Approved:
Date 2-5-01

MINUTES OF THE SENATE UTILITIES COMMITTEE.

The meeting was called to order by Chairperson Senator Stan Clark at 9:30 a.m. on January 29, 2001 in Room 231-N of the Capitol.

All members were present except: Senator Wagle, excused

Committee staff present: Raney Gilliland, Legislative Research
Bruce Kinzie, Revisor of Statutes

Jar

Conferees appearing before the committee:
Timothy R. Carr, Kansas Geological Survey

Others attending: See attached sheet

Chair Clark opened the hearing on:

S.R. 1808 - Resolution urging Corporation Commission to order refunds to be paid to certain residential natural gas customers

Chair Clark presented testimony on **S.R. 1808.** (Attachment 1)

John Cita of Kansas Corporation Commission provided information on estimated amounts of ad valorem tax refunds, names of local companies and number of customers. Many questions were asked by the committee.

Moved by Senator Emler, seconded by Senator Tyson, **S.R. 1808** urging Corporation Commission to order refunds to be paid to certain residential natural gas customers be passed out of committee. Senator Barone requested the minutes reflect that he did not vote on this issue. Motion carried.

2000 Kansas Energy Report

Dr. Timothy Carr, Chief of the Petroleum Research Section of the Kansas Geological Survey and Co-Director of the Energy Research Center at the University of Kansas stressed the importance of energy industry to Kansas Citizens and to our state's economy, and presented an analysis of the industry's history, current status and future. (Attachment 2). He also provided each member with a copy of the 2000 Kansas Energy Report, open file report 2000-69, which he refers to in his testimony.

Next meeting of the Utilities Committee will be January 30, 2001.

Adjournment.

Respectfully submitted,

Ann McMorris, Secretary

Attachments - 2

SENATE UTILITIES COMMITTEE GUEST LIST

DATE: January 29

NAME	REPRESENTING
Robert E Hemphill	
WALKER HENDRIX	CURB
Ann Hinkle	SRS
Jim BIARTLING	Goodland Gas Co
Judy Bromich	Sen. Pres. Office
Paul Johnson	PACK
Chad Depew	DOB
Susan Mahoney	Governor's Office
Kerri Spielman	Sen Maj Ldr's Office
John McNish	KCC
Ted Habbell	Avedon
DENNY KOCH	PNM
Tim Carr	Kansas Geological Survey
Chris Wilson	KS Geotech Consulting

40TH DISTRICT

KANSAS SENATE

Stan Clark

COMMITTEE ASSIGNMENTS
CHAIR: INFORMATION TECHNOLOGY
VICE CHAIR: UTILITIES
MEMBER: AGRICULTURE
FINANCIAL INSTITUTIONS & INSURANCE
RULES & REGULATIONS

TESTIMONY BEFORE THE SENATE UTILITIES COMMITTEE

SENATE RESOLUTION 1808
JANUARY, 29,2001

Committee members:

Last Wednesday night each of us watched 77 year-old Henry Parker struggle to the podium, pull his folded copy of his $636 December gas bill from his faded overalls and show it to us. Struggling through his cerebral palsy he slowly but masterfully communicated to us, "I just can't afford to pay my gas bill. My house is paid for. I built it myself. I sure don't want at my age to put a mortgage on it."

This resolution directs the Kansas Corporation Commission to order all FERC-ordered ad valorem tax refunds which are held by local natural gas distribution companies to be used to assist residential natural gas customers within the companies' respective service territories. It requests that the assistance be targeted at households that don't qualify for the Low Income Energy Assistance Program (LIEAP) but have an income below 300% of the poverty level set by the federal government.

LIEAP (a federal program with $16 million funding for the current fiscal year) currently pays about 25% of the energy bill to qualifying families and individuals under 130% of the poverty level.

With the adoption of this Senate Resolution, Kansas Corporation Commission approval and final settlement by the producers and pipelines an estimated $40 million dollars will be distributed to needy Kansans impact by this winter's natural gas price spike.

Of the five major pipelines, Northern and CIG (Colorado Interstate Gas) have settled, Williams's settlement is immanent, and Panhandle is starting talks next week. Kinder-Morgan will be sometime in the future. Kansas Gas Customers along the Northern Natural Gas pipeline should have $12 million in refunds available immediately.

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Senate Utilities Committee
January 29, 2001
Attachment 1-1

Testimony before the Senate Utilities Committee 1/29/01

Chairman Clark and Members of the Committee:

My name is Timothy R. Carr. I am Chief of the Petroleum Research Section of the Kansas Geological Survey, and Co-Director of the Energy Research Center at the University of Kansas. I do not come as an advocate of any legislation before the committee, but to inform you of the importance of energy industry to Kansas citizens and to our state's economy, and my analysis of the industry's history, current status and future.

I will apologize in advance for moving at least partially away from a usual academic tone, masses of data, and incomprehensible graphs (but rest assured you will see an abundance of figures and charts). However, I believe that *Now is the winter of our discontent*, and I should speak openly as to my interpretation of the energy situation in Kansas and the US. Provide recommendations as to how Kansas might better meet the challenges. Others may disagree strongly with my interpretations. However, I hope the data and ideas can contribute to development of sound decisions and beneficial policy.

I will refer to 2000 Kansas Energy Report and to figures in that report (Kansas Geological Survey Open File Report 2000-69 available on the web at http://www.kgs.ukans.edu/PRS/publication/2000/ofr69/index.html). I have provided additional figures attached to my testimony.

I will attempt to cover the following four points.

1) Energy Consumption: Our energy mix and changes in energy consumption patterns over the last quarter century.
2) Energy Production: The significance of energy production to the health of the Kansas economy. Kansas remains one of the few states in the Union that remains a net exporter of energy. Energy production primarily in the form of oil and gas contributes directly to wealth generated in Kansas. The nature of the Kansas energy industry makes it very sensitive to commodity prices and operating costs.
3) My interpretation of the present conditions in the Kansas and US energy industries, and how we placed ourselves in this challenging position. I will also attempt a forecast as the hurdles that we will face over the next year or two.
4) Specific actions that we could address at the level of Kansas state government. I will attempt to ignore the present problems that impact Kansas but have been created or at best ignored at the federal level and by other states (The irresponsible lack of access to federal lands and waters, and the impossible to understand actions of states such as California will not receive additional comment).

Senate Utilities Committee
January 29, 2001
Attachment 2-1

ENERGY CONSUMPTION

Kansans' consume around 1,100 trillion BTU of energy annually. The average use of energy per Kansan in 1997 was 397 million BTU, 13 percent above the US average rate of 351 million BTU. Fossil fuels supply over 90% of this. Petroleum accounts for a third of this energy with natural gas and coal providing around 30% each (Figure 8). Nuclear power, which fuels the Wolf Creek nuclear generating station, accounts for 8% of the total, while biomass comprises 1%. Hydroelectric and other sources of energy (e.g., wind and solar) comprise less than 1% of Kansas' energy consumption.

Efficiency: This was a real surprise to me. While consumption continues to increase, Kansas has become more energy efficient in the last 20 years in terms of the State economy (Figure 12). In 1998, 70% less energy was required per dollar of gross state product than it was in 1977. As energy consumption has leveled off after 1980, the State economy has continued to grow. Kansas is more energy efficient than 20 years ago.

Electrification: Kansas and the U.S. are rapidly changing how energy is delivered as we increase our dependence on electricity. Over the last 40 years, electricity's share of Kansas energy consumption has doubled from 15% to nearly 33% (Figure 1, 3). During this span, annual demand for electric power has increased 300%, growing from 24 to 99 billion kilowatt hours (kWh). Demand for electric power increases every year. With the restructuring of the electric industry and increasing uncertain environmental requirements, today's additions to baseload electric generation capacity are overwhelmingly combined-cycle or combustion turbine technology fueled by natural gas.

Changes in Primary Energy Consumption: In 1960, Kansas' primary fuel consumption was at 652 billion BTU, consisting of 57% natural gas, 40% petroleum, with coal providing the balance (3%). By 1997, energy consumption was at 1,118.1 billion BTU consisting of 30% natural gas, 33% petroleum, 28% coal, 8% nuclear power, and 1% biomass and renewable energy (Table 1 and Figures 7 & 8). The biggest change has been the increase in coal and nuclear consumption, which is used for electrical power generation. Over two-thirds of Kansas electricity is generated from coal, while nuclear power fueled 25% and natural gas picked up much of the balance.

Natural Gas Consumption: Kansas produces twice as much natural gas than it consumes. Since 1960, natural gas consumption has risen until the mid-1970's then decreased dramatically as it could no longer be used for electrical power or industrial purposes (Natural Gas Policy Act). At this time gas was replaced by coal and nuclear for electric power generation (Figure 7).

Petroleum Consumption: Petroleum consumption in Kansas is at 193,000 barrels per day, of which transportation fuels, gasoline, and distillate (diesel) have the largest shares (Figure 9). Given the rural nature of the state, liquid petroleum gases (LPG), primarily propane, are used extensively for rural heating and industrial purposes. Energy consumption by sector shows that industrial and transportation sectors are the two biggest consumers (Figure 10).

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ENERGY PRODUCTION

Natural gas and petroleum are the most important energy resources in Kansas, accounting for nearly all primary energy produced in the state. Energy production in Kansas peaked in 1967 at 1573 trillion BTU. In 1999, primary energy production had declined to approximately 912 trillion BTU (Figure 13). Natural gas production peaked in 1970 at 900 billion cubic feet (bcf). Petroleum production peaked in 1956 at 124 million barrels (bbls). Of the U.S. states, Kansas is ranked 7th in natural gas production and 8th in oil production.

In 1999, a total of 912 trillion BTU of energy were produced in Kansas with 63% from natural gas (566 bcf), 22.0% from petroleum (34 million bbls), 11 % from natural gas liquids (NGL; 34.4 million bbls), and less than 1% from coal (414,000 short tons). The break down of Kansas energy production for 1999 is shown in Figure 14. Since 1960, total energy production in Kansas has dropped by 30%. The majority of this decrease in energy production can be attributed to decreased oil production. Oil's share of the total energy produced in the state has dropped from nearly half of energy production to 22% in 1999 (Figure 13).

Estimates put 2000 Kansas production at over 34.3 million barrels of oil and at 550 billion cubic feet of gas (Figure 15). Estimated 2000 production is a conservative extrapolation of reported production for the first eight months of the year. The final reported production numbers are expected to be slightly higher. From 1999 to 2000 oil production shows an estimated marginal increase, and gas production remains flat. Using estimated 2000 average monthly wellhead prices for oil and gas in Kansas, the value of the oil and gas produced in the state is approximately $3.046 billion. Wellhead value in 2000 is an increase of over $1.4 billion dollars from 1999. The increase in total wellhead value is a result of increased prices, especially for natural gas. In 2000, the value of natural gas production ($2.052 billion) is more than twice the value of oil production ($0.924 billion). The significance of the value of Kansas' oil and gas production relative to other parts of the Kansas economy is illustrated by a comparison to agriculture. Over the past 40 years, the value of Kansas oil and gas production is comparable to the value of total statewide crop production as measured by the cash receipts for all the crops produced in the state (Figure 16). In 2000, the wellhead value of Kansas oil and gas production may exceed the value of Kansas crop production.

Oil Production (Stripper Wells and Independents): Kansas' oil production is dominated by stripper well production operated by small independent companies. Stripper wells are economically marginal oil and gas wells that produce at relatively low rates. As a result, stripper production is sensitive to changes in the wellhead oil price and well operating costs (e.g., electricity, taxes, and wages). The definition of stripper wells varies. For oil, stripper production is usually defined as production rates of between 5 and 15 barrels of oil per day (BOPD). In 1998, a total of 36,885 wells representing over 98% of the producing oil wells in Kansas averaged less than 15 BOPD and would be classified as stripper production. These stripper wells produce approximately 75% of total Kansas' oil production. Each of these well bores represents a very large capital investment that is at risk of being plugged and abandoned. Each existing stripper well represents a resource that is put back into production when prices rise sufficiently to make production economic. Monthly changes in production over the last decade have shown a strong positive correlation to current wellhead prices (Figure 18).

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In 1999, 2,273 different operators reported oil production. The average Kansas independent produced just over 15,000 barrels of oil in 1999. The top ten producing companies produced approximately 25% of the oil in 1999. All ten top producing companies are independents. Five of the top ten producing companies are headquartered and primarily operate in Kansas (Oklahoma 2, Texas 3). Independent operators dominate Kansas' oil production. Large integrated petroleum companies control less than 5% of Kansas' oil production (e.g., BP Exxon-Mobil or Texaco).

Natural Gas (Southwest Kansas and the Death of Seasonality: Kansas gas production is dominated by the large fields of southwest Kansas (e.g., Hugoton, Panoma, Byerly, Bradshaw, and Greenwood). However, stripper gas production in Kansas is significant. Stripper gas production would generally be anything less than 90 thousand cubic feet per day (MCFPD). In Kansas, 63% of the 17,146 producing gas wells averaged less than 90 MCFPD and produced 24.1% of the gas. As with oil, stripper gas production is sensitive to changes in the wellhead oil price and well operating costs (e.g., electricity, taxes, and wages).

In 1999, 1,015 different operators reported natural gas production. The average Kansas independent produced just less than 550,000 mcf of gas in 1999. The top ten producing companies produced approximately 78% of the gas in 1999. Seven of the top ten producing companies are independents. Kansas' gas production is a mix of the largest integrated companies and independent companies.

The seasonal nature of natural gas production has changed significantly after the mid-1990's. Prior the mid-1990's natural gas displayed a seasonal pattern with peak production during the winter heating season (Figure 23). This variation in production was also reflected in seasonal price fluctuations. With the construction of underground gas storage, the development of futures markets, and the increased use of natural gas in electric power generation, seasonal variations in production and price have disappeared. As a result, during the summer there is no longer a cheap and plentiful supply of natural gas to power irrigation pumps in southwest Kansas.

PRESENT CONDITIONS

In summary, we are seeing rapid changes in our energy systems and strong challenges to maintaining reliable supply to the consumer. The changes come for a number of different quarters, and are domestic in origin (They affect parts of energy system that are not dominated by imports).

Natural Gas: Demands on natural gas for electric power generation are absorbing all the excess natural gas supply during warm months, gas that traditionally was put into storage for use as a home heating fuel during the winter. As a result entered the winter of 2000-01 with very low natural gas storage levels and extremely high prices (Figures 23, 24).

The last few winters have had above-normal temperatures, masking the increased demand for natural gas resulting from the strong economic growth and the increased electrification. The winter of 1999-2000 had 3,404 Heating Degree Days (HDD). The normal winter is 3,958 HDD.

As this winter appears more seasonable, wellhead prices have exceeded $9-10/MCF for periods of time. As storage levels approach historically low levels, the ability of underground natural gas storage facilities to meet peak demand will be significantly degraded. By using natural gas to solve an electric supply problem, we have created a gas supply problem. The highest prices may coincide with the end of the heating season and the onset of irrigation as storage levels reach their lowest levels (i.e., April-May-June, Figure 20).

If we limp out of the winter 2000-01 with less than 500 Bcf of gas in storage, we will barely get storage back to even half-full before newly installed summer gas-fired electricity plants are cranked up. If summer weather is hot, particularly in the population areas of the eastern U.S., gas storage withdrawals may occur in the summer. If this does not happen in summer 2001, it will almost certainly occur a year later. Once gas withdrawals begin in the summer, the U.S. has one winter left before our storage system runs dry.

Electricity: At the national level our additions to electric power generation capacity have not keep up with demand. The consequence our excess capacity cushion at peak demand has diminished from 25% to less than 10%. Rolling brownouts/blackouts have become more frequent both in the upper Midwest and west coast. We have set off on a building binge of capacity additions (Figure attached to Testimony). In 1998 we had a net addition of a negative one thousand megawatts. In 1999, we added 10.3 thousand megawatts. Through the first 9 months of 2000, over 23 thousand megawatts of capacity was added. Almost 98% of this capacity was gas fired. If you convert the additions of the last two years to gas consumption you come up with an approximate increase of 2 trillion cubic feet. That is a 10% increase in consumption in less than 2 years.

We have the pedal to the metal: As we face a hydra-like energy crisis that seems to grow new heads every day, we have been whip our energy system from side to side and run it at full bore. First gasoline shortages, so we run our refineries at near full utilization during the summer with a gasoline bias when we should have been producing distillates. So we create a heating oil crisis (Figure 19). We again go full bore with a distillate bias when we should be shutting down for maintenance and producing gasoline stocks for summer. Expect tight gasoline supplies this summer (You are already see prices begin to creep upwards). We are in danger of seeing a refinery failure. We are already seeing failures of electric generation plants on the west coast, pipeline failures in New Mexico and gas storage failures close to home. I am not saying that any of these were due to lack of maintenance, but one can not run any mechanical system at full bore, all the time, without inducing failure. We have failed to build sufficient capacity in our energy production and transportation systems and we can expect to pay the price.

Energy is a Global Integrated Market: With improved communication and transportation of energy (The two major factors in Adam Smith's *Invisible Hand*), we have radically changed energy markets. Energy is increasingly a national and global market dominated by high technology, high capital requirements and large integrated companies. All companies are now competing to various degrees in an unregulated market (Even our regulated utilities). Small and mid-sized companies, which dominate the Kansas energy system, must continue to innovate in order to compete. To meet the rapid changes in energy demand, Kansas must work to increase energy supply to prevent shortages and maintain reasonable costs. Kansas and US energy supply will continue to be dominated by fossil fuels. However, an economic and measured approach

that integrates new energy sources (e.g., wind and ethanol production from agricultural production) into the Kansas energy system can have a positive impact. Increased synergy and efficiencies are required among all the various aspects of the Kansas energy system.

KANSAS NEEDS

High Risk Technology: Over the past two decades economic incentives have not been adequate to attract capital to increase drilling activity and maintain our personnel and capital infrastructure. To substantially increase petroleum production will require attracting technical talent, increased application of technology, and improved access to high risk capital. Risk capital is an essential prerequisite to application of new innovative technologies to increase energy production. Large integrated international companies have relatively easy access to capital markets and significant internal cash flows that can be accessed for innovation capital. Banks, small investors, internal cash flow, and other traditional sources of capital for the Kansas independent cannot meet the capital needs for high-risk projects that represent early or first application of new technologies. There is no source of capital at the state level for Kansas energy producers to use for new technology and high-risk innovation. The Survey and the KU Energy Research Center have worked with Kansas independents to locate this capital at the federal level (usually 50/50 or 40/60 match dollars). I believe we are seeing some positive impacts that have the potential to significantly increase Kansas energy production. However, federal dollars are very limited, competitive, and focused on national problems. If this capital is not readily available, we can expect energy production in Kansas will continue to decline.

Improved Energy Data: When putting together the Kansas Energy Report, we had to pull data from numerous sources. Some of this data such as electric power plant production and emissions is passed upwards to the federal government, but to my knowledge is not available at the state level (e.g., EPA-AIRS, FERC-423, EIA-861, EIA-860, EIA-759). We are working with federal agencies to bring Kansas data back to Kansas (In some cases we may be designing relational database systems to improve our access to our own data). Can't we devise systems and requirements to intercept these reports as they travel to Washington? Also, our oil and gas reporting system is scattered among different agencies with different missions (e.g., KDOR, KCC, KDHE and the Survey). We need to improve our collection and dissemination of data. Paper copies stashed away in file cabinets do not represent an efficient approach.

Summary Comments: There are two other quotes from Shakespeare's Richard:

Avoid the Kingdom of perpetual night

and to complete the couplet

Now is the winter of our discontent.

Made glorious summer by this sun of York.

We need to get to work. It will take time, but I believe we can make it so.

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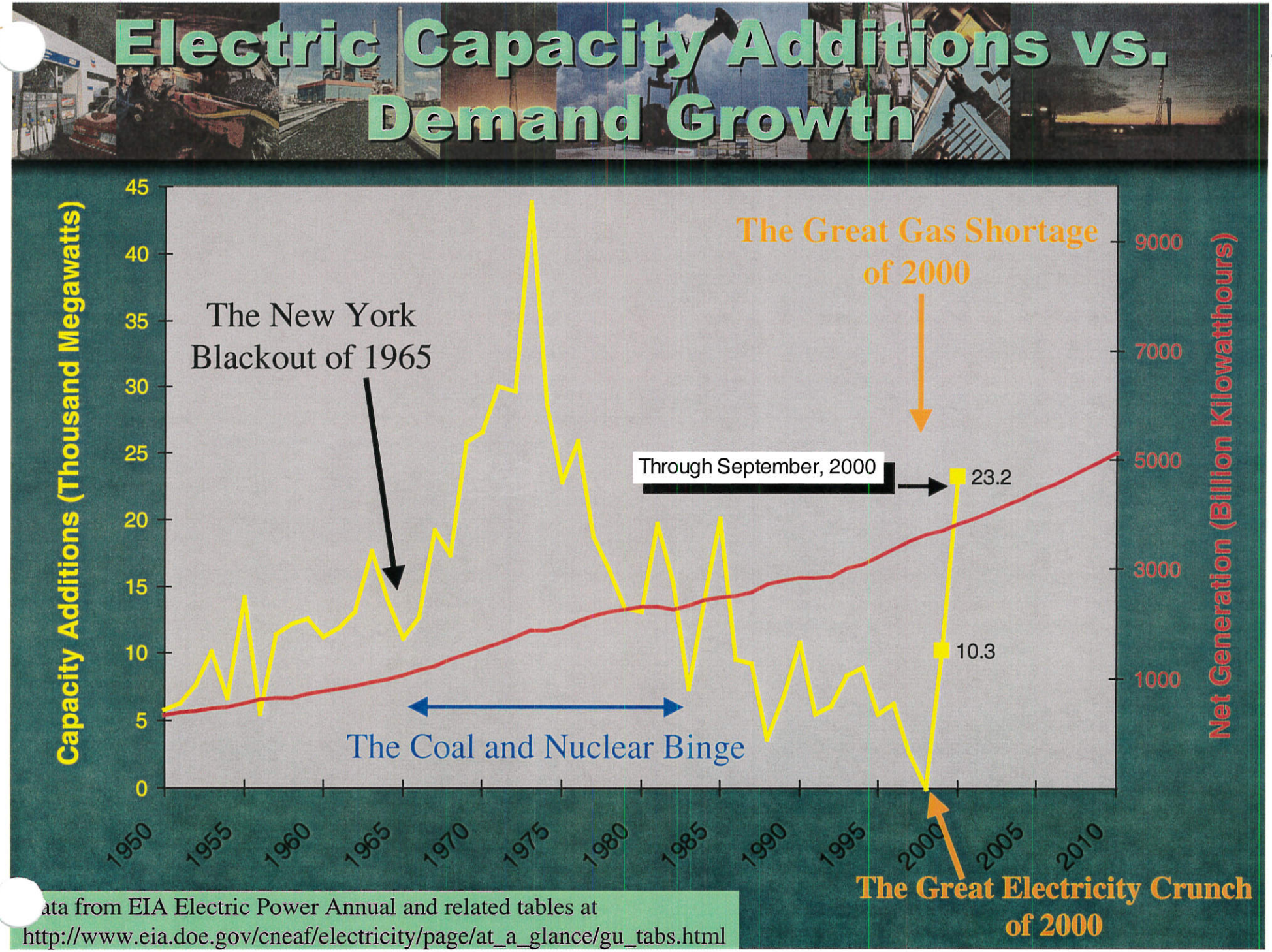
Electric Capacity Additions vs. Demand Growth



ata from EIA Electric Power Annual and related tables at
http://www.eia.doe.gov/cneaf/electricity/page/at_a_glance/gu_tabs.html

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