<sub>x</sub> burners, over-fired air and neural net controls. Unit 7/9's low NO<sub>x</sub> system has a spring 2008 in-service date and Unit 8/10 is scheduled for spring 2009. The electrostatic precipitators for each unit will be rebuilt with Unit 7/9 scheduled for spring 2008 and Unit 8/10 for spring 2009.

### **LaCygne Station**

KCPL recently installed a selective catalytic reduction system (SCR) on LaCygne Unit 1 to reduce NO<sub>x</sub> emissions. The SCR went online May 2007. To date NO<sub>x</sub> emissions rates have dropped significantly and are meeting expectations. Additional emission controls for NO<sub>x</sub> are planned for Unit 2 and may include the installation of an SCR and low NO<sub>x</sub> systems. The installation schedule at this time is speculative, but will likely occur in the next few years.

KCPL plans to install an SO<sub>2</sub> scrubber on Unit 2 and replace the existing scrubber on Unit 1. Both projects are scheduled to come online after 2010.

Both units will have their existing particulate control enhanced to the best available control technology, which in this case will be bag house/fabric filters

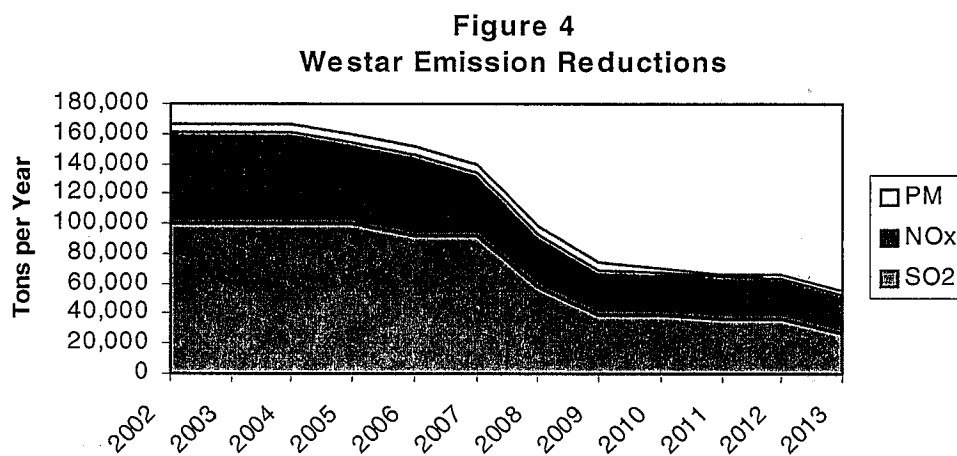
4-48

technology. This equipment will replace the Venturi system (integrated with the SO<sub>2</sub> scrubber) on Unit 1 and the electrostatic precipitator on Unit 2. Installation dates have not been determined.

### Other Air Emission Projects

Additional but less significant air emission projects include the installation of continuous emission monitoring and ancillary equipment to satisfy both the Acid Rain Program and anticipated mercury emissions regulation. Emission control equipment to remove mercury, which involves the installation of capital equipment to inject activated carbon in the flue gas stream, is likely to be required in the next few years. The cost of this equipment is unknown at this time, but may run several million dollars per unit. The major expense for any mercury removal requirement will be O&M dollars to purchase activated carbon. We expect to recover the cost of such environmental consumables similar to the way we recover costs today for fuel and limestone; i.e., as an element of the RECA. Other impacts will be the loss of fly ash sales revenue due to contamination with carbon and reduced life of existing landfills possibly requiring earlier permitting and construction of new landfill capacity.

Figure 4 below illustrates the emission reductions Westar expects to realize from its environmental projects.



4.49

# Reliability Initiatives

## Performance Improvements

In 2001 and 2002, Westar's reliability performance as measured by the industry-standard System Average Interruption Duration Index (SAIDI) and the System Average Interruption Frequency Index (SAIFI), was in the third and fourth quartiles, respectively, compared with other investor-owned utilities. Seeking to improve service reliability, Westar began targeting the poorest performing areas for improvement.

Our SAIDI and SAIFI measures have improved significantly from the pre-2002 levels. (Figures 5 & 6) Year-end 2007 performance is second quartile for SAIDI (closely approaching first quartile) and third quartile for SAIFI (closely approaching second quartile). This improvement is a direct result of our enhanced vegetation management and reliability programs identified later in this paper.

Figure 5

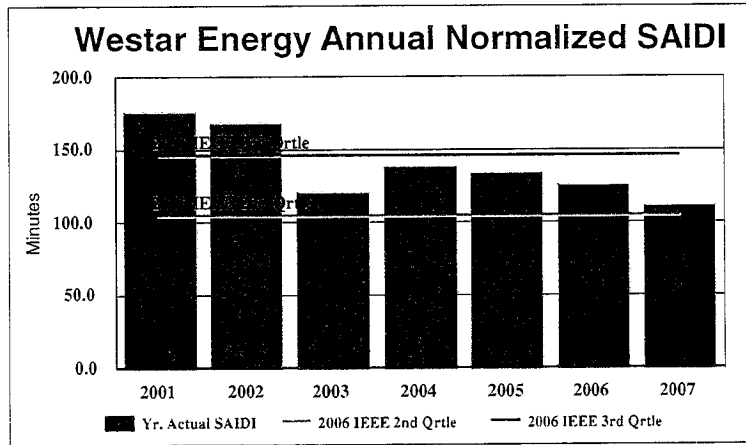
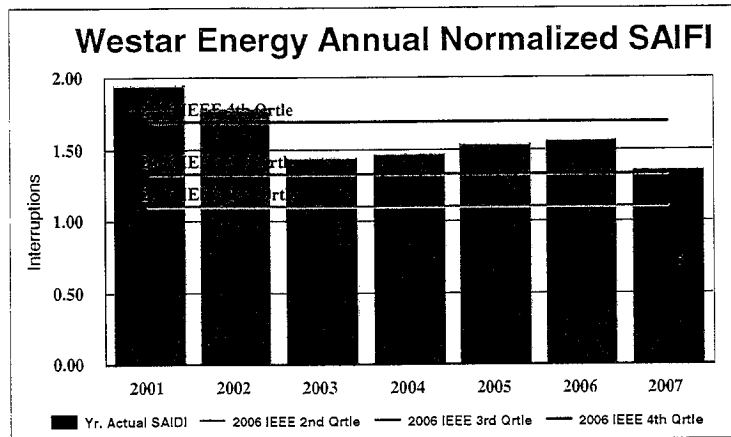


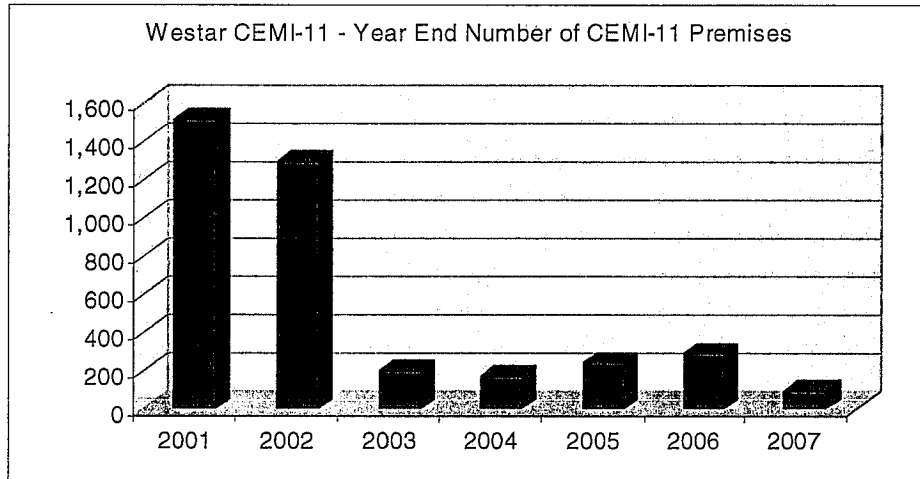
Figure 6



4-50

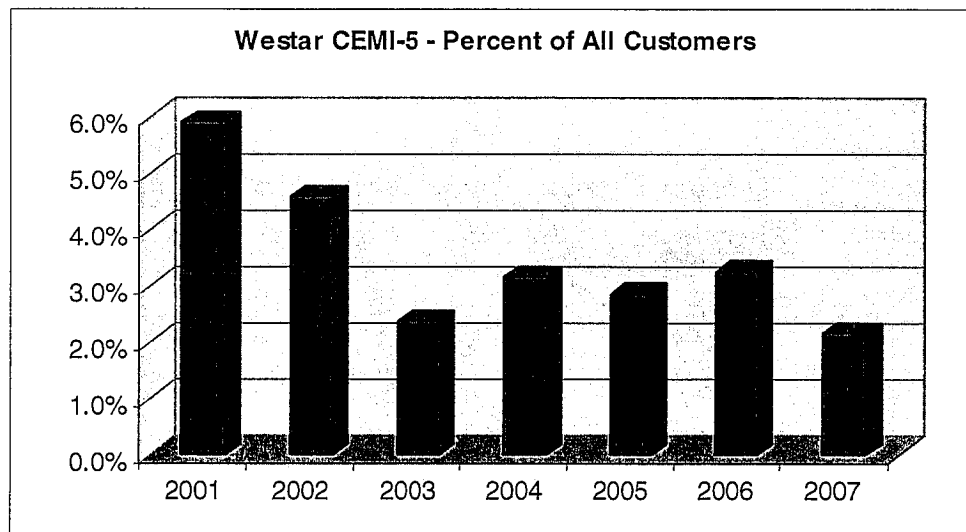
In addition to improving our SAIDI and SAIFI performance numbers, our reliability effort has also emphasized reducing the number of Customers Experiencing Multiple Interruptions (CEMI). In 2001, Westar had more than 1,500 customers who experienced more than 11 outages (Figure 7), i.e. CEMI-11 annually. By 2007, we reduced that number to fewer than 100 customers.

**Figure 7**



With the substantial reduction of CEMI-11 instances, and with our continuing efforts focusing on the worst performing circuits, we are moving toward reducing customer's experiencing more than 5 sustained interruptions (CEMI-5). Though we see room for further improvement, these efforts are taking hold with CEMI-5 instances also having been reduced dramatically; falling from 5.9% of our customers in 2001 to 2.2% today (Figure 8).

**Figure 8**



4-51

## Vegetation Management

Vegetation, principally, but not exclusively, trees, growing in and near lines has been the leading cause of service interruptions. To address this problem, Westar substantially improved its vegetation management and line clearance program, devoting significantly greater resources to this effort. Between 1998 and 2007, transmission and distribution O&M line clearance expenditures increased from \$7.9 million annually to \$25.2 million annually, representing real growth multiples above the general rate of inflation. We are continuing to maintain an enhanced and more focused vegetation management program within constraints of available resources.

## Reliability Strategic Plan (2004 through 2008)

In 2003, as part of our effort to improve service reliability and to move SAIDI and SAIFI from the third and fourth quartiles to the top one-half, Westar embarked on a five-year Reliability Strategic Plan (R-Plan). Implementing the R-Plan required an additional \$6 million in annual expenditures from 2004 to 2007, above the increases in vegetation management expenditures. The initial phase of the R-Plan focused on:

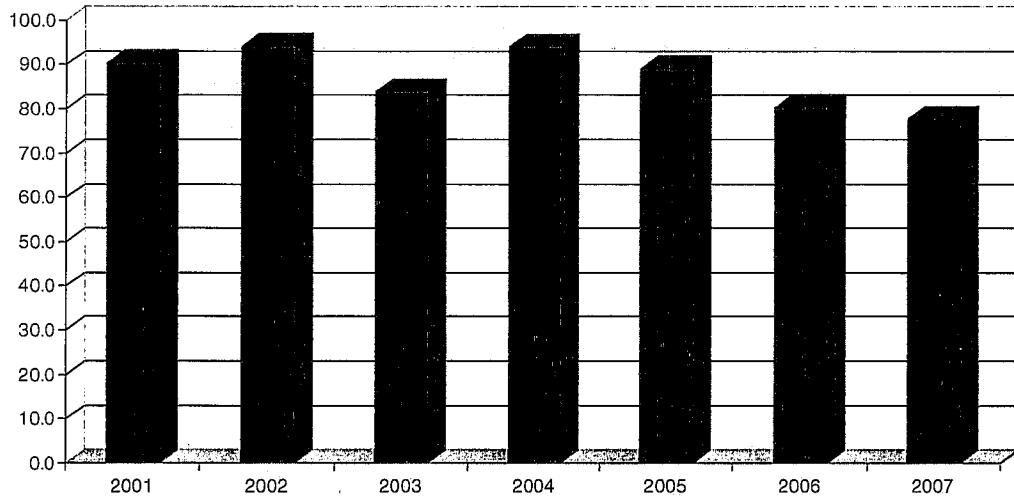
- upgrading coordination on selected circuits;
- completing visual and infrared inspections and subsequent repairs on the 50 to 60 circuits with the highest incidences of equipment failure;
- installing remote-controlled mid-circuit reclosers; and
- completing a wide range of specific improvements to increase reliability on the 100 worst performing circuits.

Vegetation management remains a primary component of our reliability effort, but as vegetation induced outages have been reduced, we have turned our attention to the next most prevalent cause of outages, equipment failure. To address this cause of outages, we increased visual inspections and began infrared inspections, again on the worst performing circuits. We followed these inspections with preventive maintenance.

We also undertook a detailed review of how we restore service once interruptions occur. The result was that we were able to modify our restoration activities to reduce the average duration of customer interruptions (CAIDI). (Figure 9) One example of these efforts was the installation of more than 1,000 visual fault indicators on risers for underground cables and at other selected locations on the circuits. This equipment allows field personnel quickly to locate the fault equipment and, in doing so, reduce the duration of service interruptions on these circuits.

4-52

Figure 9  
**Westar - Annual Normalized CAIDI**



### Aging Infrastructure and Asset Management

Prospectively, a key feature of Westar's reliability programs will be to reduce the stress on facilities that results from repeated physical contact and electrical faults, typically caused by trees. A goal is to achieve a more routine cycle for line clearance. By doing so, we believe we can reduce ongoing costs for vegetation management.

As part of the R-Plan, we are also tackling the problem of aging infrastructure among our 660,000 distribution poles, 23,671 circuit miles of distribution lines and over 500 substations. We estimate that over 33% of distribution poles are older than 40 years and many are approaching the end of their useful lives. Forty-five percent of substation transformers are over 40 years old.

In 2004, we began the process of inspecting 34 kV poles and lines. As a result of our having identified poles in need of replacement, trussing or above-ground repair, we have improved significantly the reliability of these lines. These inspections and repairs have been focused on the aged 34 kV lines with the worst reliability history. By the end of the first quarter in 2008, we anticipate that Westar will have completed the inspection on 40% of the entire 34 kV system, resulting in improved reliability for customers in mostly rural parts of our service area.

For Phase 2 of the R-Plan, improvements under consideration for the next five years are:

- installing monitoring equipment on selected substation equipment better to predict pending problems before equipment failures occur;
- installing additional supervisory control and data acquisition (SCADA) capabilities in existing substation;

4-53

- performing pole ground-line inspection on distribution circuits.<sup>23</sup>

We also continue to review and implement changes to our management processes. Recently, we reorganized our people and processes to gain efficiencies from centralized contractor management, better oversight of line contractors and utilizing company employees rather than contractors to focus on maintenance work. We are also reviewing new information systems that might also help us improve our efficiencies.

As described earlier in this report, AMI when fully deployed will allow real-time monitoring of circuits for the first time. As a result, we will be able more quickly to identify and respond to outages, further reducing the duration of customer interruptions.

All of these programs and initiatives are aimed toward maintaining and improving the reliability of our service while balancing against the equally important goals of keeping our costs reasonable and maintaining public health and safety.

---

<sup>23</sup> One recent phenomenon affecting both public safety and reliability is copper theft, particularly ground wires and substation equipment. In addition to doing more to protect this equipment from thieves, Westar has been active in lobbying for penalties and stepped up law enforcement to reduce such incidents.

4-54



## Financing the Strategy

Implementation of Westar's comprehensive strategy will require capital expenditures well in excess of the cash flow produced by the business. Table 5 shows capital expenditures for major functions and projects for the period 2007 through 2010.

Table 5<sup>24</sup>

	Actual 2007	2008	2009	2010	2007-2010 Cumulative
	(In Thousands)				
Generation:					
Refurbishments and other	\$ 45,271	\$ 98,200	\$ 136,800	\$ 133,100	\$ 413,371
Additional capacity	189,757	96,500	56,400	12,300	354,957
Wind	79,195	205,000	----	----	284,195
Environmental	207,781	198,400	206,200	259,000	871,381
Nuclear fuel	38,168	18,100	20,000	33,900	110,168
Transmission	70,651	148,100	228,600	165,900	613,251
Distribution:					
Refurbishments and other	34,797	35,600	47,900	53,700	171,997
Advanced metering infrastructure	----	----	36,900	38,400	75,300
Customer growth	60,521	57,000	59,200	61,600	238,321
Other	22,015	31,300	28,300	23,100	104,715
Total capital expenditures	<u>\$ 748,156</u>	<u>\$ 888,200</u>	<u>\$ 820,300</u>	<u>\$ 781,000</u>	<u>\$3,237,656</u>

As previously noted, we anticipate that over the next five years continued investment for efficiency, for new generation and transmission, and for environmental projects will likely result in a doubling of our net utility plant. Single-year investments for these projects are expected to be from approximately \$750 million to nearly \$900 million. By comparison, Westar's capital expenditures historically have been in the

<sup>24</sup> We prepare these estimates for planning purposes and revise our estimates from time to time. Actual expenditures will differ due to changing environmental requirements, changing costs, delays and other factors. We and our plant co-owners periodically evaluate these estimates and this may result in frequent and possibly material changes in actual costs. These amounts do not include all estimates for expenditures that may be incurred as a result of the U.S. Environmental Protection Agency's nationwide investigations regarding the New Source Review permitting program or respecting environmental requirements relating to mercury and CO<sub>2</sub> emissions.

4-55

range of \$150 million to \$250 million. Accordingly, Westar will need to raise substantial external funds, in the forms of both new debt and equity capital.

Although the magnitude of projected capital expenditures is significant and challenging, we believe that with reasonable capital market conditions and constructive regulation, we should be able to attract the necessary external capital on reasonable terms. More to the point, a necessary precedent of Westar's ability to formulate these plans is a sustainable, consistent and constructive regulatory platform assembled in a collaborative and cooperative approach among regulators, elected officials, consumer representatives and the company. We believe it important that all parties understand that the ability to continue executing on these plans also requires that the parties remain committed to constructive and predictable regulatory outcomes.

Consistent with maintaining an overall strategic positioning as a pure electric utility, in the short-term Westar maintains a target capitalization ratio of approximately 50% equity and 50% debt, but will target a slightly higher equity ratio over time. Because capital, particularly long-term debt, is most efficiently raised in \$100+ million increments, Westar also maintains access to significant short-term revolving credit facilities that allow it to finance on a low-cost shorter-term basis until such time as the need for external capital is large enough to warrant the issuance of debt or equity securities. Westar believes the proposed capital structure, consisting of long-term debt, equity, and perhaps hybrid equity securities, will result in a reasonable cost of capital consistent with assuring access to necessary capital.

Equity capital will typically be in the form of common equity. New equity may be issued through various channels to increase flexibility and access and decrease market risk. These avenues include traditional underwritten secondary public offerings, underwritten forward sales of equity, controlled offerings through an agent, dividend reinvestment, and direct placement of shares to existing shareholders. Depending on market conditions and market demand, but secondarily to common equity, Westar may also consider the issuance of hybrid equity securities.

Because the vast proportion of Westar's capital expenditures is related to long-lived, fixed utility assets, financial management believes long-term debt is an appropriate form of financing. Debt will typically be issued in the form of first mortgage bonds, with and without embedded call optionality, depending on the market price of call options. It is in the interests of our customers and shareholders — and more specifically, the viability of this plan — that Westar maintain strong investment grade debt ratings. While we also retain the option to issue unsecured debt, credit ratings on secured debt are higher and interest expense would typically be lower as a result. Debt capital will be issued from both the Kansas Gas and Electric Company and Westar Energy legal entities.

4-56

## Rate Implications of Sustained Capital Investment

---

Rising energy costs are going to be a fact of life across all fuel and energy types for years to come in the United States as we begin to see the effects of tightening supplies, soaring construction costs and mounting environmental requirements. In particular, there is a narrowing gap between growing consumer demand and the generation and transmission assets necessary to support that growth. It is inevitable that prices will climb to reflect utility efforts to provide adequate supplies.

Westar heads into this new era with a distinct advantage — an average retail rate of \$.06/kWh, about 30% below the national average of \$.089/kWh. It is our intent to preserve this relative advantage in the coming years. We will do it by avoiding "big bet" investments with unsettled or untested technology, making selective investments across a range of generation options to maintain supply diversity and stimulating meaningful energy conservation — all to defer a baseload investment until more promising baseload technologies are commercially proven.

The capital expenditures we contemplate are substantial and critical to success of this strategy, and it will be equally important that the investment community have confidence in the willingness of Kansas regulators and policy-makers to support the pricing to match this growth in our utility plant.

Portions of this higher revenue requirement will be recovered through annual adjustments to the Environmental Cost Recovery Rider and the Transmission Delivery Charge. The use of these riders is constructive, for both Westar and our customers:

- They provide more timely cost recovery for Westar, which in turn supports the credit ratings of the company and allows us to access capital on reasonable terms.
- They provide customers clearer price signals about the cost of energy and associated environmental requirements.
- They serve to reduce volatility in utility rates and provide for more gradual rate adjustments.

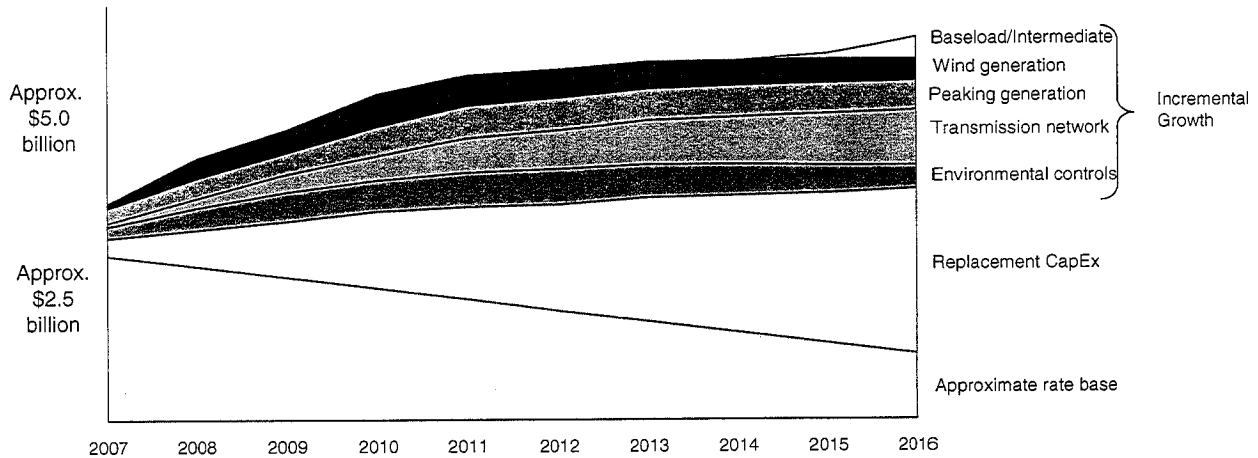
We believe that the measure of whether rates are reasonable or not includes both volatility and absolute levels of rates. The largest portion of capital additions still requires rate adjustment through the periodic filing and processing of traditional rate cases, but the operation of the riders tends to lessen the likelihood of sharp increases that would otherwise result from the exclusive use of rate cases.

Figure 10 illustrates the changes and growth in the major components of our utility plant that result from our planned investments. It incorporates expenditures for maintaining and replacing existing plant as well as our investments in the projects discussed in this paper. With these investments, our rate base (including transmission and environmental plant) would increase from approximately \$2.5 billion determined in

4-57

our 2005 rate case to above \$5 billion by 2016. Over time, this increase will exert significant upward pressure on customer rates.

Figure 10



Utility rates are, of course, affected by both plant additions and changes in operating and maintenance costs (O&M), which will also increase as a result of general inflationary pressures and the requirements of operating plant additions. Growth in both retail and wholesale sales and in projected asset-based sales margins partially offset the higher costs associated with new investment and increased O&M. It is too early to predict precisely the rate impacts of these investments. Given their scope and magnitude, however, neither Westar nor our customers will be immune from the energy cost increases sweeping the country over the next decade.<sup>25</sup> However, we believe our strategy avoids the "sticker shock" of a major baseload investment and our past investments in baseload will help us maintain a comparative advantage over the ultimate rates for energy being predicted across the country.

<sup>25</sup> Nationally, it is estimated that the cost of electricity will likely increase by more than 60% in the next 8 to 10 years. As previously noted, Westar's rates are much lower than the national average and we intend to maintain this rate advantage for our customers.

4-58

## Regulatory Plan

---

Generally, Westar will seek recovery of costs incurred in implementing the elements of the energy plan through already established procedures and mechanisms:

- Generation and distribution system capital costs will be included in future requests for rate review.
- Capital expenditures for environmental costs will be recovered through the Environmental Cost Recovery Rider.
- Jurisdictional transmission costs that are approved by the FERC and included in SPP charges and tariffs will be included in the statutorily authorized Transmission Delivery Charge.
- For fuel and purchased power costs, including the power purchase costs related to the wind energy that we will purchase from plants owned by others, and environmental consumables such as limestone, fuel treatments and allowances, we will recover through the RECA.
- For energy efficiency and AMI/MDM program costs, Westar will seek prior specific approval for implementation of discrete programs and recovery of associated costs through mechanisms such as the rider approved in Docket No. 07-KCPE-905-RTS, accounting orders, or other mechanisms identified and approved by the Commission in its recently opened generic energy efficiency dockets (Docket Nos. 08-GIMX-441-GIV and 08-GIMX-442-GIV). We believe strongly that establishing appropriate cost recovery mechanisms and incentives for investments in energy efficiency initiatives are fundamental to the long-term success of efficiency programs.
- For ongoing study costs related to future plants not part of our immediate plans (e.g., evaluating the suitability of sites for future power plants, etc.), we may seek accounting authority to defer such costs as regulatory assets. Should a power plant eventually be constructed as a result of those studies, the costs would be capitalized into the plant costs. Should a plant not result from such studies we would then propose to amortize those study costs over a reasonable period of time. At present, Westar has no such application before the Commission.

We recognize that the timing, and perhaps even the nature, of planned generation additions will likely need to be modified in response to future changes in markets, available technology, regulation, changing customer demand and other unforeseeable events. Accordingly, as with the Emporia Energy Center and our proposed wind generation projects, Westar intends to file with the Commission appropriate applications for predetermination of ratemaking principles associated with future generation facilities. Such filings provide transparency to our customers as to the

4-59

nature and cost of our resource planning and better inform investors as to the credit quality and business risks associated with capital expenditures. Predetermination also affords the Commission an upfront opportunity to consider whether construction of the facilities is consistent with the public interest and consistent with Westar's obligation to meet customer demands — all before Westar makes those substantial commitments of investor-supplied capital on behalf of its customers.

4-60

## The Way Forward

Although we have offered both broad context and considerable detail about our view of the future – including the inherent uncertainties – this paper is not intended as a dissertation on the "Westar way." Rather, we offer it as an invitation to facilitate discussion with the Commission and other state policy-makers on the fundamental challenges we face together.

Ultimately, we recognize that parties who share our concern for the future may differ in their view of how Westar should proceed best to meet the needs of our state in the context of heightened environmental concerns and mandates. Nonetheless, we believe that the quality of public decision-making is enhanced through a collaborative process where, to the extent reasonably practical, plans are publicly disclosed, comments are received, and alternative approaches may be proposed and thoughtfully discussed.

We welcome that next step.

4-61

## Climate Change Policy



Westar Energy recognizes the growing concerns regarding the threat of climate change and believes our industry must take a leadership role in this debate. It must be understood that climate change is a global problem requiring global solutions guided by sound science, objective engineering and out best economic information.

At the federal level the solution must be comprehensive, far-sighted and recognize all sources of greenhouse gases. The Westar Climate Change Policy and its Climate Change Principles, together represent the shared commitment of all Westar employees to protect and enhance the environment while providing safe, reliable and reasonably priced energy service.

1. We will intensify our efforts to make reductions in greenhouse gas emissions while continuing to provide safe, reliable and reasonably priced energy service.
2. We will base greenhouse gas reduction strategies on sound science, objective engineering and best available economic information.
3. We will support science-based education on climate change, its causes and how consumer choices can affect energy consumption.
4. We will support public policies and initiatives to accelerate the development and use of environmentally beneficial and cost effective strategies for:
  - demand-side management
  - energy efficiency programs for both customers and Westar's own operations
  - zero - or low - emissions generation technologies
  - renewable energy resources
  - carbon capture and storage technologies
5. We will support public policies and initiatives that recognize early actions or investments made to mitigate greenhouse gas emissions.
6. We will support public policies and initiatives that recognize and correct for possible extreme financial consequences that could result from the imposition of greenhouse gas regulations.
7. We will support compliance timelines for greenhouse gas reductions consistent with the expected development and commercialization of technology solutions.

4-62



## Forward-looking Statements

This document is intended for a broad audience, and we recognize that our investors may be part of that audience. We encourage our investors to be mindful of the following statement as they review this document.

Forward-looking statements: Certain matters discussed in this document are “forward-looking statements.” The Private Securities Litigation Reform Act of 1995 has established that these statements qualify for safe harbors from liability. Forward-looking statements may include words like we “believe,” “anticipate,” “expect,” “likely,” “estimate,” “intend” or words of similar meaning. Forward-looking statements describe our future plans, objectives, expectations or goals and are based on assumptions by the management of the Company as of the date of this document. If management’s assumptions prove incorrect or should unanticipated circumstances arise, the Company’s actual results could differ materially from those anticipated. These differences could be caused by a number of factors or a combination of factors including, but not limited to, those factors described under the heading “Risk Factors” contained in the Company’s quarterly and annual periodic reports as filed with the Securities and Exchange Commission. Readers are urged to consider such factors when evaluating any forward-looking statement, and the Company cautions you not to put undue reliance on any forward-looking statements. Any forward-looking statement speaks only as of the date such statement was made, and we do not undertake any obligation to update any forward-looking statement to reflect events or circumstances after the date on which such statement was made except as required by applicable laws or regulations.

The information contained in this document is intended to be considered in the context of our filings with the U.S. Securities and Exchange Commission (“SEC”) and other public announcements that we may make, by press release or otherwise, from time to time. We disclaim any current intention to revise or update the information contained in this document, although we may do so from time to time as our management believes is warranted. Any such updating may be made through the filing of reports or documents with the SEC, through press releases or through other public disclosure.

4-63