



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

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.

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): \$40 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–\$40/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.

Notation regarding options: **Options marked with an asterisk (*) and presented in blue colored font indicate options that are at least partially “base case” policies, i.e., that have been considered or undertaken at some level in Kansas.**

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					
1.1	GHG cap-and-trade					
1.2	Carbon (GHG) tax					
1.3	Generation performance standards and/or mitigation requirements for electricity					*Executive Order 08-04 Reformulates the composition of the Kansas Energy Council
1.4	Integrated resource planning (IRP)					
1.5	Voluntary GHG commitments					*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 company-wide 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, Westar will implement the

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reduction	Cost per Ton	Externalities, Feasibility Considerations	Priority for Analysis	Notes / Related Actions in KS
						<p>reduction measures at each of their applicable generating units. In March, 2007, Kansas City Power & Light (KCP&L), 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 KCP&L's proposed new coal-fired powerplant in Missouri. KCP&L 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 Kansas.</p>
						<p>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 Kansas developer and will be owned by Enel North America,</p>

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reduction	Cost per Ton	Externalities, Feasibility Considerations	Priority for Analysis	Notes / Related Actions in KS
						<p>Inc. It features 100 MW of wind generation to be divided among Sunflower Electric, Kansas City Board of Public Utilities, and Midwest Energy. It will be fully operational in January of 2008.</p> <p>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 Kansas City Power & Light and the Sierra Club of a commitment of another 400 MW of wind generation. Westar plans to have about 300 MW of the development installed by the end of 2008.</p> <p>KCPL already owns the Spearville Wind Energy Facility in Ford County that was put into operation in the fall of 2006.</p> <p>These announcements will assure Kansas utilities will meet a voluntary goal of 1,050 MW of wind by 2010 as announced by Governor Kathleen Sebelius during the State of the State address on January 10, 2007. This equals about 10% of nameplate electric generation</p>

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reduction	Cost per Ton	Externalities, Feasibility Considerations	Priority for Analysis	Notes / Related Actions in KS
						capacity for the state's utilities. The utilities agreed to a commitment of a 20% voluntary goal by 2020
1.6	Technology Research and Development					
ES-2	RENEWABLE ENERGY AND ENERGY EFFICIENCY					
2.1	Renewable and/or Environmental Portfolio Standard (RPS/EPS)					
2.2	Grid-based renewable energy incentives and/or barrier removal					<p>*Executive Order 08-01</p> <p>Establishes the Governor's 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 through its Wind Working Group network, now operating in some 30 states. WPA will provide technical assistance, objective analysis, up-to-date information and education and</p>

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reduction	Cost per Ton	Externalities, Feasibility Considerations	Priority for Analysis	Notes / Related Actions in KS
						seed funding for the Kansas Wind Working Group.
2.3	Distributed renewable energy incentives and/or barrier removal					
2.4	Green power purchases and marketing					
2.5	Combined Heat and Power (CHP) standards, incentives and/or barrier removal					
2.6	Pricing strategies to promote renewable energy and/or CHP (e.g., net metering)					
2.7	Renewable energy development issues (zoning, siting, etc.)					
2.8	Technology-focused initiatives (biomass co-firing, energy storage, fuel cells, etc.)					*The 2007 Kansas Renewable Energy & Energy Efficiency Conference was held September 25-26, at the Topeka Ramada Inn had over 500 attendees. Kansas Lieutenant Governor Mark Parkinson, also co-chair of the Kansas Energy Council, kicked-off the conference. Keynote speakers were Wes Jackson, founder and current president of The Land Institute, located near Salina, and Soren Hermansen, director of the Samsø Energy Agency of Denmark. Multiple concurrent

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reduction	Cost per Ton	Externalities, Feasibility Considerations	Priority for Analysis	Notes / Related Actions in KS
						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					
ES-3	FOSSIL FUEL AND NUCLEAR ELECTRICITY					
3.1	Advanced fossil fuel technology (e.g., IGCC, CCSR) incentives, support, or requirements					*KDHE denied Sunflower Electric's air quality permit
3.2	New Nuclear Power					
3.3	Relicensing/Up-rating Existing Nuclear Power					
3.4	Efficiency improvements and re-powering existing plants					
3.5	Technology-focused initiatives					
ES-4	FUEL PRODUCTION, PROCESSING AND DELIVERY					
4.1	Oil and gas production: GHG emission reduction incentives, support, or requirements					

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reduction	Cost per Ton	Externalities, Feasibility Considerations	Priority for Analysis	Notes / Related Actions in KS
4.2	Natural gas transmission and distribution					
4.3	Oil Refining: GHG emission reduction incentives, support, or requirements					
4.4	Coal Production: GHG emission reduction incentives, support, or requirements					
4.5	Coal-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)					<p>*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:</p> <p>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</p>

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reduction	Cost per Ton	Externalities, Feasibility Considerations	Priority for Analysis	Notes / Related Actions in KS
						<p>Kansas using miscible-CO2 flooding. Additional information and can be obtained from the Energy Resource Center's project website: http://www.kgs.ku.edu/ERC/CO2Pilot/index.html</p> <p>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 production. Particular focus is proposed to develop an enhanced oil recovery project.</p>
5.2	R&D for CCSR					<p>*The KGS 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 portions of: Arizona, Colorado, Kansas, Nevada, New Mexico, Oklahoma, Texas, Utah and</p>

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reduction	Cost per Ton	Externalities, Feasibility Considerations	Priority for Analysis	Notes / Related Actions in KS
						Wyoming. Participants include the coal, oil and gas industries; electric utilities; the Navajo Nation; nongovernmental organizations; universities; and U.S. federal agencies.
ES-6	OTHER ENERGY SUPPLY OPTIONS					
6.1	Transmission system upgrading					
6.2	Reduction of transmission and distribution line losses					
6.3	General distributed generation support (interconnection rules, net metering, etc.)					
6.4	Environmental (GHG emissions) disclosure					
6.5	Landfill Gas Recovery (see also Waste)					
6.6	Waste to Energy (see also Waste)					
6.7	N ₂ O Reduction Co-benefit					
6.8	Smart Grid					