



Draft Catalog of State Actions Energy Supply (ES) Technical Work Group (TWG)

A catalog of state-level, greenhouse gas (GHG)-reducing actions and policy options prepared by the Center for Climate Strategies (CCS), Kansas Energy and Environmental Policy Advisory Group (KEEP), and others based on actions undertaken or considered by Kansas and other states, including regional, state, local, and private actions.

Important Note: The state actions are numbered in this catalog solely for convenience in referencing them. Their numbers do NOT reflect a ranking or prioritization of the actions.

Items in **Green** are additions to the options.

Items in **Red** are comments to the notes or recent KS actions section.

Key to Future Rankings of Options in the Tables That Follow

Potential GHG Emission Reductions*	Potential Cost or Cost Savings* [†]
High (H): At least 1.0 million metric tons (MMt) carbon dioxide equivalent (CO ₂ e) per year by 2020	High (H): \$50 per metric ton CO ₂ e (tCO ₂ e) or above
Medium (M): From 0.1 to 1.0 MMtCO ₂ e per year by 2020	Medium (M): \$15–\$50/tCO ₂ e
Low (L): Less than 0.1 MMtCO ₂ e per year by 2020, or 1 MMtCO ₂ e by 2050	Low (L): Less than \$15/tCO ₂ e
Uncertain (U): Not able to estimate at this time	Uncertain (U): Not able to estimate at this time
	Negative (Neg): Net cost savings

*Several measures may overlap in terms of emissions reductions and/or cost impacts. Estimates assume measures would be implemented independently from other measures.

[†] Costs are denoted by a positive number. Cost savings (i.e., “negative costs”) are denoted by a negative number.

Definition of “Priorities for Analysis”

- **High:** High priority options will be analyzed first.
- **Medium:** Medium priority options will be analyzed next, time and resources permitting.
- **Low:** Low priority options will be analyzed last, time and resources permitting.

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reduction	Cost per Ton	Externalities, Feasibility Considerations	Priority for Analysis	Notes / Related Actions in KS
ES-1	EMISSIONS POLICIES AND OVERARCHING ITEMS					
1.0	Overarching items					<ul style="list-style-type: none"> • KS is a member of the Midwestern GHG Reduction Accord. • KS is an observer of the Western Climate Initiative. • KS Administrative Order 08-03 establishes KEEP
1.1	GHG cap-and-trade					<ul style="list-style-type: none"> • KS is a member of the Midwestern GHG Reduction Accord, which is exploring regional cap-and-trade policies. • KS is an observer of the Western Climate Initiative, which is exploring cap-and-trade policies.
1.2	Carbon (GHG) tax					
1.3	Generation performance standards and/or mitigation requirements for electricity					
1.4	Integrated resource planning (IRP)					<ul style="list-style-type: none"> • Sunflower (and KEPCo) are required to submit Integrated Resource Plans to federal agencies (i.e., Western Area Power Administration) as a requirement of participating in hydro power preference allocations.
1.5	Voluntary GHG commitments					<ul style="list-style-type: none"> • KS is a member of the Midwestern GHG Reduction Accord. • KS Executive Order 08-03 established KEEP to develop recommendations for a climate

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						<p>action plan.</p> <ul style="list-style-type: none"> <li data-bbox="1411 337 1938 873">• In February 2008, Westar, Inc. and KDHE signed an agreement to voluntarily reduce GHG emissions, including carbon dioxide. Under the agreement, Westar will perform a companywide inventory of its GHG. It will also conduct a comprehensive evaluation of net greenhouse gas reduction measures, including carbon capture and sequestration as well as energy efficiency programs. Upon approval from KDHE and potential regulatory approval for cost-recovery, Westar will implement the reduction measures at each of their applicable generating units. <li data-bbox="1411 881 1938 1409">• In March 2007, Kansas City Power & Light (KCPL), the Sierra Club, and the Concerned Citizens of Platte County (CCPC) agreed on a set of initiatives to offset carbon dioxide (CO₂), particularly with respect to KCPL's proposed new coal-fired powerplant in Missouri. KCPL agreed to pursue offsets for GHG associated with its new plant through significant investments in energy efficiency and renewable energy. The agreement proposes other investments in clean energy and significant decreases in emissions from the LaCygne powerplant in KS.

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						<i>(Question: Are these decreases related to criteria pollutant emissions, not carbon dioxide?)</i>
1.6	Technology Research and Development					
ES-2	RENEWABLE ENERGY AND ENERGY EFFICIENCY					
2.1	Renewable and/or Environmental Portfolio Standard (RPS/EPS)					<ul style="list-style-type: none"> • Voluntary RPS to achieve 10% of KS energy consumption from wind by 2010 and 20% by 2020. • Since December of 2006 nearly 1,000 megawatts (MW) of potential new wind was announced by a number of the state's leading utilities. The new Smoky Hill Wind Project, along Interstate 70 in Lincoln and Ellsworth Counties, was developed by TradeWind Energy, LLC, a KS developer and will be owned by Enel North America, Inc. It features 100 MW of wind generation to be divided among Sunflower Electric, KS City Board of Public Utilities, and Midwest Energy. It will be fully operational in January 2008. <i>(Moved from ES-1.)</i> • The state's largest utility, Topeka-based Westar, announced on Feb. 26, 2007, a request for proposals (RFP) for 500 MW of renewable energy. This was followed by a joint announcement on Mar. 20 by KCPL and the Sierra Club of a commitment

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						<p>of another 400 MW of wind generation. Westar plans to have about 300 MW of the development installed by the end of 2008. KCPL already owns the Spearville Wind Energy Facility in Ford County that was put into operation in Fall 2006. <i>(Moved from ES-1.)</i></p> <ul style="list-style-type: none"> • These announcements will assure KS utilities will meet a voluntary goal of 1,050 MW of wind by 2010 as announced by Governor Sebelius during the State of the State address in January 2007. This equals about 10% of nameplate electric generation capacity for the state's utilities. The utilities agreed to a commitment of a 20% voluntary goal by 2020. <i>(Moved from ES-1.)</i>
2.2	Grid-based renewable energy incentives and/or barrier removal					<ul style="list-style-type: none"> • Executive Order 08-01 establishes the Governor's Kansas Wind Working Group which will educate stakeholder groups with current information on wind energy markets, technologies, economics, policies, prospects and issues. The WWG will be supported by the Energy Programs Division of the KCC, the lieutenant governor's office and Wind Powering America (WPA). WPA is collaborating with state partners and their stakeholders

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						<p>through its WWG network, now operating in some 30 states. WPA will provide technical assistance, objective analysis, up-to-date information and education and seed funding for the Kansas WWG.</p> <ul style="list-style-type: none"> • HB 2038 provides income tax credits for investment in new renewable cogeneration facilities and for certain biofuel storage and blending equipment.
2.3	Distributed renewable energy incentives and/or barrier removal					<ul style="list-style-type: none"> • KS has a property tax exemption for property with renewable energy equipment. • HB 2038 provides income tax credits for investment in new renewable cogeneration facilities and for certain biofuel storage and blending equipment. • The Renewable Energy Electric Generation Cooperative Act provides for creation of a cooperative by five or more persons. Members of these cooperatives must operate generation facilities that use renewable resources and have a capacity of at least 100 kilowatts of electricity.

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2.4	Green power purchases and marketing					<ul style="list-style-type: none"> Green power purchases were offered by Westar in 1999, but discontinued due to low participation.
2.5	Combined Heat and Power (CHP) standards, incentives and/or barrier removal					<ul style="list-style-type: none"> HB 2038 provides a property tax exemption for certain waste heat utilization systems. The Renewable Energy Electric Generation Cooperative Act provides for creation of a cooperative by five or more persons. Members of these cooperatives must operate generation facilities that use renewable resources and have a capacity of at least 100 kilowatts of electricity.
2.6	Pricing strategies to promote renewable energy and/or CHP (e.g., net metering)					
2.7	Renewable energy development issues (zoning, siting, etc.)					<ul style="list-style-type: none"> KEC developed the Wind Energy Siting Handbook in 2005 with suggestions for developing local guidelines. The Electric Generation Facility Siting Act Amendments of 2000 exempt all renewable generation facilities, except nuclear, from siting requirements. Siting of wind resources has been controversial in some situations in

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						<p>Kansas; for example, the executive order placing a moratorium in the Flint Hills raised objections in the Ellis County and Ellsworth County areas.</p>
2.8	<p>Technology-focused initiatives (biomass co-firing, energy storage for renewable energy generation, fuel cells, etc.), including grant programs</p>					<ul style="list-style-type: none"> The 2007 Kansas Renewable Energy & Energy Efficiency Conference was held September 25-26, at the Topeka Ramada Inn had over 500 attendees. Multiple concurrent sessions on various energy topics were facilitated by over 40 energy experts from Kansas and throughout the country. Topics included efficiency and conservation, new technologies, wind and solar energy, biofuels, public education and loan programs, and federal policy updates. Another Renewable Energy Conference will be held in September 2008.
2.9	Public benefits charge					
2.10	Research and development for renewable technologies					
2.11	Co-location or integration of energy producing facilities					<ul style="list-style-type: none"> The integration proposed by Sunflower at the Holcomb facility is an example of efforts to encourage the more efficient utilization of heat and energy by encouraging the co-location of those facilities.

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ES-3	FOSSIL FUEL AND NUCLEAR ELECTRICITY					
3.1	Advanced fossil fuel technology (e.g., IGCC, CCSR, advanced pulverized coal, CFB) incentives, support, or requirements					<ul style="list-style-type: none"> • HB 2419 provides incentives for carbon sequestration by allowing any CCSR equipment to be exempt from all property taxes. • SB 303 provided tax credits and KDFA financing for building and expanding IGCC plants, but the bill died in committee. • KS Energy Plan (2007) recommends the KCC consider the value of lower-emissions coal generation and CCSR technologies when evaluating investments or purchase power agreements for IGCC with CCSR.
3.2	New Nuclear Capacity					<ul style="list-style-type: none"> • HB 2038 has a property tax exemption for new nuclear facilities built nearby other nuclear facilities. • SB 586 provides electric utilities the ability to recover certain costs related to planning for new nuclear generation capacity.
3.3	Relicensing/Up-rating Existing Nuclear Power					
3.4	Efficiency improvements and re-powering existing plants					
3.5	Technology-focused initiatives					

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ES-4	FUEL PRODUCTION, PROCESSING AND DELIVERY					
4.1	Oil and gas production: GHG emission reduction incentives, support, or requirements					<ul style="list-style-type: none"> Several oil and gas production companies operating in Kansas are participating in EPA's GAS STAR program, a voluntary program to report and reduce methane emissions. More Kansas companies could be encouraged to join GAS STAR. <i>Policy Question: Are there additional regulatory restrictions or requirements on these activities which "do no harm" to the overall fuel production and supply? (Question for all of these under ES-4)</i>
4.2	Natural gas transmission and distribution					<ul style="list-style-type: none"> Several oil and gas production companies operating in Kansas are participating in EPA's GAS STAR program, a voluntary program to report and reduce methane emissions. More Kansas companies could be encouraged to join GAS STAR.
4.3	Oil Refining: GHG emission reduction incentives, support, or requirements					

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4.4	Coal Production: GHG emission reduction incentives, support, or requirements					
4.5	Coal-to-liquids and gas-to-liquids Production: GHG emission reduction incentives, support, or requirements					
4.6	Low-GHG Hydrogen production incentives and support					
ES-5	CARBON CAPTURE AND STORAGE OR REUSE					
5.1	CCSR incentives, requirements and/or enabling policies (administration, regulation, liability, incentives)					<ul style="list-style-type: none"> • HB 2419 (Carbon Dioxide Reduction Act) provides property tax incentives for the sequestration of carbon dioxide, beginning with FY 2008. • EPA has put out a proposed rule on the Underground Injection Control Program for Carbon Dioxide Geologic Sequestration Wells. • KS Geological Survey is a partner in the Southwest Regional Partnership on Carbon Sequestration (SWP). SWP was developed as a part of the U.S. Department of Energy's effort to respond to global climate change. The SWP has been challenged to evaluate available technologies that capture and store CO2 in the southwest region. The SWP includes

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						<p>portions of Arizona, Colorado, Kansas, Nevada, New Mexico, Oklahoma, Texas, Utah and Wyoming. Participants include the coal, oil and gas industries; electric utilities; the Navajo Nation; nongovernmental organizations; universities; and U.S. federal agencies.</p> <ul style="list-style-type: none"> • The use of sequestered carbon dioxide to enhance oil recovery is of great interest due to the rise in the price of crude oil. Wellfields that were once marginal may be brought back to production. Some of these efforts include: <ul style="list-style-type: none"> ○ An on-going project at the University of Kansas Energy Research Center, which includes research by the KU Tertiary Oil Recovery Project, the Kansas Geological Survey, and the ERC for enhanced oil recovery in Kansas using miscible-CO2 flooding. ○ A partnership between Coffeyville Resources Nitrogen Fertilizers and Blue Source to develop options for the utilization of CO2 captured from petroleum coke gasification-based ammonia and urea ammonium nitrate

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						<p>production. Particular focus is proposed to develop an enhanced oil recovery project.</p> <ul style="list-style-type: none">
5.2	R&D for CCSR					<ul style="list-style-type: none"> Various carbon sequestration research efforts exist in Kansas, including KU Energy Research Center and KSU's Soil Carbon Center. Carbon reuse opportunities are proposed by Sunflower for the Holcomb facility. Utilization of flue-gas for the enhanced production of algae for integration with the production of high value products. Has potential application in many industrial facilities that use conventional fossil fuel.
ES-6	OTHER ENERGY SUPPLY OPTIONS					
6.1	Transmission system upgrading					<ul style="list-style-type: none"> KS Electric Transmission Authority was created to manage transmissions issues and upgrades.
6.2	Reduction of transmission and distribution line losses					

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6.3	General distributed generation support (interconnection rules, net metering, etc.)					<ul style="list-style-type: none"> • K.S.A. 66-1238 required KCC to establish standard provisions for interconnection with renewable energy generators. See also K.S.A. 66-1,184 • Utilities are required to pay 150% of the monthly system average cost per kWh for customer supplied renewable generation, up to 200 kW. See also K.S.A. 66-1,184 for exceptions
6.4	Environmental (GHG emissions) disclosure					
6.5	Landfill Gas Recovery (see also Waste)					<ul style="list-style-type: none"> • KS has a property tax exemption for land used to collect, refine, transport or treat landfill gas and for the gas itself.
6.6	Waste to Energy (see also Waste)					<ul style="list-style-type: none"> • Anaerobic digesters can recycle agricultural and ethanol byproducts as fuels and as feedstock for other bio-energy facilities as are proposed by Sunflower for the Holcomb facility.
6.7	N ₂ O Reduction Co-benefit					
6.8	Smart Power Grid					

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6.9	Consider expanded hydroelectric power opportunities					<ul style="list-style-type: none"> The State of Kansas has many reservoirs that discharge a lot of water each year; this could offer small-scale hydro power opportunities. Kansas has one hydro-power facility, the Bowersock Mills & Power Company facility at Lawrence on the Kansas River. The Bowersock facility is comprised of 7 hydroelectric turbines and is capable of producing 2.5 MW.
ES-7	EDUCATION AND OUTREACH					
7.1	General education to public on energy supply options					<ul style="list-style-type: none"> Some energy generation facilities in Kansas provide educational public tours, such as the Bowersock hydro facility.
7.2	Workforce development education to support energy supply options and economic development					<ul style="list-style-type: none"> Community College system in Kansas could be a model to develop and deploy educational and technical curriculum to support workforce development needs associated with potential actions.