

## Strategic Initiative #1 – SWOT Summary

Strengths	Weaknesses
<ul style="list-style-type: none"> <li>• Programs in               <ul style="list-style-type: none"> <li>• Climate research across physical, natural and social sciences, and engineering</li> <li>• Carbon &amp; non-carbon based energy research</li> <li>• Sustainable natural resources (water, unconventional hydrocarbons)</li> <li>• Energy-use research in transportation, vehicles &amp; infrastructure</li> <li>• Environmental impacts in biological and social science, and humanities</li> </ul> </li> <li>• Proven research centers and infrastructure in key areas</li> <li>• Campus leadership in sustainability</li> <li>• History of interdisciplinary research and collaborative effort</li> <li>• University commitment to allocating resources to promote this initiative</li> </ul>	<ul style="list-style-type: none"> <li>• Deficiencies in research infrastructure               <ul style="list-style-type: none"> <li>• Administration &amp; support</li> <li>• Incentives (compensation, course release)</li> <li>• Coordination of fundraising, cross-unit hires</li> <li>• Physical structures</li> </ul> </li> <li>• Comparative isolation from industry concerns and needs, lack of realism</li> <li>• Lack of cross-unit platforms for communication, collaboration, teaching and research</li> <li>• Lack of inter-institutional collaboration, other connections nationally</li> <li>• Research has low emphasis in some units</li> <li>• Lack of policy and economic expertise on energy</li> <li>• Comparative failure to hire aggressively at mid-career and senior levels</li> </ul>

Opportunities	Threats
<ul style="list-style-type: none"> <li>• Traditional federal programs (NIH, NSF) on health, climate change, sustainability, and interdisciplinary approaches to research and education</li> <li>• Other federal programs: DoD, DoE</li> <li>• Increased federal and industry interest in:               <ul style="list-style-type: none"> <li>• Scientists, engineers with energy &amp; environmental training</li> <li>• Research on energy efficiency, recovery, alternative fuels, environmental impacts</li> </ul> </li> <li>• Kansas' potential in biomass, wind, solar, hydrocarbons and CO2 sequestration</li> <li>• Cross-disciplinary initiatives:               <ul style="list-style-type: none"> <li>• Applications of computer science and information technology</li> <li>• Combining business/economics with engineering/science for both energy and environmental issues</li> </ul> </li> <li>• International collaboration</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of AAU status</li> <li>• Initiatives of other universities, in particular large state schools mid-continent</li> <li>• Erosion of public support and lack of interest in science state-wide</li> <li>• Falling student enrollments</li> <li>• Not known in D.C. as a research university</li> </ul>

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For more detail, see pages 2-5

## Expanded List of Strengths, Weaknesses, Opportunities, and Threats

Strengths (internal)	Weaknesses (internal)
<ul style="list-style-type: none"> <li>• Strong paleoclimate research programs in geo, bio, social sciences</li> <li>• Strong niche modeling research program in bio and geosciences with social science potential</li> <li>• Strong clusters of energy research</li> <li>• Strong leadership in sustainability research</li> <li>• Strong climate change modeling capacity</li> <li>• CRESIS</li> <li>• CEBC</li> <li>• Biodiversity data in Natural History Museum</li> <li>• IGERT Program</li> <li>• EPSCOR – climate and energy projects</li> <li>• Lifespan Institute</li> <li>• Commitment to economic growth</li> <li>• Good but limited infrastructure (MRB, NIST Building, Library)</li> <li>• Commitment from KU leadership</li> <li>• Strong research expertise in conventional and unconventional hydrocarbons</li> <li>• Strong water resources research &amp; assessment &amp; conservation</li> <li>• Strong Humanities program in history &amp; environment</li> <li>• Long history of collaborative &amp; interdisciplinary research</li> <li>• Strong health-related research programs</li> <li>• Strong sustaining life of existing infrastructure research program</li> <li>• Emerging alternative fuels/vehicles research program</li> <li>• Dynamic faculty in some key areas</li> <li>• Proven research centers in solar, transportation, bio-refining, petroleum, KBS, KGS, climate change</li> <li>• Commitment to economic growth in State</li> <li>• Good infrastructure in some key areas</li> </ul>	<ul style="list-style-type: none"> <li>• Lack space for interdisciplinary collaboration in energy &amp; sustainability research &amp; teaching</li> <li>• Limited understanding of environmental aspects of energy and dimensions of environmental change</li> <li>• Complacency about research funding—evidence: about to lose AAU membership</li> <li>• No clear policies on course release for funded research</li> <li>• Ineffective research overhead distribution and reinvestment</li> <li>• Poor support for leading interdisciplinary proposals &amp; project management</li> <li>• Lack of connection to public policy and real-world practice</li> <li>• Lack of pragmatism with industry – don't know what industry wants &amp; can't meet industry's needs</li> <li>• Lack staff for development of research opportunities with agencies/industry</li> <li>• Lack communication between researchers and research administration</li> <li>• Research admin. lacks ability to support research infrastructure; has bureaucratic and gatekeeping culture</li> <li>• Researchers limited knowledge regarding available funding</li> <li>• Lack seed/bridge money or incentives to start or continue research</li> <li>• Isolated nationally with regard to sustainability/energy theme</li> <li>• Not all Depts. value research the same</li> <li>• Lack of communication between researchers, endowment, etc.</li> <li>• No institutional framework for coordinating interdisciplinary hires</li> </ul>

## Expanded List of Strengths, Weaknesses, Opportunities, and Threats

	<p><i>(weaknesses continued)</i></p> <ul style="list-style-type: none"><li>• Differing teaching loads makes collaboration difficult</li><li>• Few people who do energy policy</li><li>• Physical infrastructure</li><li>• Research computing support (modeling, large databases, etc.)</li><li>• Lack of inter-institutional collaboration</li><li>• Issues of energy and climate change regarded as antithetical leading to different communities of scholarship</li></ul>
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## Expanded List of Strengths, Weaknesses, Opportunities, and Threats

Opportunities (external)	Threats (external)
<ul style="list-style-type: none"> <li>• NSF, NIH, DOE-Energy Research, &amp; NIST received budget increases; NIH slight increase to \$32B</li> <li>• NSF increase to \$7.8B, includes \$998M for sustainability research &amp; clean energy economy, \$225M research facilities construction, &amp; \$576M nanotechnology and biotechnology energy research</li> <li>• DOE Office of Science \$5.4B for long-term R&amp;D; \$550M for ARPA-E; Energy Efficiency &amp; Renewable Energy (\$3.2B) increased by 44.4 %</li> <li>• DOE to invest \$588M in developing advanced vehicles &amp; \$200M in electric vehicle infrastructure</li> <li>• Three new DOE Energy Innovation Hubs proposed</li> <li>• DOE “Race to Green” grants provided to reduce energy use at universities &amp; hospitals</li> <li>• Proposed \$556B reauthorization (DOT) transportation bill spread over 6 years</li> <li>• USDA to invest \$6.5 billion in renewable &amp; clean energy w/ grants \$350K to \$500K for regional biofuels production</li> <li>• Dept. of Commerce budget increased to monitor weather &amp; climate to improve forecasting severe weather events. DOC/NIST/NOAA - \$4.5B</li> <li>• DOD to receive \$76.7B for RDT&amp;E including basic and applied research and for cleaner &amp; more efficient energy use.</li> <li>• Despite budget decrease EPA to implement Sustainable (green) Water Infrastructure Policy</li> <li>• Forest Service &amp; Fish and Wildlife to provide \$1.4B for forest restoration and wetlands protection</li> <li>• USDA socioeconomic grants (\$350K) to assess impacts of biofuels on rural communities</li> <li>• USDA grants of \$500K to assess direct &amp; indirect implications of land use change from biofuels feedstock</li> </ul>	<ul style="list-style-type: none"> <li>• KU is in danger of being expelled from the AAU</li> <li>• KU is not well-known in Washington as a research university</li> <li>• Lack of respect for higher education and sciences state-wide</li> <li>• KU is behind most universities in having a center for research and teaching on global sustainability, climate and energy or energy and environment.. Those centers are where the funding will go, not KU</li> <li>• Other institutions attract the best faculty and students interested in interdisciplinary energy &amp; environment</li> <li>• Our best and brightest faculty &amp; students in energy and environment are being attracted elsewhere because we don’t have any synergy or investment in energy/environment collaborations</li> <li>• Other institutions conduct more open rank faculty searches which attracts established scholars—we tend to hire Assistant Professor level</li> <li>• In-state competition and head hunting of faculty talent</li> <li>• Fragmentation of research strengths</li> <li>• Universities that have already made large investments in campus sustainability (e.g. recent announcement at U of Michigan) likely have a competitive edge over KU when seeking sustainability-related external funding</li> </ul>

## Expanded List of Strengths, Weaknesses, Opportunities, and Threats

*(opportunities continued)*

- HUD to receive \$48B; includes \$150M to promote sustainable development, reduce greenhouse gas emissions, & increase transit-accessible housing.
- Changes in research and experimentation tax credit may make industry potential funding source
- New Chancellor and Provost can allocate resources & leadership support to motivate energy & environment collaborations (this is an opportunity even though it's internal)
- Federal government interest in the issue of climate change – education (including K-12) and research in energy and sustainability
- Kansas is a biomass producing state with good wind resources, and geology for oil, gas and CO2 sequestration
- State Dept. & USAID (\$47B) promote sustainability & mitigate climate change impacts
- Shortage of qualified scientist supply demands of the environmental, geosciences, and engineering sectors, and many others.
- Increasing interest of the oil & gas industry in supporting research including environmental and alternative fuels research