

ENERGY AND WATER REQUESTS

- ***Algae to Green Fuels Project***
 - **Organization:** University of Tulsa
 - **Amount Requested:** \$1,000,000
 - **Purpose:** For the last two years, the University of Tulsa (TU) has been working with Sapphire Energy, a startup company headquartered in San Diego, CA. to develop algae as a source of green fuels. The University of Tulsa has contributed to the overall project by identifying the best compounds to target so that strains of algae can be engineered to yield compounds that have potential for conversion to fuels that are the same as fuels currently obtained from crude oil. Four patent applications have already been filed based on TU's collaborative work. TU has also demonstrated the process of converting algae oils into gasoline. University of Tulsa's algae research program could be enhanced by supporting several algae-to-fuels projects. They have identified four specific project areas that require additional development: (1) optimization of the catalytic conversion process, (2) optimization of the fuel conversion reactions, (3) small- and large-scale process synthesis and optimization of algae-based biofuel production, and (4) pathway engineering in microalgae. Over the course of the 5-year project, TU expects to fund 10 Ph.D. level students, 30 post-doctoral researchers, and 50 undergraduate research students.
 - **Justification:** Green fuels have become a national priority against the backdrop of volatile energy prices from politically unstable regions of the world. Current renewable fuels, such as ethanol from corn or other food crops or biodiesel from vegetable or animal oils, are seriously flawed either technically, economically or both. Making fuels from algae is rapidly becoming recognized as possessing significant potential for avoiding these pitfalls. Another benefit these fuels offer over other bio-fuels, such as ethanol or biodiesel, is that the ultimate algae products are gasoline, diesel, and jet fuel that are 100% compatible with our current fuel distribution infrastructure. This project will also provide a significant talent pool from which to spawn further entrepreneurial activities in alternative fuels in the Tulsa area, as evidenced by the long history of entrepreneurial activity of the chemical engineering alumni from TU.
 - **Authorization:** DOE/Science – Activities authorized under Department of Energy Organization Act (42 U.S.C. 7101 et seq.)

- ***Alternative Crops and Biofuel Production***
 - **Organization:** Oklahoma State University
 - **Amount Requested:** \$500,000
 - **Purpose:** This integrated research and technology transfer initiative will provide a comprehensive study of the economic feasibility of oilseed processing and further refining and biodiesel production from winter canola feedstock. Research will specifically focus on the economic feasibility of oilseed processing, analyzing the economics of alternative processing technologies, and estimating the potential economic impact of canola/biodiesel production facilities on rural communities in Oklahoma and the Southern Plains Region.

- **Justification:** This project facilitates the development of biofuel production from regionally produced alternative crops and animal fats. These activities are consistent with and complementary to USDA-administered initiatives to promote alternative crop production (2008 Farm Bill) and DOE initiatives to support both technology assessment and infrastructure financing. In the short term, this project will provide rural communities and renewable energy advocates in the Southern Plains states of Kansas, Oklahoma, and Texas with decision tools for assessing the viability of a renewable energy production facility for their communities. Long-term benefits will include the assessment of economic and ecological impacts associated with land-use decision related to the production of alternative crops for biofuel production, measured economic impacts for communities and counties associated with the development of biofuel production facilities, and the development of alternative feedstock harvesting and handling infrastructure. The Southern Plains has the potential to produce over 1.4B gallons of biofuels from regionally produced alternative crops and animal fats. Realizing only 10% of this potential would create over 6,700 direct and indirect jobs and over \$1.1B of economic impact per year, based on previous studies of biofuel projects. Additional economic activity will be generated from the development and restructuring of harvesting and storage logistics systems for alternative crops used as biofuel feedstocks. Most of the job growth and economic impacts will occur in rural communities which are struggling to identify economic growth and diversification opportunities.
 - **Authorization:** DOE/Science – Activities authorized under Department of Energy Organization Act (42 U.S.C. 7101 et seq.)
- **Arkansas River Corridor, OK**
 - **Organization:** Indian Nations Council of Governments (INCOG) and Army Corps of Engineers
 - **Amount Requested:** \$1,650,000
 - **Purpose:** The Arkansas River below Keystone Dam is arguably one of the greatest, but most underutilized natural resources in Tulsa County. The need to improve the river's environment and provide for areas of quality urban development inspired the creation of the Arkansas River Corridor Master Plan by INCOG and the US Army Corps of Engineers. The projects from the Master Plan that are proposed include two additional low water dams, pedestrian bridges, habitat improvement, bank stabilization and major safety and environmental improvements to the existing Zink Low Water Dam. The funds requested for appropriation under this section will be used by the US Army Corps of Engineers, Tulsa District, to perform the following studies in support of the design and implementation of the proposed projects: NEPA Environmental studies; alternatives formulation and screening; detailed alternatives analyses; a sediment transport study; geotechnical studies; and the beginning of an incremental cost analysis.
 - **Justification:** The Arkansas River project has been developed through an inclusive community based planning process involving key stakeholders including business and industry, state and federal resource agencies, affected governments

and residents. Significant local development along the river corridor has already been inspired by the proposed low water dam construction, and more new proposals have been announced that are dependent on the completion of these infrastructure projects. Better river flow management, environmental habitat improvements, sediment management, public safety, recreational opportunities and private development opportunities will result from the implementation of the proposed projects. The implementation of the proposed projects, as recommended in the Arkansas River Corridor Master Plan prepared by the Corps of Engineers and local partners, will significantly improve the environmental conditions of the river, improving habitat and stabilizing river banks and the river's normal flow regime, and providing opportunities for private development on the shores at appropriate locations. This project has been acknowledged and proposed by the Corps of Engineers to be effective in mitigating negative impacts of Keystone Dam and providing significant environmental benefits.

➤ **Authorization:** Sec. 3132, P.L. 110-114 (WRDA 2007)

- ***Center for Biomass Refining***

- **Organization:** University of Oklahoma

- **Amount Requested:** \$1,000,000

- **Purpose:** This project will develop the technology for the efficient conversion of lignocellulosic biomass (biomass which does not compete with the food supply, such as switchgrass) into liquid motor fuels and liquid fuels used for heat and power production. The project focuses on biomass fast pyrolysis integrated with catalytic stabilization/upgrading of the pyrolysis oil. The product of the stabilization/upgrading will be oil fractions that are completely compatible with the existing liquid fuels infrastructure. Depending on the processing option, the fractions may be blended in the existing motor fuels distribution system, refined in conventional petroleum refineries or combusted to produce heat and/or power.

- **Justification:** This project focuses on technologies to produce liquid hydrocarbon transportation fuels (i.e., green gasoline and diesel) that are completely fungible with the existing fuel infrastructure, as well as liquid fuels for use in heat and power production. Development of these technologies not only allows replacement of imported oil with domestic energy, it significantly contributes to economic development of US rural areas and a sustainable energy future. For the State of Oklahoma, this project creates a use for new energy crops, greatly benefiting rural areas in particular. Oklahoma has the potential to produce tens of millions of tons per year of energy crops such as switchgrass; processes developed by this project would economically convert these crops to hundreds of millions of gallons of liquid fuels in proximity to the crop production locations.

- **Authorization:** DOE/Science – Activities authorized under Department of Energy Organization Act (42 U.S.C. 7101 et seq.)

- ***Central Oklahoma Master Conservancy District***

- **Organization:** Oklahoma Water Resources Board

- **Amount Requested:** \$900,000

- **Purpose:** Thunderbird Lake, located on the Little River in Central Oklahoma, was constructed in 1965 by BOR for flood control, water supply, recreation, and fish and wildlife purposes. All available yield is allocated to the Central Oklahoma Master Conservancy District, which supplies municipal and industrial water supplies to the cities of Norman, Midwest City and Del City. Appraisal level studies initiated by BOR in FY2003 support the need for additional water supplies to meet the region's future needs. This funding would allow BOR to conduct feasibility study of alternatives to augment the water supplies of the COMCD and member cities.
 - **Justification:** Appraisal level studies initiated by the Bureau of Reclamation in Federal FY2003 support the need for additional water supplies to meet the region's future needs. Some potential short and long-term alternatives that have been identified include: drill additional wells, implement a seasonal pool plan at Thunderbird; construct terminal storage to hold wet weather yield from Lake Thunderbird; reallocation of storage; and import surplus water from sources outside the basin.
 - **Authorization:** Section 516 of P.L. 110-229 (Consolidated Natural Resources Act of 2008)
- ***Oklahoma Comprehensive Water Plan Study***
 - **Organization:** Oklahoma Water Resources Board and Army Corps of Engineers
 - **Amount Requested:** \$2,300,000
 - **Purpose:** This is a multi-year study to provide technical assistance to the state of Oklahoma and its citizens in updating the Oklahoma Comprehensive Water Plan. The OWRB envisions that, combined with federal cost-shared funds, the OWRB could work with local water suppliers in evaluating their system conditions, long-term needs, and develop a strategy to meet their needs over a 50-year time horizon.
 - **Justification:** The OWRB anticipates that continued funding of their Financial Assistance Program would provide low-cost loans and grants to enable actual implementation of long-term strategies. The plan would also address the long-term needs of other water use sectors, including agricultural, industrial, power, recreational and environmental considerations. OWRB is preparing the periodic update of the State's Comprehensive Water Plan to be able to plan for future water availability needs throughout the state and plan for water and wastewater financing with a 25% minimum matching requirement by communities.
 - **Authorization:** Section 5119 of P.L. 110-114 (WRDA 2007)
- ***Planning Assistance to States***
 - **Organization:** Oklahoma Water Resources Board
 - **Amount Requested:** \$500,000
 - Purpose:** This project assists Oklahoma in development of plans for management, utilization and conservation of water resources. It provides technical assistance for the development of the Oklahoma Comprehensive Water Plan. The State Water Plan is to provide technical assistance for acquisition of hydrologic data, groundwater characterization, database development, and data

distribution; expansion of surface water and groundwater monitoring networks; assessment of existing water resources, surface water storage, and groundwater storage potential; numerical analysis and modeling necessary to provide an integrated understanding of water resources and water management options; participation in State planning forums and planning groups; coordination of Federal water management planning efforts; and technical review of data, models, planning scenarios, and water plans developed by the State.

- **Justification:** The OWRB anticipates that continued funding of their Financial Assistance Program would provide low-cost loans and grants to enable actual implementation of long-term strategies. This program has been very instrumental in past and present water resources planning endeavors in Oklahoma. Studies initiated in Oklahoma under this program must be under an agreement with the OWRB and cost-shared equally between the Corps and a non-federal sponsor.
 - **Authorization:** Sec. 22 of P.L. 93-251 (WRDA 1974), as amended
- ***Red River Chloride Control Study, Elm Fork Area VI, TX and OK***
 - **Organization:** Red River Valley Association, Oklahoma Water Resources, and Army Corps of Engineers
 - **Amount Requested:** \$800,000
 - **Purpose:** The purpose of the Red River Chloride Control project is to control natural chloride brine emissions at ten major source areas to improve water quality for municipal, industrial, and agricultural uses. Improvements include construction of low flow dams, pump stations, and diversion pipelines to impoundment facilities. Area VI is on the Elm Fork, a tributary of the North Fork of the Red River, in Harmon County, Oklahoma. The majority of brine in this area is from three small canyons that drain into the Elm Fork. The plan for this area is to construct a 115-acre detention reservoir around the entrance to the canyons. The Elm Fork River would be diverted around this reservoir and the brine would be pumped from the detention reservoir to a permanent storage reservoir on Fish Creek.
 - **Justification:** The project is designed to control about 420 tons (82%) per day of natural chloride brine emissions. Recent concerns about the availability of adequate supplies of water in southwestern Oklahoma have fostered renewed interest in continuing work at Area VI.
 - **Authorization:** WRDA 1986, Sec. 1107 as amended by Sec. 3136 of P.L. 110-114 (WRDA 2007)
- ***Renewable Energy Center***
 - **Organization:** Woodward Industrial Foundation
 - **Amount Requested:** \$1,000,000
 - **Purpose:** The requested funds will be used for the expansion of the Renewable Energy Center at the Northwestern Oklahoma State University - Woodward Branch campus to accommodate the increased need in facilities to train a skilled workforce that can support the rapid growth in wind energy production. The university has developed a two year Associate Applied Science degree program

which will enable graduates/skilled technicians to install, maintain, and service wind turbines and progress to a supervisory role.

- **Justification:** Wind energy is one of the few growth industries in the United States with an average growth rate of thirty-two percent in the past five years. Over \$300 million has been invested in wind energy production in northwest Oklahoma alone with more expected investment in the future. If wind energy generates twenty percent of US Electric needs, the US Department of Energy estimates that it would create 500,000 jobs. Much of the growth in wind energy in Oklahoma is concentrated in the region of Northwest and Woodward due to its strategic location. To support the growth in this region, a skilled workforce is needed and the funding requested will provide for construction of additional classroom and lab space which will be used to train such a workforce.
 - **Authorization:** DOE/Energy Efficiency and Renewable Energy - Activities authorized under Department of Energy Organization Act of 1977, as amended (42 U.S.C. 712); Energy Reorganization Act of 1974 (42 U.S.C. 5813(6)(7)(8)); Energy Policy Act 1992 (42 U.S.C. 13231).
- ***Southeast Oklahoma Water Resource Study***
 - **Organization:** Oklahoma Water Resources Board and Army Corps of Engineers
 - **Amount Requested:** \$500,000
 - **Purpose:** The project covers a 29-county area in southeast Oklahoma, including the Kiamichi River Basin and other tributaries of the Red River. The output of this multi-year study will be a Southeast Oklahoma Watershed Management Plan that identifies solutions to water resource problems within the study area, including a systems approach to collaboratively develop pertinent existing, forecasted and strategic information for the Oklahoma Comprehensive Water Plan.
 - **Justification:** This is one of three studies that will result in development of watershed management plans. Studies are assessing water demands and existing water resources within the study area; strengths and weaknesses of the infrastructure currently in place; and alternatives for long-term plans that identify environmentally sound water resource projects required to utilize the full potential of waters in the region for both the study area and the State of Oklahoma for the ecosystem in the Kiamichi River basin and other critical ecosystem/habitat areas.
 - **Authorization:** 1983 Supplemental Appropriation (P.L. 98-63); FCSA signed July 2001
 - ***Washita River Basin Study***
 - **Organization:** Oklahoma Water Resources Board and Army Corps of Engineers
 - **Amount Requested:** \$500,000
 - **Purpose:** The requested funds will be used for the study of the approximate southwest corner of the state and adjacent areas. Ongoing studies will evaluate water supply and demands in the study area and identify, evaluate and recommend implementable alternatives to meet future water demands. This activity would be complementary to other Oklahoma Comprehensive Water Plan

initiatives. The resulting watershed management plans will allow for better, more efficient water resources planning and environmental restoration.

- **Justification:** This project is one of three studies that are assessing water demands and existing water resources within the study area; strengths and weaknesses of the infrastructure currently in place; and alternatives for long-term plans that identify environmentally sound water resource projects required to utilize the full potential of waters in the region for both the study area and the State of Oklahoma for the ecosystem in the Washita River basin and other critical ecosystem/habitat areas. Long-term implementation of water plan strategies could result in a tremendous impact on the economy and job-related opportunities.
 - **Authorization:** House Resolution (1938) and Senate Resolutions (1954 and 1962)
- ***Water Supply Infrastructure Development***
 - **Organization:** City of Bartlesville
 - **Amount Requested:** \$1,000,000
 - **Purpose:** This project will evaluate infrastructure options and initiate implementation of water supply infrastructure development, including: the surveying, design, bidding, and construction of a raw water pump station and water transmission line. Approximately 21-29 jobs could be created by this project.
 - **Justification:** The City of Bartlesville is a regional supplier of drinking water, providing service to six rural water districts and three municipalities. As such, securing a long-term water supply is critical to the economic vitality of this area.
 - **Authorization:** Section 219 of WRDA 1992, as amended by Section 5158 of P.L. 110-114 (WRDA 2007)
 - ***Yukon Municipal Water Redevelopment***
 - **Organization:** City of Yukon
 - **Amount Requested:** \$2,000,000
 - **Purpose:** The city of Yukon requests funding for a phased project between FY 2010-2012. The three-year project will include a 9.5 mile main water line connecting Yukon and Oklahoma City, two new water towers to provide storage and pressure and replacement of existing water line network.
 - **Justification:** The City of Yukon has been forced to find new sources of water because of the 2006 EPA mandate on significantly lower arsenic standards in drinking water. Yukon is partnering with Oklahoma City to supplement Yukon's water supply, but the water supply and distribution system requires changes to meet the short and long-term supply for the growing city. Funding for this project was previously appropriated to the U.S. Army Corps of Engineers in FY2002, however, the money was reprogrammed. This request is for the payback of those funds.
 - **Authorization:** Sec. 223 of P.L. 102-580 (WRDA 1992)
 - ***Army Corps of Engineers, Construction General in Oklahoma***

- ***\$10,000,000 for McClellan-Kerr Arkansas River Navigation System, 12 Foot Deepening Project, AR and OK*** – authorized by PL 108-137, Sec. 136
- ***Army Corps of Engineers Operations & Maintenance lakes, locks, dams in Oklahoma***
 - ***\$10,500,000 for McClellan-Kerr Arkansas River Navigation System, Locks and Dams, OK*** – authorized under the River and Harbor Act of 1946