

Kansas Energy Chart Book 2008

Kansas Energy Council
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www.kec.kansas.gov

Kansas Energy Chart Book

The charts, graphs, and tables in the *Kansas Energy Chart Book* are intended to supplement the content in the [Kansas Energy Plan](#), which is published annually by the Kansas Energy Council. Relevant charts, graphs, and tables will be added and existing ones revised as new data become available and as additional sections of the plan are developed. See KEC web site (http://www.kec.kansas.gov/chart_book.htm) for online versions of these charts.

Chapter 3: Fossil Fuels

Kansas Net Electrical Generation, July 2006.....	2
U.S. Coal Consumption, 2000 – 2030: Total Consumption vs. Consumption for Electric Generation.....	2
U.S. SO ₂ Emissions from Various Sources, 2000.....	3
U.S. NO _x Emissions from Various Sources, 2000	3
Kansas Total NO _x Emissions by Source, 2002.....	4
Kansas Total NO _x Emissions from Point Sources, 2005	4
U.S. Mercury Emissions from Various Sectors, 1994 – 1995	5
U.S. CO ₂ Emissions from Various Sectors, 2005	5
Projected Impact on Selected Kansas Electric Utilities of \$1.00 Per Ton Tax on CO ₂	6
Proposed and Existing Coal-Fired Power Plants in Kansas, 2007.....	6
Kansas CO ₂ Emissions from Combustion of Oil, Gas, and Coal, 1960 – 2001.....	7
Kansas Per Capita CO ₂ Emissions by Source, 1960 – 2001	7

Chapter 5: Biomass and Biofuels

Percentage of Combined Kansas Corn and Sorghum Crop Used for Ethanol Production, 2000 – 2006....	10
U.S. Corn Price vs. Ethanol Production, 1991 – 2006.....	10
Life-cycle Greenhouse Gas Emissions Reductions of Various Biofuels Compared to Fossil Fuel Equivalent.....	11
Emissions from Different Ethanol Blends as Percentage of Unleaded Gasoline Emissions	11
U.S. Gasoline and E85 Prices, 2003 – 2006	12
U.S. Diesel vs. Biodiesel (B20) Prices, 2000 – 2007.....	12
Ethanol Consumption as a Percentage of Total U.S. Gasoline Consumption, 2000 – 2005.....	13
Biodiesel Consumption as a Percentage of Total U.S. Diesel Consumption, 2001 – 2005	13
U.S. Ethanol Gross Margins Based on Near Futures Prices, March 2005 – September 2007.....	14
Projected U.S. Ethanol Gross Margins, December 2007 – November 2009	14
Corn-based Ethanol Production Cost by Plant Size, Dry and Wet Mill	15
Projected U.S. Distillers Grain Production and Prices, 2006 – 2016.....	15
Historic and Projected U.S. Corn Usage, 1995 – 2008.....	16

Chapter 6: Wind Energy

Wind Energy Project Activity in Kansas, January 2008.....	18
Kansas Wind Energy Resource Map and Electric Transmission.....	18
Kansas Net Electrical Generation, Thousand Megawatthours, July 2006 – June 2007.....	19
Projected Impact on Selected Kansas Electric Utilities of \$1.00 Per Ton Tax on CO ₂	19
Kansas Wind Farm Production and Average Capacity Factors, 2002 – 2006	20
U.S. Installed Wind Energy Capacity in Megawatts (MW), September 2007.....	20

Chapter 9: Energy Conservation and Efficiency

U.S. Direct Energy Consumption by Sector, 2007	22
Kansas Direct Energy Consumption by Sector, 2004.....	22
Kansas Facility Conservation Improvement Program (FCIP): Projects, December 2007.....	23

Average Annual Household Energy Expenditures in the Midwest.....	23
Leadership in Energy and Environmental Design (LEED) Certified Green Buildings in Kansas, October 2007	24
Average U.S. Household Annual Electrical Use for Common Appliances	24
Kansas Per Capita Natural Gas Consumption, 1997 – 2005	25
Kansas Natural Gas Consumption by Sector, 1997 – 2005	25
Kansas Natural Gas Prices by Sector, 1997 – 2006	26

Chapter 10: Energy Use in the Transportation Sector

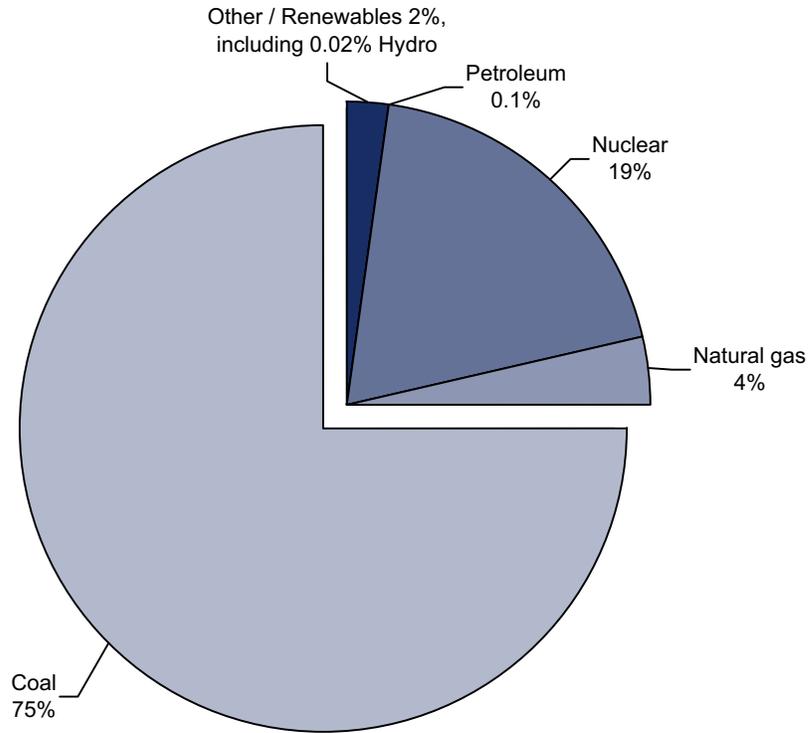
U.S. Transportation Energy Use per Passenger Mile, 1975 – 2005.....	28
Total Vehicle Miles Traveled (VMT) in the U.S., 1997 – 2005	28
Total Vehicle Miles Traveled (VMT) in Kansas, 1997 – 2005	29
Average Vehicle Miles Traveled (VMT) Per Capita in Kansas and the U.S., 1997 – 2005	29
Kansas Total NO _x Emissions by Source, 2002.....	30
Comparison of NO _x Emissions in Selected Areas of Kansas and Los Angeles, 2002	30
Comparison of Volatile Organic Compound (VOC) Emissions in Selected Areas of Kansas and Los Angeles, 2002.....	31
Commuting to Work in Kansas, 2005.....	31
E-85 and Biodiesel Fueling Stations in Kansas, November 2007	32
State of Kansas Vehicle Fleet, 2007: Vehicle Type.....	32
State of Kansas Vehicle Fleet, 2007: Vehicle Year	33
Vehicle Speed vs. Fuel Consumption	33
Vehicle Speed vs. Greenhouse Gas Emissions	34
Kansas Railroad Track Miles Abandoned, 1980 – 2006.....	34
Kansas Off-road Fuel Consumption, 2005	35

Chapter 11: Energy Use in the Agricultural Sector

U.S. Direct Energy Consumption by Sector, 2007	38
Kansas Direct Energy Consumption by Sector, 2004.....	38
Monthly Diesel Prices in SW Kansas and U.S., January 1996 – July 2006	39
U.S. Monthly Natural Gas Prices, January 1996 – July 2006.....	39
Kansas Agricultural Machinery Costs Per Acre, 2001	40
Fuel and Oil Costs for Irrigated Farms in Kansas Farm Management Association (KFMA), 2000 – 2007.....	40
Fuel and Oil Costs for Non-irrigated Farms in Kansas Farm Management Association (KFMA), 2000 – 2007	41
Irrigation Energy Costs for Farms in Kansas Farm Management Association (KFMA), 2000 – 2007.....	41
Energy-related Costs for Irrigated Farms in Kansas Farm Management Association (KFMA), 2000 – 2007	42
Energy-related Costs for Non-irrigated Farms in Kansas Farm Management Association (KFMA), 2000 – 2007	42
Percentage of Kansas Acres in No-till by Crop, 1989 – 2004	43
Comparison of Fuel and Oil Costs in North-central Kansas, 1996 – 2005: No-till vs. Conventional- and Reduced-till	43
Agricultural Tillage Systems in Kansas, 1989 – 2004.....	44
Projected Annual Fuel Savings from Conversion of All Kansas Crop Production to No-till.....	44
Projected Annual Dollar Savings from Conversion of Kansas Crop Production to No-till.....	45
Kansas Acres Scheduled to Come Out of Conservation Reserve Program (CRP), 2006-2007, and Extension and Re-enrollment Offers	45
Summary of Federal and State Resource Management Programs and Management Practices that Promote Energy Savings and Carbon Sequestration.....	46

Chapter 3: Fossil Fuels

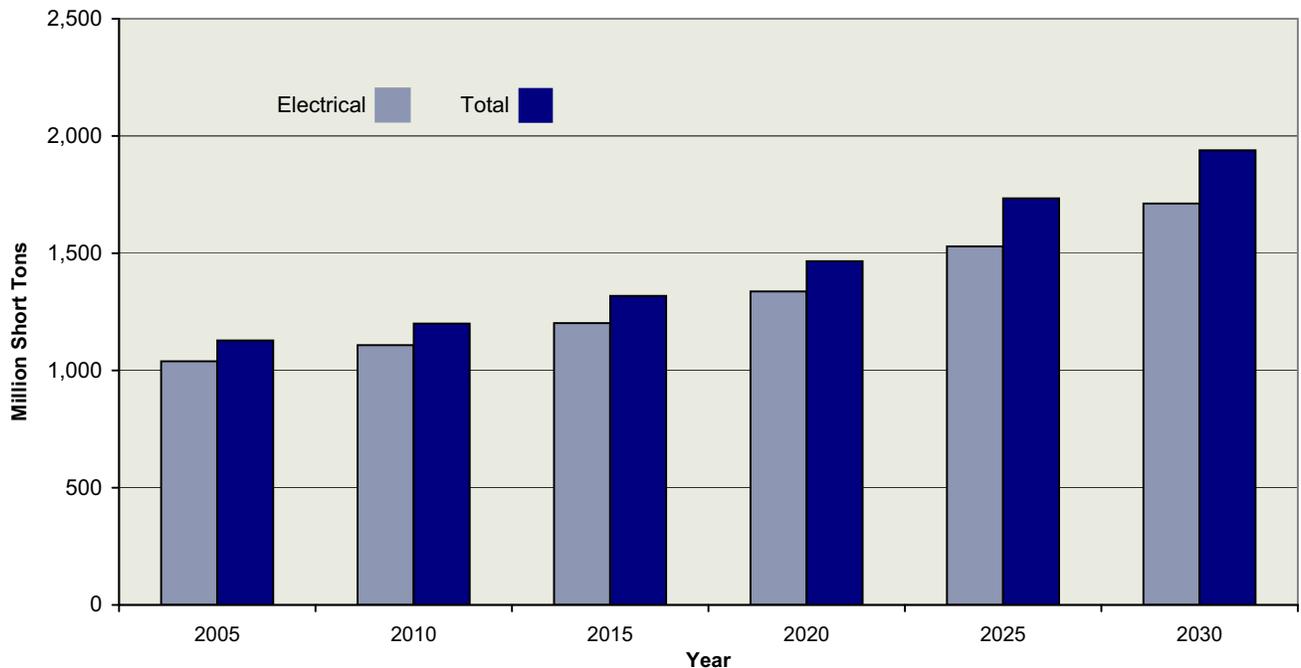
Kansas Net Electrical Generation, July 2006 through June 2007



Source: U.S. Dept. of Energy, Energy Information Administration (EIA), 2007, Electric Power Monthly, various months, DOE/EIA-0226 (2006 - 2007/VARIOUS); http://www.eia.doe.gov/cneaf/electricity/epm/matrix96_2000.html (Accessed December 2007)

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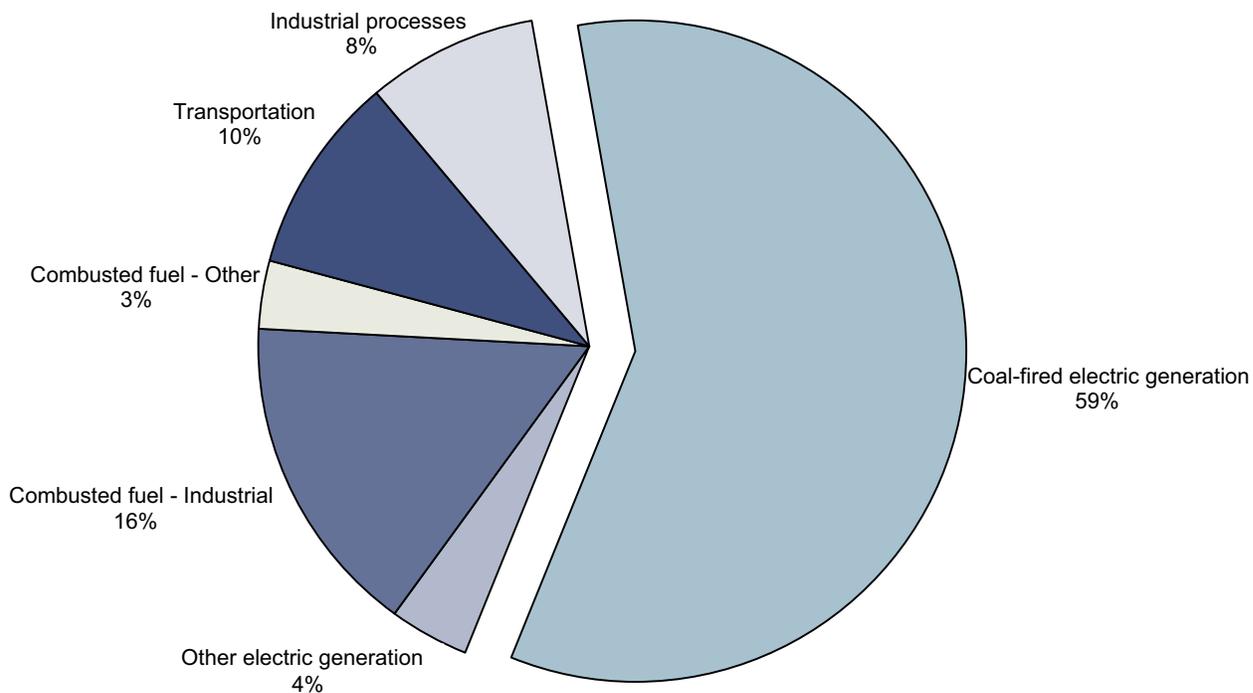
U.S. Coal Consumption, 2000 – 2030: Total Consumption vs. Consumption for Electrical Generation



Source: U.S. Dept. of Energy, Energy Information Administration (EIA), Annual Energy Outlook, 2007; U.S. Coal Consumption by End-use Sector, 1st Quarter 2007; http://www.eia.doe.gov/oiaf/aeo/excel/aeohmtab_8.xls (accessed December 2007)

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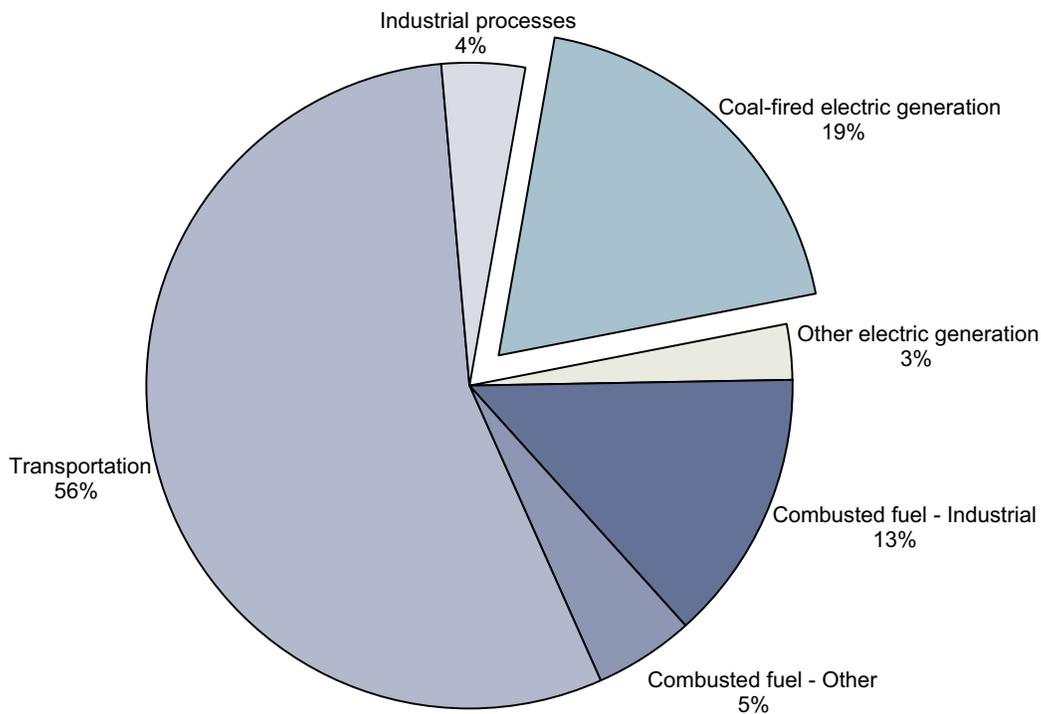
U.S. SO₂ Emissions from Various Sources, 2000



Kansas Energy Chart Book, Chapter 3

Source: National Air Quality and Emissions Trends Report, 2003, Appendix A, Tables A-4 and A-9

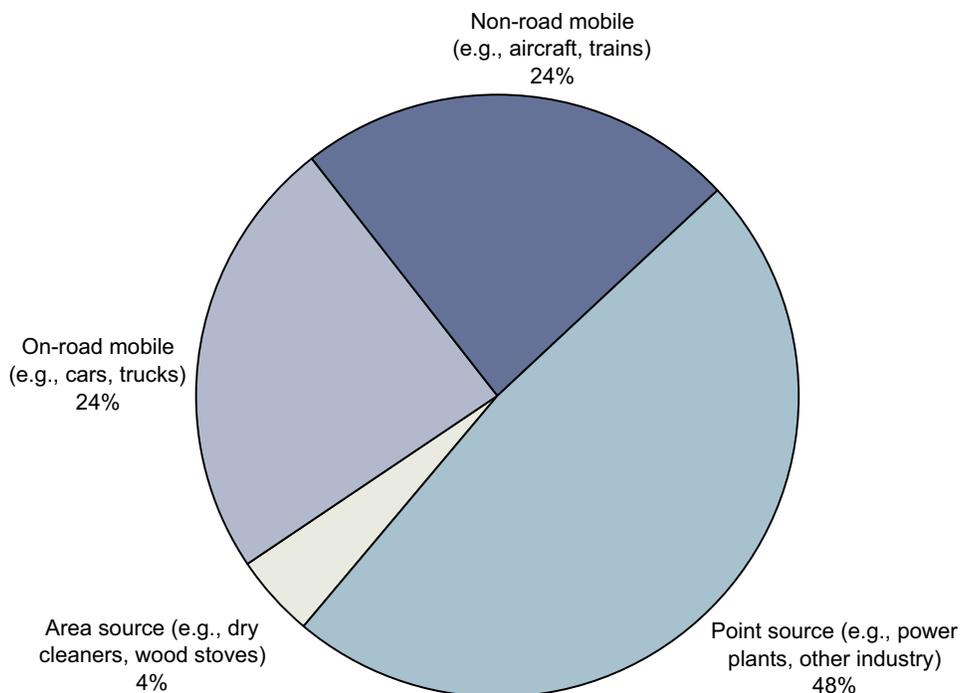
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Kansas Energy Chart Book, Chapter 3

Source: National Air Quality and Emissions Trends Report, 2003, Appendix A, Tables A-4 and A-9

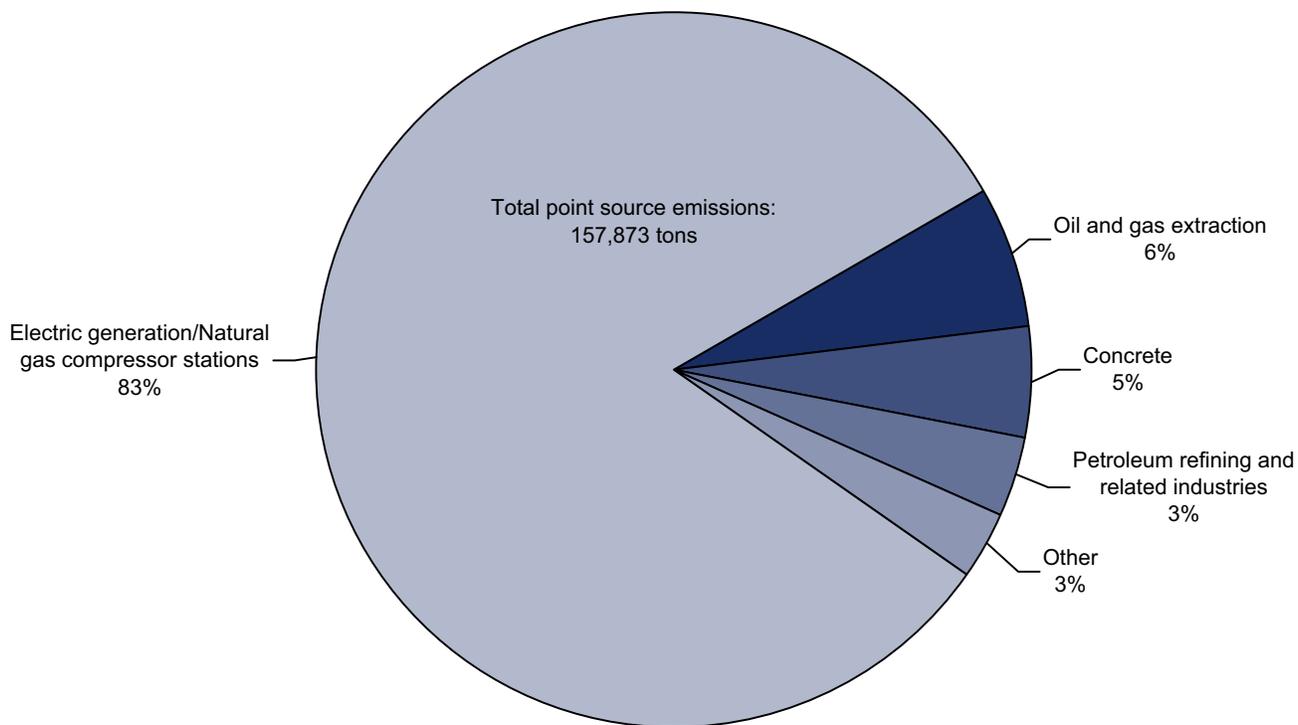
Kansas Total NO_x Emissions by Source, 2002



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Source: KDHE Bureau of Air and Radiation, based on 2002 National Emissions Inventory (NEI)

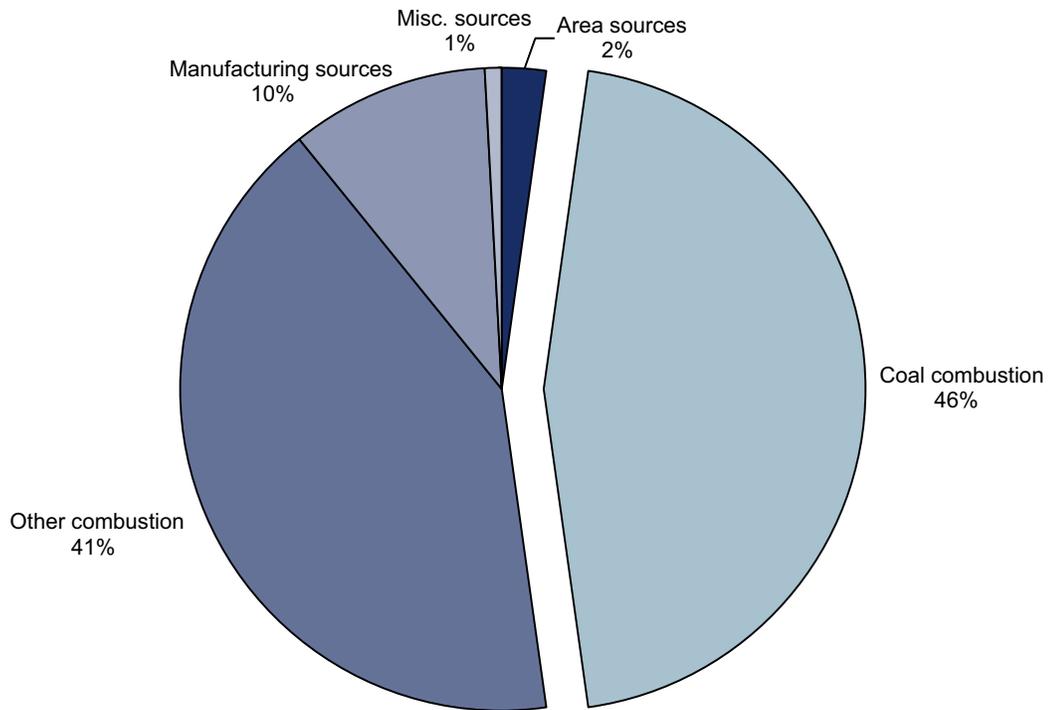
Kansas Total NO_x Emissions from Point Sources, 2005



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Source: KDHE Bureau of Air and Radiation, based on 2005 National Emissions Inventory (NEI)

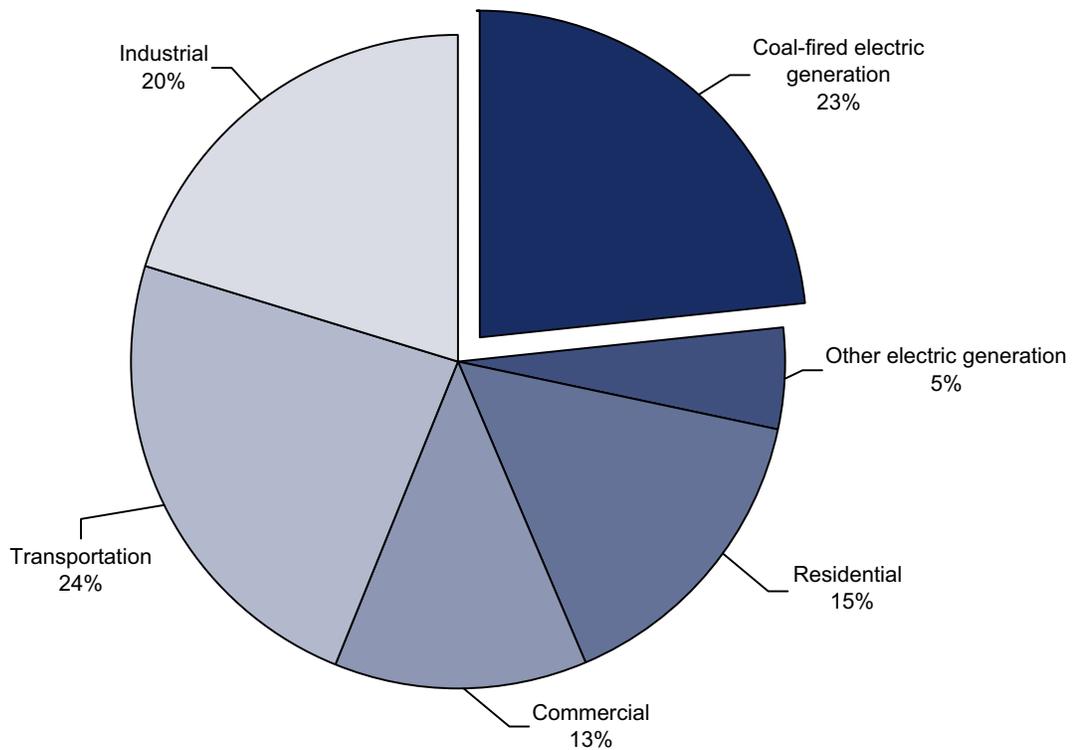
U.S. Mercury Emissions from Various Sectors, 1994 – 1995



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Source: Mercury Study Report to Congress, EPA-452/R-97-004, Dec. 1997, Table ES-3

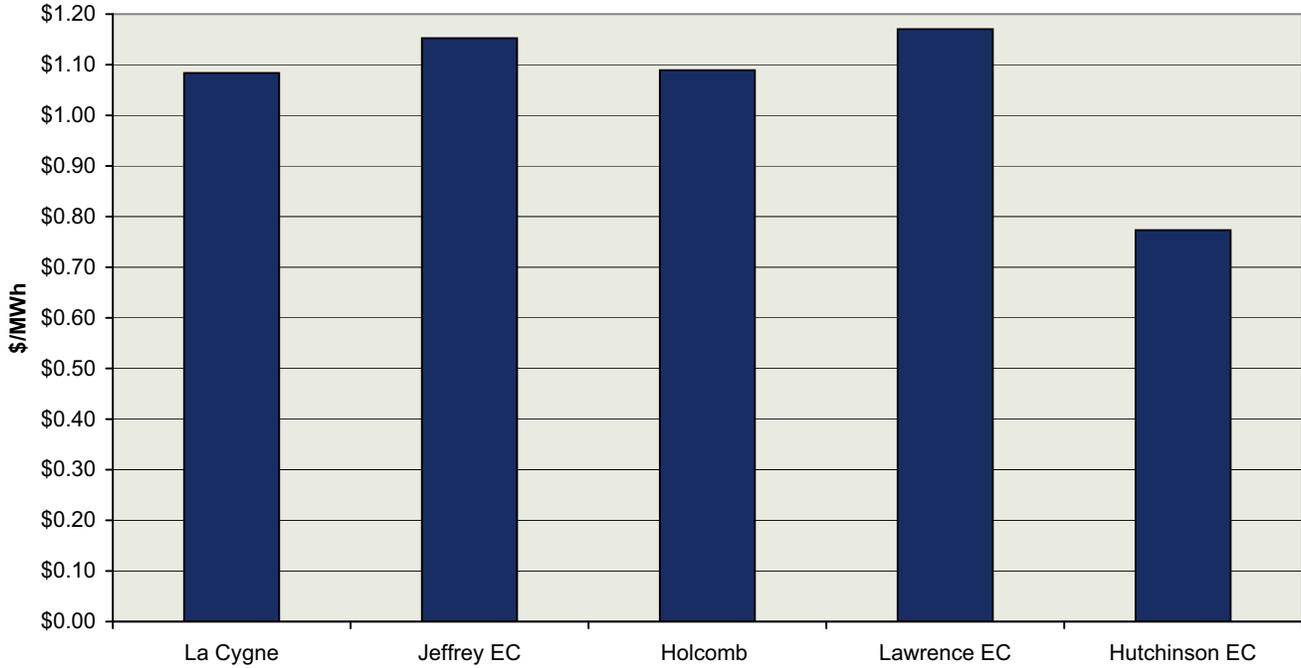
U.S. CO₂ Emissions from Various Sectors, 2005



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Source: U.S. Dept. of Energy, Energy Information Administration (EIA), Greenhouse Gas Emissions

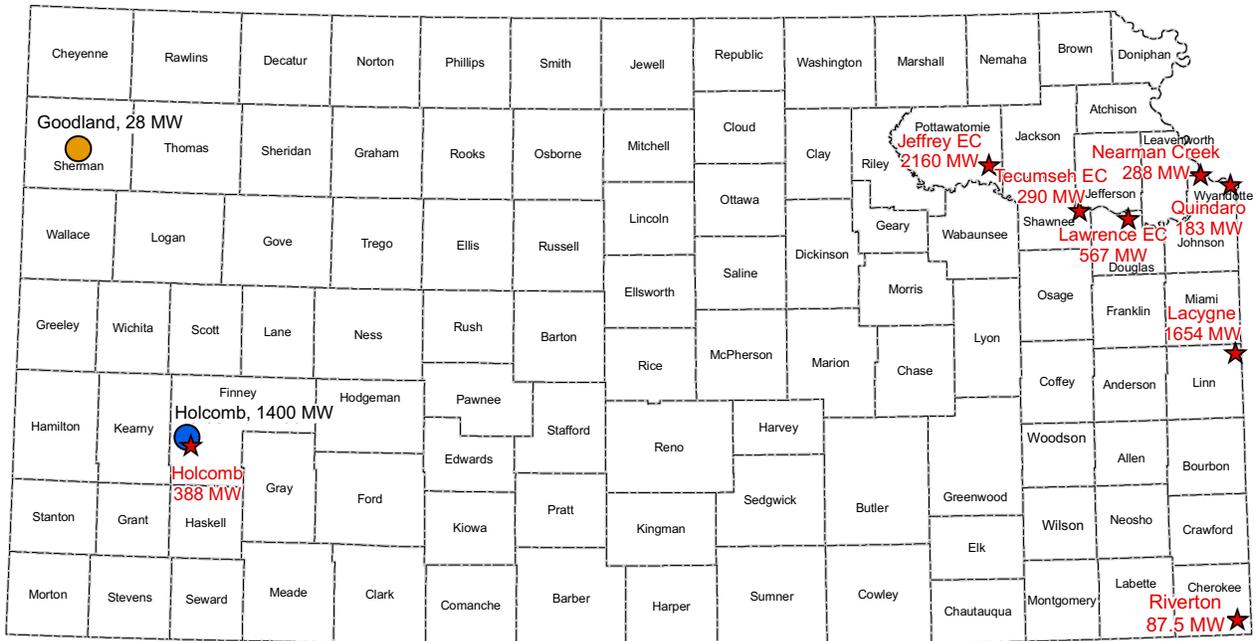
Projected Impact on Selected Kansas Electric Utilities of \$1.00 per Ton Tax on CO₂



Source: U.S. Dept. of Energy, Energy Information Administration (EIA), EIA-906/920 and EIA-860 databases, August 2007:
http://www.eia.doe.gov/cneaf/electricity/page/eia906_920.html (accessed September 2007)

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Proposed and Existing Coal-fired Power Plants in Kansas, 2007

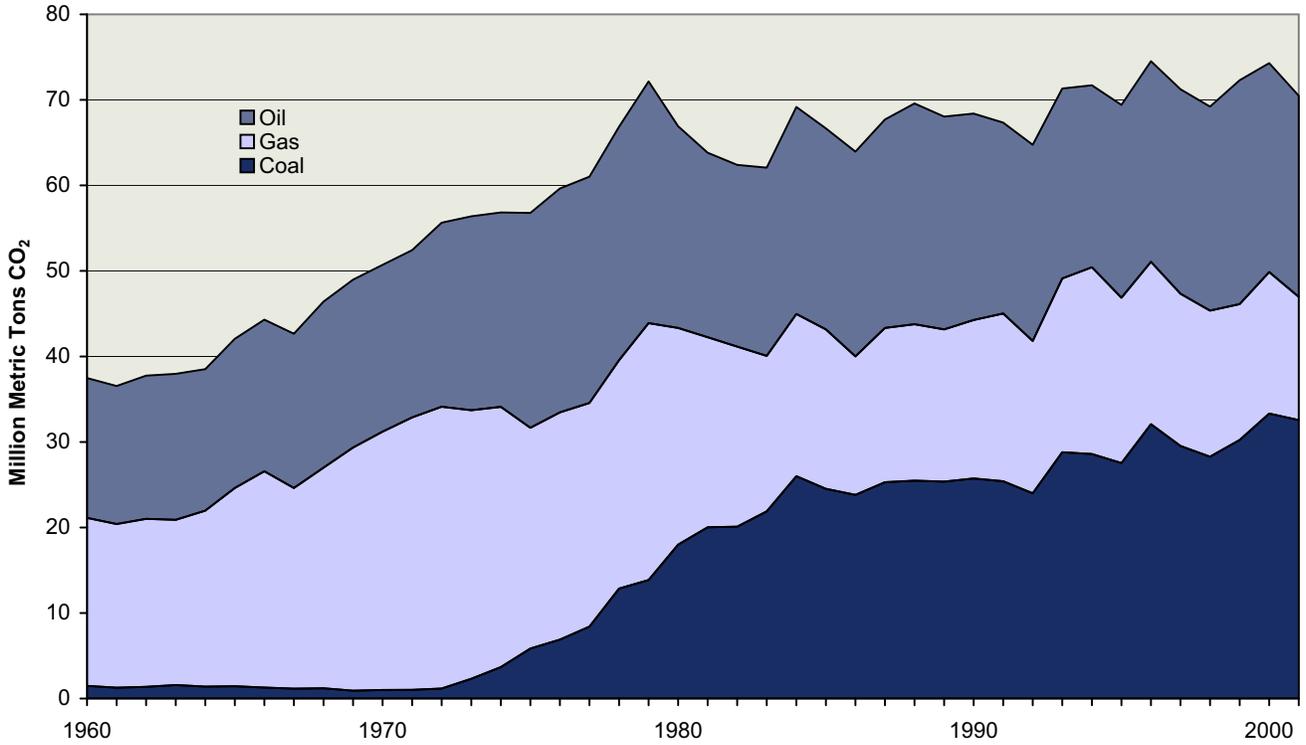


- Proposed
- Under Construction
- ★ Existing

Sources: Based on data from the 2006 Federal Energy Regulatory Commission (FERC) Form 1: <http://www.ferc.gov/docs-filing/eforms/form-1/viewer-instruct.asp>; Quindaro and Nearman Creek data acquired through communication with the Kansas City Board of Public Utilities (KCBPU) (January 2008)

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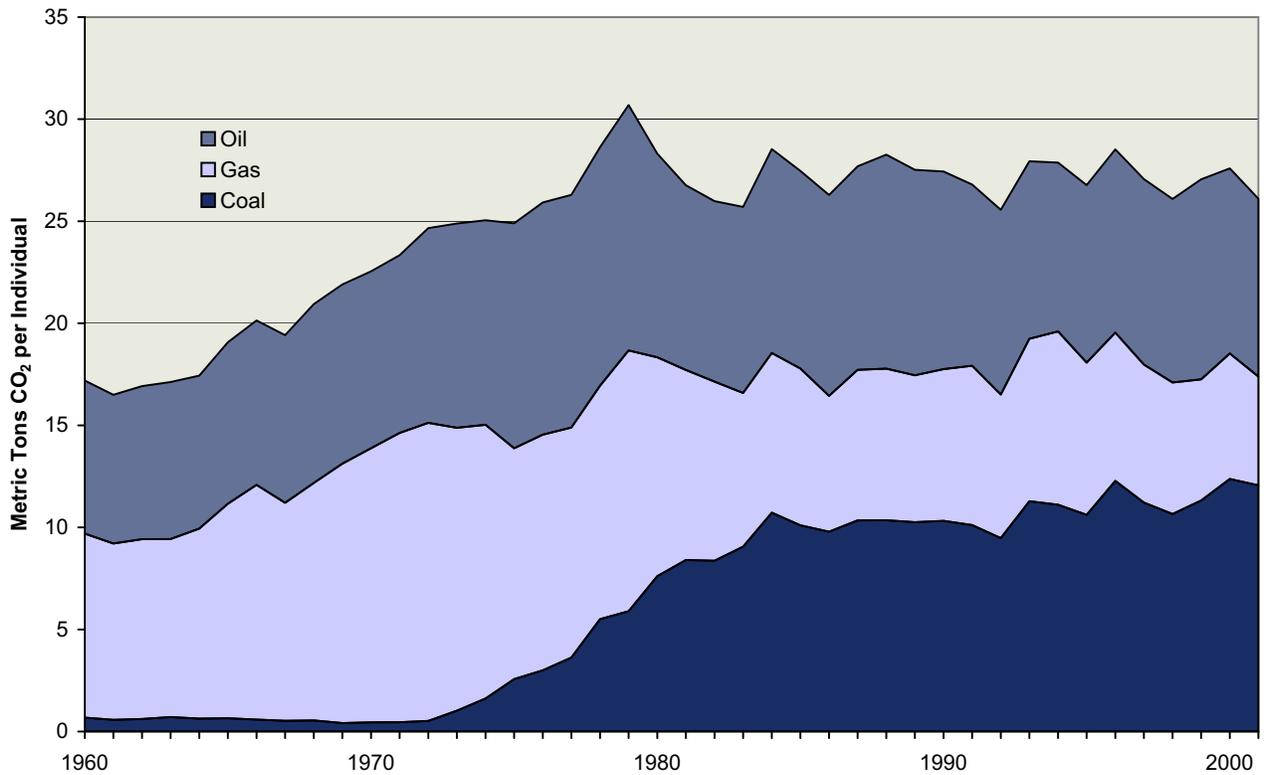
Kansas CO₂ Emissions from Combustion of Oil, Gas, Coal, 1960 – 2001



Kansas Energy Chart Book, Chapter 3

Source: U.S. Dept. of Energy, Carbon Dioxide Information Analysis Center (CDIAC); http://cdiac.ornl.gov/trends/emis_mon/stateemis/data/datacsv.html (accessed December 2007)

Kansas Per Capita CO₂ Emissions by Source, 1960 – 2001

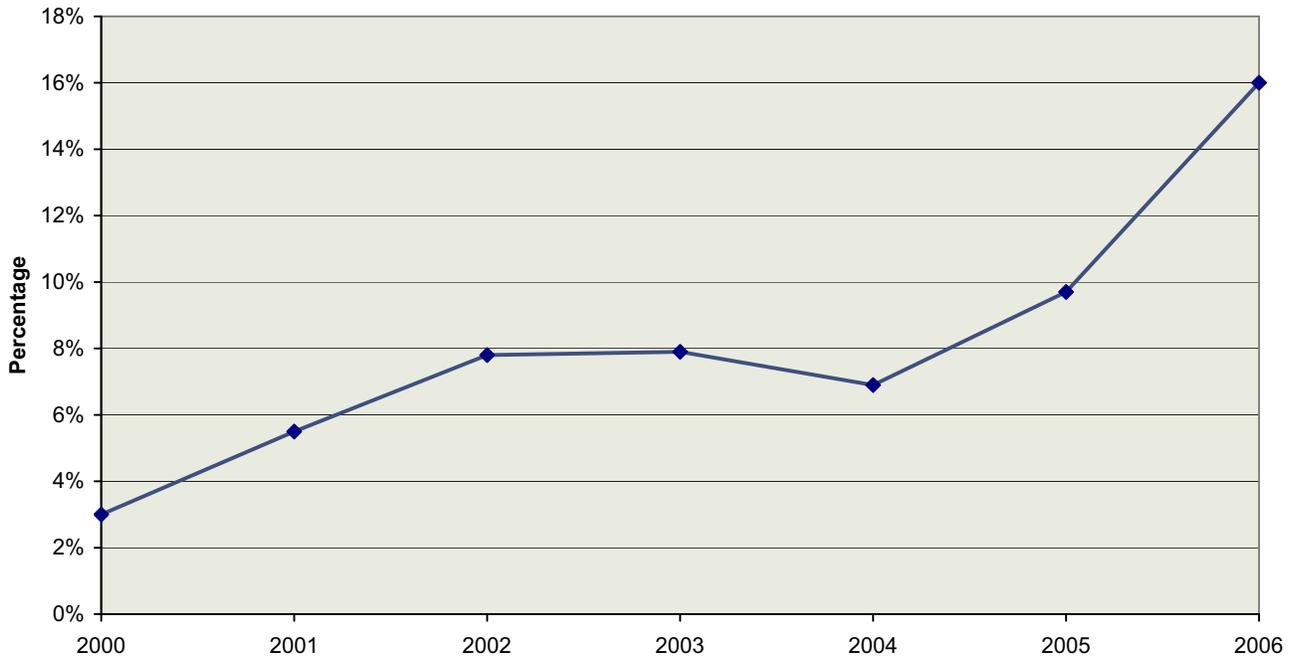


Kansas Energy Chart Book, Chapter 3

Source: U.S. Dept. of Energy, Carbon Dioxide Information Analysis Center (CDIAC) (http://cdiac.ornl.gov/trends/emis_mon/stateemis/data/datacsv.html)

Chapter 5: Biomass and Biofuels

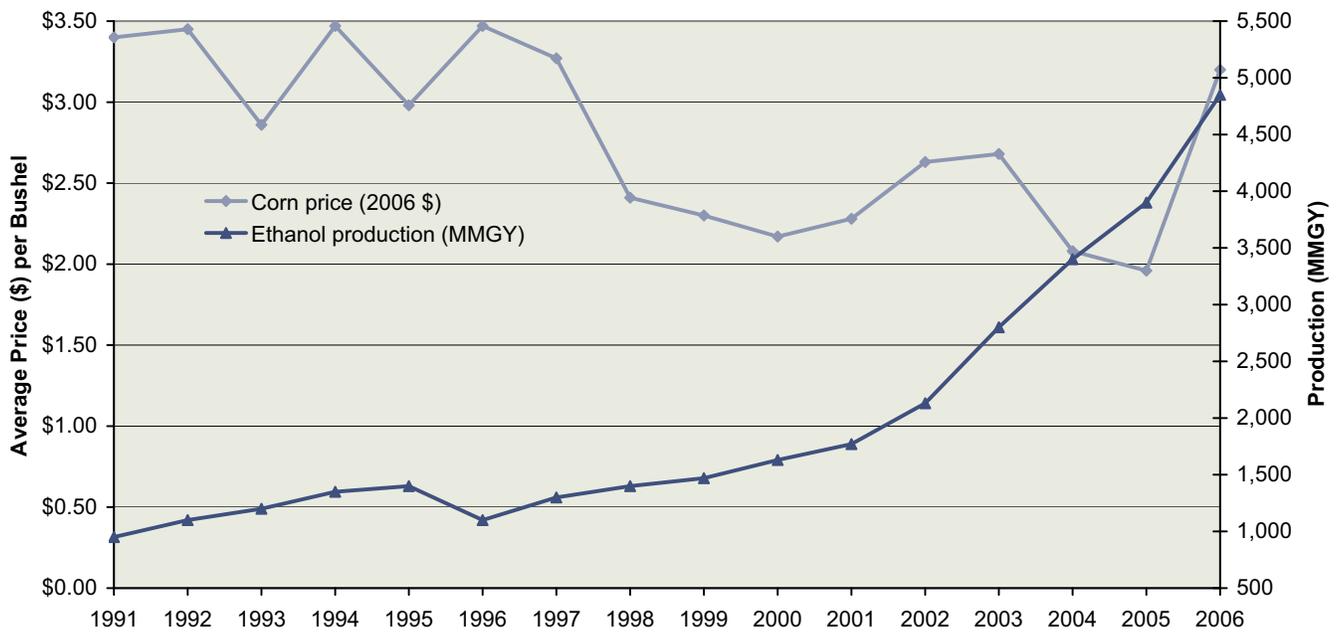
Percentage of Combined Kansas Corn and Sorghum Crop Used for Ethanol Production, 2000 – 2006



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Source: Data prepared by Kansas Grains Staff: www.ksgrains.com (data received October 2007)

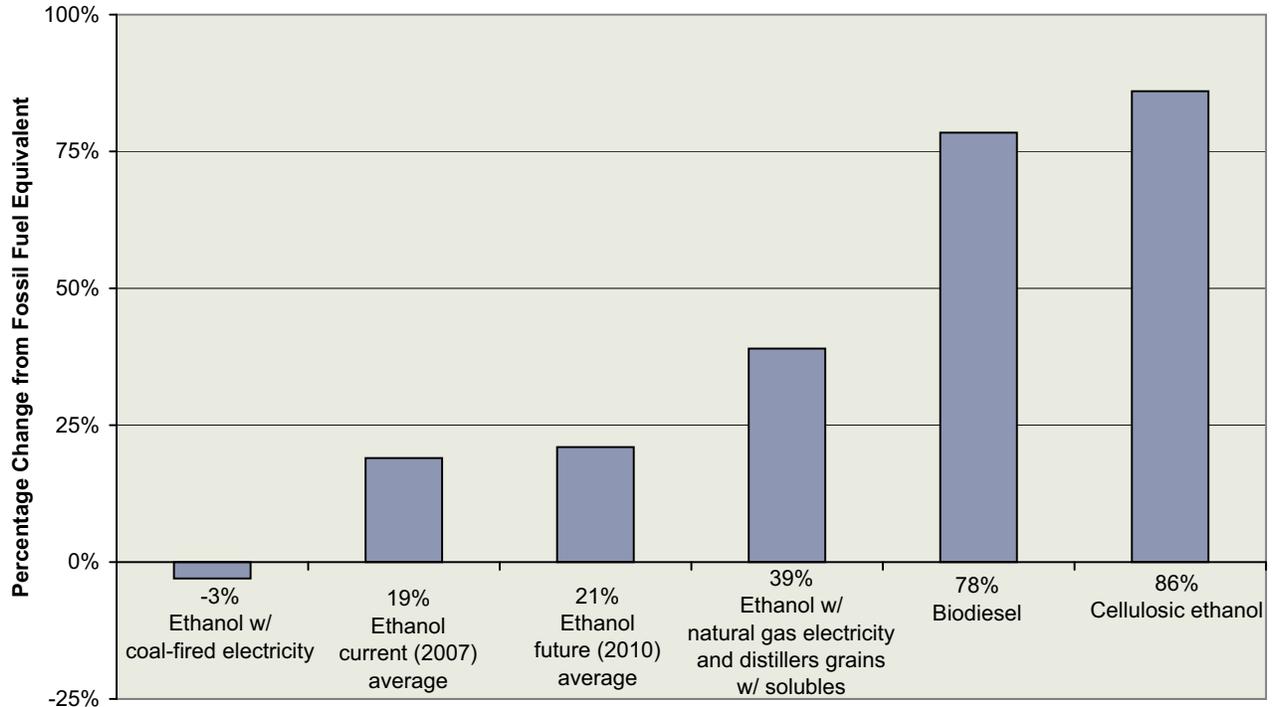
U.S. Corn Price vs. Ethanol Production, 1991 – 2006



Sources: U.S. Dept. of Agriculture, Economics, Statistics, and Market Information System, Agricultural Prices Summary: <http://usda.mannlib.cornell.edu/MannUsda/viewDocumentInfo.do?documentID=1003> (accessed September 2007); Jim Jordan & Associates, prepared for U.S. International Trade Commission, data via Biofuels Journal, Annual and Monthly U.S. Ethanol Production: http://www.biofuelsjournal.com/articles/Annual_and_Monthly_U_S_Ethanol_Production-25474.html (accessed September 2007); Federal Reserve Consumer Price Index Calculator: <http://www.minneapolisfed.org/research/data/us/cal/> (accessed September 2007)

Kansas Energy Chart Book, Chapter 5

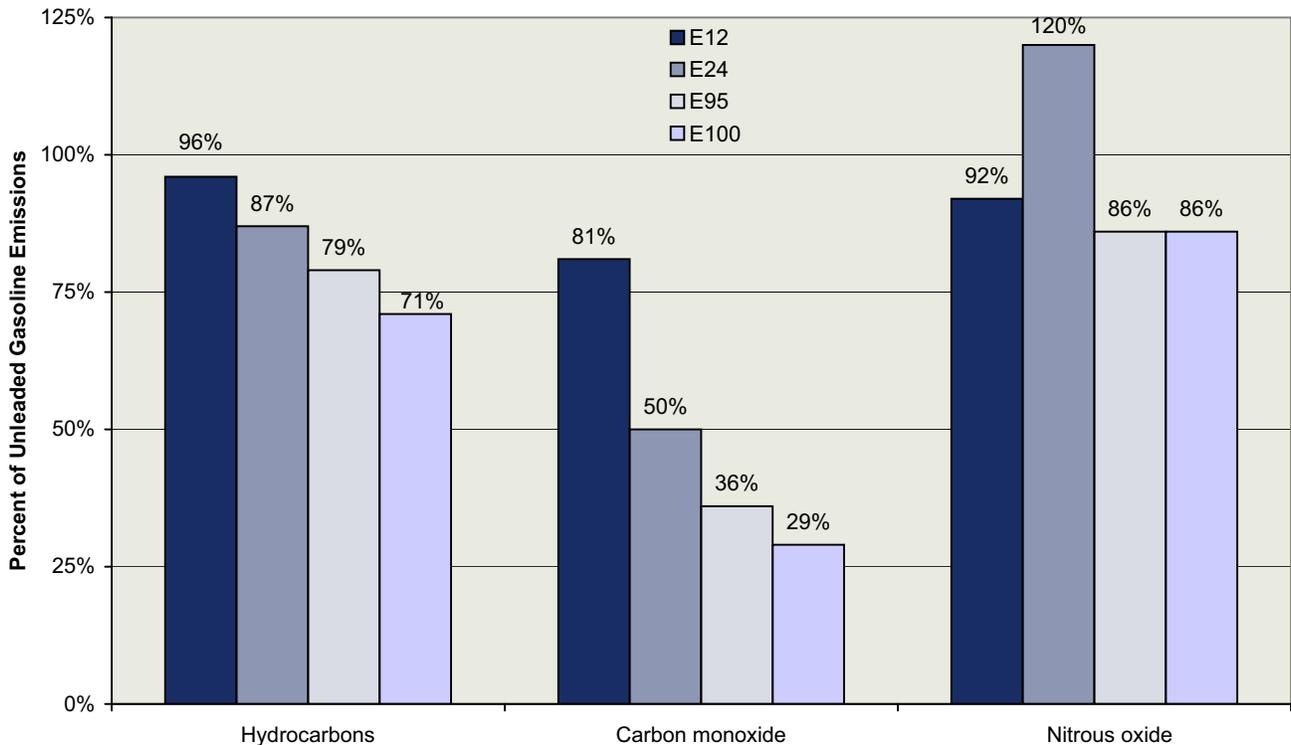
Life-cycle Greenhouse Gas Emissions Reductions of Various Biofuels Compared to Fossil Fuel Equivalent



Sources: Argonne National Laboratory, Center for Transportation Research, Lifecycle Energy and Greenhouse Gas Emissions Impacts of Different Corn Ethanol Plant Types, May 2007: http://www.iop.org/EJ/article/1748-9326/2/2/024001/er17_2_024001.html#erl245942non4; U.S. Dept. of Energy, Lifetime Cycle Inventory of Biodiesel and Petroleum Diesel for Use on an Urban Transit Bus, May 1998: <http://www.nrel.gov/docs/legosti/fy98/24089.pdf> (accessed August 2007)

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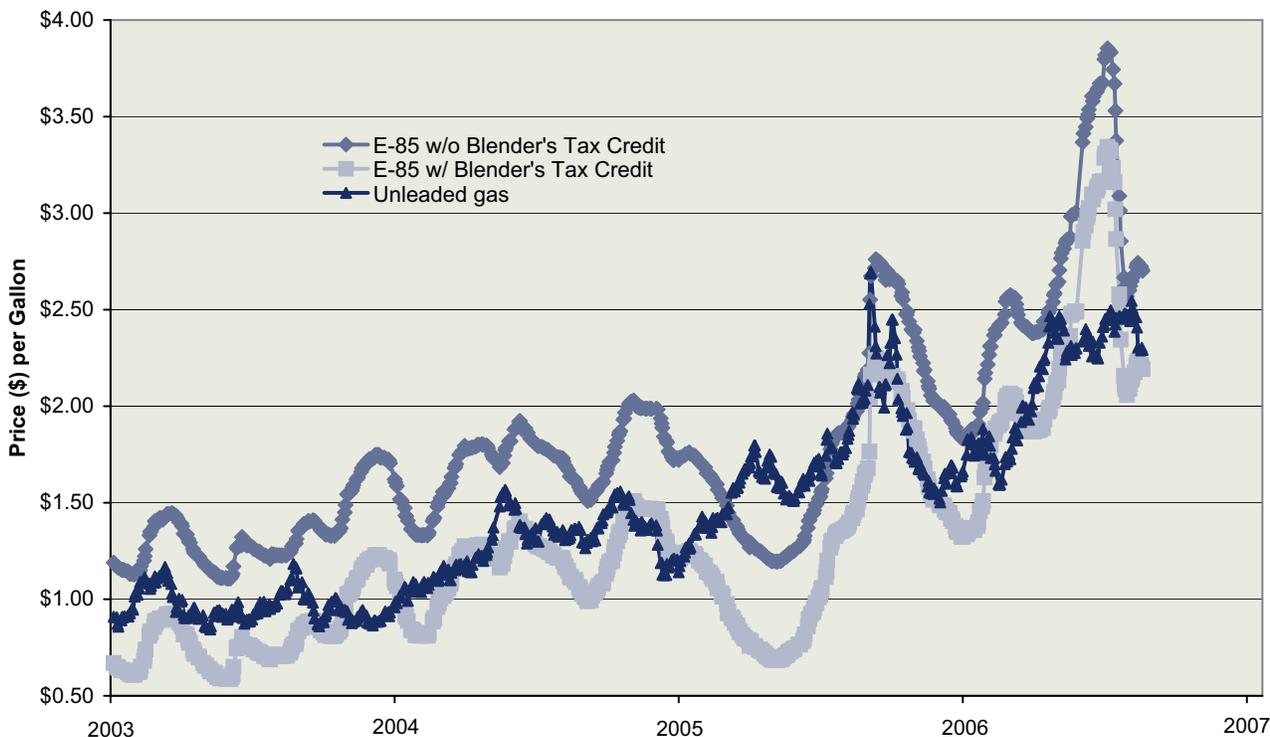
Emissions from Different Ethanol Blends as Percentage of Unleaded Gasoline Emissions



Source: U.S. Dept. of Energy (DOE), National Renewable Energy Laboratory (NREL), Issues Associated with the Use of Higher Ethanol Blends: <http://www.nrel.gov/docs/fy03osti/32206.pdf> (accessed October 2007)

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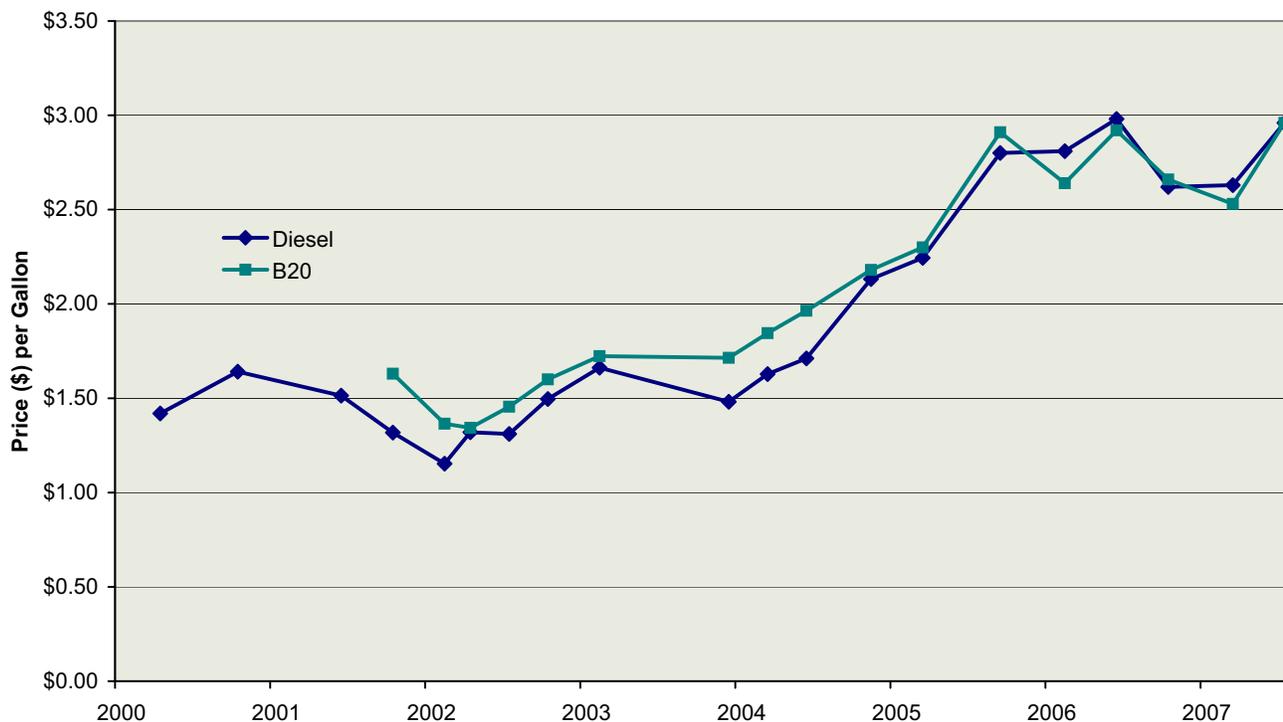
U.S. Gasoline and E-85 Prices, 2003 – 2006



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Source: U.S. Dept. of Energy, Energy Information Administration (EIA), 2007 Energy Outlook: [http://tonto.eia.doe.gov/FTP/PROOT/forecasting/0383\(2007\).pdf](http://tonto.eia.doe.gov/FTP/PROOT/forecasting/0383(2007).pdf) (accessed October 2007)

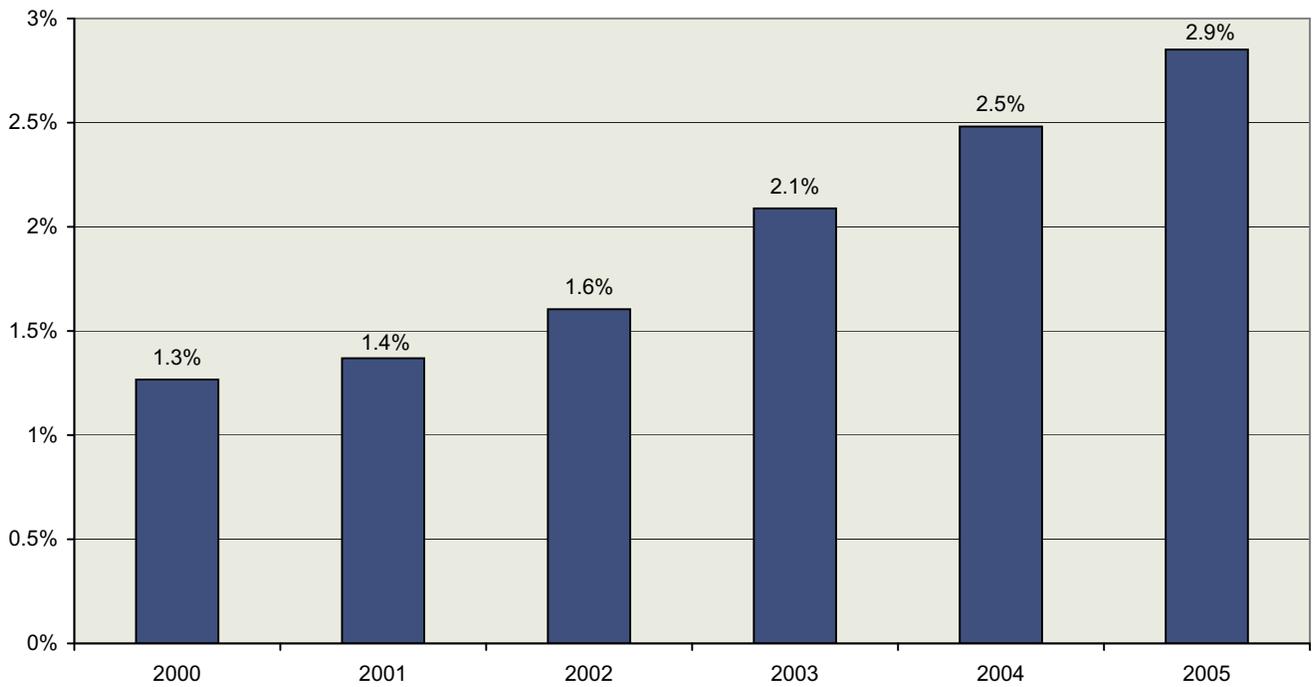
U.S. Diesel vs. Biodiesel (B20) Prices, 2000 – 2007



Kansas Energy Chart Book, Chapter 5

Source: U.S. Dept. of Energy, Energy Efficiency and Renewable Energy (EERE), Alternative Fuels Report, 2007: http://www.eere.energy.gov/afdc/price_report.html (accessed September 2007)

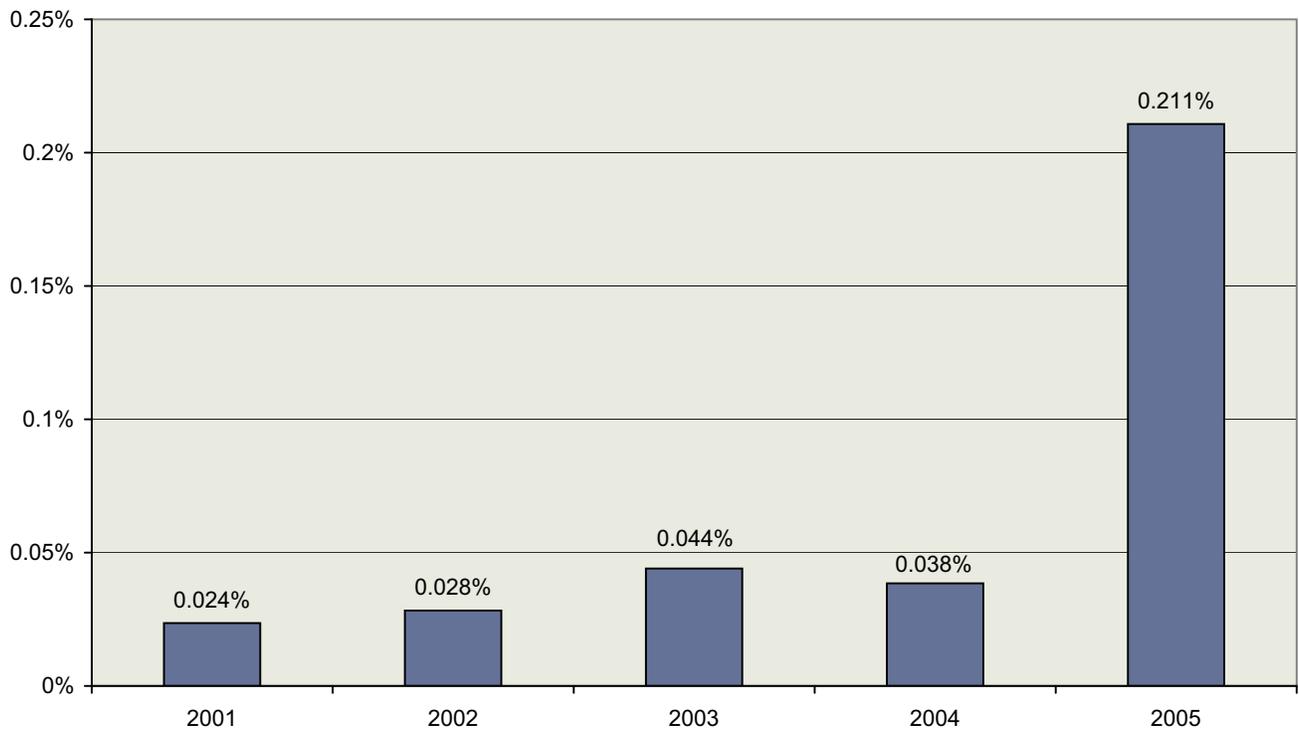
Ethanol Consumption as Percentage of Total U.S. Gasoline Consumption, 2000 – 2005



Kansas Energy Chart Book, Chapter 5

Source: U.S. Dept. of Energy, Energy Information Administration (EIA), Biofuels in the Transportation Sector: <http://www.eia.doe.gov/oiaf/analysispaper/biomass.html> (accessed December 2007)

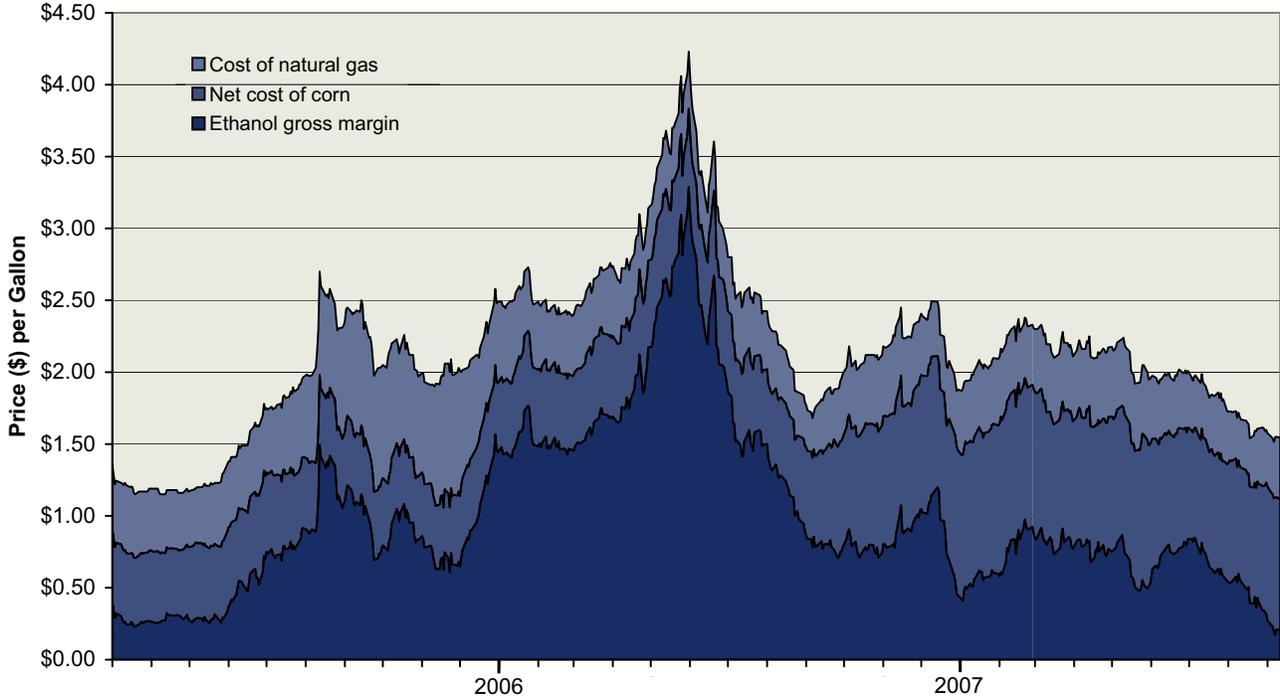
Biodiesel Consumption as Percentage of Total U.S. Diesel Consumption, 2001 – 2005



Kansas Energy Chart Book, Chapter 5

Source: U.S. Dept. of Energy, Energy Information Administration (EIA), Biofuels in the Transportation Sector: <http://www.eia.doe.gov/oiaf/analysispaper/biomass.html> (accessed December 2007)

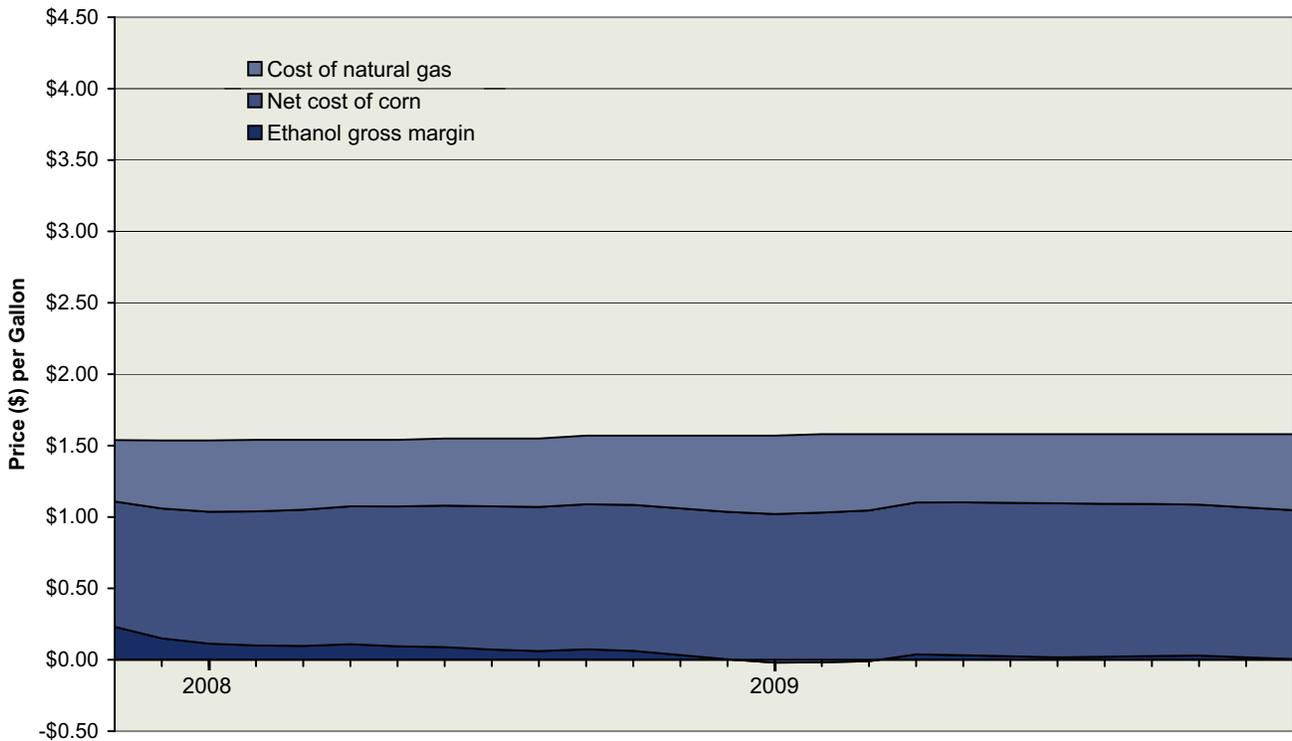
U.S. Ethanol Gross Margins Based on Near Futures Prices, March 2005 – September 2007



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Source: Iowa State Center for Agricultural Research and Development (CARD);
http://www.card.iastate.edu/research/bio/tools/hist_eth_gm.aspx (received October 2007)

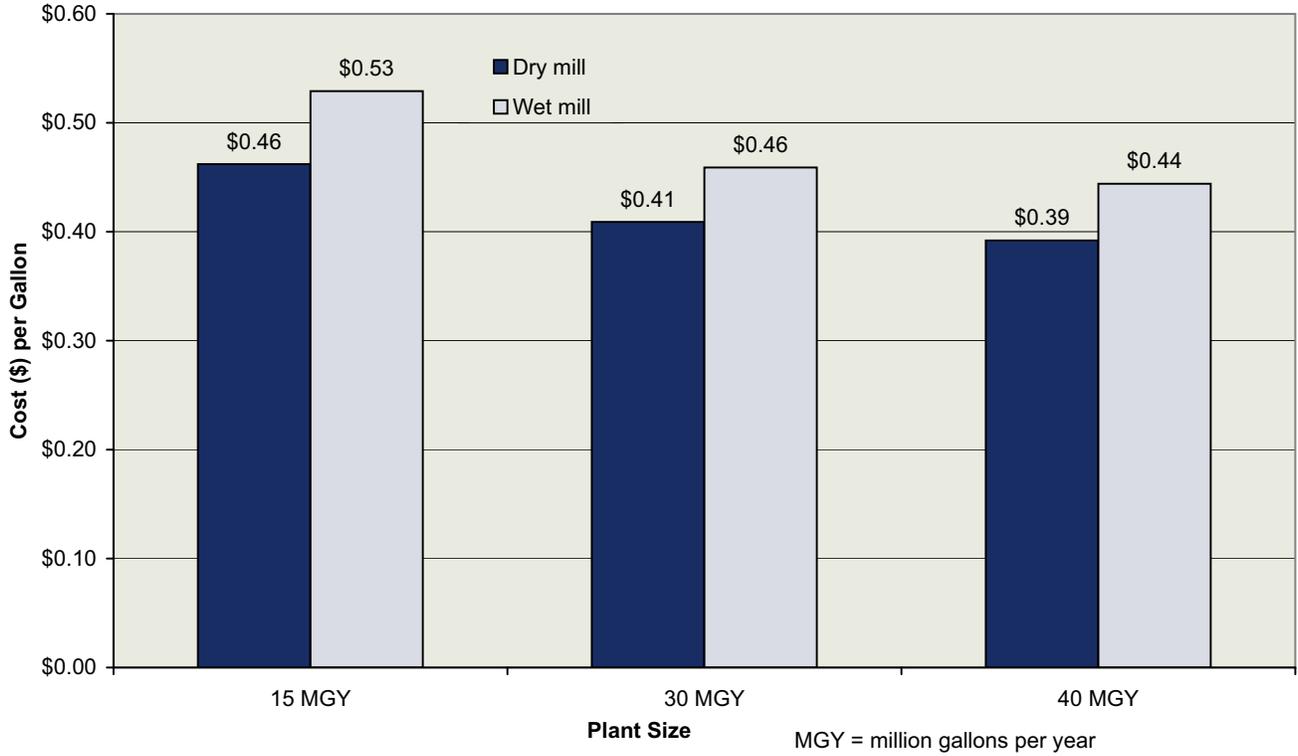
Projected U.S. Ethanol Gross Margins, December 2007 – December 2009



Kansas Energy Chart Book, Chapter 5

Source: Iowa State Center for Agricultural Research and Development (CARD);
http://www.card.iastate.edu/research/bio/tools/proj_eth_gm.aspx (received October 2007)

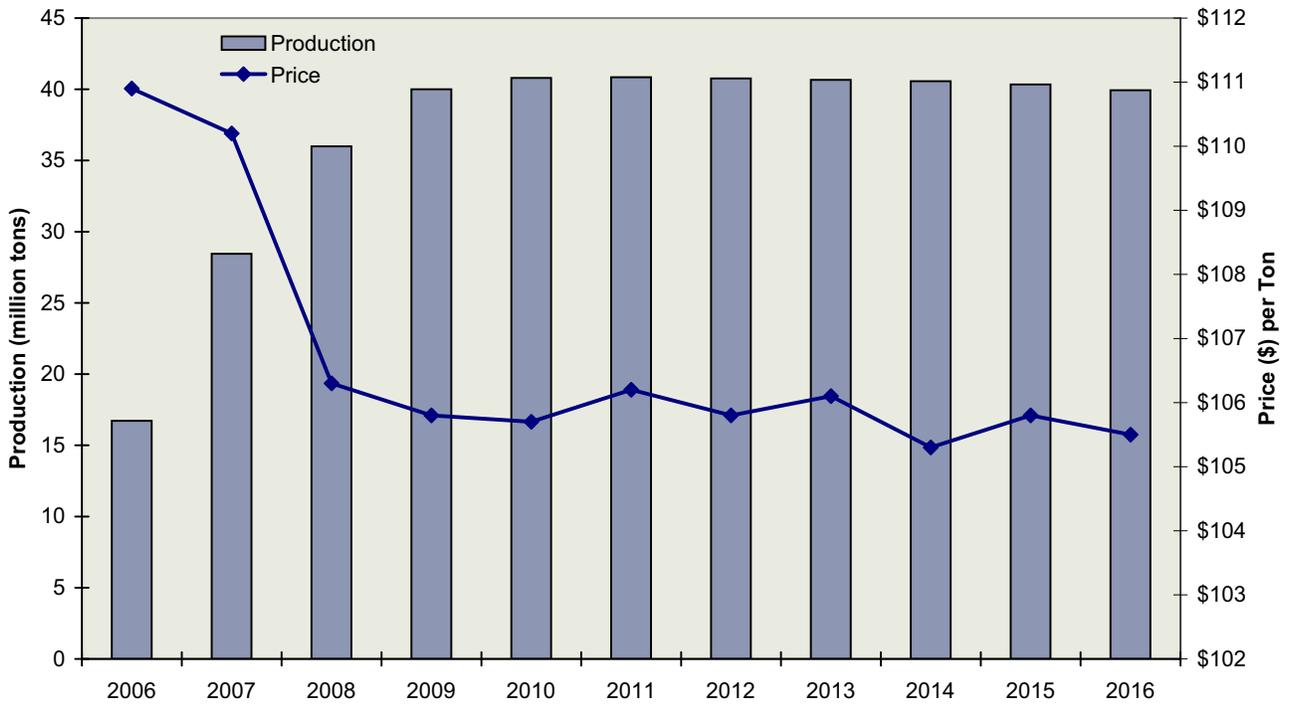
Corn-based Ethanol Production Cost by Plant Size, Dry and Wet Mill



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Source: Kansas State University Dept. of Agricultural Economics, Corn-based Ethanol Costs and Margins Report, May 2002: <http://www.agmrc.org/NR/rdonlyres/AA5DBE03-C649-4679-8A29-BCA18E376F2D/0/ksueth1.pdf> (accessed October 2007)

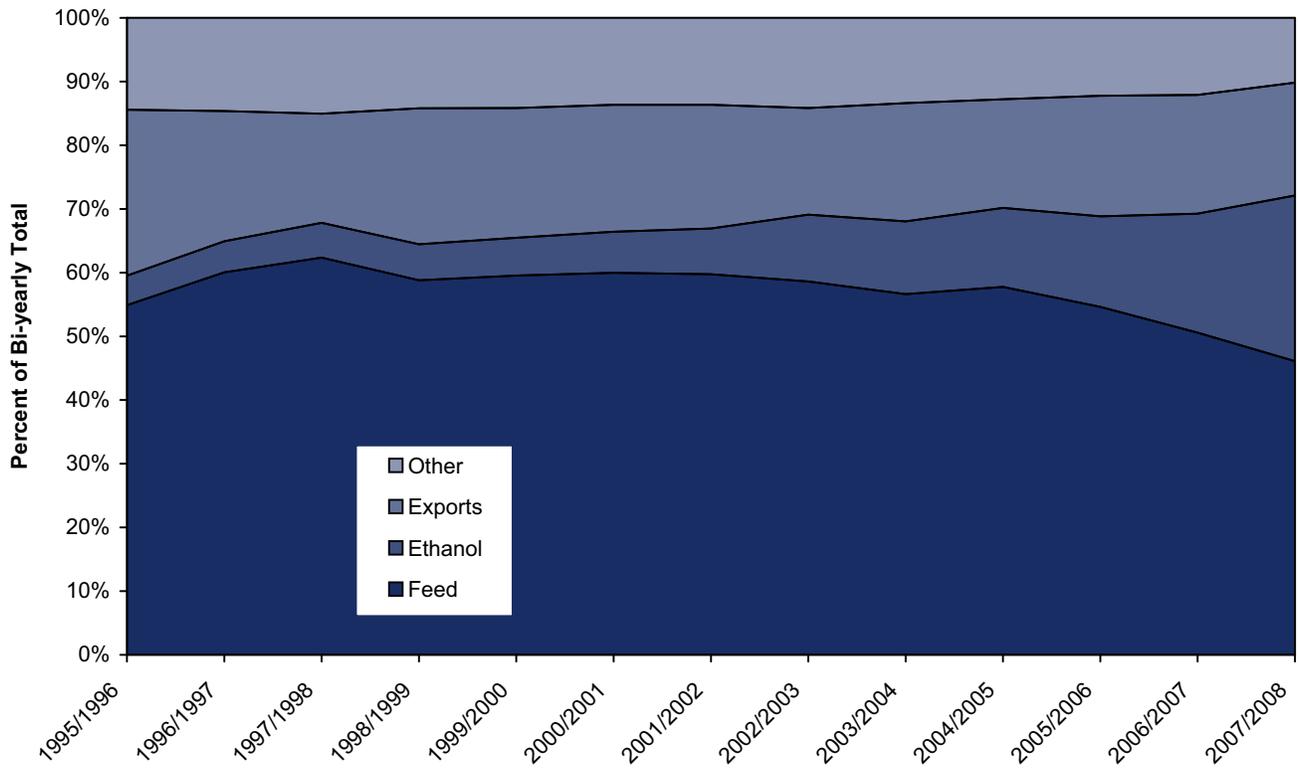
Projected U.S. Distillers Grain Production and Prices, 2006 – 2016



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Source: Chad Hart, Center for Agricultural Research and Development, Iowa State University; U.S. Dept. of Agriculture, Production, Supply, and Distribution Online: <http://www.fas.usda.gov/psdonline/> (accessed October 2007)

Historic and Projected U.S. Corn Usage, 1995 – 2008

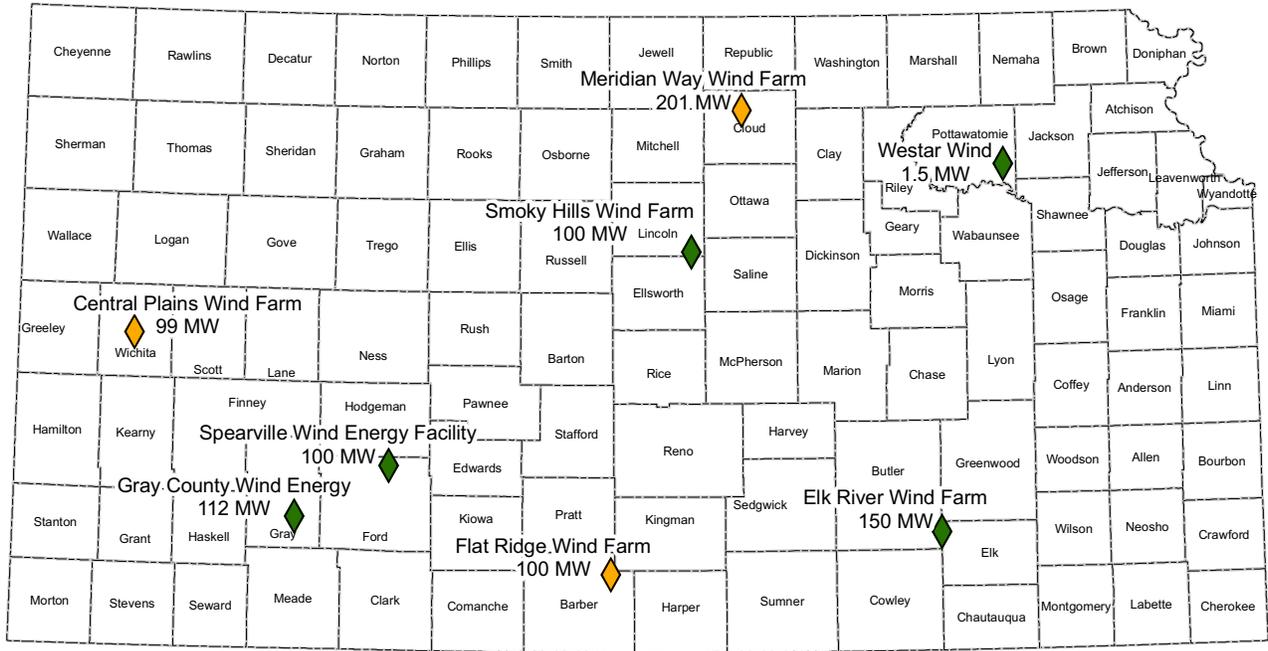


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Source: Chad Hart, Center for Agricultural Research and Development, Iowa State University U.S. Dept. of Agriculture, Production, Supply, and Distribution Online: <http://www.fas.usda.gov/psdonline/> (accessed October 2007)

Chapter 6: Wind Energy

Wind Energy Project Activity in Kansas, January 2008

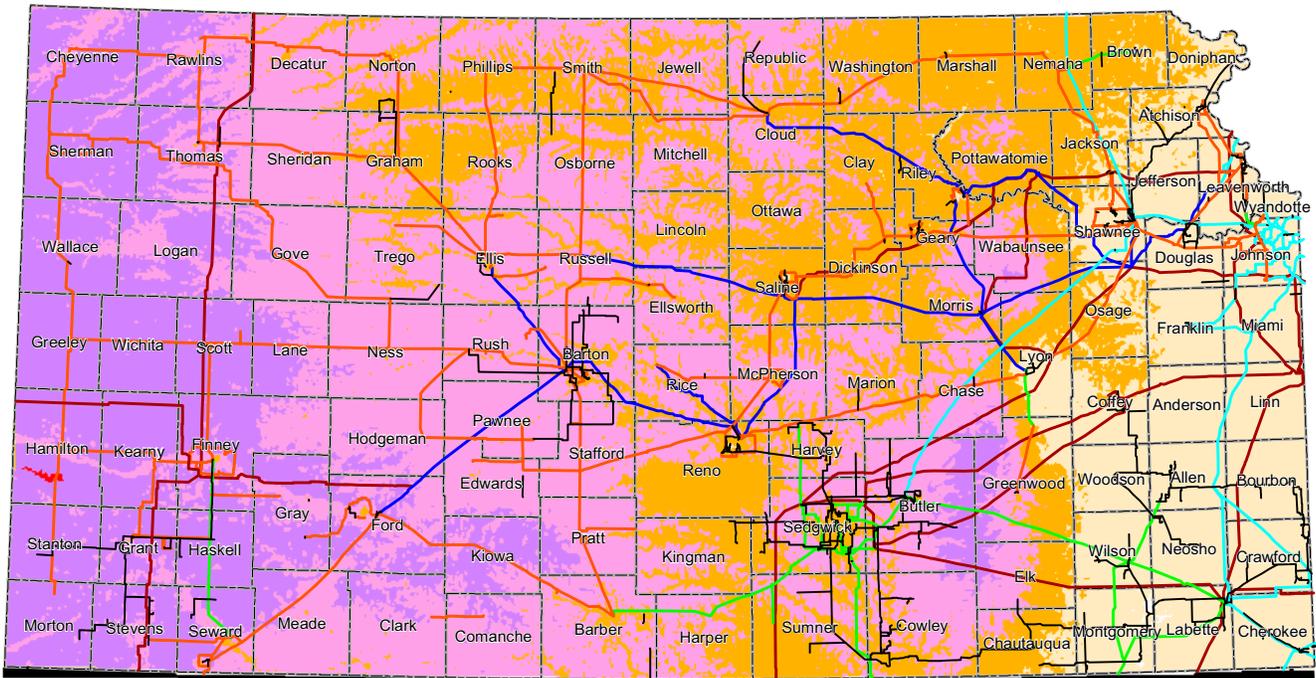


- ◆ Announced
- ◆ Existing

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Source: Data provided by Kansas Corporation Commission, Energy Programs Division staff (January 2008)

Kansas Wind Energy Resource Map and Electric Transmission



Electric Transmission Lines	Wind Speed at 50 meters		Wind Power Density at 50m Wm ²
	(m/s)	(mph)	
345 - KV	Class 1: 0.00 - 5.60	0.00 - 12.5	0 - 200
230 - KV	Class 2: 5.60 - 6.40	12.5 - 14.3	200 - 300
161 - KV	Class 3: 6.40 - 7.00	14.3 - 15.7	300 - 400
138 - KV	Class 4: 7.00 - 7.50	15.7 - 16.8	400 - 500
115 - KV	Class 5: 7.50 - 8.00	16.8 - 17.9	500 - 600
69 - KV	Class 6: 8.00 - 8.80	17.9 - 19.7	600 - 700
	Class 7: > 8.80	> 19.7	> 700

The wind resource estimates presented on this map were developed by Coriolis-AE using WindMap TM. The spatial grid resolution is of 1000 (app) meters.

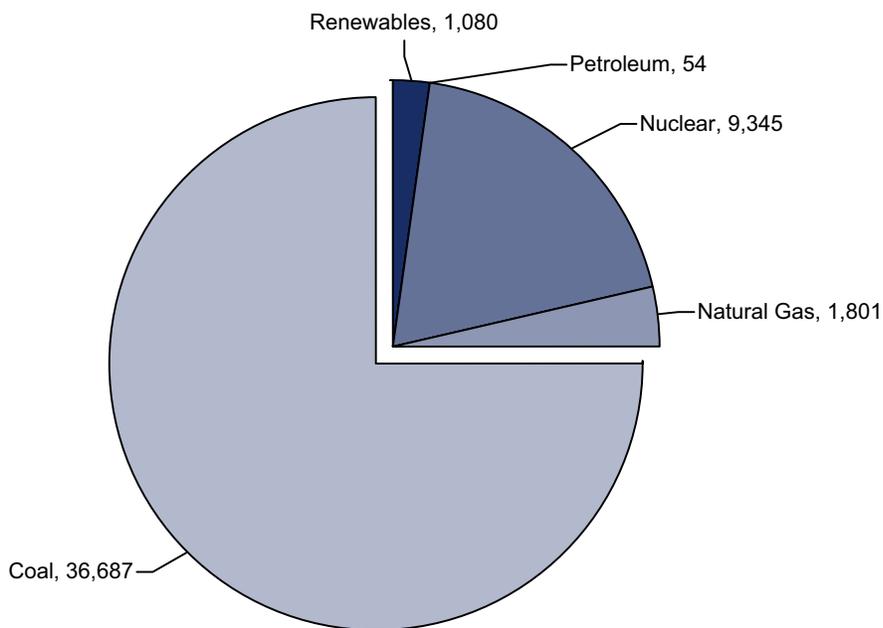
Development of this map was performed under contract with the Kansas Corporation Commission Energy Program with funding from the U. S. Department of Energy's Wind Power America Program.

This map may be viewed on the web at: <http://www.kcc.state.ks.us/energy/wind.htm>

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Source: Kansas Corporation Commission (March 2004)

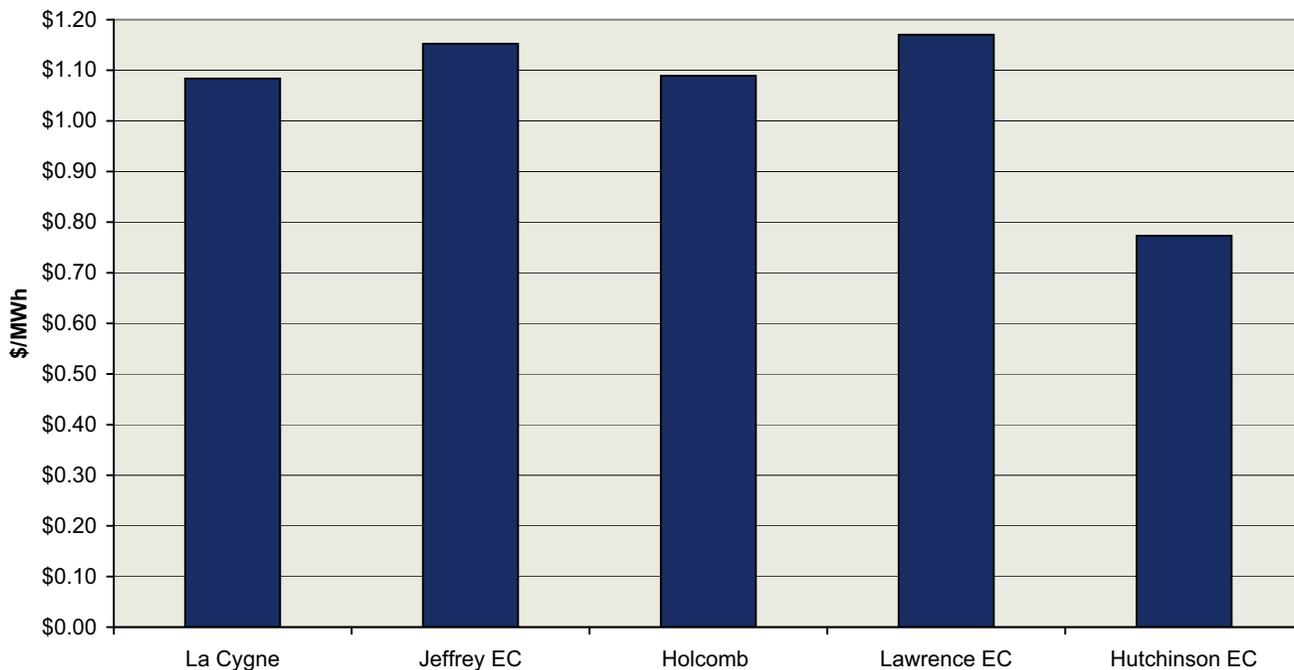
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Source: U.S. Dept. of Energy, Energy Information Administration (EIA), 2007, Electric Power Monthly, various months, DOE/EIA-0226 (2006 - 2007/VARIOUS): http://www.eia.doe.gov/cneaf/electricity/epm/matrix96_2000.html (accessed September 2007)

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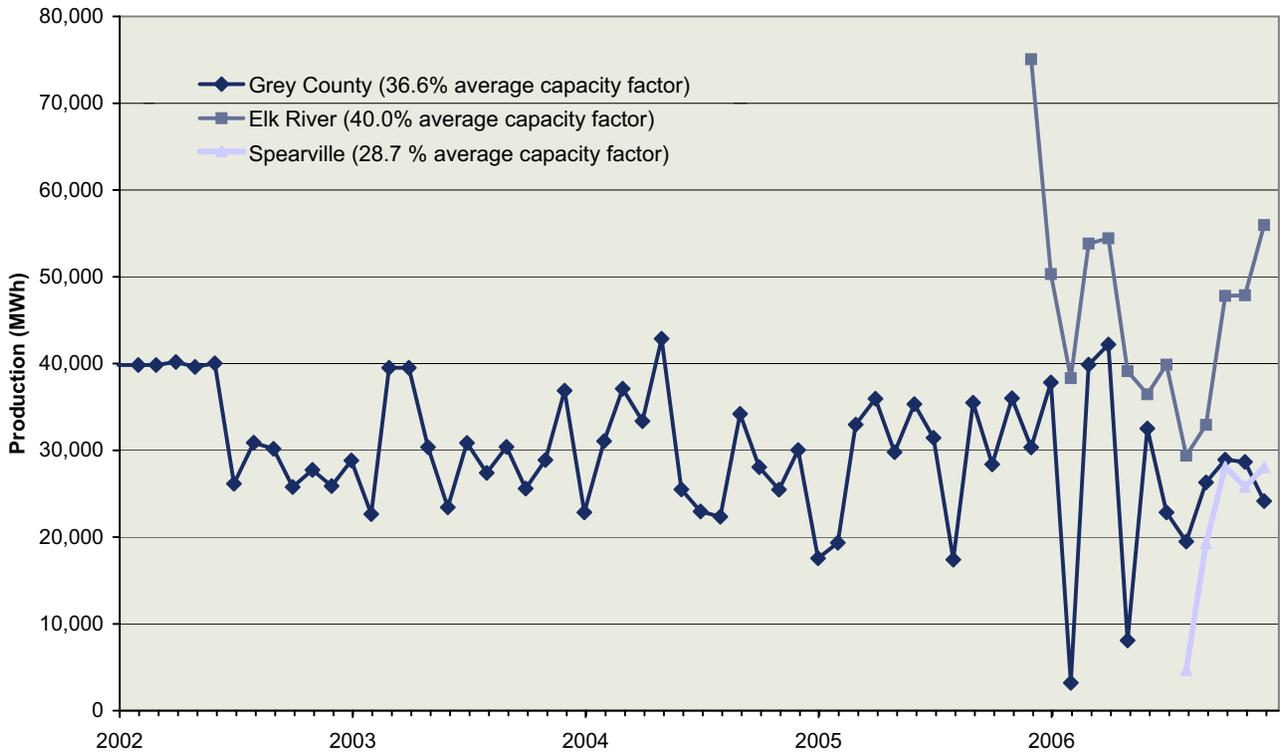
Projected Impact on Selected Kansas Electric Utilities of \$1.00 per Ton Tax on CO₂



Source: U.S. Dept. of Energy, Energy Information Administration (EIA), EIA-906/920 and EIA-860 databases, August 2007: http://www.eia.doe.gov/cneaf/electricity/page/eia906_920.html (accessed September 2007)

Kansas Energy Chart Book, Chapters 3, 6

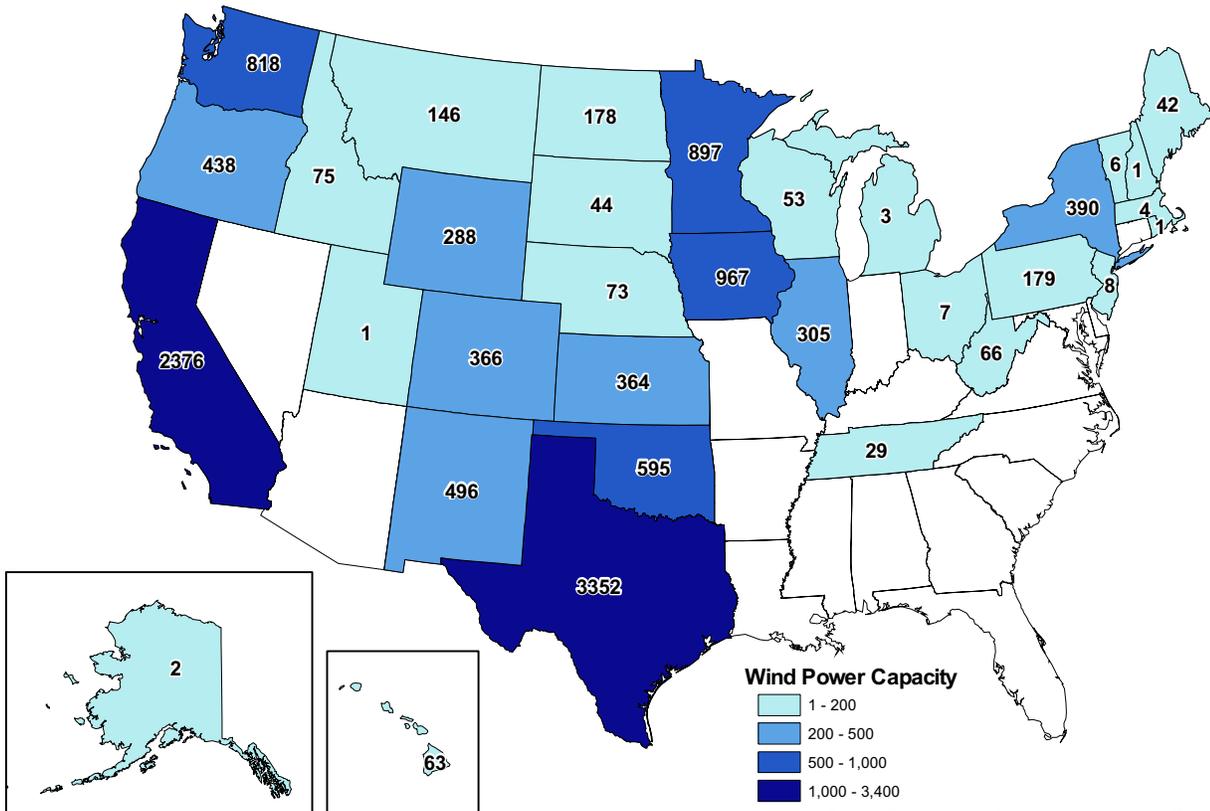
Kansas Wind Farm Production and Average Capacity Factors, 2002 – 2006



Source: Kansas Corporate Commission, based on U.S. Dept. of Energy, Energy Information Administration (EIA), forms 906 and 920: <http://www.eia.doe.gov/cneaf/electricity/page/eia906u.html> (accessed October 2007)

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U.S. Installed Wind Energy Capacity in Megawatts (MW), September 2007

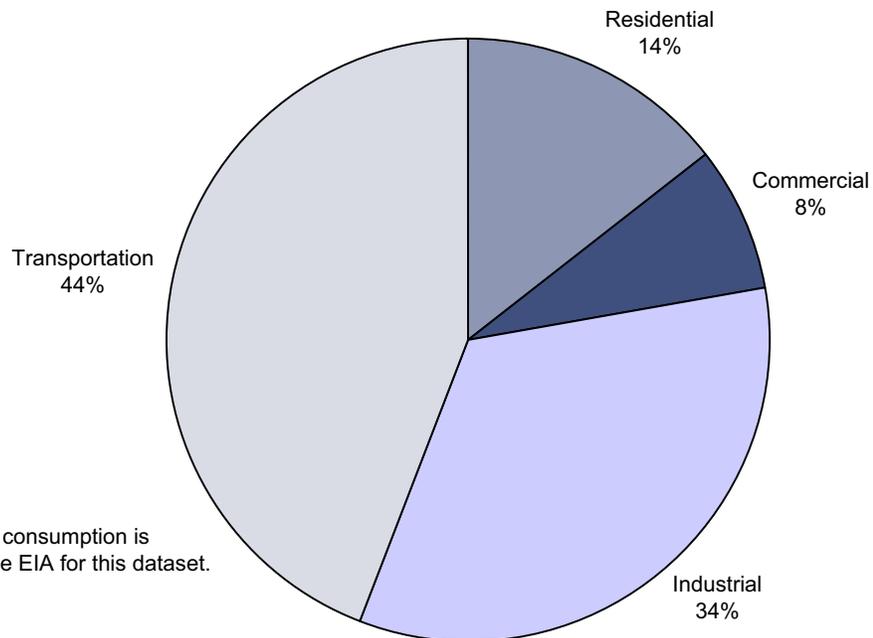


Source: Based on data from the American Wind Energy Association: <http://www.awea.org/projects/> (December 2007)

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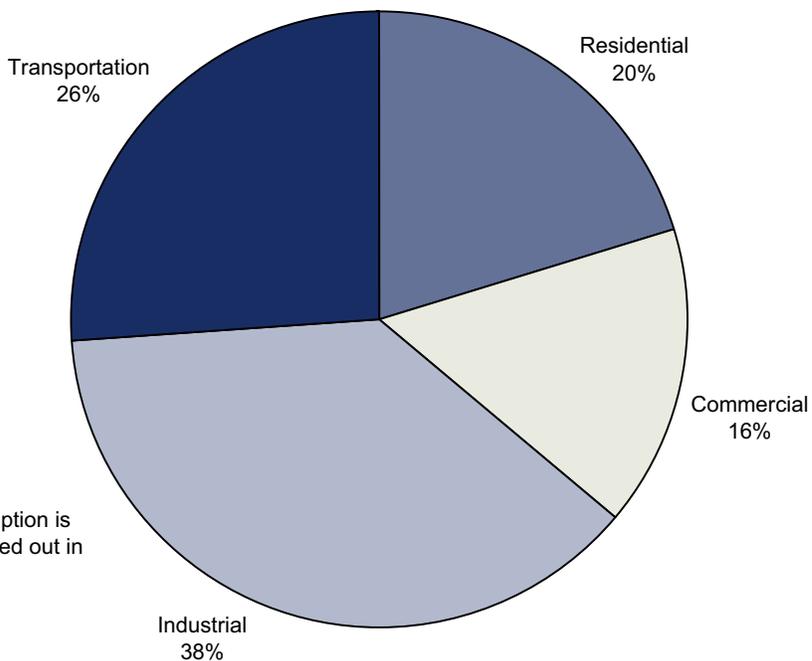
Chapter 9: Energy Conservation and Efficiency

U.S. Direct Energy Consumption by Sector, 2007



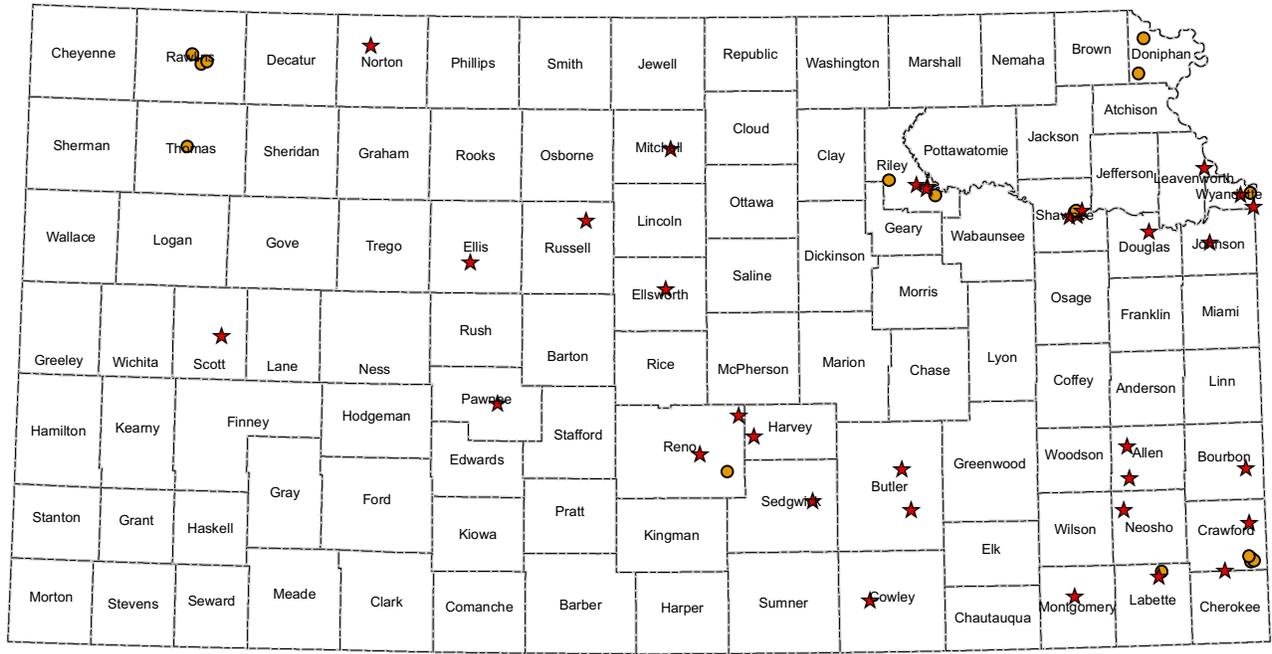
Agriculture sector consumption is not provided by the EIA for this dataset.

Kansas Direct Energy Consumption by Sector, 2004



Agriculture sector consumption is negligible and not separated out in these data.

Kansas Facility Conservation Improvement Program (FCIP) Projects, December 2007



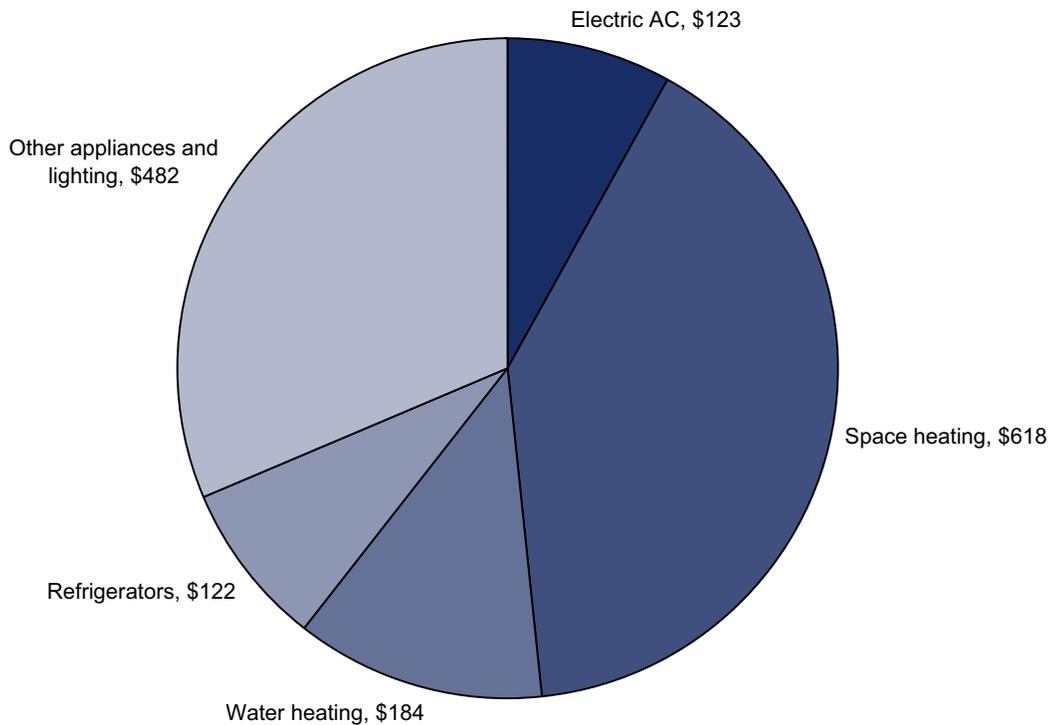
FCIP Locations

- ★ Completed
- Ongoing

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Source: Data provided by KCC Energy Programs Division, Facility Conservation Improvement Program (FCIP) staff (December 2007)

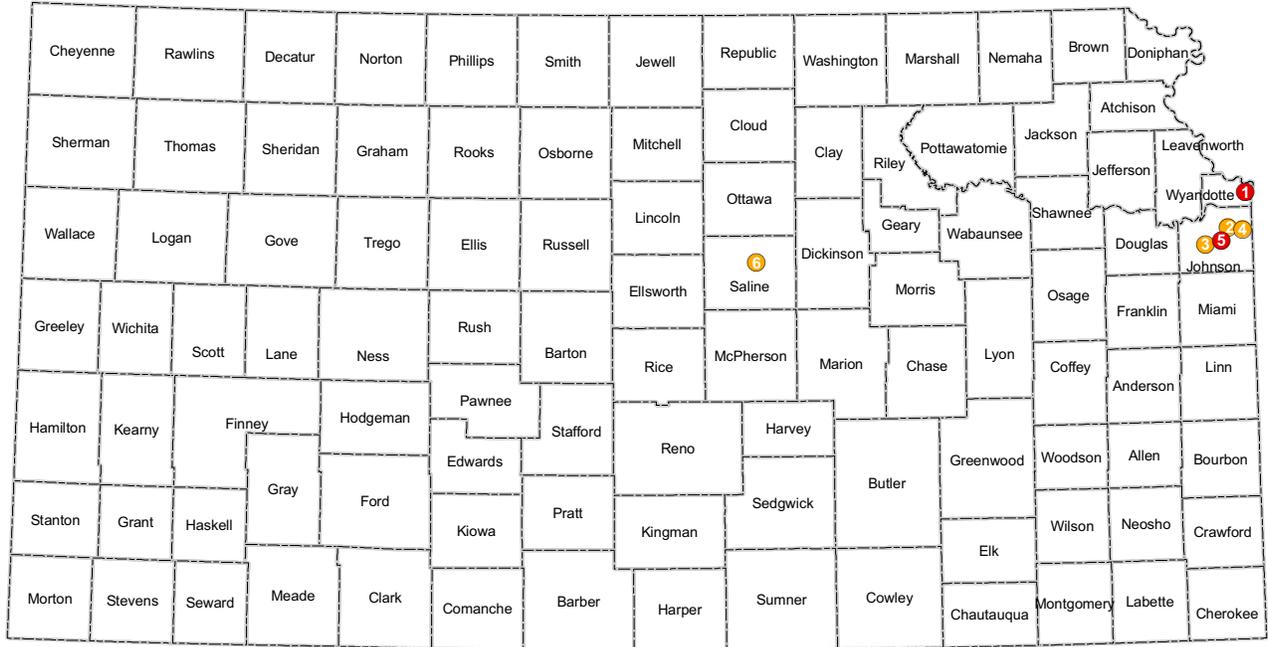
Average Annual Household Energy Expenditures in the Midwest



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Source: U.S. Dept. of Energy, Energy Information Administration (EIA), Residential Energy Consumption Survey, 2001: <http://www.eia.gov/emeu/recs/recs2001/detailcetbls.html#appliances> (accessed December 2007)

Leadership in Energy and Environmental Design (LEED) Certified Green Buildings in Kansas, October 2007



LEED Green Building Rating System

- Certified
- Gold

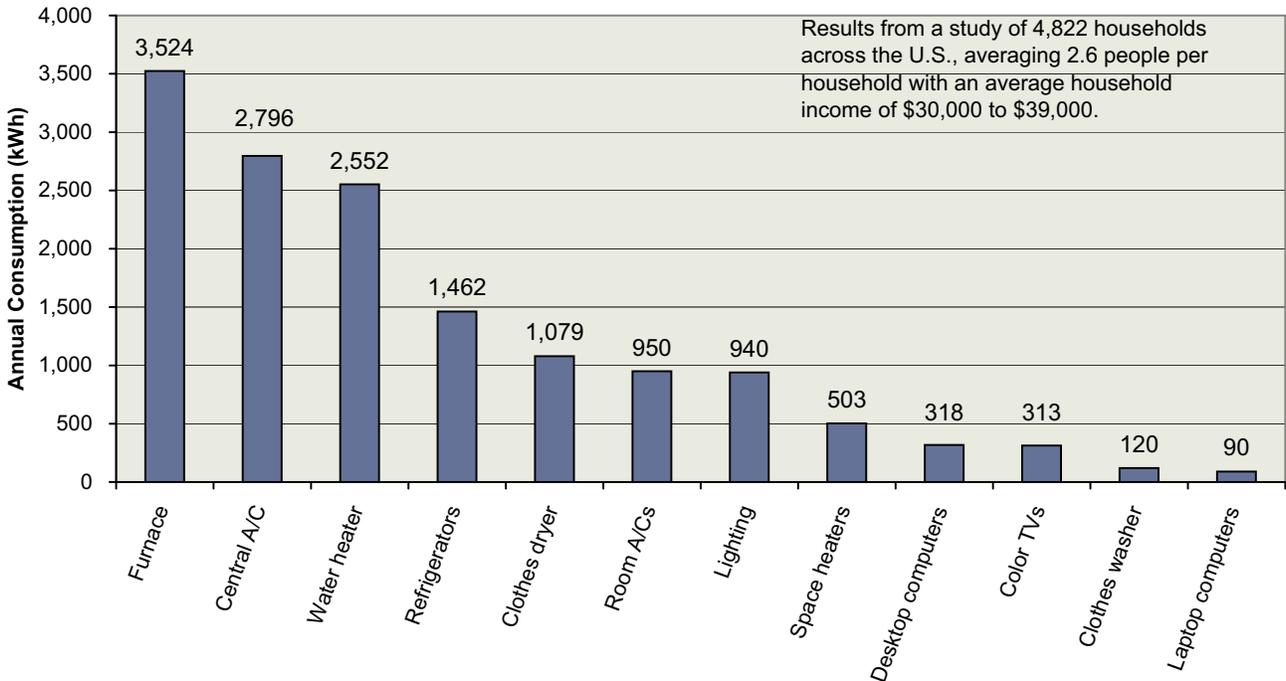
- 1 – EPA Science and Technology Center
- 2 – EcoWorks at Southlake Phase One
- 3 – Olathe Municipal Service Center
- 4 – Sprint, Building 14
- 5 – Johnson County Sunset Drive Office Building
- 6 – Pioneer President's Place

Bordering States with LEED-certified Buildings: Missouri (14), Oklahoma (2), Colorado (38)

Kansas Energy Chart Book, Chapter 9

Source: Based on data from the U.S. Green Building Council: <http://www.usgbc.org/LEED/Project/CertifiedProjectList.aspx> (October 2007)

Average U.S. Household Annual Electrical Use for Common Appliances



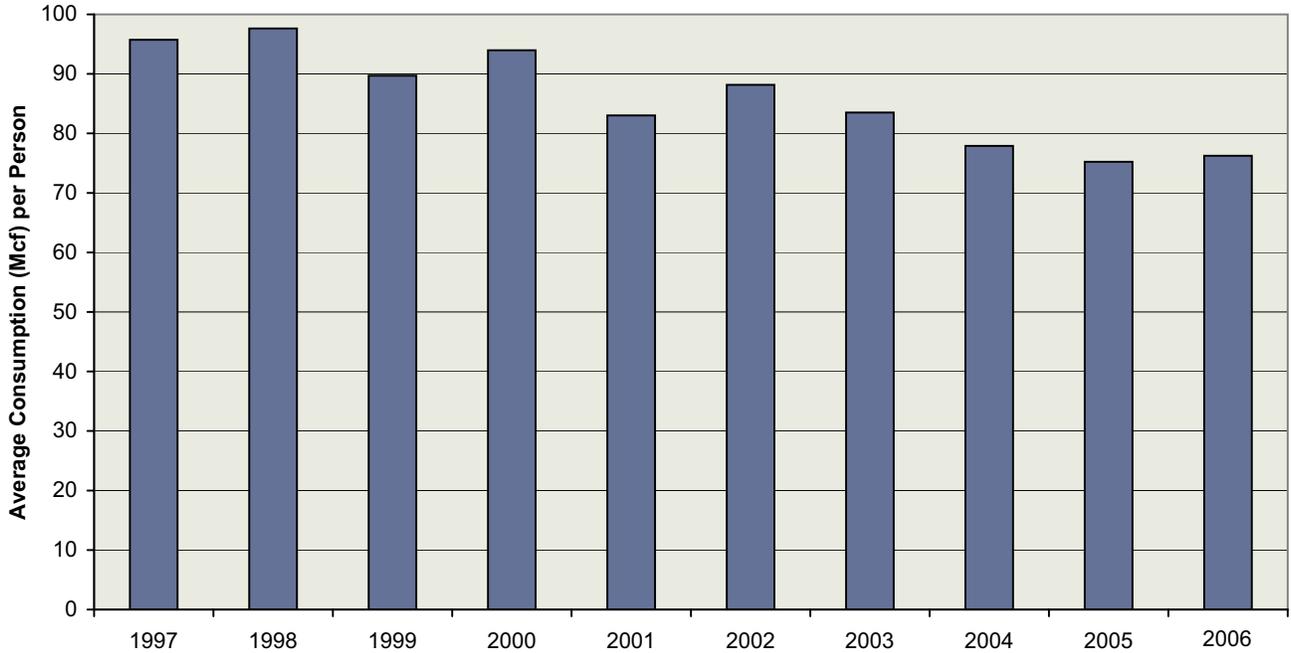
Results from a study of 4,822 households across the U.S., averaging 2.6 people per household with an average household income of \$30,000 to \$39,000.

Kansas Energy Chart Book, Chapter 9

Source: U.S. Dept. of Energy, Energy Information Administration (EIA), Residential End Use Electricity Consumption, 2001: <http://www.eia.doe.gov/emeu/recs/recs2001/enduse2001/enduse2001.html> (accessed September 2007)

Kansas Per Capita Natural Gas Consumption, 1997 – 2005

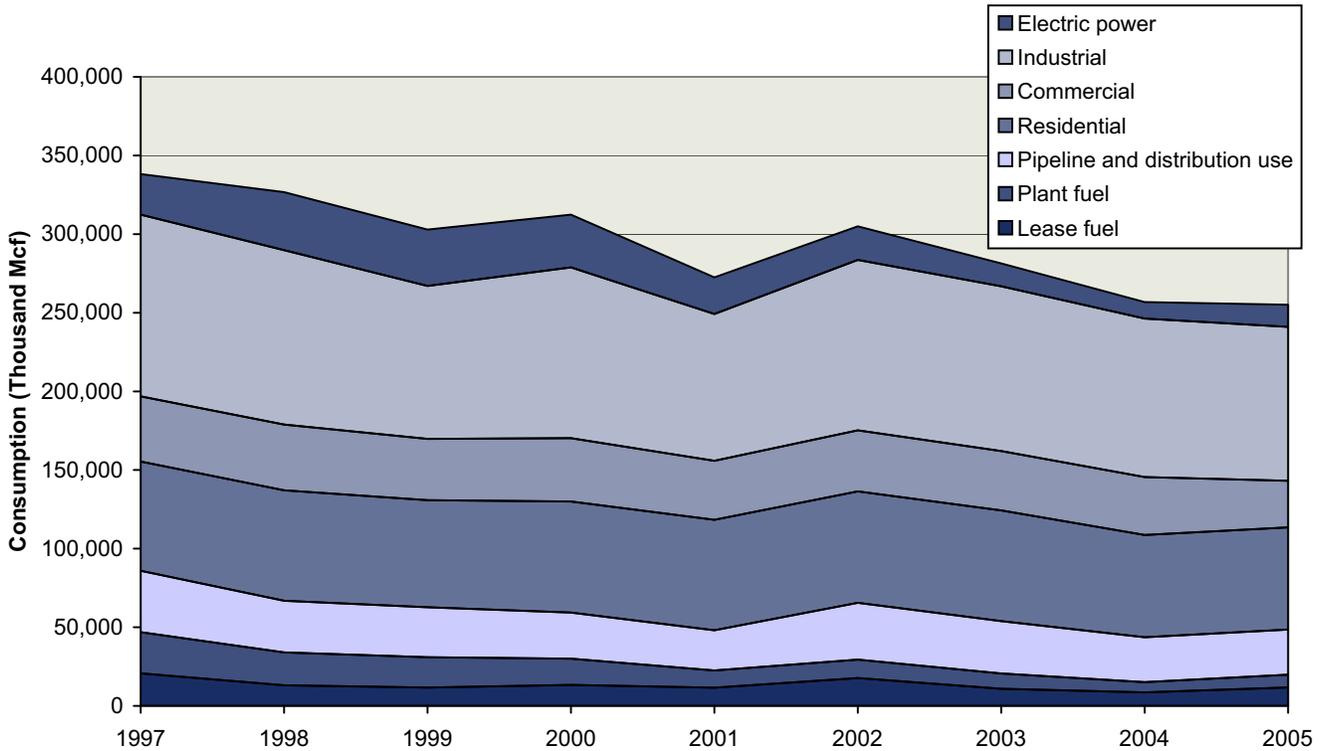
Based on volumes delivered to consumers (residential, commercial, industrial, & electric);
infrastructure uses not included



Sources: U.S. Dept. of Energy, Energy Information Administration (EIA), Natural Gas Navigator, 2007:
http://tonto.eia.doe.gov/dnav/ng/hist/na1490_sks_2a.htm (accessed October 2007);
 Kansas Department of Health and the Environment (KDHE), Population Statistics Query, 2007:
http://kic.kdhe.state.ks.us/kic/popeth_table.html (accessed October 2007)

Kansas Energy Chart Book, Chapter 9

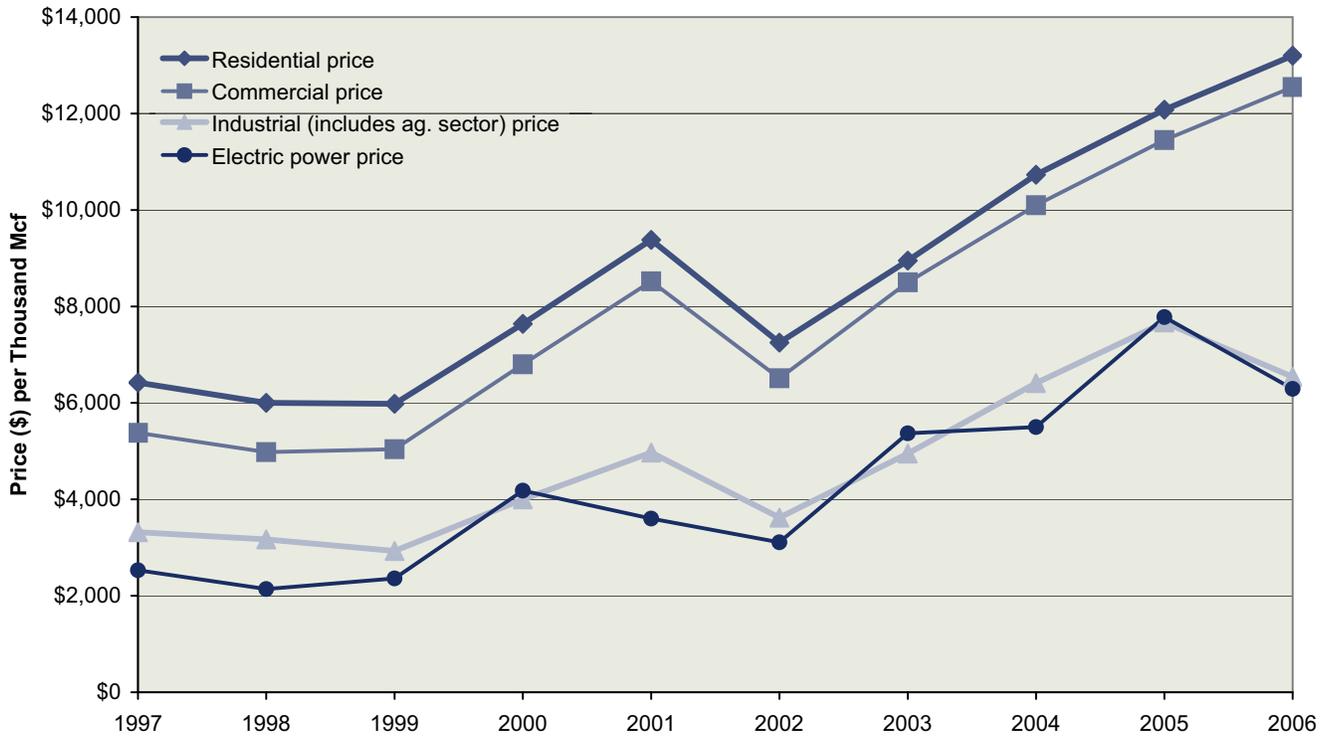
Kansas Natural Gas Consumption by Sector, 1997 – 2005



Source: U.S. Dept. of Energy, Energy Information Administration (EIA), Natural Gas Navigator, 2007:
http://tonto.eia.doe.gov/dnav/ng/ng_cons_sum_dcu_sks_a.htm (accessed October 2007)

Kansas Energy Chart Book, Chapter 9

Kansas Natural Gas Prices by Sector, 1997 – 2006

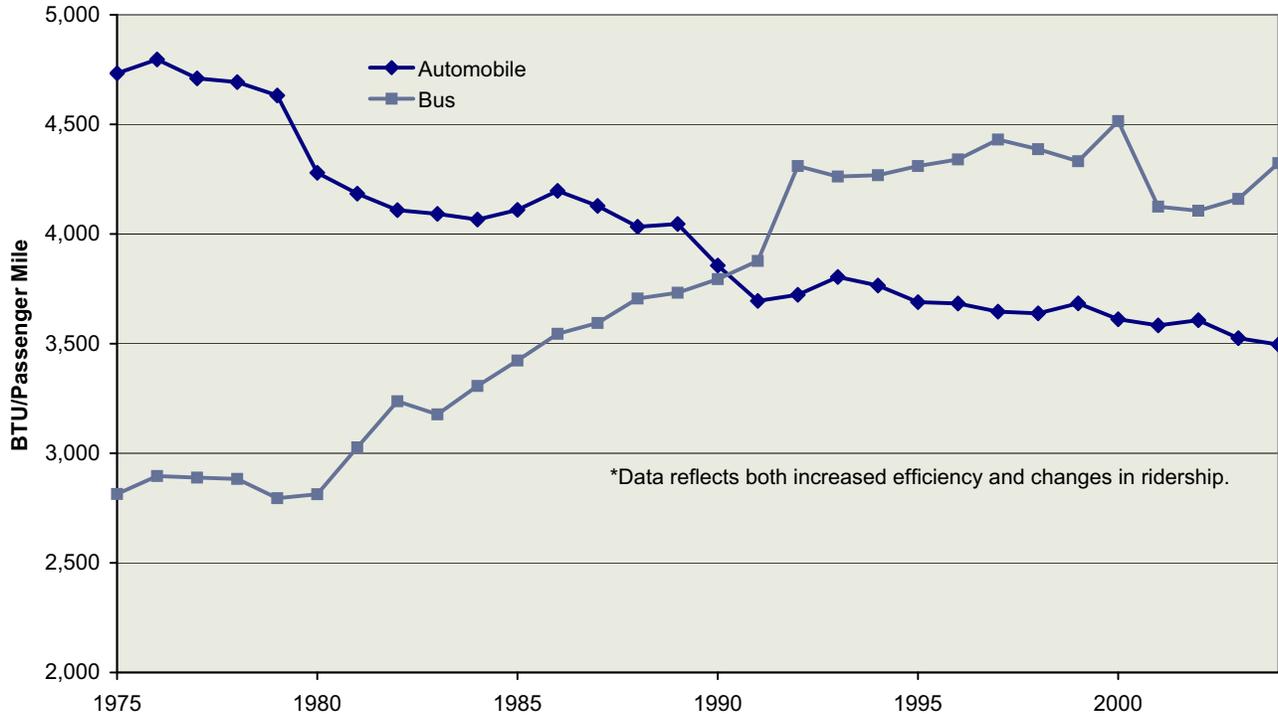


Kansas Energy Chart Book, Chapter 9

Source: U.S. Dept. of Energy, Energy Information Administration (EIA), Natural Gas Navigator, 2007: http://tonto.eia.doe.gov/dnav/ng/ng_pri_sum_dc_u_SKS_a.htm (accessed October 2007)

Chapter 10: Energy Use in the Transportation Sector

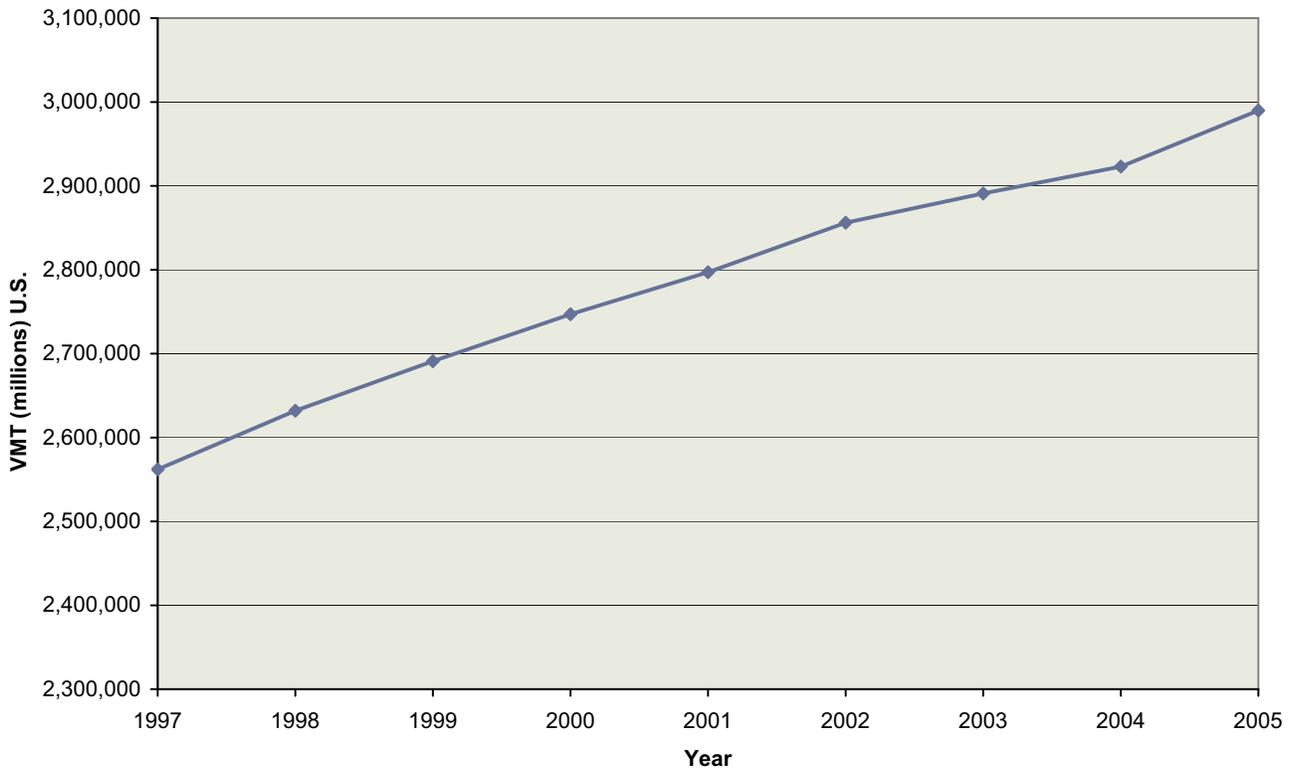
U.S. Transportation Energy Use per Passenger Mile, 1975 – 2005



Kansas Energy Chart Book, Chapter 10

Source: Center for Transportation Analysis, Transportation Energy Data Book, Edition 26, 2007: http://cta.ornl.gov/data/tebd26/Spreadsheets/Table2_13.xls (accessed October 2007)

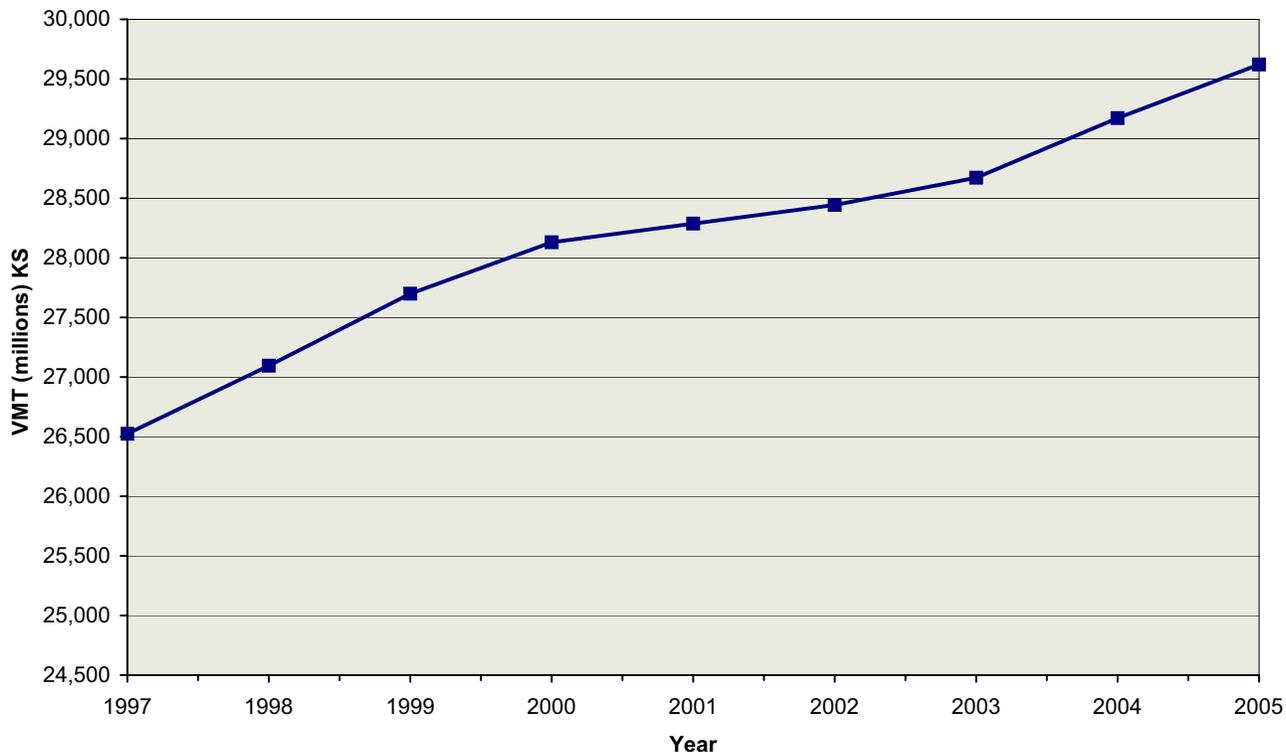
Total Vehicle Miles Traveled (VMT) in the U.S., 1997 – 2005



Kansas Energy Chart Book, Chapter 10

Source: U.S. Department of Transportation, Federal Highway Administration (FHWA), Highway Statistics 2005: http://www.fhwa.dot.gov/policy/ohim/hs05/roadway_extent.htm (accessed September 2007)

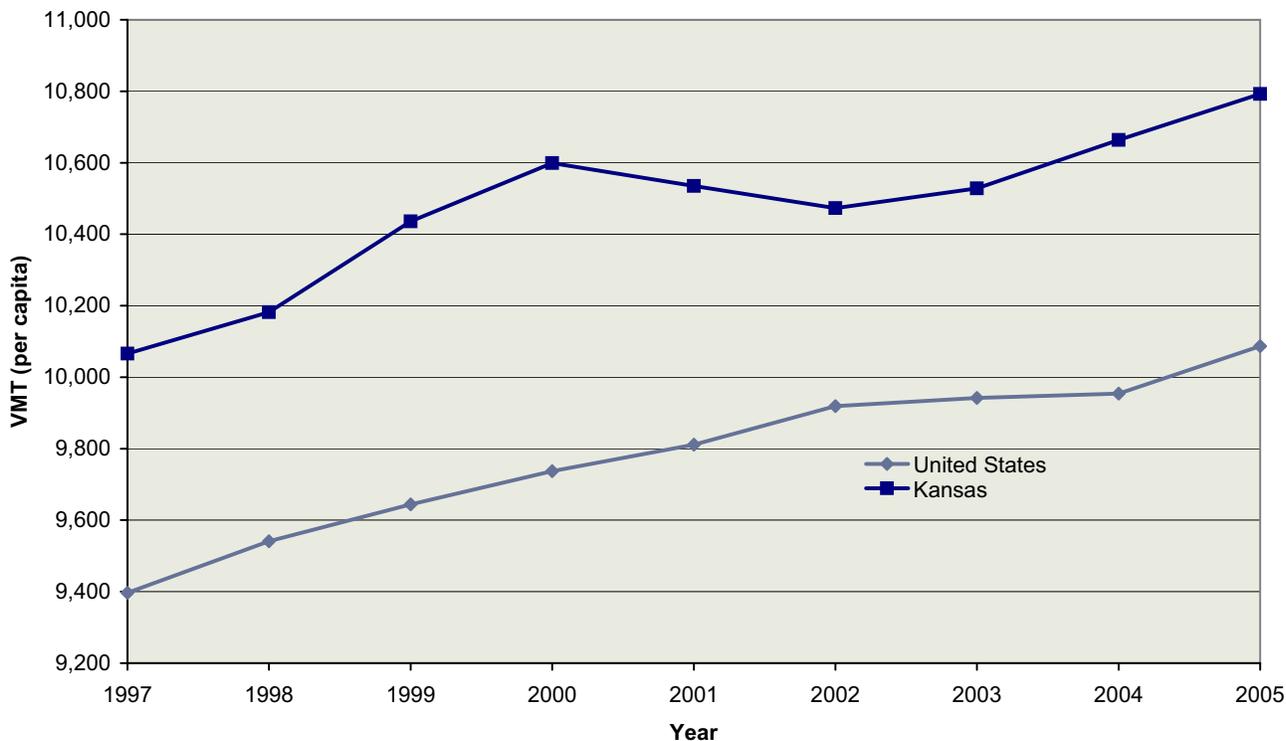
Total Vehicle Miles Traveled (VMT) in Kansas, 1997 – 2005



Kansas Energy Chart Book, Chapter 10

Source: U.S. Department of Transportation, Federal Highway Administration (FHWA), Highway Statistics 2005: http://www.fhwa.dot.gov/policy/ohim/hs05/roadway_extent.htm (accessed September 2007)

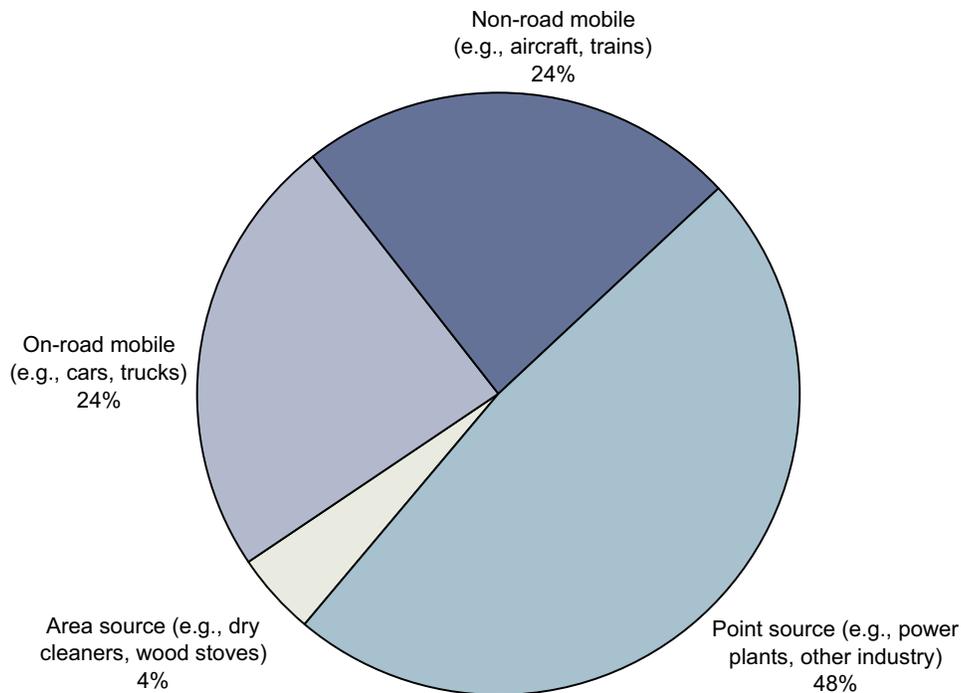
Average Vehicle Miles Traveled (VMT) Per Capita in Kansas and the U.S., 1997 – 2005



Kansas Energy Chart Book, Chapter 10

Source: U.S. Department of Transportation, Federal Highway Administration (FHWA), Highway Statistics 2005: http://www.fhwa.dot.gov/policy/ohim/hs05/roadway_extent.htm (accessed September 2007)

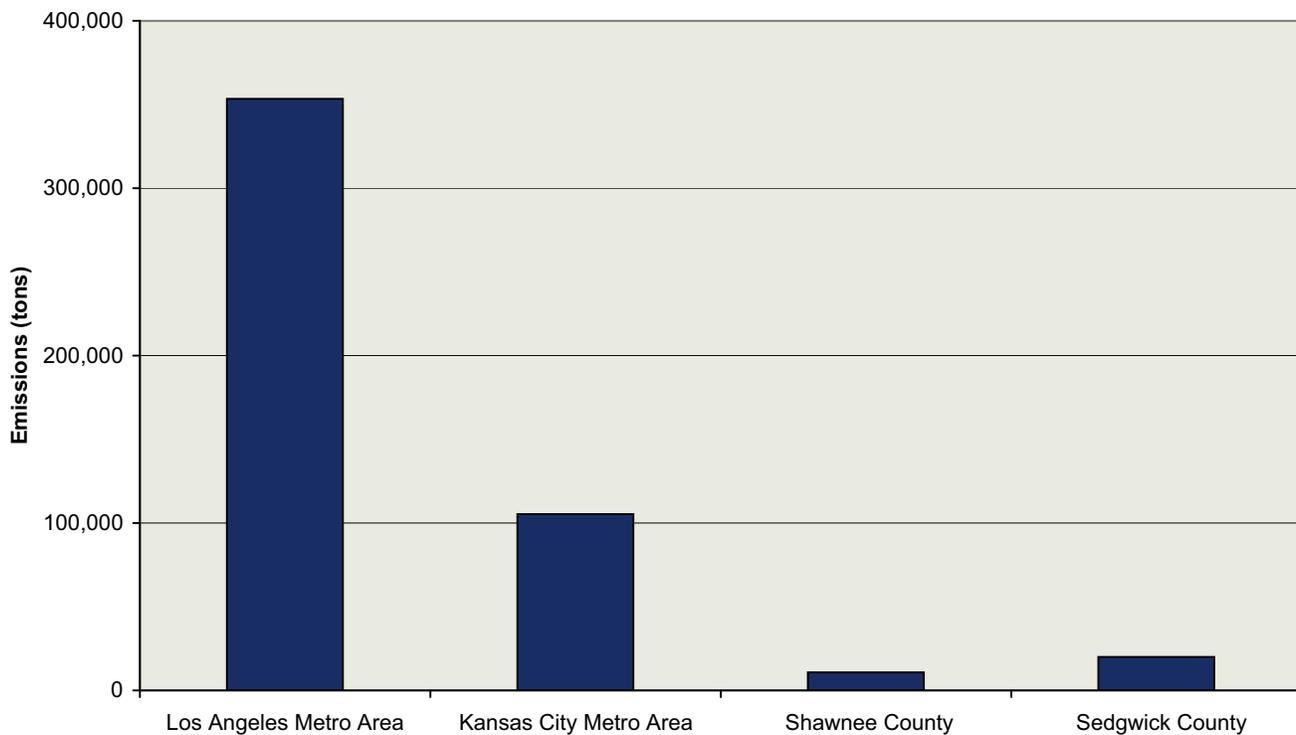
Kansas Total NO_x Emissions by Source, 2002



Kansas Energy Chart Book, Chapters 3, 10

Source: KDHE Bureau of Air and Radiation, based on 2002 National Emissions Inventory (NEI)

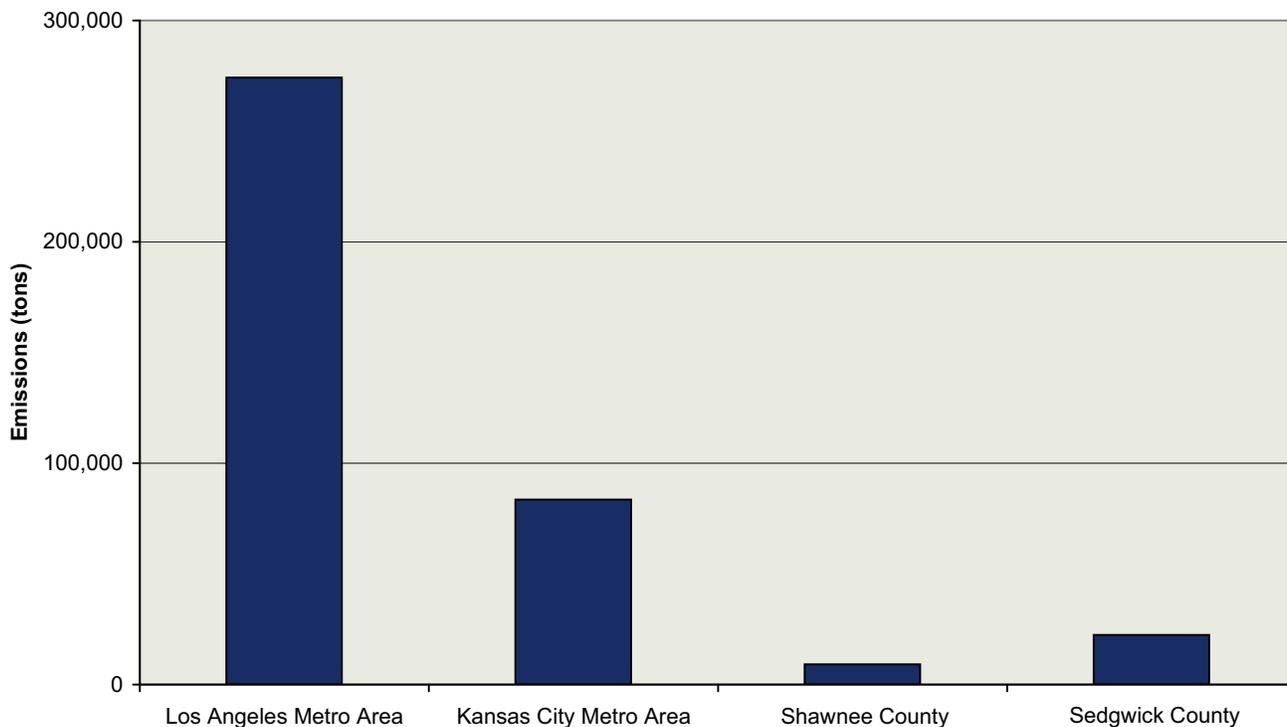
Comparison of NO_x Emissions in Selected Areas of Kansas and Los Angeles, 2002



Kansas Energy Chart Book, Chapter 10

Source: KDHE Bureau of Air and Radiation, based on 2002 National Emissions Inventory (NEI): <http://www.epa.gov/ttn/chief/net/2002inventory.html>

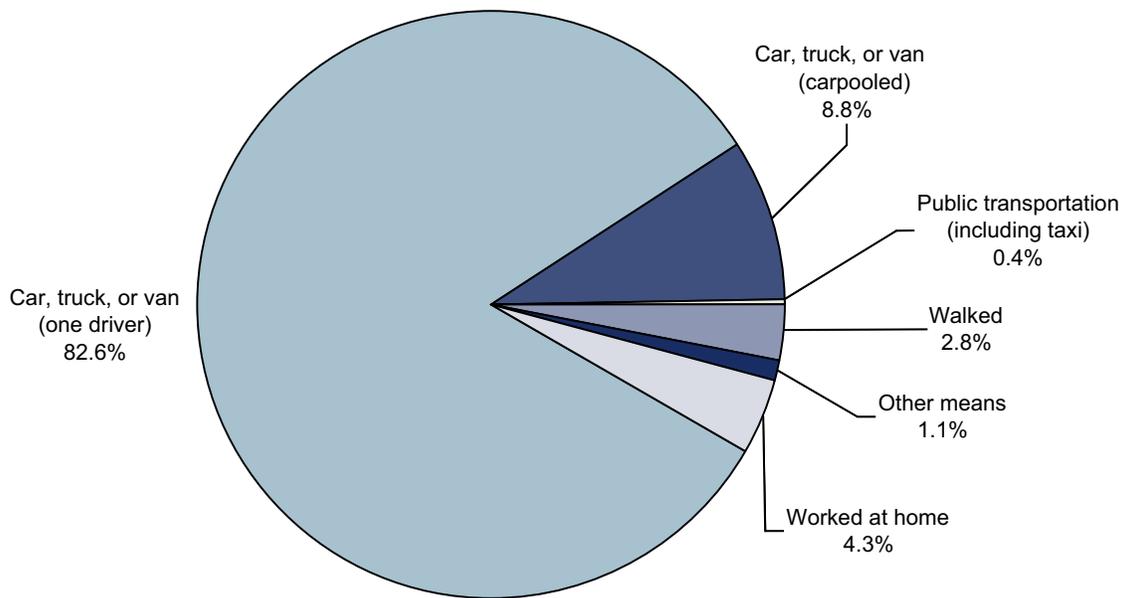
Comparison of Volatile Organic Compound (VOC) Emissions in Selected Areas of Kansas and Los Angeles, 2002



Kansas Energy Chart Book, Chapter 10

Source: KDHE Bureau of Air and Radiation, based on 2002 National Emissions Inventory (NEI): <http://www.epa.gov/ttn/chief/net/2002inventory.html>

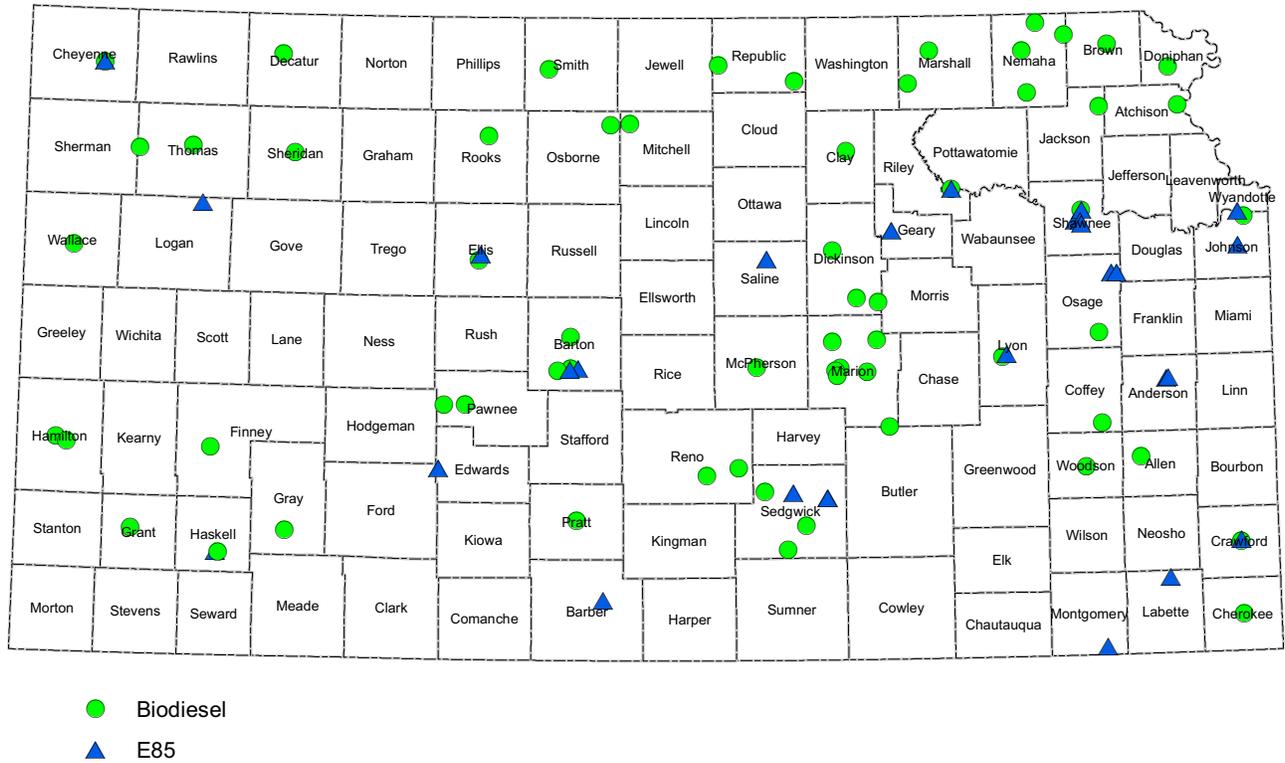
Commuting to Work in Kansas, 2005



Kansas Energy Chart Book, Chapter 10

Source: U.S. Dept. of Transportation, Bureau of Transportation Statistics, Commuting to Work: http://www.bts.gov/publications/state_transportation_profiles/state_transportation_statistics_2005/html/table_04_01.html

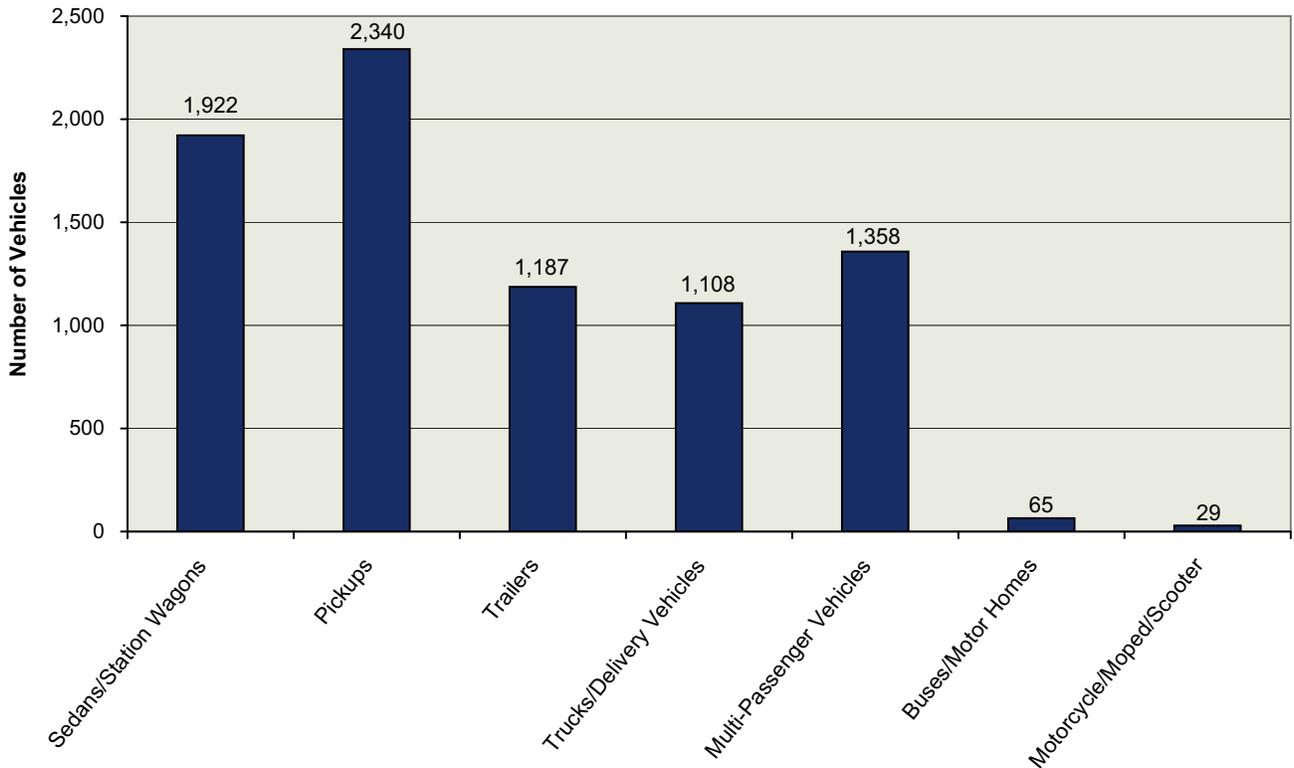
E-85 and Biodiesel Fueling Stations in Kansas, November 2007



Kansas Energy Chart Book, Chapter 10

Sources: Biodiesel sites based on data from the National Biodiesel Board: <http://www.biodiesel.org>; E85 sites based on data from the Kansas Corn Commission: <http://www.ksgains.com> (November 2007)

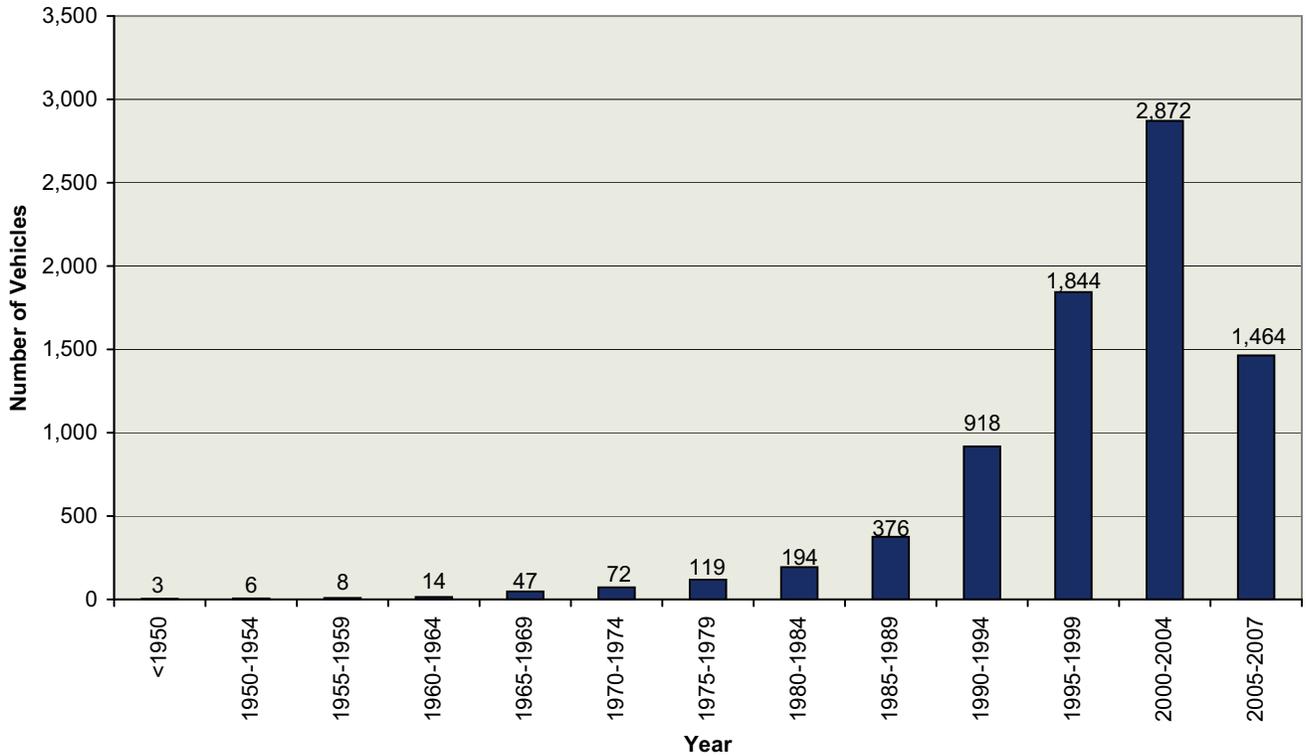
State of Kansas Vehicle Fleet, 2007: Vehicle Type



Kansas Energy Chart Book, Chapter 10

Source: Kansas Dept. of Administration, State Agency Vehicle Usage: <http://www.da.ks.gov/fm/vehicle/index.htm> (accessed September 2007)

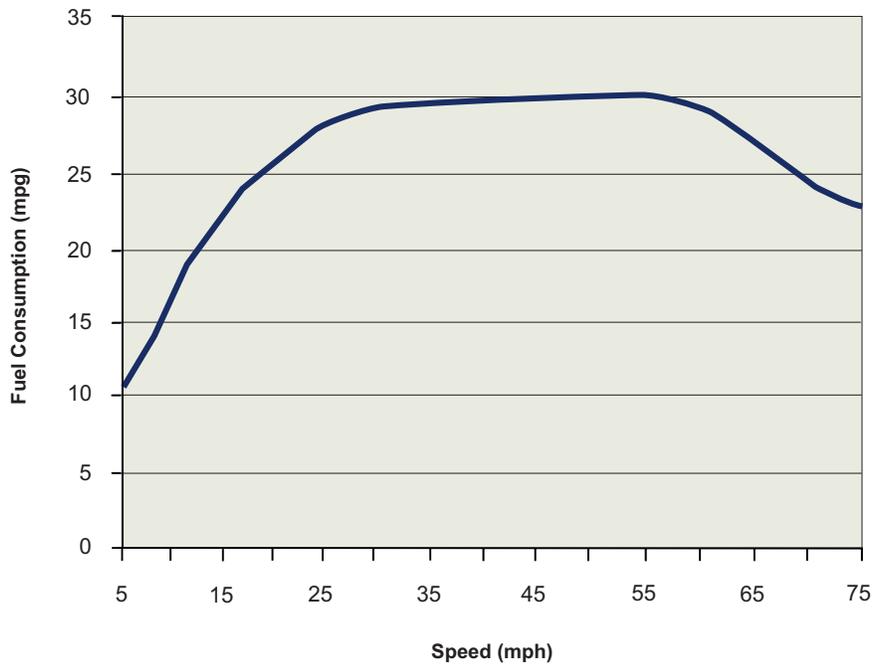
State of Kansas Vehicle Fleet, 2007: Vehicle Year



Kansas Energy Chart Book, Chapter 10

Source: Kansas Dept. of Administration, State Agency Vehicle Usage: <http://www.da.ks.gov/fm/vehicle/index.htm> (accessed September 2007)

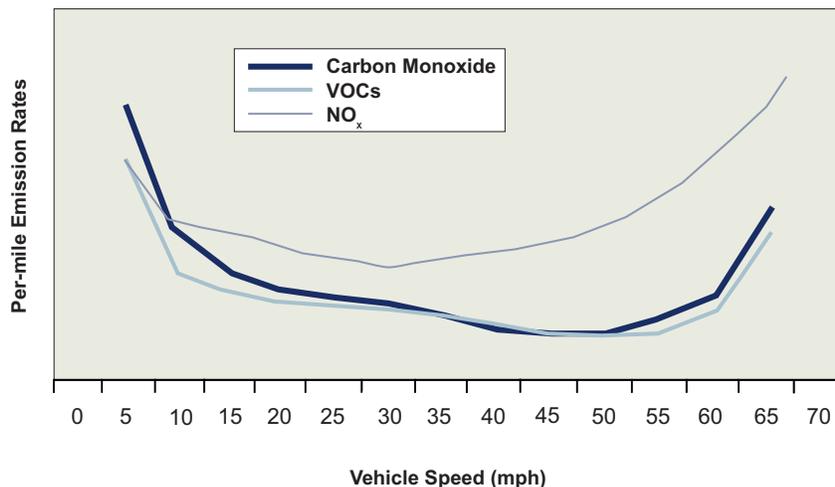
Vehicle Speed vs. Fuel Consumption



Kansas Energy Chart Book, Chapter 10

Source: U.S. Department of Energy web site: <http://www.fueleconomy.gov/feg/driveHabits.shtml>

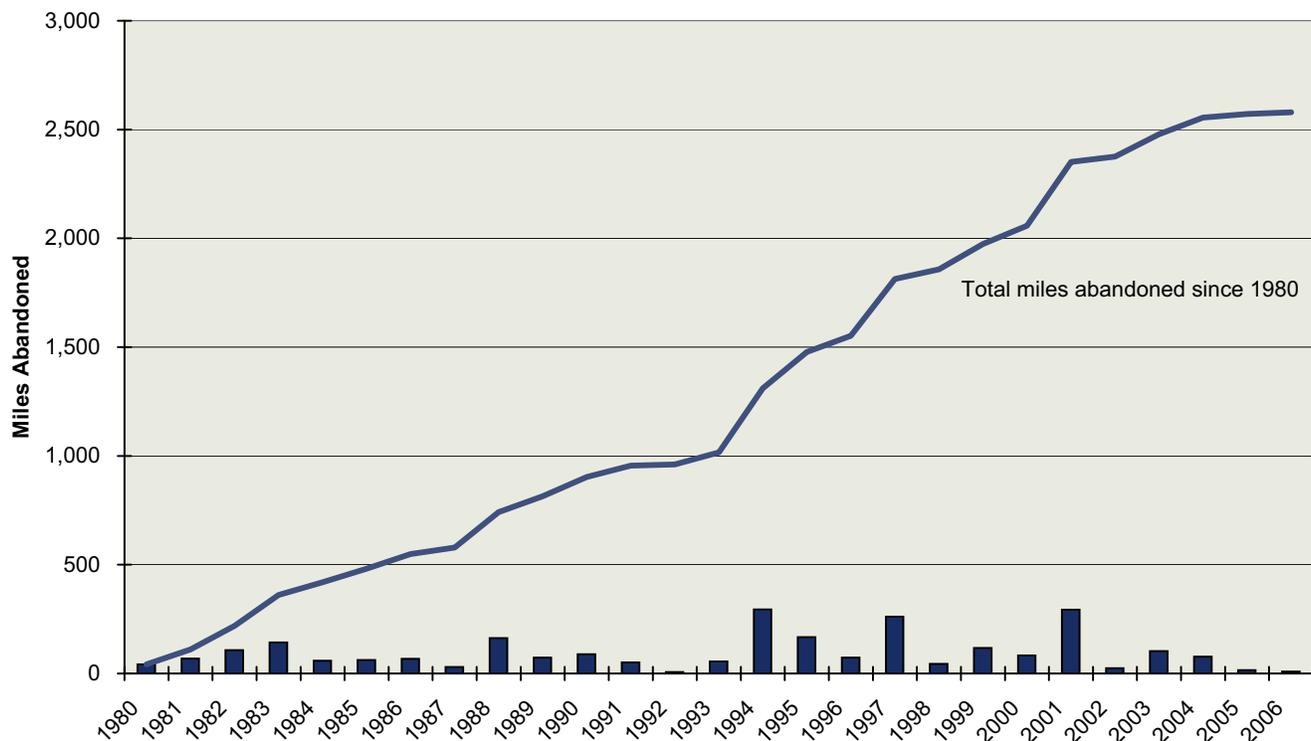
Vehicle Speed vs. Greenhouse Gas Emissions



Kansas Energy Chart Book, Chapter 10

Source: Victoria Transport Policy Institute: <http://www.vtpi.org/tm/tm12.htm>

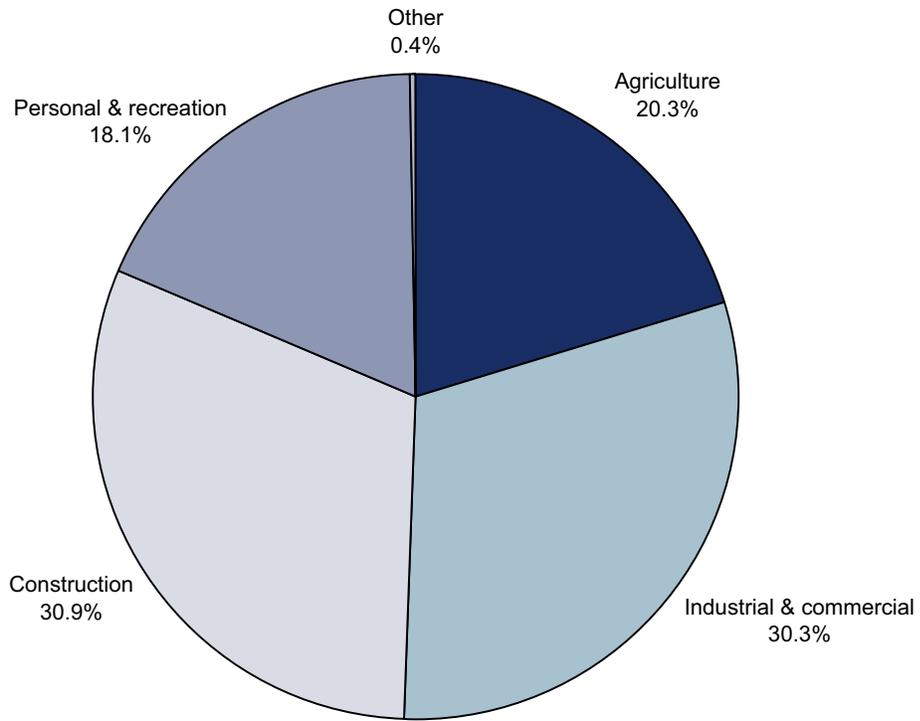
Kansas Railroad Track Miles Abandoned, 1980 – 2006



Kansas Energy Chart Book, Chapter 10

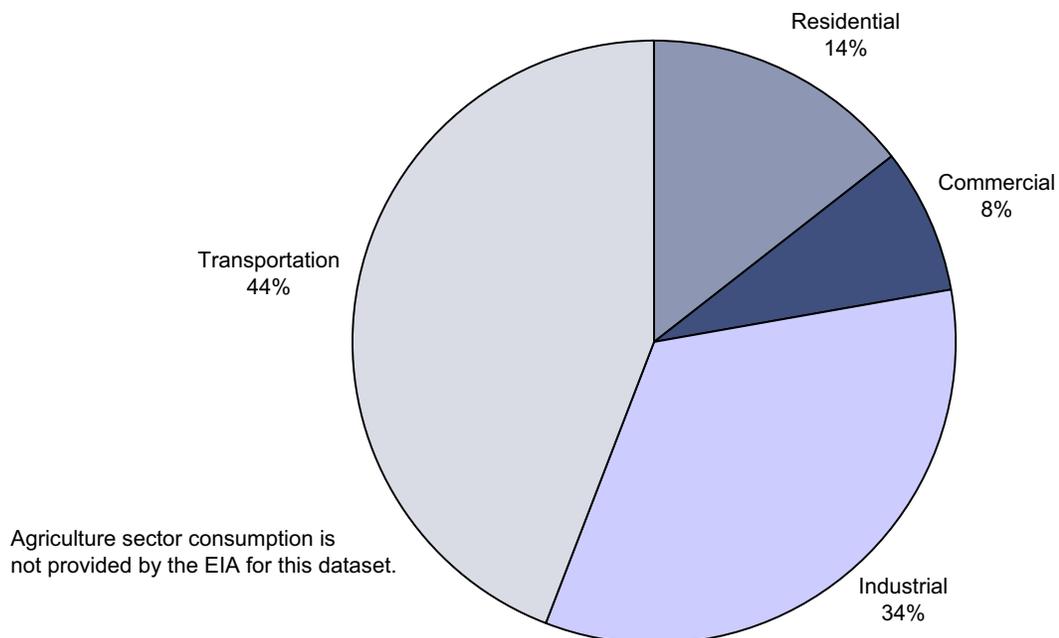
Source: Kansas Department of Transportation, 2006 Rail Plan: <http://www.ksdot.org/burRail/Rail/default.asp> (accessed September 2007)

Kansas Off-road Fuel Consumption, 2005



Chapter 11: Energy Use in the Agricultural Sector

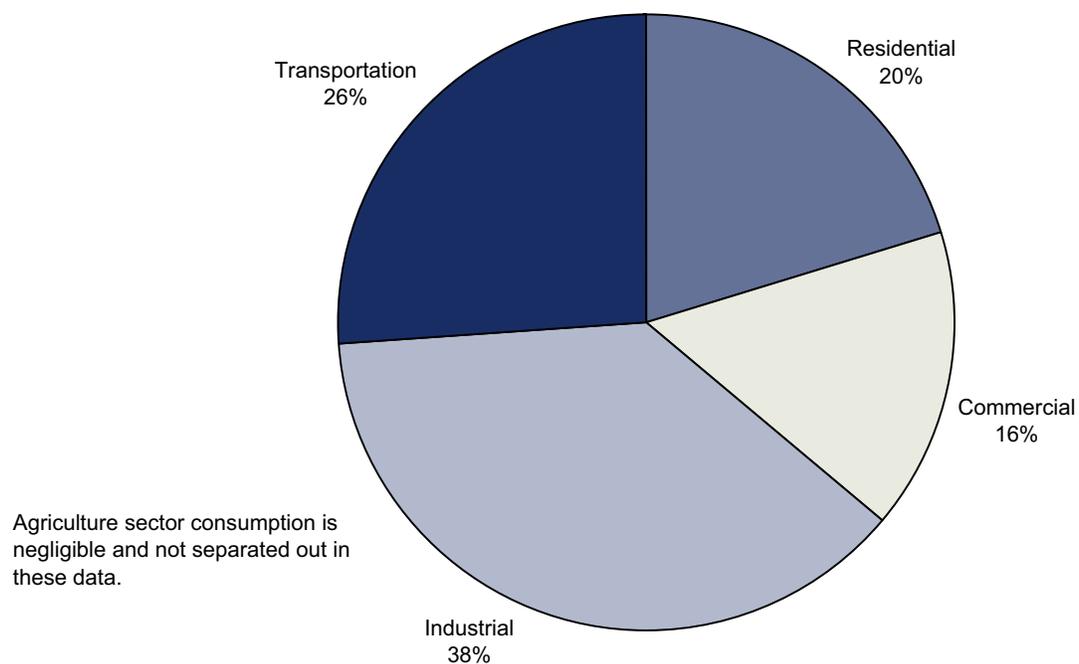
U.S. Direct Energy Consumption by Sector, 2007



Kansas Energy Chart Book, Chapters 9, 11

Source: U.S. Dept. of Energy, Energy Information Administration, Monthly Energy Review, August 2007: http://www.eia.doe.gov/emeu/mer/pdf/pages/sec2_3.pdf (accessed September 2007)

Kansas Direct Energy Consumption by Sector, 2004



Kansas Energy Chart Book, Chapters 9, 11

Source: U.S. Dept. of Energy, Energy Information Administration (EIA), Monthly Energy Review, 2007: http://www.eia.doe.gov/emeu/states/state.html?q_state_a=ks&q_state=KANSAS (accessed August 2007)

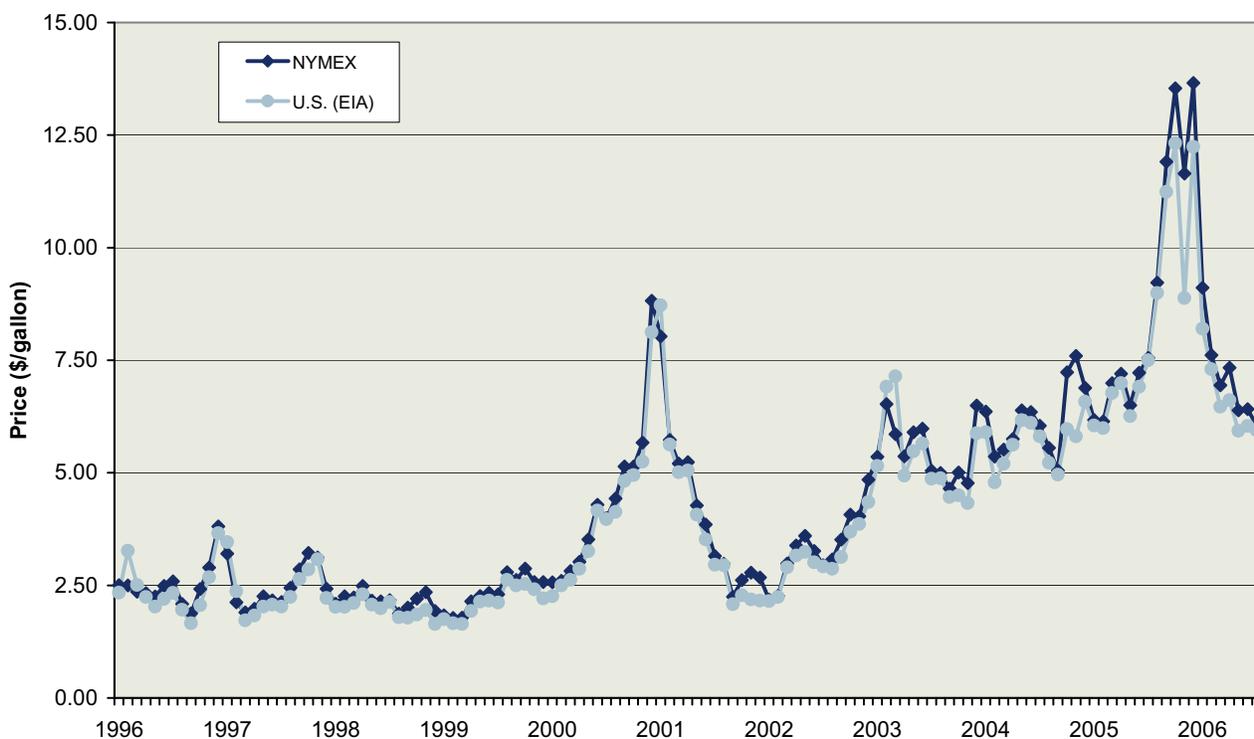
Monthly Diesel Prices in SW Kansas and U.S., January 1996 – July 2006



Kansas Energy Chart Book, Chapter 11

Source: Kastens et al., Energy Use in the Kansas Agricultural Sector: Report Submitted to the Kansas Energy Council, June 15, 2006: <http://kec.kansas.gov/>

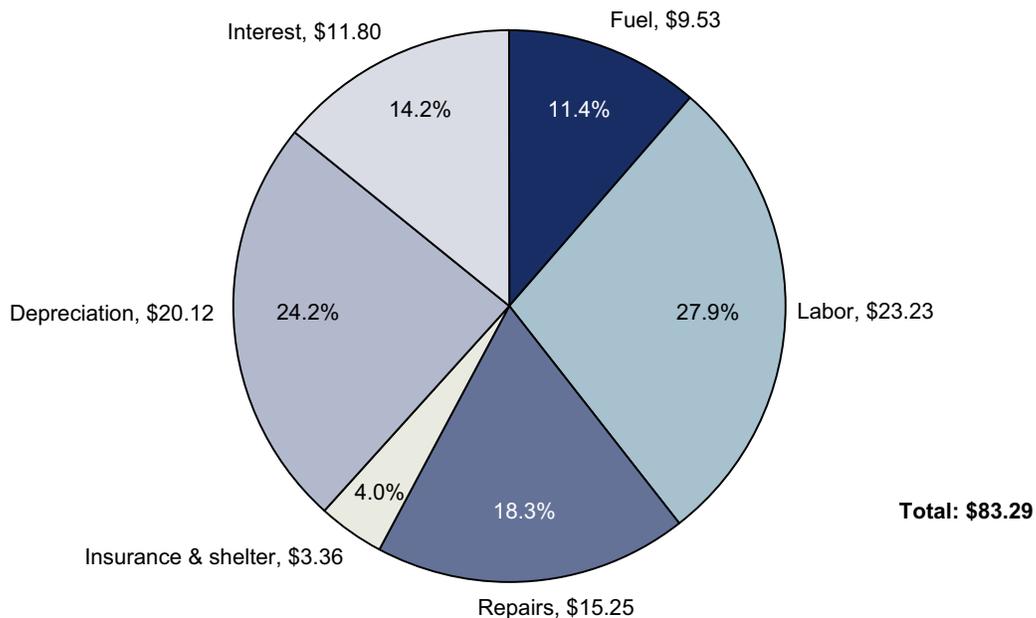
U. S. Monthly Natural Gas Prices, January 1996 – July 2006



Kansas Energy Chart Book, Chapter 11

Source: Kastens et al., Energy Use in the Kansas Agricultural Sector: Report Submitted to the Kansas Energy Council, June 15, 2006: <http://kec.kansas.gov/>

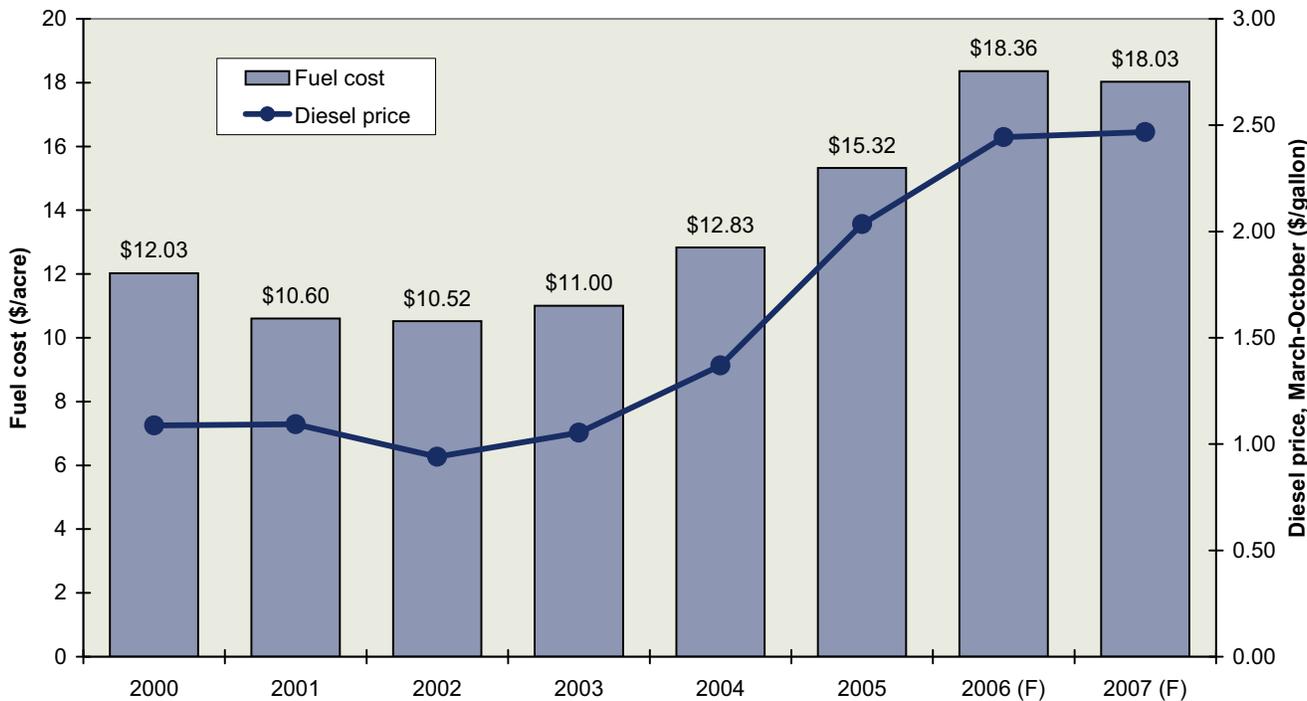
Kansas Agricultural Machinery Costs Per Acre, 2001



Kansas Energy Chart Book, Chapter 11

Source: Kastens et al., Energy Use in the Kansas Agricultural Sector: Report Submitted to the Kansas Energy Council, June 15, 2006: <http://kec.kansas.gov/>

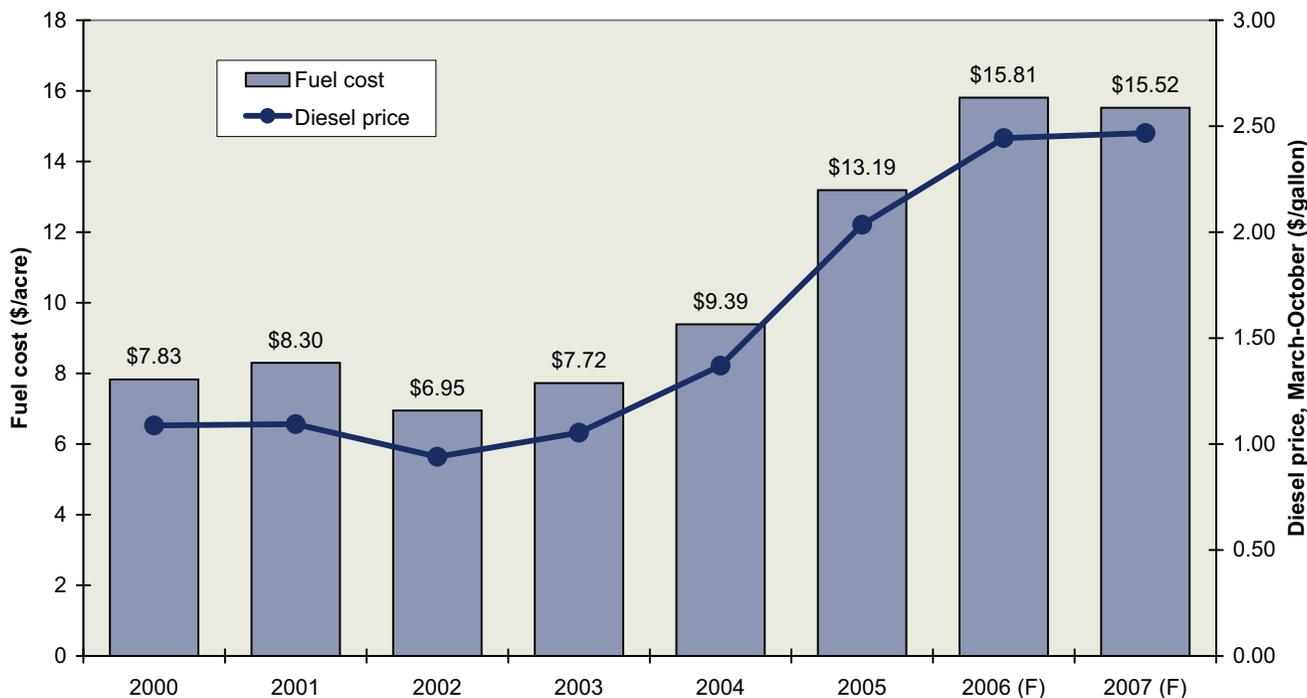
Fuel and Oil Costs for Irrigated Farms in Kansas Farm Management Association (KFMA), 2000 – 2007



Kansas Energy Chart Book, Chapter 11

Source: Kastens et al., Energy Use in the Kansas Agricultural Sector: Report Submitted to the Kansas Energy Council, June 15, 2006: <http://kec.kansas.gov/>

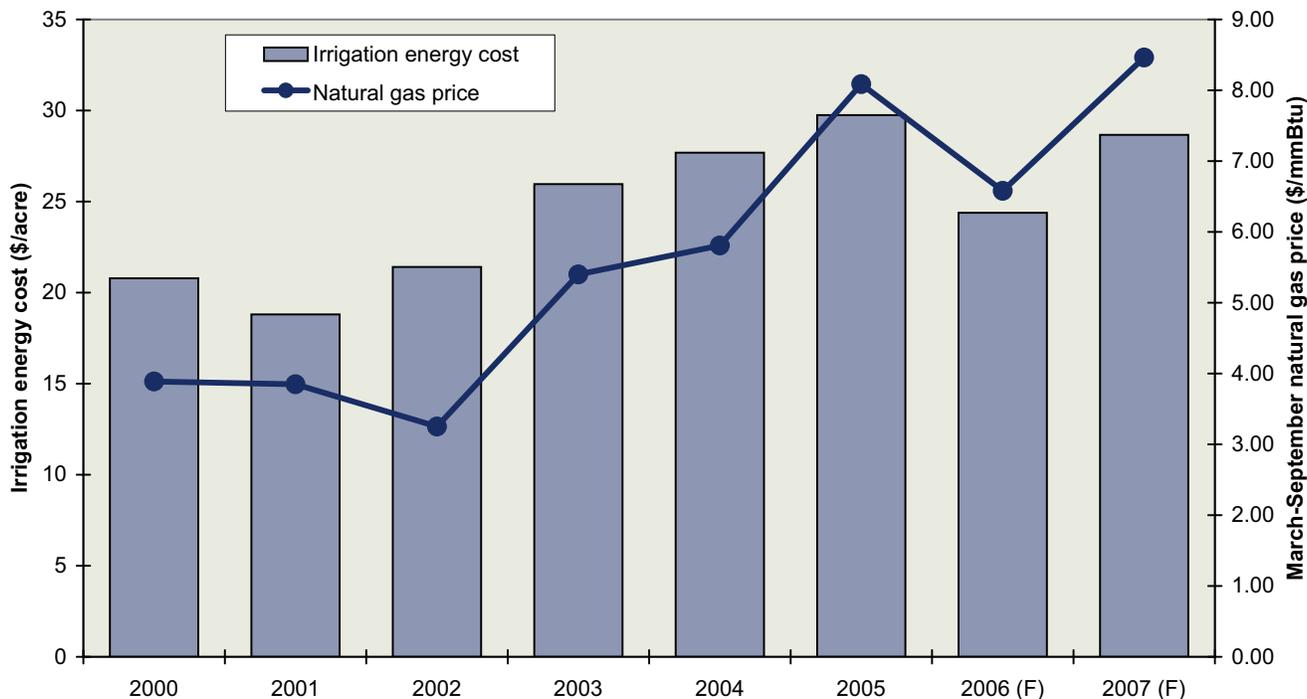
Fuel and Oil Costs for Non-irrigated Farms in Kansas Farm Management Association (KFMA), 2000 – 2007



Kansas Energy Chart Book, Chapter 11

Source: Kastens et al., Energy Use in the Kansas Agricultural Sector: Report Submitted to the Kansas Energy Council, June 15, 2006; available at <http://kec.kansas.gov/>

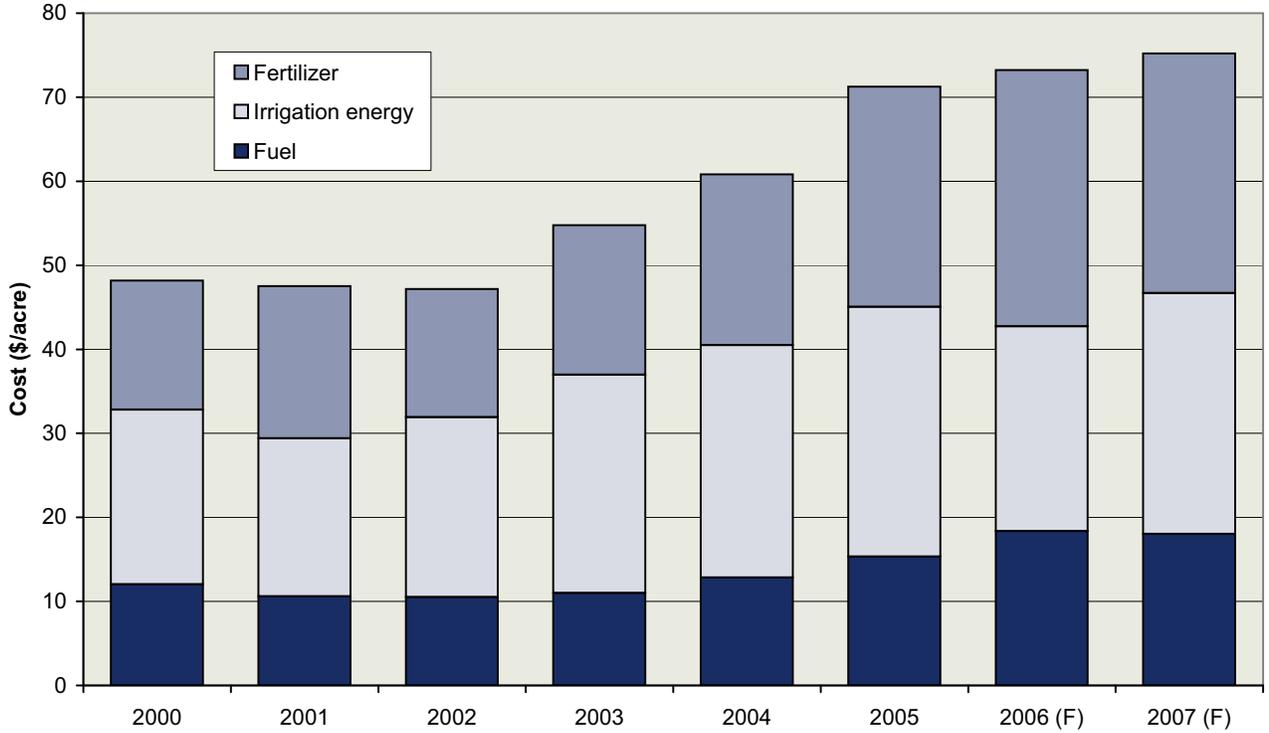
Irrigation Energy Costs for Irrigated Farms in Kansas Farm Management Association (KFMA), 2000 – 2007



Kansas Energy Chart Book, Chapter 11

Source: Kastens et al., Energy Use in the Kansas Agricultural Sector: Report Submitted to the Kansas Energy Council, June 15, 2006; available at <http://kec.kansas.gov/>

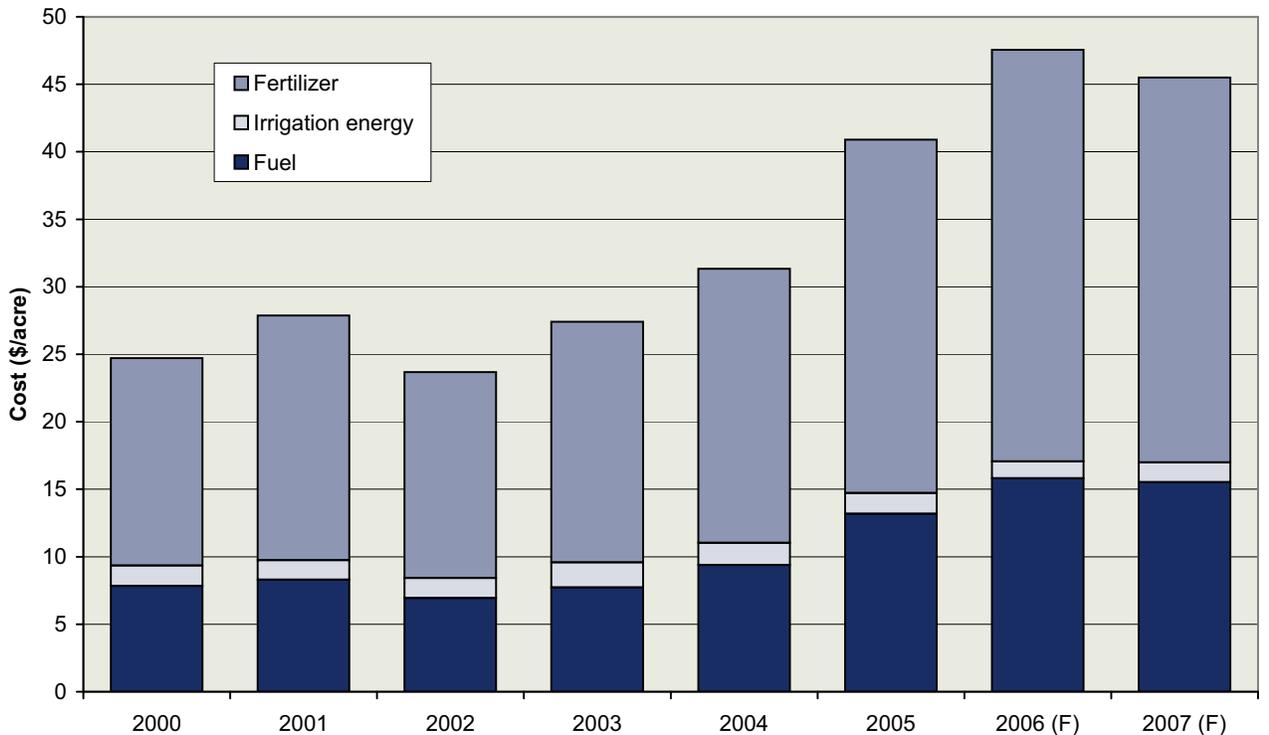
Energy-related Costs for Irrigated Farms in Kansas Farm Management Association (KFMA), 2000 – 2007



Kansas Energy Chart Book, Chapter 11

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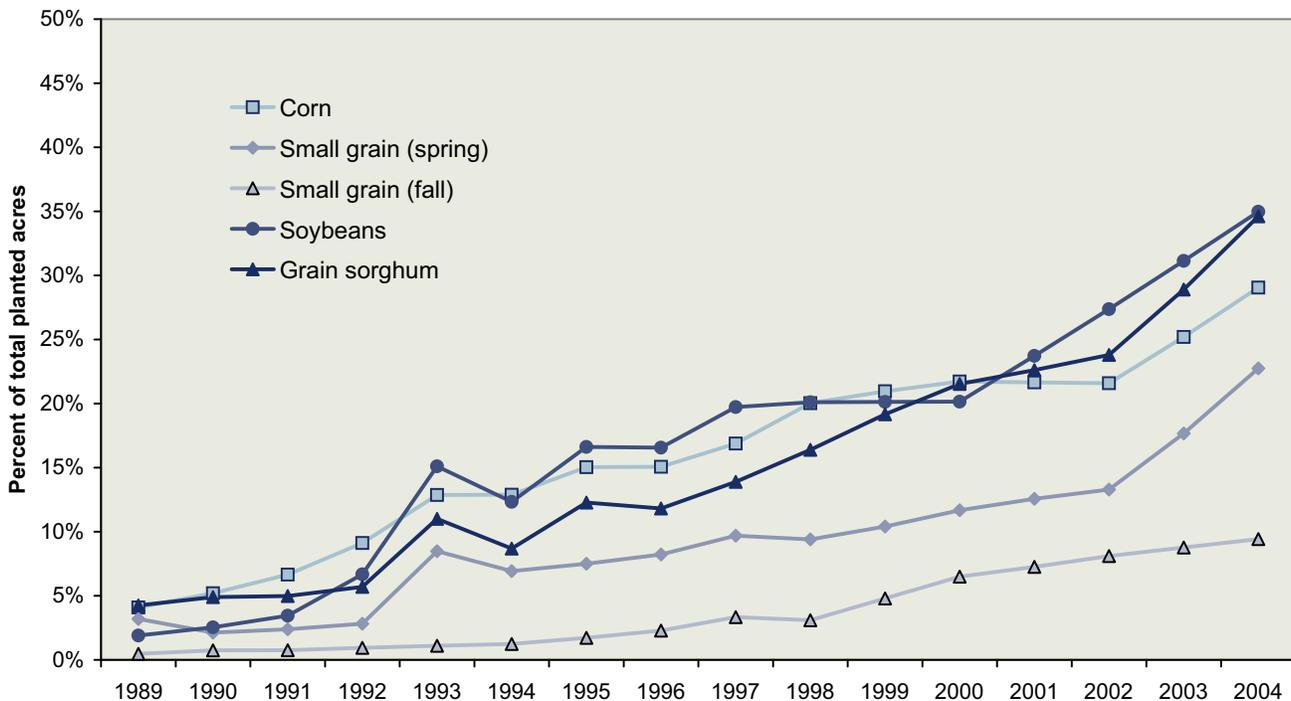
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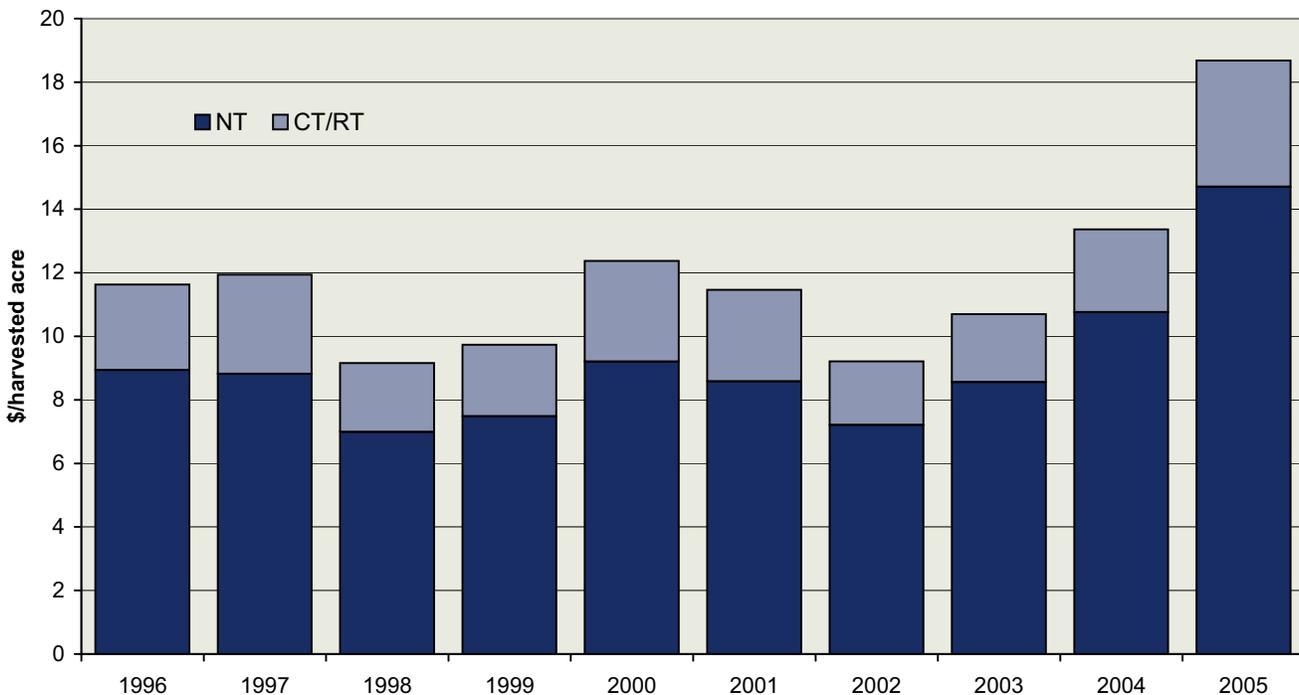
Percentage of Kansas Acres in No-till by Crop, 1989 – 2004



Kansas Energy Chart Book, Chapter 11

Source: Kastens et al., Energy Use in the Kansas Agricultural Sector: Report Submitted to the Kansas Energy Council, June 15, 2006: available at <http://kec.kansas.gov/>

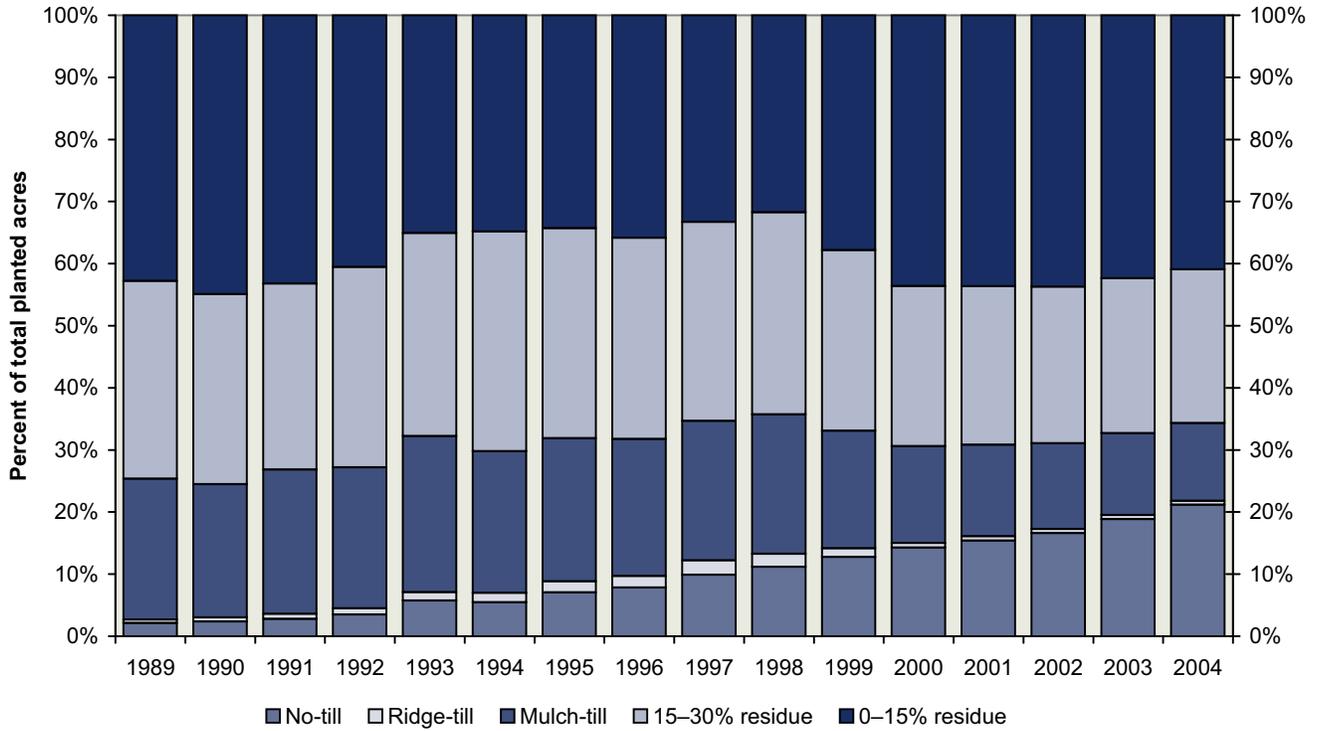
Comparison of Fuel and Oil Costs in North-central Kansas, 1996 – 2005 No-till vs. Conventional-till/Reduced-till



Kansas Energy Chart Book, Chapter 11

Source: Kastens et al., Energy Use in the Kansas Agricultural Sector: Report Submitted to the Kansas Energy Council, June 15, 2006: available at <http://kec.kansas.gov/>

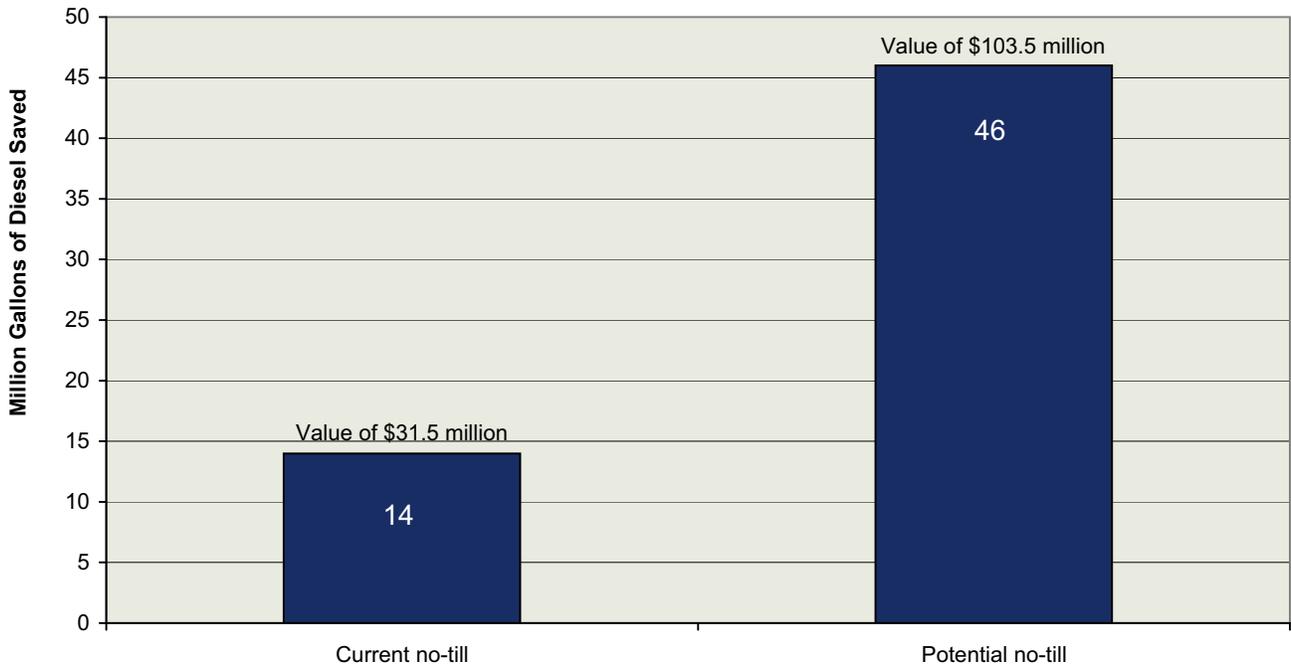
Agricultural Tillage Systems in Kansas, 1989 – 2004



Kansas Energy Chart Book, Chapter 11

Source: Kastens et al., Energy Use in the Kansas Agricultural Sector: Report Submitted to the Kansas Energy Council, June 15, 2006: available at <http://kec.kansas.gov/>

Projected Annual Fuel Savings from Conversion of All Kansas Crop Production to No-till (assumes 2 gallons per acre savings and \$2.25 diesel)

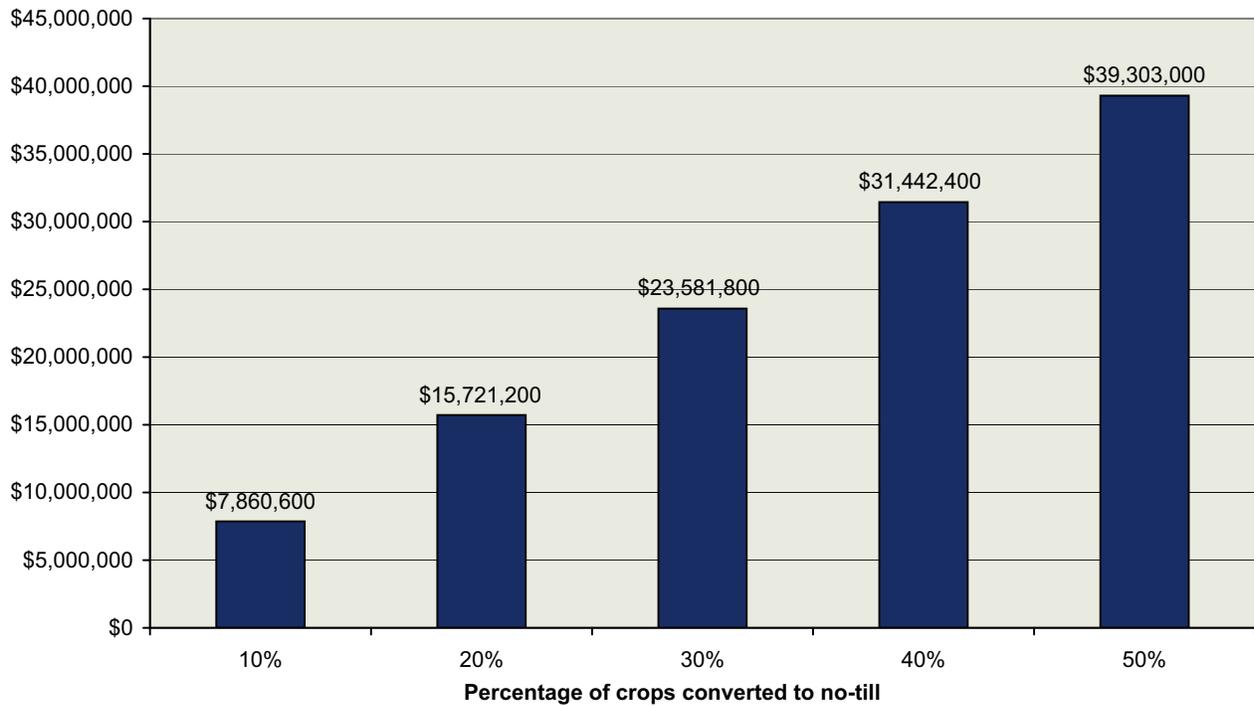


Kansas Energy Chart Book, Chapter 11

Source: Kastens et al., Energy Use in the Kansas Agricultural Sector: Report Submitted to the Kansas Energy Council, June 15, 2006: available at <http://kec.kansas.gov/>

Projected Annual Dollar Savings from Conversion of Kansas Crop Production to No-till

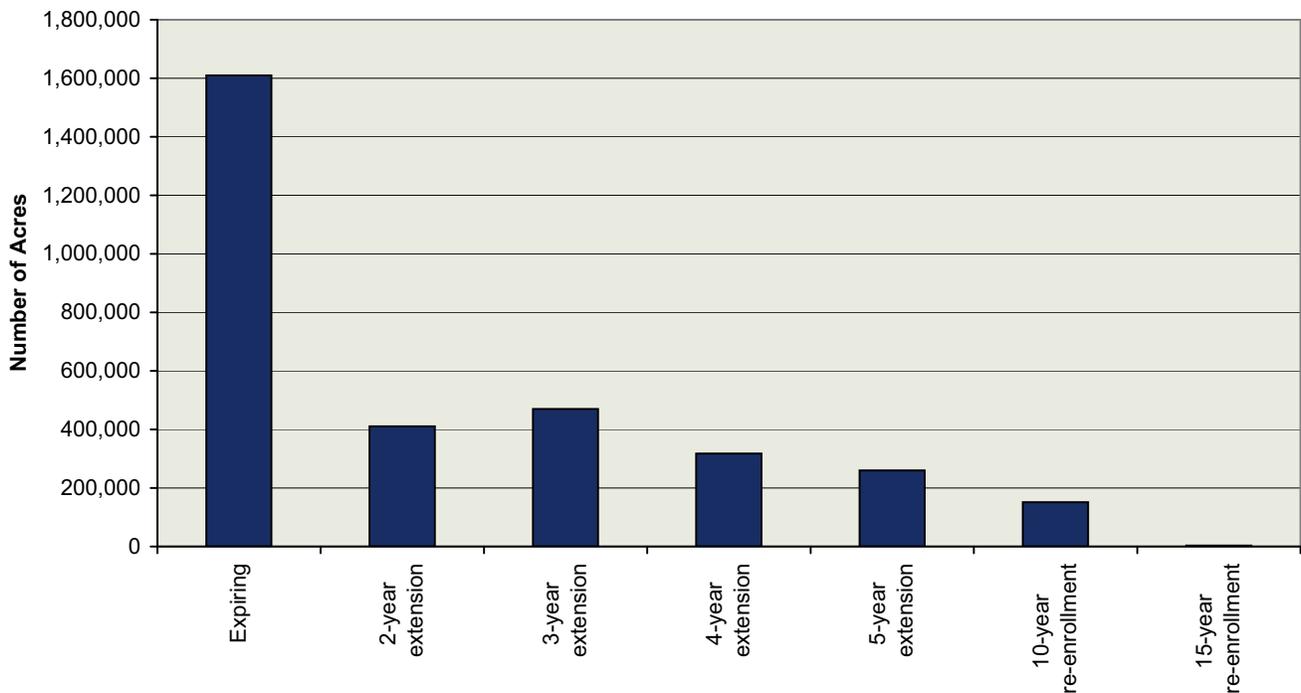
(assumes 2 gallons per acre savings and \$2.25 diesel prices)



Kansas Energy Chart Book, Chapter 11

Source: Kastens et al., Energy Use in the Kansas Agricultural Sector: Report Submitted to the Kansas Energy Council, June 15, 2006: available at <http://kec.kansas.gov/>

Kansas Acres Scheduled to Come Out of Conservation Reserve Program (CRP), 2006 – 2007, and Extension and Re-enrollment Offers



Kansas Energy Chart Book, Chapter 11

Source: Baker & Lowe, Staff Analysis of KEC Background Report *Energy Use in the Kansas Agricultural Sector*, August 2006: available at <http://kec.kansas.gov/>

Federal and State Resource Management Programs and Management Practices that Conserve Energy and Enhance Carbon Sequestration (1 = Improve Forage Quality, 2 = Prescribed Burning, 3 = Reduce Overgrazing, 4 = Buffer Strips, 5 = High Carbon Storage Crops, 6 = No-till and Reduced Till, 7 = Grass Plantings, 8 = Increase Cropping Intensity, 9 = Tree Plantings, 10 = Erosion Control, 11 = Cover Crops).

Agency	Program	Purpose	Energy Conservation and Carbon Sequestration Potential	Relevant Management Practices (see above)
Health and Environment	Nonpoint Source Pollution	Provides funds for projects that will reduce sources of nonpoint source pollution or that treat nonpoint source pollution before it reaches receiving water	Practices may reduce energy consumption through reduced water supply treatment needs. Projects may result in opportunities for C sequestration and provide multiple benefits	1 - 11
USDA/NRCS	Conservation Compliance	Requires specific treatment of highly erodible cropland and wetlands in order participate in most USDA programs	Practices may reduce energy consumption through reduced water supply treatment needs. Projects may result in C sequestration and provide multiple benefits. Watershed function improvement.	1 – 11
	Conservation Operations	Provides technical assistance on private lands for development and application of Resource Management Plans	Practices may reduce energy consumption through reduced water supply treatment needs. Projects may result in opportunities for C sequestration and provide multiple benefits.	1 - 11
	Environmental Quality Incentives Program	Offers financial and technical assistance to install structural and management practices	Practices may reduce energy consumption through reduced water supply treatment needs. Projects may result in C sequestration and provide multiple benefits. Watershed function improvement.	1 - 11
	Inventory and Monitoring	Provides information on soils, water and related resources. Conducts a national survey every five years.	Assists in tracking and quantifying land uses and conversions	1 - 11
	Plant Materials Program	Assists with development of plant materials and techniques for their use in environmental improvement programs	Opportunities to develop high carbon sequestration potential plants.	1, 5, 7, 8, 9, 10, 11

Agency	Program	Purpose	Energy Conservation and Carbon Sequestration Potential	Relevant Management Practices (see above)
	Watershed Planning and Operations	Provides assistance to watershed or conservation districts to install treatment and structural practices	Practices may reduce energy consumption through reduced water supply treatment needs	4, 10
	Ground and Surface Water Conservation	Facilitates a conservation measure that results in a net savings in ground or surface water resources in the agricultural operation of a producer	Water conservation and energy use reduction	
	Wetlands Reserve Program	Cost share and easements to restore and protect wetlands	Reduces flood damage, filters pollutants, and reduces soil erosion, supplies wildlife habitat. Watershed function improvement and C sequestration	4, 7, 9, 10
	Wildlife Habitat Incentives Program	Cost share to establish wildlife habitat	Watershed function improvement and C sequestration	1, 3, 4, 7, 9, 10
	Grassland Reserve Program	Cost share and easements to protect, restore, and enhance native rangeland	Watershed function improvement and C sequestration	1, 2, 3, 7, 10
	Grazing Lands Conservation Initiative	Enhances the state's privately-owned grazing lands by increasing technical assistance at the grassroots level	Healthy grazing lands result in reduced runoff and nonpoint source pollution while sequestering carbon	1, 2, 3, 5, 7, 10
	Conservation Security Program	Contract payments for utilizing beneficial conservation practices. CSP is a voluntary program that provides financial and technical assistance to promote the conservation and improvement of soil, water, air, energy, plant and animal life on Tribal and private working lands	Reduces soil erosion, improves water quality, water conservation. Watershed function improvement and C sequestration. Opportunities for energy use reduction.	1 – 11
	Conservation Reserve Enhancement Program	A voluntary land retirement program that helps agricultural producers protect environmentally sensitive land, decrease erosion, restore wildlife habitat, and safeguard ground and surface water	Reduces energy use. Reduces soil erosion, improves water quality, water conservation. Watershed function improvement and C sequestration	1, 2, 3, 4, 7, 9, 10, 11

Agency	Program	Purpose	Energy Conservation and Carbon Sequestration Potential	Relevant Management Practices (see above)
	Farm and Ranchland Protection Program	Provides funding to keep farm and ranchlands in agricultural uses	Watershed function improvement and multiple C sequestration	1 - 11
	Energy Audits	Assessment of how energy is being consumed and suggestion on how reductions can be made and alternative energy produced	Energy use reduction and alternate energy sources	
Farm Services Agency	Conservation Reserve Program	Cost share and rental agreements to convert marginal cropland to native grasses and wetlands	Preserve the function of these systems and may enhance C sequestration. Energy conservation	1, 2, 3, 4, 7, 9, 10, 11
US Fish and Wildlife Service	Fish and Wildlife Enhancement Program	Supports field operations which includes technical assistance on protecting, restoring or maintaining native habitats	Preserves the function of these systems and may enhance C sequestration	1, 2, 3, 7, 9, 10, 11
	Private Lands Program	Contracts for 1 to 29 years to restore, enhance or create wetlands or native grasslands.	Preserves the function of these systems and may enhance C sequestration	1, 2, 3, 4, 7, 9, 10, 11
Wildlife and Parks	Conservation Easements for Riparian and Wetland Areas	Establishes easements to permanently secure and enhance quality areas in the state	Preserves the function of these systems and has potential for C sequestration	4, 7, 9, 10, 11
	Wildlife Habitat Improvement Program	Provides limited assistance for development of wildlife habitat	Watershed function improvement and C sequestration	1, 3, 4, 7, 9, 10
	North American Waterfowl Conservation Act	Provides up to 50% cost share for purchase and/or development of wetlands and wildlife habitat	Watershed function improvement and C sequestration	4, 7, 9, 10, 11
	Wildtrust	Accepts donated money, property and real estate to acquire and protect sensitive habitat	Watershed function improvement and C sequestration	2, 4, 7, 9, 10, 11
	MARSH Program	May provide up to 100% of funding for small wetland projects. Projects need to provide waterfowl benefits and be open to the public	Watershed function improvement and C sequestration	4, 7, 9, 10, 11

Agency	Program	Purpose	Energy Conservation and Carbon Sequestration Potential	Relevant Management Practices (see above)
State Conservation Commission	Water Resources Cost Share Program	Provides state financial assistance to landowners for the establishment of enduring water conservation practices to protect and improve the quality and quantity of Kansas Water Resources	Reduces soil erosion, improves water quality, water conservation. Watershed function improvement and C sequestration	1 – 11
	Nonpoint Source Pollution Control Fund	Provides state financial assistance for nonpoint source pollution control practices for the protection or restoration of surface and groundwater quality	Protects and/or restores surface and ground water quality. Watershed function improvement and C sequestration. Practices may reduce energy consumption through reduced water supply treatment needs.	1 – 11
	Riparian and Wetland Program	Addresses the conservation and management of riparian areas and wetlands.	Reduces flood damage, filters pollutants, reduces soil erosion, supplies wildlife habitat. Watershed function improvement and C sequestration	4, 7, 9, 10
	Water Rights Purchase Program	Provides financial assistance to a local entity to purchase a water right to restore base flows in designated streams and/or slow or reverse the decline of groundwater levels in specific aquifers	Water and energy conservation	
	Water Quality Buffer Initiative	State cost share incentives supplement federal incentives to encourage the establishment of riparian forest buffers and vegetative filter strips.	Watershed function improvement and C sequestration	4, 7, 9, 10
Kansas Forest Service	Conservation Tree Planting Program	Provides low cost trees and shrubs for conservation plantings	Watershed function improvement and C sequestration	4, 9, 10
	Riparian and Wetland Program	Promotes and assists with establishment of riparian forest land and wetlands	Watershed function improvement and C sequestration	4, 7, 9, 10

Agency	Program	Purpose	Energy Conservation and Carbon Sequestration Potential	Relevant Management Practices (see above)
Kansas Rural Center	River Friendly Farms Program	Producers may qualify for a \$250 incentive payment for completing the RFFP assessment and action plan. Upon Completion, producers may be eligible to apply for up to \$5,000 in cost share funds	May identify opportunities for energy use reduction. Watershed function improvement and C sequestration	1 – 11
Kansas Alliance for Wetlands and Streams	Wetland and Riparian Program	Provides financial assistance for water education statewide. Financial and technical assistance for construction of streambank restoration and wetland projects.	Watershed function improvement and C sequestration	4, 7, 9, 10, 11