

ENERGY AND WATER DEVELOPMENT APPROPRIATIONS FOR FISCAL YEAR 2013

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, DC.

NONDEPARTMENTAL WITNESSES

[CLERK'S NOTE.—The subcommittee was unable to hold hearings on nondepartmental witnesses. The statements and letters of those submitting written testimony are as follows:]

DEPARTMENT OF DEFENSE—CIVIL

DEPARTMENT OF THE ARMY

CORPS OF ENGINEERS—CIVIL

PREPARED STATEMENT OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS

Madam Chair and members of the subcommittee: The American Society of Civil Engineers (ASCE) is pleased to provide this statement for the record on the proposed budgets of the U.S. Army Corps of Engineers (USACE) and the Bureau of Reclamation (BOR) for fiscal year 2013.

U.S. ARMY CORPS OF ENGINEERS

The fiscal year 2013 budget provides \$4.7 billion, a decrease of more than 5 percent from the fiscal year 2012 enacted level of \$5 billion. The President's budget for fiscal year 2013 is inadequate to meet the needs of an aging waterways infrastructure and must be increased. The Congress must expand funding for fiscal year 2013.

The fiscal year 2013 budget plan released by the House Budget Committee last week would further erode the Nation's ability to rebuild its aging water resources infrastructure by reducing total outlays in fiscal year 2013 by \$94 billion.

Under the Budget Control Act of 2011, the Congress has \$1.047 trillion in new discretionary budget authority for fiscal year 2013, with \$686 billion set aside for security programs (defense, intelligence, and homeland security) and \$361 billion for all domestic discretionary spending.

ASCE recommends a minimum appropriation of \$5.2 billion for USACE in fiscal year 2013 to account for inflation and to halt the decline in budget authority to ensure safe infrastructure and a sound economy.

The administration proposal for fiscal year 2013 would reduce construction funding from \$1.694 billion to \$1.471 billion, a reduction of 13 percent. Operations and maintenance funding would be down slightly from \$2.412 billion to \$2.398 billion. The Mississippi River and Tributaries account would decline from \$252 million to \$234 million or 7 percent. Investigations—the money used to complete project feasibility studies—would go from \$125 million to \$102 million, a decline of 18 percent. In all, the Civil Works program budget for fiscal year 2013 would be cut from \$5.002 billion in fiscal year 2012 to \$4.731 billion in fiscal year 2013, an overall reduction of 5.4 percent.

In 2005, Hurricane Katrina vividly demonstrated the perils of relying upon poorly funded infrastructure to protect lives and property. An ASCE investigation (conducted on behalf of USACE) reported in 2007 that chronic under funding was one of the principal causes of the levee failures after Katrina.

“Because of the congressional budgeting process, the stream of funding for the New Orleans hurricane protection system was irregular at best. If a project was not sufficiently funded, the USACE was often required to delay implementation or to scale back the project.

This push-pull mechanism for the funding of critical life-safety structures such as the New Orleans hurricane protection system is essentially flawed. The process creates a disconnect between those responsible for design and construction decisions and those responsible for managing the purse-strings. Inevitably, the pressure for tradeoffs and low-cost solutions compromised quality, safety, and reliability.

The project-by-project approach—in which projects are built over time based on the availability of funding—resulted in the hurricane protection system being constructed piecemeal with an overall lack of attention to ‘system’ issues. The project-by-project approach appears to be associated with congressional limitations. The USACE was forced into a ‘reductionist’s’ way of thinking: reduce the problem into one that can be solved within the given authority and budget. Focus only on the primary problem to be solved, inevitably making the issues of risk, redundancy, and resilience a lower priority.”

American Society of Civil Engineers, *The New Orleans Hurricane Protection System 71–72* (2007).

With this proposed budget, USACE would continue to suffer from under investment in essential infrastructure systems. If allowed to continue, this trend likely will result in ever greater system failures and the consequent expenditure of tens of billions of dollars to rebuild what could have been built more economically in the first instance.

In the face of USACE’s aging infrastructure needs, the President’s budget for the Civil Works program in fiscal year 2013 reduces Federal investments in vital national civil works systems. Moreover, the negative budgeting trend is not likely to improve in future years. USACE estimates that its budget proposals will continue to decline through fiscal year 2015. USACE expects that inflation will reduce actual spending on key infrastructure programs by a further \$3 billion over the next 5 years. ASCE believes that these levels of spending are inadequate to meet the Nation’s security, economic, and environmental demands in the 21st century.

THE HARBOR MAINTENANCE TRUST FUND

The Harbor Maintenance Revenue Act authorizes expenditures from the Harbor Maintenance Trust Fund (HMTF) to finance up to 100 percent of eligible USACE harbor operation and maintenance costs, including the operation and maintenance of Great Lakes navigation projects.

The fund fully finances eligible operation and maintenance costs of the Saint Lawrence Seaway Development Corporation. The Water Resources Development Act of 1996 authorizes the fund to pay the Federal share of the costs for the construction of dredged material disposal facilities that are necessary for the operation and maintenance of coastal or inland harbors, the dredging and disposal of contaminated sediments that are in or affect the operation and maintenance of Federal navigation channels, the mitigation of impacts resulting from Federal navigation operation and maintenance activities, and the operation and maintenance of dredged material disposal facilities.

The dredging of the Nation’s ports and harbors has suffered from years of under investment in a system that is critical to America’s ability to compete in the global marketplace. For fiscal year 2013 the administration has requested \$839 million be appropriated from the HMTF—only 50 percent of total estimated revenues. Total revenues are now estimated at \$1.659 billion for fiscal year 2013. The busiest U.S. harbors are presently under maintained. USACE estimates that full channel dimensions at the Nation’s busiest 59 ports are available less than 35 percent of the time. This situation can increase the cost of shipping as vessels carry less cargo in order to reduce their draft or wait for high tide before transiting a harbor. It could also increase the risk of a ship grounding or collision.

The fiscal year 2013 budget request does not come close to meeting the requirements of the Nation’s ports and harbors, which have an annual need for maintenance dredging of between \$1.3 and \$1.6 billion, according to USACE.

This trend toward reduced investments in our ports and harbors has led to ever greater balances in the HMTF, and the unexpended balance in the Trust Fund is

growing with a bookkeeping balance of more than \$8 billion by September 30, 2013, according to the Office of Management and Budget.¹

As a result, the great majority of our Nation's harbors—including 8 of the top 10 largest ports—are not being maintained to their fully authorized width and depth. Ships carrying U.S. goods must “light-load”, thus increasing the costs of the goods and decreasing American competitiveness in the global economy.

This subcommittee should appropriate \$1.6 billion from the HMTF in fiscal year 2013.

BUREAU OF RECLAMATION

The fiscal year 2013 budget request for BOR is \$994 million. The Water and Related Resources, BOR's principal operating account, is budgeted at \$818.6 million, a decrease of 8 percent.

The request includes a total of for water and energy, land, and fish and wildlife resource management and development activities. Funding in these activities provides for planning, construction, water conservation activities, management of BOR lands, including recreation, and actions to address the impacts of BOR projects on fish and wildlife.

The Congress needs to maintain appropriate and vital levels of funding for the BOR's Water and Related Resources account to support construction and rehabilitation of critical western water projects.

Population growth, climate change, drought, under financing and environmental protection needs have tightened water supplies in the West, and made BOR's infrastructure more important than ever for providing essential water supplies to rural and urban communities as well as agriculture economies throughout the West.

While we recognize the urgent need to address the national deficit, we ask for your support for maintaining at least \$1 billion in fiscal year 2013 for BOR. In particular, maintaining this level of funding will help address BOR's unfunded project backlog and create beneficial construction jobs throughout the West. Most significantly, the back log for congressionally authorized BOR water projects now stands at several billion dollars.

We strongly encourage you to recognize through the appropriations process that the infrastructure built and maintained by the Bureau and local governments help power the economic productivity—and tax revenue—on which the U.S. Government depends. Job creation, efficient agricultural production, and reliable drinking water supplies are just a few of the benefits of these investments to the national economy.

ASCE recommends an appropriation of \$1 billion for BOR in fiscal year 2013.

PREPARED STATEMENT OF THE BOARD OF LEVEE COMMISSIONERS FOR THE YAZOO-MISSISSIPPI DELTA

There are investments, and then there are investments, just as there are priorities, and then there are priorities.

Since its inception, the United States Congress has allocated approximately \$14 billion to the Mississippi River and Tributaries (MR&T) project. According to the U.S. Army Corps of Engineers (COE), last year alone, throughout the Great Flood of 2011, the largest this Nation has ever known, the MR&T prevented \$110 billion in flood damages to the Nation's heartland.

That's a good investment.

But such Acts of God as was that flood invariably produce consequences for man. More water than any living human being has ever witnessed was contained—in some instances, barely contained—by one of the greatest engineering and construction feats ever, the mainline Mississippi levee system. But that much water inflicts damages; that much water takes a toll.

COE says that it will take approximately \$2 billion to repair and strengthen the levee system that just saved the country \$110 billion worth of damage. That's a benefit to cost ratio of 54–1. While less than one-half of an emergency allocation did go to the MR&T, not only is that inadequate, it is a dangerous gamble. Surely, we can adequately restore the levees that just saved us.

That should be a high priority.

¹We recognize that none of the U.S. Army Corps of Engineers' funding for ports and harbors is appropriated directly from the HMTF. The money is appropriated from the General Fund of the Treasury. The HMTF then reimburses the General Treasury for the actual dollars expended on projects that are eligible to receive funding through the HMTF.

We ask that the Congress provide \$375 million in fiscal 2013 funding for the MR&T—so that we might at least begin the process of getting ready for the next great flood that as always is a matter of when, not if.

All of us, of course, are aware of the Congress's self-imposed moratorium on earmarks. And we can certainly understand such from a fiscal responsibility standpoint. But that said, we also think there is a fundamental flaw in that reasoning, a serious misunderstanding inherent in the very definition of the word, "earmark".

When the men and women of this country think of earmarks, they think of pork-laden legislation which specifically benefits large political campaign contributors. They think of unnecessary public works projects that never seem to end or stay within budgets. They think of bridges that lead to nowhere.

And ladies and gentlemen, that is not what we are talking about here today. Flood control is not a boondoggle. Flood control is a necessity for life as we know it within the greater Mississippi Valley. Public dollars for flood control projects are investments in the national infrastructure. Tax dollars for flood control can literally be thought of as premiums for flood insurance—not for flood damage, but for flood prevention.

Beneath the umbrella of the MR&T, of course, are many component projects, and we would be remiss in our obligation to the citizens of our levee district not to point out the injustice related to one of them. The Upper Yazoo Projects (UYP) represents the virtual ideal of what any flood control project should be. It works—where it has been completed, that is—and absolutely no one, including the environmental community, in any way opposes it.

The UYP has provided documented localized flooding relief to thousands at its southern stretches, while thousands more at the projects' northern end still suffer due only to a lack of funding. In last year's event, the town of Sledge and a heavily traveled State highway were under water, while those to the south of the same tributary were dry. And that is simply wrong.

COE says it has the capability to do \$16.5 million toward completion of the projects in 2013. Please give them at least some of the funding needed to continue.

As always, we ask that the Congress also provide needed maintenance funding for Mississippi's four flood control reservoirs and also for the Delta Headwater Project which helps alleviate the stress on those structures and our interior steams by slowing runoffs from the hills to our east. COE's capabilities for those needed efforts are attached.

But most critically, we feel, is that the Congress rejects the demonstrably false and potentially disastrous notion that flood control is optional or some luxury that can be discarded when money gets tight. Not only would lives and livelihoods be lost, but the Nation's economy would be wrecked should America's heartland be inundated by floodwaters.

Flood control is literally a pay me now or pay me later proposition. We can pay to prevent the kind of disasters that last year's epic flood very nearly represented, or we can pay much, much more to try to restore that which is left in the wake of such an event.

Thank you very much for allowing us the opportunity to testify on this matter that is so critical to the future of our Nation.

PREPARED STATEMENT OF THE BOARD OF MISSISSIPPI LEVEE COMMISSIONERS

Madam Chair and members of the subcommittee: This statement is prepared by Peter Nimrod, Chief Engineer for the Board of Mississippi Levee Commissioners, Greenville, Mississippi, and submitted on behalf of the Board and the citizens of the Mississippi Levee District. The Board of Mississippi Levee Commissioners is comprised of seven elected commissioners representing the counties of Bolivar, Issaquena, Sharkey, Washington, and parts of Humphreys and Warren counties in the Lower Yazoo Basin in Mississippi. The Board of Mississippi Levee Commissioners is charged with the responsibility of providing protection to the Mississippi Delta from flooding of the Mississippi River and maintaining major drainage outlets for removing the flood waters from the area. These responsibilities are carried out by providing the local sponsor requirements for the congressionally authorized projects in the Mississippi Levee District. The Mississippi Levee Board and the Mississippi Valley Flood Control Association support an appropriation of \$375 million for fiscal year 2013 for the Mississippi River and Tributaries (MR&T) project. This is the minimum amount that we consider necessary to allow for an orderly completion of the remaining work in the Valley and to provide for the operation and maintenance, as required, to prevent further deterioration of the completed flood control and navigation work.

It is apparent that the administration loses sight of the fact that the MR&T project provides protection to the Lower Mississippi Valley from waters generated across 41 percent of the continental United States. These waters flow from 31 States and 2 provinces of Canada and must pass through the Lower Mississippi Valley on its way to the Gulf of Mexico. We will remind you that the MR&T project is one of, if not the most cost-effective project ever undertaken by the United States Government. The foresight of the Congress in their authorization of the many features of this project is exemplary.

The many projects that are part of the MR&T project not only provide protection from flooding in the area, but the award of construction contracts throughout the Valley provides assistance to the overall economy of this area. The employment of the local workforce and purchases from local vendors by the contractors help stabilize the economy in one of the most impoverished areas of our country.

In 2011, the MR&T project successfully passed the greatest flood on the Mississippi River. Every feature of the MR&T project including levees, floodways, and reservoirs were utilized. Not one acre of land was flooded that was not designed to flood. Not one life was lost. The MR&T system prevented \$108 billion in damages in 2011 alone. All together since 1928, the Congress has invested \$13.9 billion in the MR&T project, and it has prevented \$478.3 billion in damages. This is a 34:1 benefit to cost ratio. The flow carried by the Mississippi River in 1927 was 66 percent of a Project Design Flood. The flow carried by the Mississippi River in 2011 was 85 percent of a Project Design Flood. There is a larger flood on the horizon. In fact, stages will be 8-foot higher when we have the Project Design Flood than we just experienced in 2011. The MR&T project is only 89-percent complete. The Congress must be proactive and fully fund the MR&T project until it is completed. If not, the MR&T project will not pass the Project Design Flood.

Even though the MR&T project worked, it suffered a lot of damage and many weaknesses were discovered during the 2011 Epic Flood. The Mississippi Levee Board would like to commend the Congress for appropriating \$802 million for repairing the MR&T system following the historic 2011 Flood. This money will help reset and rebuild the MR&T system so that we can pass the next major flood event. Money spent on the MR&T project is money well spent that returns much more money in prevented damages.

We are concerned about the “earmark moratorium” that the Congress has adopted. The Congress has essentially given up their right to appropriate money. They have relinquished this right to the Office of Management and Budget (OMB). OMB always provides a budget that undercuts our projects in the MR&T project because they know that the Congress will provide “congressional adds”. Unfortunately people think that the “congressional adds” for the MR&T project are “earmarks”. “Earmarks” account for less than 1 percent of the entire Federal budget, but it is these “earmarks” that provide money for much needed and essential projects and provide jobs for the economy. The stimulus money spent the past few years created jobs, built projects, and stimulated the economy. This ban on “earmarks” will cause many projects to be stopped and jobs will be lost. The Congress needs to define what an “earmark” is and they need to be able to do “congressional adds” for our projects.

Thanks to the additional funding provided by the Congress over the last several years over and above the administration’s budget, work on the Mainline Mississippi River Levee Enlargement Project is continuing. Of the original 69 miles of deficient levees in the Mississippi Levee District, 32 miles of work have been completed and 8.1 miles are currently under contract. We are requesting \$58.687 million for construction on the Mainline Mississippi River Levees in the Lower Mississippi Valley Division which will allow the Vicksburg and Memphis districts to keep existing contracts on schedule and award contracts to avoid any future unnecessary delays in completing this vital project.

The President’s fiscal year 2013 budget did not include funding for any construction projects within the Yazoo Basin. This action is especially difficult to understand during a time when our Nation needs an economic boost. These are all projects authorized and funded so wisely by the Congress. All of these projects are encompassed in the footprint of the Delta Regional Authority, an area recognized by the Congress as requiring special economic assistance to keep pace with the rest of our great Nation. We can not lose sight of the fact that all of these projects are required to return more than a \$1 in benefits for each \$1 spent.

The recommended plan for the Yazoo Backwater Project included a pump that will lower the 100-year flood event by 4.5 feet thereby reducing urban and rural structural damages, providing benefits to the remaining agricultural lands, and reducing the frequency and duration of floods. The plan also includes reforestation easements to be purchased on up to 55,600 of existing agricultural land which will provide benefits in every environmental category—wetlands, terrestrial, aquatics,

and waterfowl resources as well as vastly improving water quality. This was a model project that should be the standard for future public works projects in the United States. However on August 31, 2008, the Environmental Protection Agency (EPA) used its authority under section 404(c) of the Clean Water Act (CWA) to veto the Yazoo Backwater Project even though it is exempt by section 404(r) of the CWA. The Mississippi Levee Board sued EPA in a lawsuit against EPA asking the Federal Court to determine if this project is indeed exempt from an EPA 404(c) veto by the exemption in section 404(r) of the CWA. The Federal court has ruled in favor of EPA. Unfortunately this model project is now completely stopped. If the Yazoo Backwater Project were in place in 2008, 2009, and 2011, the \$220 million project would have prevented \$257.5 million in damages. The Congress promised flood protection for the Mississippi South Delta back in 1941 when the Eudora Floodway was removed from the MR&T project. Arkansas and Louisiana have both benefitted from this floodway removal while Mississippi continues to be flooded. We urge the Congress to take up this backwater flooding problem again and find a solution for the Mississippi South Delta.

We are requesting \$4.575 million for the Yazoo Backwater less Rocky Bayou Project. This money will be used to start the Environmental Impact Statement for the Yazoo Backwater Levee Enlargement Project. This levee is designed to overtop during a project design flood, but it needs to be raised 5.8 feet to get to the required elevation. This backwater levee is supposed to overtop when we are within 2 feet of a Project Design Flood. In 2011 the Mississippi River was 8 feet below a Project Design Flood and the Yazoo Backwater Levee came within 4 inches of overtopping. We need this backwater levee raised immediately.

Work on the Big Sunflower (Upper Steele Bayou) project has proved to be very beneficial. The Steele Bayou Sedimentation Reduction project has installed drop-pipe structures at headcut locations all along Steele Bayou. These control structures stop the movement of sediment into Steele Bayou. Sediment is bad for flood control and water quality. We are requesting \$1.7 million to keep this project moving forward.

Work on the Delta Headwaters project has proven effective in reducing sediments to downstream channels. To discontinue this project will only diminish water quality by increasing sediment, reducing the level of flood protection to the citizens of the Delta and increasing required maintenance. We are requesting \$13 million to continue this project.

Maintenance of completed works can not be overlooked. The four flood control reservoirs overlooking the Delta have been in place for 50 years and have functioned as designed. Required maintenance must be performed to avoid any possibility of failure during a flood event. We are asking for \$7.7 million for Arkabutla Lake, \$7.245 million for Enid Lake, \$7.346 million for Grenada Lake, and \$11.397 million for Sardis Lake.

We are requesting \$12.754 million for Maintenance of the Mainline Mississippi River Levees in the Lower Mississippi Valley Division which will provide for repair of levee slides, slope repair, and repair of the gravel maintenance roadway which is so vital to access during high water.

The Mississippi River and our Ports and Harbors need money for maintenance dredging. The Mississippi River carries tons of sediment every second. This sediment falls out in slack water areas such as entrances to our ports and harbors. The Greenville Port needs \$1 million and the Vicksburg Port needs \$750,000 to perform annual maintenance dredging. This dredging is vital to keep these ports open during the low-water season when much of the farm harvest is ready to be transported.

We are requesting \$2.58 million for the Lower Mississippi Valley Division for Collection of Basic Data under General Investigations. This money is used to monitor and collect water-quality samples at gaging stations located throughout the Mississippi Delta. With the emphasis on water quality, water quantity, and total maximum daily loads (TMDLs), we must be able to continue to collect good data on water quality so we can get a baseline established to be able to monitor and improve water quality in the Mississippi Delta. Improvements in water quality in the Mississippi Delta will translate into improved water quality in the Gulf of Mexico and help the Gulf Hypoxia issue.

EPA has been given too much power under section 404(c) of CWA which allows EPA to veto congressionally authorized projects. During the early 1990s, due to abuse of the 404(c) power by EPA, the Congress considered removing this authority from EPA. EPA has again invoked this veto power on the Yazoo Backwater Project. EPA is saying that you can't lower the water level with a flood control project. By killing this project with 404(c) veto authority, EPA is drawing a line in the sand over the future of flood control in our great Nation. EPA has vetoed the Yazoo Backwater Project even though it was approved, authorized, and funded by the Congress

and exempt from a 404(c) veto by 404(r). It is now time to again take up this issue and remove the 404(c) veto power from EPA before they kill another flood control project that has been authorized by the Congress.

The Council of Environmental Quality (CEQ) draft proposal of changes to the Principals and Guidelines (P&G) for Federal agencies fails to establish a clear, concise, and workable framework to guide development of water resources projects. It elevates environment considerations over economic benefits, social well-being, and public safety. Because of these critical and extensive failings, we recommend that this effort be put aside and restarted from the beginning.

As Members of the Congress representing the citizens of our Nation who live with the Mississippi River everyday, you clearly understand both the benefits provided by this resource and the destructive force that must be controlled during a flood. On behalf of the Mississippi Levee Board, I can not express enough our appreciation for your efforts in providing adequate funding over the last several years that has allowed construction to continue on our much needed projects and thank you in advance for your kind consideration of our requests for fiscal year 2013.

PREPARED STATEMENT OF THE FIFTH LOUISIANA LEVEE DISTRICT

The Board of Commissioners for the Fifth Louisiana Levee District respectfully requests that construction funding for Mississippi River levees be increased from the \$45,187,000 contained in the proposed budget for fiscal year 2013, to the U.S. Army Corp of Engineers' (COE) capability of \$58,687,000.

Reduced funding, combined with the inability to let construction contracts under a continuing contract clause, has left thousands of people in Louisiana vulnerable to the adverse effects of a deficient levee system. Construction of levee enlargements is essential if the levee is to contain the "Project Flood" which is estimated to be 20 percent greater than the record Flood of 1927.

The effect of fully funded contracts for levee construction, now required under Public Law 109-103, (sections 106 and 108), adopted by the 109th Congress in 2005, as opposed to the previous system of continuing contract clauses, has virtually halted enlargement of the Mississippi River levee system in Louisiana. Year after year, as the cost of projects and maintenance has increased, funding for levee systems and flood control has been reduced. The current proposed budget is no exception, with only \$234 million allocated for the entire Mississippi River and Tributaries (MR&T) project. We request that be increased to COE's capabilities of \$375 million.

Since the MR&T project was established, \$13 billion has been invested and more than 475 billion of flood damages have been prevented. This investment provides benefits far beyond their actual cost to the taxpayer by offering protection to more than 4 million citizens and allows people to live and work throughout a 35,000 square mile area in seven States.

With the help of the Congress, great progress has been made in the Mississippi River Valley over the years, but there is still much to be done, and because of that, we urge the Congress to increase funding to COE in fiscal year 2013, to insure that COE is not forced to halt or delay contracts for levee construction essential to the well-being of this Nation. It is vital that the MR&T project(s) be completed at the earliest possible date.

PREPARED STATEMENT OF THE IZAAK WALTON LEAGUE OF AMERICA

I am Scott Kovarovics and the Conservation Director of the Izaak Walton League of America. The Izaak Walton League of America appreciates the opportunity to submit testimony concerning appropriations for fiscal year 2013 for programs under the jurisdiction of the subcommittee. The League is a national, nonprofit organization founded in 1922 with more than 39,000 members and 250 local chapters nationwide. Our members are committed to advancing common sense policies that safeguard wildlife and habitat, support community-based conservation, and address pressing environmental issues. The following pertains to programs administered by the U.S. Army Corps of Engineers (COE).

CORPS OF ENGINEERS, OPERATIONS AND MAINTENANCE, MISSOURI RIVER

The League joins other groups in urging the subcommittee to appropriate \$90 million in fiscal year 2013, as requested by the President, for the Missouri River Recovery Program. With this funding, COE, U.S. Fish and Wildlife Service (FWS), States, and other partners can continue important ecosystem restoration efforts that are producing long-term ecological and economic benefits.

The Missouri River basin encompasses land in 10 States covering one-sixth of the continental United States. The Missouri is one of the most altered ecosystems on Earth. Although recovery and restoration efforts are on-going, they need to continue and expand.

COE, FWS, and many State agencies have been restoring habitat for fish and wildlife along the river. This work is critical for the Interior Least Tern and Pallid Sturgeon, listed as endangered, and the Piping Plover, listed as threatened, under the Endangered Species Act. The restoration efforts also benefit many other species of fish and wildlife throughout the region. These habitat restoration projects are working with the river—not against it.

These projects also generate additional economic activity in communities along the river. Anglers, hunters, boaters, birdwatchers, and others have been using these areas proving the old adage “if you build it, they will come.” The Missouri Department of Conservation and the Nebraska Game and Parks Commission found recreational spending provides \$68 million in annual economic impact to communities along the Missouri River from Yankton, South Dakota to St. Louis, Missouri. A South Dakota Game, Fish, and Parks study shows that recreational benefits from angling on the Missouri River account for more than \$107 million in annual economic activity in the Dakotas and Montana. These projects are bringing more people to the river throughout the Missouri basin.

In addition to the economic boost from tourism, restoration projects support job creation throughout the entire region. COE contracts with local construction companies, creating jobs, and injecting dollars into local economies through purchases of materials, fuel, food, and lodging. With the funding requested, COE could readily implement more of these important economic and river restoration projects.

Missouri River Ecosystem Restoration Plan.—The League urges the subcommittee not to include any provision in its fiscal year 2013 bill limiting funding for the Missouri River Ecosystem Restoration Plan (MRERP). This long-term ecosystem study will lead to a comprehensive plan that Federal agencies, States, tribes, and communities along the river will be able to implement for a healthier Missouri River. A great deal of time and effort has already gone into development of MRERP. Funding must be allowed for this important effort to get back on track before the information already gathered loses relevance and will cost U.S. taxpayers more to gather again.

Missouri River Authorized Purposes Study.—The League urges the subcommittee to provide funds to complete the Missouri River Authorized Purposes Study (MRAPS). The League strongly opposes the funding prohibition contained in the Consolidated Appropriations Act of 2012. It does not provide taxpayers with meaningful savings in the near-term and jeopardizes real-future savings. Delaying this analysis deprives the country of Missouri River management geared toward future needs rather than those identified during World War II.

MRAPS for the first time will review the eight authorized Missouri River purposes established by the Flood Control Act of 1944. This thorough analysis of the purposes will determine the best management for the American taxpayer, all the residents of the basin, and fish and wildlife, taking in account today’s economic values and priorities, rather than those imagined nearly 70 years ago.

Full funding of MRAPS is a wise investment. A comprehensive review and accompanying changes will streamline future COE operational expenses saving tax dollars and bringing Missouri River management into the 21st century. MRAPS needs to be re-started in fiscal year 2013.

CORPS OF ENGINEERS, OPERATIONS AND MAINTENANCE, UPPER MISSISSIPPI RIVER

The League is an active and long-time proponent of restoring the Upper Mississippi River (UMR) ecosystem. We have supported the Upper Mississippi River Restoration (UMRR) program (also known as the Environmental Management Program) since its inception and continue to support this vital restoration initiative. We urge the subcommittee to provide \$33.2 million for UMRR in fiscal year 2013 as authorized by the Water Resources Development Act (WRDA). Although we are encouraged by the President’s request for fiscal year 2013, pressing restoration needs on-the-ground require the full amount authorized for UMRR.

The League has also strongly expressed its opinion that the large-scale navigation modifications included in the Recommended Plan for the Upper Mississippi Navigation and Ecosystem Sustainability Program (NESP), as authorized by the Water Resources Development Act of 2007, have not been justified by COE and should not be pursued. Previous reviews by the National Academy of Sciences and the Assistant Secretary of the Army, Civil Works found that the navigation construction component of NESP was not economically justifiable. A report released in 2010 by the Nicollet Island Coalition, of which the League is a member, provides additional evi-

dence that proposed locks and dams in this region are not a good investment for American taxpayers. With this in mind, the League supports the administration's decision not to request funding for NESP in fiscal year 2013.

While the lock and dam expansion authorized by NESP is not a good investment, the League recognizes the need for the Congress to invest in inland navigation to maintain the transportation infrastructure on the rivers. The Inland Waterway Trust Fund (IWTF) provides 50-percent cost-share for construction and rehabilitation on navigation infrastructure. The League agrees with the administration that the IWTF needs to be reformed because not enough revenue is generated by the \$0.20 per gallon fuel tax on navigation to fund the multibillion dollar backlog of projects. The League supports the President's proposal to implement a user fee at the locks, while maintaining the 50-percent cost-share model on all inland waterway construction and navigation projects. The League strongly opposes including any provision in the subcommittee's fiscal year 2013 bill that increases the cost-share portion from the taxpayer funded general appropriation, as proposed by the Inland Marine Transportation System Capital Investment Strategy Team. Such a proposal will increase the national deficit and allow environmentally damaging and economically questionable projects to move forward.

The UMR is one of the most complex ecosystems on Earth. It provides habitat for 50 species of mammals, 45 species of reptiles and amphibians, 37 species of mussels, and 241 species of fish. The need for ecosystem restoration is unquestionable. As COE correctly stated in its study of navigation expansion, this ecosystem is "significantly altered, is currently degraded, and is expected to get worse." Researchers from the National Academy of Sciences have determined that river habitat is disappearing faster than it can be replaced through existing programs such as UMRR, which was authorized at \$33.2 million annually by the Congress in 1999, but has never received full appropriations. As habitat vanishes, scientists warn that many species will decline and some will disappear.

Our Nation relies on a healthy Mississippi River for commerce, recreation, drinking water, food, and power. More than 12 million people annually recreate on and along the UMR spending \$1.2 billion and supporting 18,000 jobs. More people recreate on the Upper Mississippi than visit Yellowstone National Park while barge traffic has remained static on the river for more than 2 decades.

In assembling the UMR-IWW navigation study, COE recognized the critical need for ecosystem restoration and encouraged the Congress to invest approximately \$130 million annually in UMR habitat restoration efforts. With this need in mind, the League strongly encourages the subcommittee to prioritize investment in ecosystem restoration by appropriating \$33.2 million for the UMRR in fiscal year 2013. Additional funding for restoration will support economic development and job creation in communities along the UMR and provide long-term conservation and economic benefits for the region and the Nation.

CLEAN WATER ACT GUIDANCE AND RULEMAKING

This year, the American people will be celebrating the 40th anniversary of passage of the Clean Water Act. With this in mind, the League strongly urges the subcommittee not to include or accept any provision in its fiscal year 2013 bill barring COE from finalizing and implementing Clean Water Act guidance or proceeding with the formal rulemaking process to revise its clean water regulations. We appreciate the subcommittee's leadership last year on this critical issue.

Since proposing draft guidance last spring, COE has conducted a nearly unprecedented public engagement process for agency guidance. During this process, COE and the Environmental Protection Agency (EPA) held a 90-day public comment period. The agencies received nearly 230,000 comments and have publicly described the overwhelming majority as supporting the proposal. In mid-February 2012, COE and EPA submitted revised guidance to the Office of Management and Budget (OMB) for another round of inter-agency review. This process also allows nongovernmental organizations to meet with OMB to share their perspectives on the policy.

Guidance proposed by COE is based on sound science and clearly complies with the Supreme Court decisions in SWANCC and Rapanos. Allowing COE to proceed with guidance will partially restore protections for streams flowing to public drinking water supplies for 117 million Americans. It will also begin—but only begin—to restore protections for some wetlands. Healthy wetlands are essential to waterfowl, fish, and other wildlife, provide cost-effective flood protection, and improve water quality. They also support hunting, angling, and wildlife watching, which together inject \$122 billion annually into our economy. Finalizing the guidance will also provide more clarity and certainty about Clean Water Act implementation to landowners, developers, agency personnel, and State and local governments.

Once again, we urge the subcommittee not to include or accept any provision in its fiscal year 2013 bill limiting COE's ability to finalize and implement Clean Water Act guidance or initiate formal rulemaking concerning clean water regulations.

We appreciate the opportunity to submit this testimony.

PREPARED STATEMENT OF THE LITTLE RIVER DRAINAGE DISTRICT

My name is Sam M. Hunter, DVM. I am a veterinarian, landowner, and farmer, and I reside in Sikeston, in southeast Missouri.

I am the president of the Board of Supervisors of The Little River Drainage District, the largest such entity in the Nation. Our district serves as a drainage outlet and provides flood control to parts of seven counties in southeast Missouri. We also provide flood protection to a sizable portion of northeast Arkansas. Our district is funded solely by the annual assessment of benefits of more than 3,500 landowners.

My remarks will address the Mississippi River and Tributaries (MR&T) project and specifically the St. Francis River Basin line item of the MR&T. These funds are investments yielding a return of substantial benefit to the Nation. They provide funding for flood control that protects numerous cities, farms, and industries. Funding through the MR&T also provides needed repairs and upgrades to locks and dams, modernization of hydroelectric plants, and environmental restoration. This project was authorized by the Congress in 1928 and remains incomplete, yet yields a return of \$34 in damage reduction for every \$1 spent. I know of no better investment of taxpayer dollars.

We fully understand the financial constraints on our Government and the need to do more with less in order to reduce the national debt, balance the budget, and create jobs. Programs and projects have been eliminated or downsized; however, the MR&T is so critical to the Nation that it cannot withstand deep cuts without jeopardizing the safety of our citizens and our economy. The Mississippi River flood of 2011 would have been catastrophic without the MR&T. It is estimated that more than \$112 billion in flood damages were prevented by the project. The system did suffer damage as a result of the flooding and the Congress did respond to that and appropriated additional emergency funds to restore and repair the system, and for that we are grateful. But the work to maintain and complete the project must continue.

In the fiscal year 2013 budget submitted by the President the MR&T appropriation was \$210 million. That amount is identical to the fiscal year 2012 request. It appears that the Office of Management and Budget (OMB) has again chosen to ignore the infrastructure needs of the Mississippi Valley. That amount will possibly keep the lights on, but does not allow for much needed maintenance. To allow the project to crumble away is inexcusable. The navigation element alone, which includes the necessary maintenance of locks, dams, and harbors, is vital to this Nation's economy. Moving products on the Mississippi River is the most economical and environmentally friendly method of transportation. It is dramatically more fuel efficient than truck or rail. It allows our commodity producers to compete in a global market. Continued underfunding of the MR&T is a dangerous course of action. The failure of just one lock and/or dam could have an impact on the entire Nation's economy, yet this fact appears to have been left to chance by OMB.

Fortunately the power of the purse remains with the Congress. Even with an earmark moratorium, the Congress still retains the power to increase the President's budget request, as it has done annually since the administration of President Jimmy Carter. We believe that a minimum of \$375 million is necessary to continue to keep the MR&T viable. The Corps of Engineers' (COE) stated capability for the MR&T is \$375 million due to the supplemental appropriations for flood repairs.

Within the MR&T budget request is a line item for the St. Francis River and Tributaries that directly impacts our District. The President's budget request for fiscal year 2013 is slightly more than \$5.9 million for maintenance, but COE's stated capabilities for the St. Francis Basin is \$18.4 million. We maintain that a minimum of \$15 million is necessary for maintenance of the St. Francis Basin. This is not for new project construction but for maintenance at a minimum level of functionality.

I can tell you that the 2012 Disaster Relief Act will assist our District by funding the cleanout of our floodway ditches, for which COE is responsible, at a cost of \$7.9 million, and the Diversion Channel Stabilization at a cost of \$3.5 million. We appreciate this help in recovering from the infamous Flood of 2011.

Another program providing help for flood recovery is the Emergency Watershed Protection Program which is administered through the Natural Resource Conservation Service of the U.S. Department of Agriculture. This program is designed to as-

sist districts such as ours restore drainage facilities that are non-Federal through a local cost share agreement, of which we provide 25 percent. Past experience with this program has been impressive. It allows local control of the project, offers quick approval of projects, and addresses our needs immediately. This year's program is laid out on a very short-completion deadline for the extraordinary amount of recovery work that needs to be done. We intend to request that the completion dates be extended past the current deadline of end of fiscal year 2012 and ask this committee to join in that request.

In closing, I would like to thank each member of the subcommittee, their staff, and the Committee staff for taking the time to review the above-written testimony. We are appreciative of anything the Energy and Water Development Subcommittee can do to improve our environment and our livelihoods, and to ensure the safety of our communities. Your work is very important to our country and we feel it is important for us to thank you for your service, and for giving us the opportunity to share our viewpoints.

PREPARED STATEMENT OF THE MISSISSIPPI VALLEY FLOOD CONTROL ASSOCIATION

The Mississippi Valley Flood Control Association respectfully requests that the sum of \$375,000,000 be appropriated in fiscal year 2013 for the Mississippi River and Tributaries (MR&T) project.

The Flood Control Association was first organized in 1922 by a group of interested citizens from the States of Arkansas, Mississippi, and Louisiana. From that first meeting, held in Memphis, Tennessee, a delegation was selected to come to Washington in an attempt to convince both the Congress and the executive branch that the prevention of catastrophic floods in the lower Mississippi River Valley was beyond the capabilities of the local people and was in fact too large for any group other than the Federal Government. This group of dedicated citizens was without success until the record flood of 1927 swept through the Mississippi River Valley with the fury of devastation not seen before. An unknown number of people perished along with thousands of head of livestock and large numbers of many species of wildlife. Some 7 percent of all the productive land on this planet was under water for a period of almost one-half a year. The Congress, after extensive hearings, passed the Flood Control Act of May 15, 1928, that was signed into law by then President Calvin Coolidge.

The Flood Control Association then disbanded, acting under the erroneous assumption that the United States Government would provide whatever was needed to prevent flooding in the valley. In 1935, it became apparent that additional legislation was required and the Association, under the leadership of Senator John Overton from Louisiana, was re-organized. It has been in continuous and active existence since for some 77 years.

We have been fortunate since 1935 to have as our president and two vice presidents Members of the United States Congress with Senator Roger Wicker from the State of Mississippi serving as our president, Congressman Blaine Luetkemeyer from Missouri and Congressman Rodney Alexander from Louisiana serving as our vice presidents.

We are a nonprofit agency made up of levee boards, drainage districts, harbor and port commissions, States, cities, and towns, including many other agencies and individuals that have an interest in the protection and betterment of the people and property in the Mississippi River Watershed, the third largest in the world. But we feel it is the greatest, because of its size coupled with its essential usefulness to the Nation. In a few words we are an agency through which the local people may speak and act jointly on all flood control, bank stabilization, navigation, and major drainage problems.

Never before have we seen our Nation faced with such huge public debts and budget deficits as we do today. In our daily life we are made aware of the gut-wrenching sadness of seeing homes foreclosed and jobs disappear. We know all those things, but we also know that the country that is and has been for generations the bright light of freedom and prosperity, must not and cannot let its infrastructure deteriorate and fall into ruin; neither can we allow one of our vital forms of transportation become underutilized or useless due to the lack of proper and necessary maintenance.

Unfortunately, today as usual you are considering a budget request from the executive department that has insufficient funding to prevent either of the cases just outlined. The only recourse we have is to request the Congress do, as you have always done, add the necessary supplemental funds to protect the lives, property, and livelihoods of the citizens of the river basin.

Earlier in this statement, it was said that the Mississippi River Watershed that provides drainage for 41 percent of the Nation, moves almost 1 billion tons of commodities—60 percent of our grain, 25 percent of our petroleum products, 20 percent of the coal to fire our power plants—was the greatest watershed on the planet because of size coupled with its usefulness. Useful because the river has been controlled and improved beginning with the first levee for flood protection built in New Orleans, Louisiana in 1717. Levees came early because “without flood control, nothing else matters”. Over the years, the Congress, the Corps of Engineers (COE), and the local people have worked together to make the Mississippi River Watershed, stretching from New York on the east to Montana on the west and from the Canadian border to the Gulf of Mexico, the greatest and the envy of the developed world.

Our great country has always been a maritime Nation, almost totally dependent during the earliest years on the oceans and unimproved waterways to move our commerce including, at that time in history, our people. Westward expansion used the rivers whenever possible and many of the earliest construction projects in the new country were the building of canals connecting commercial waterways. Our national security and economic well-being has always, now more than ever, depended on the seas, lakes, and inland waterways that give us accessibility to every corner of our great Nation.

All improvements, great or small, sooner or later, require maintenance. We have been too lax in this great country with maintaining and improving our basic forms of transportation. We have not built new airports to keep up with the demand of a growing population nor have we improved and properly maintained those that we have. Our system of railroads is in such bad shape that we no longer even attempt to move human cargo by train except for a very few small, densely populated areas of the country. The interstate highway system that we constructed more than 50 years ago was a great source of pride, but we failed again to properly maintain it. Now we are paying a tremendous price to keep it functioning. A great majority of our waterway improvements, including our locks and dams and our flood control facilities, are well past their design life. Soon we will find ourselves in emergency mode of repairing and replacing failures. This will be very expensive, an economic disaster. Farmers will be especially hard hit with no efficient and economical way to transport their crops to the international market.

Our principal, but certainly not our only concern, is with the funding of the MR&T project. This is a very unique project that was conceived and developed with consideration for the functional relation between all its parts and the whole. It is a project that covers all the aspects of development in the Mississippi River Valley below the vicinity of Cape Girardeau, Missouri, from flood control to navigation to environmental protection and enhancement. The MR&T project is well-planned, well-organized, well-engineered, well-constructed and until recently, well-maintained. Unfortunately, it is not yet completed and adequate funding from the Congress is imperative if it is to be completed and properly maintained. If, because of inadequate funding and uncalled for delays due to countless and repetitive studies and misguided lawsuits by the misnamed and misled environmentalists, the lower reaches of the Mississippi River are not usable by commercial boats and barges and sea-going ships, then no amount of improvement on the upper reaches of the Mississippi River can have any favorable effect. “Without flood control nothing else matters.”

One of the major opportunities that we have to increase the wealth of our Nation is to continue the improvement and development of our major river systems. As noted the major system is the Mississippi River Watershed. For that reason, we request that the Congress do what it has done since 1928. That is, to appropriate sufficient supplemental funds, allowing COE to continue what the Congress has directed them to do. We are not talking about “earmarks” or pork barrel politics. We are talking about funds to keep our navigation channels open and to provide necessary dredging in order that our smaller but no less critical ports may continue to function; funds to continue the on-going work to bring some miles of levee sections that are deficient in either grade or section up to the design required to protect our citizens against the “greatest possible flood”; funds to bring our bank stabilization program to completion in the most efficient manner, both economically and environmentally.

The Executive Committee of the Mississippi Valley Flood Control Association has carefully examined the President’s budget request for fiscal year 2013. We have arrived at the unanimous conclusion that the required appropriation for the MR&T project is \$375 million, just to be reasonably assured that the goals of navigation, flood control, levee improvement and bank stabilization are met; nothing more, nothing less.

In a special message to the Congress on flood control in the Mississippi Basin, dated July 16, 1947, President Harry S Truman began with the following in his opening sentence: "the major opportunity of our generation to increase the wealth of the nation lies in the development of our great river systems". Later on in his message President Truman used these words: "we must never forget that the conservation of our natural resources and their wise use are essential to our very existence as a nation. The choice is ours. We can sit idly by, or almost as bad, resort to the false economy of feeble and inadequate measures, while these precious assets waste away. On the other hand, we can, if we act in time put into effect a realistic and practical plan which will preserve these basic essentials of our national economy and make this a better and a richer land". Mr. Truman was speaking about the MR&T project in this last quote. These words are still true today. On July 31, 1947, President Truman approved appropriations bills, including supplemental provisions for flood control on the MR&T project in fiscal year 1948 of \$250 million. And that was in 1948 dollars.

We have attached a breakdown of the requested funds of \$375 million for the Mississippi River and Tributaries Project for fiscal year 2013.

MISSISSIPPI VALLEY FLOOD CONTROL ASSOCIATION
FISCAL YEAR 2013 CIVIL WORKS REQUESTED BUDGET
MISSISSIPPI RIVER AND TRIBUTARIES APPROPRIATIONS

(In thousands of dollars)

Project/Study	
Fiscal year 2013 request	375,000
MISSISSIPPI RIVER AND TRIBUTARIES INVESTIGATIONS	
Collection and study of basic data	500
Memphis Metro Storm Water Management, Tennessee (FEAS)	100
Total investigations	600
MISSISSIPPI RIVER AND TRIBUTARIES CONSTRUCTION	
Atchafalaya Basin, Louisiana	9,000
Atchafalaya Basin Floodway System, Louisiana	4,000
Channel Improvement, Arkansas, Illinois, Kentucky, Louisiana, Mississippi, Missouri, and Tennessee	71,000
Mississippi River Levees, Arkansas, Illinois, Kentucky, Louisiana, Mississippi, Missouri, and Tennessee	69,490
Yazoo Basin, Upper Yazoo Projects	5,000
Total construction	158,490
MISSISSIPPI RIVER AND TRIBUTARIES MAINTENANCE	
Atchafalaya Basin, Louisiana	12,865
Atchafalaya Basin Floodway System, Louisiana	2,295
Baton Rouge Harbor, Devils Swamp, Louisiana	80
Bayou Cocodrie and Tributaries, Louisiana	50
Bonnet Carre, Louisiana	55,029
Channel improvement, Arkansas, Illinois, Kentucky, Louisiana, Mississippi, Missouri, and Tennessee—TOT	62,615
Channel improvement—dredging	18,785
Channel improvement—revetments and dikes	43,830
Greenville Harbor, Mississippi	30
Helena Harbor, Arkansas	210
Inspection of completed works	1,918
Lower Arkansas River, North Bank, Arkansas	375
Lower Arkansas River, South Bank, Arkansas	255
Lower Red River—South Bank Levees	565
Mapping	1,063
Memphis Harbor McKellar Lake, Tennessee	1,935
Mississippi Delta Region—Caernarvon, Louisiana	625
Mississippi River Levees, Arkansas, Illinois, Kentucky, Louisiana, Mississippi, Missouri, and Tennessee	8,645
Old River Control Structure, Louisiana	10,625
St. Francis River and Tributaries, Arkansas and Missouri	7,800
Tensas Basin, Boeuf and Tensas Rivers, Arkansas and Louisiana	2,450
Tensas Basin, Red River Backwater, Louisiana	3,185
Vicksburg Harbor, Mississippi	55
Wappapello Lake, Missouri	5,360

MISSISSIPPI VALLEY FLOOD CONTROL ASSOCIATION—Continued
FISCAL YEAR 2013 CIVIL WORKS REQUESTED BUDGET
MISSISSIPPI RIVER AND TRIBUTARIES APPROPRIATIONS

(In thousands of dollars)

Project/Study	
White River Backwater, Arkansas	1,510
Yazoo Basin, Arkabutla Lake, Mississippi	7,200
Yazoo Basin, Big Sunflower (Bogue Phalia), Mississippi	300
Yazoo Basin, Enid Lake, Mississippi	6,795
Yazoo Basin, Greenwood, Mississippi	1,000
Yazoo Basin, Grenada Lake, Mississippi	7,200
Yazoo Basin, Main Stem, Missouri	2,275
Yazoo Basin, Sardis Lake, Mississippi	8,500
Yazoo Basin, Tributaries, Mississippi	1,000
Yazoo Basin, Will M. Whittington Auxiliary Channel, Mississippi	575
Yazoo Basin, Yazoo Backwater, Mississippi	700
Yazoo Basin, Yazoo City, Mississippi	1,000
Total maintenance	215,910
Total Mississippi River and Tributaries	375,000

PREPARED STATEMENT OF THE NATURE CONSERVANCY

Madam Chair and members of the subcommittee: Thank you for the opportunity to present The Nature Conservancy's testimony on the fiscal year 2013 appropriations for the U.S. Army Corps of Engineers (COE) and Bureau of Reclamation. The Nature Conservancy is dedicated to saving the lands and waters on which all life depends. Our on-the-ground conservation work is carried out in all 50 States and more than 30 foreign countries and is supported by approximately 1 million members.

We recognize the challenges of working in a constrained fiscal environment. But we also recognize the critical importance of our water resources and the benefits these resources provide to virtually every sector of the economy, the quality of life in our communities, and the health of our people. Our focus is on supporting the programs and investments needed to ensure these benefits are enhanced today and made sustainable for tomorrow.

The Nature Conservancy supports building sustainability into the management of our Nation's water infrastructure, including the ecosystem restoration projects essential to ensuring that sustainability. These ecosystem restoration projects pay dividends through natural flood control, higher quality water, sustaining commercial fisheries, and supporting recreation and tourism. With impacts stretching out for decades to come, the projects and proposals that follow reap high returns on investment.

SUSTAINABLE RIVERS PROJECT

The Sustainable Rivers Project (SRP) is an initiative launched by COE in partnership with the Conservancy to update decades-old water management practices to meet society's needs today and in the coming decades. By managing dams in coordination with downstream flood-prone lands, the SRP is developing and demonstrating innovative approaches to maintain and enhance water supply, flood protection, hydropower generation, and recreation while restoring critical ecosystems and the economically valuable services they provide.

This approach was recently studied by COE, The Nature Conservancy, and University of California—Davis in two river basins—Georgia's and South Carolina's Savannah and California's Mokelumne. The Savannah River study found that small changes in floodplain management enable the use of up to 50 percent of the existing flood storage capacity for hydropower and recreation, producing a net benefit of more than \$12 million per year, without increasing flood risk and with additional benefits for water supply and the environment. The Mokelumne River study found similarly modest shifts in floodplain management frees up 25 percent to 50 percent of flood storage for public water supply—enough additional water for nearly 450,000 people—while maintaining flood protection and increasing hydropower generation and improving habitat for declining salmon. COE's budget includes three specific

initiatives that support SRP efforts; the Conservancy supports all three at the levels provided by COE:

Reducing Civil Works Vulnerability.—The Conservancy supports \$8 million.

Response to Climate Change.—The Conservancy supports \$5 million.

National Portfolio Assessment for Reallocations.—The Conservancy supports \$571,000.

U.S. ARMY CORPS OF ENGINEERS CONSTRUCTION PRIORITIES

Hamilton City Flood Damage Reduction and Ecosystem Restoration.—The fact that COE again selected Hamilton City for its construction budget in fiscal year 2013 is a testament to the innovative dual nature of the project: increasing flood protection for Hamilton City while restoring approximately 1,500 acres of riparian habitat. Appropriations for the first phase will initiate construction of approximately 2 miles of levee, removal of one-half of the existing levee, and completion of roughly one-third of the habitat restoration. The Conservancy strongly supports the \$7.5 million proposed in fiscal year 2013 to complete the first phase of construction.

Chesapeake Bay Oyster Recovery.—This project will build on recent progress and continue to increase the scale of oyster restoration in the Chesapeake Bay. Scientists in Maryland have estimated that oysters in just one Chesapeake tributary—the Choptank River—remove pollution that would otherwise cost waste water treatment systems \$300,000/year to remove. The \$5 million proposed for the fiscal year 2013 budget and supported by the Conservancy will allow COE to conduct additional habitat restoration in the Choptank River, as well as new restoration/enhancement work in the Great Wicomico, Lynnhaven and Piankatank Rivers in Virginia.

South Florida Ecosystem Restoration Program.—In recent years, the Federal Government has made substantial progress on Everglades projects, and we encourage continued funding for the three authorized Comprehensive Everglades Restoration Plan (CERP) projects. We also support inclusion of language to allow COE to carry over credit between studies and projects for which cost-share agreements have been executed with the South Florida Water Management District; such language would enable COE to more efficiently manage projects like the Kissimmee River Restoration Project (KRRP), a high priority for the restoration of the Everglades. The project is currently projected to be complete by 2015. The Conservancy supports the \$153,324,000 proposed for the South Florida Ecosystem Restoration Program in fiscal year 2013.

Upper Mississippi River Environmental Management Program.—Authorized in 1986, this program supports coordinated habitat rehabilitation and enhancement projects in the Upper Mississippi River system. Over the 25 years of the program, COE has completed more than 54 projects, benefiting more than 100,000 acres of aquatic and floodplain habitat. Currently, 35 projects in the program are in planning, design, or under construction. Completion of these projects will benefit an additional 75,000 acres of aquatic and floodplain habitat. The Conservancy supports the \$17,880,000 proposed for Environmental Management Program in fiscal year 2013.

Missouri River Fish and Wildlife Recovery Program.—Record upper basin precipitation in 2011 brought historic flooding to the Missouri River. The Recovery Program is expending funds to compile information on the impacts of the floods to native species and various Recovery projects while conducting a study on how Recovery Program actions could reduce impacts from future floods. The Conservancy supports restoration of funding for the Missouri River Ecosystem Restoration Plan (MRERP) as part of the \$90 million proposed for Missouri River Recovery Program (MRRP) in fiscal year 2013.

Chicago Sanitary and Ship Canal Dispersal Barrier.—Invasive plants, invertebrates, and fish pose serious threats to the biodiversity and fisheries of the Great Lakes and Mississippi River basins, which are home to nearly 50 percent of our Nation's freshwater fish species and support sport and commercial fisheries worth billions of dollars. This project seeks to prevent the immediate invasion of the Great Lakes by Asian carp by completing three electronic barriers in the Construction phase. The Nature Conservancy supports the budget request of \$24.5 million.

GENERAL INVESTIGATION PRIORITIES

Puget Sound Nearshore Marine Habitat Restoration.—This study, when completed, will identify restoration and protection needs and opportunities in the nearshore regions of Puget Sound. The Sound supports the second largest U.S. port (combined Ports of Seattle and Tacoma) for container traffic that has accounted for more than \$70 billion in foreign trade; it is an economic priority to ensure that

Puget Sound maintains the ecological resiliency to sustain vital services for both people and nature. The Conservancy supports the proposed \$850,000 in fiscal year 2013 to carry out this investigation.

Great Lakes and Mississippi River Interbasin Study.—The Conservancy encourages the Congress to instruct COE to deliver recommendations in a much shorter timeframe—2 years—to address the urgent problem of invasive species in the Chicago Area Waterway System (CAWS), and to focus their attention and resources on the CAWS alone, as it is the most urgent and significant invasion threat, the only continuous connection, and only pathway with a proven invasion history. The Conservancy requests no less than \$3 million for Great Lakes and Mississippi River Interbasin Study.

Illinois River Basin Restoration Program.—This Federal-State partnership sustains the health of the entire Illinois River Basin through projects that restore habitats, species, and the natural processes that sustain them. It complements other Federal programs such as the Illinois Conservation Reserve Enhancement Program and Environmental Management Program of the Upper Mississippi, yet is unique in its basin-wide approach to restoration. The Conservancy supports the \$400,000 funding proposed for this program in fiscal year 2013.

Lower Mississippi River Resource Assessment.—Flood control and drainage systems have accelerated erosion and habitat loss along the Lower Mississippi River and its tributaries. Working with the Department of the Interior, COE will evaluate river management, habitat, and public access to recommend actions for addressing current and future needs. The Conservancy supports the \$571,000 included for this program in fiscal year 2013.

Willamette River Floodplain Restoration Study.—COE and the Conservancy are working together to identify ecological flow requirements downstream of Corps dams on the Willamette River and incorporate those flows into dam operations to improve fish and wildlife habitat and community flood protection. Additionally, this study will assess the potential for floodplain restoration in the Middle Fork and Coast Fork tributaries of the Willamette River to reduce flood damage while restoring natural wetlands and promoting ecosystem restoration. The Conservancy supports the \$380,000 proposed in fiscal year 2013 to continue this study.

Yellowstone River Corridor Comprehensive Study.—Funding these ongoing economic, fisheries, and wetlands studies will help ensure that the longest free-flowing river in the lower 48 States maintains its natural functions while supporting irrigation and other uses of its waters. The study will help determine the significance of the cumulative effects of water use on aquatic species and riparian hardwood forests, while guiding the establishment of beneficial management practices. The Conservancy supports the proposed \$200,000 for fiscal year 2013.

CONTINUING AUTHORITIES PROGRAM

Section 1135, Project Modifications for Improvement of the Environment and Section 206, Aquatic Ecosystem Restoration.—Adequate funding for the Continuing Authorities Programs (CAPs) will ensure support for a section 1135 project at Spunky Bottoms and a section 206 project at Emiquon East, both located in Illinois and both serving as model floodplain restoration and reconnection projects. Demand for these valuable programs continues to outstrip funding, which is why the Conservancy urges the subcommittee to match the fiscal year 2012 funding level of \$7,909,000 each for the 1135 and 206 CAPs in fiscal year 2013.

BUREAU OF RECLAMATION

Upper Colorado River Endangered Fish Recovery and San Juan River Basin Recovery Programs.—These programs take a balanced approach to restore four endangered fish species by implementing a range of basin-wide strategies, including improved management of Federal dams, river and floodplain habitat improvement, stocking of endangered fish, and management of non-native fish species. The Conservancy supports the proposed \$8,387,000 in fiscal year 2013 for the two programs and the extension of their full base funding through 2019.

Platte River Recovery Implementation Program.—The program helps restore the four endangered or threatened species in the basin—whooping crane, interior least tern, piping plover, and pallid sturgeon—while enabling existing water projects in the basin to continue operations. Specifically, the program is working to increase stream flows in the central Platte River at ecologically and economically important times; enhance, restore and protect lands for target bird species; and offset post-1997 depletions. The Conservancy supports the proposed \$8 million for this recovery effort in fiscal year 2013.

Basin Studies and WaterSMART.—We support the request for the basin study programs and WaterSMART grant programs. These programs support sustainable water use and management by focusing on water conservation, reuse and recycling, and on environmental protection and restoration. We also support the proposed funding for the Bureau’s environmental restoration work, including the programs in the California Bay Delta and Colorado River.

DISCRETIONARY FUNDS

We support the approach that the Congress took in the fiscal year 2012 budget to provide additional funds so that many important on-going projects could continue toward completion. Our Connecticut River Planning Study will be finalized in fiscal year 2013 and would benefit from such flexibility.

Connecticut River Watershed Study.—This project will restore 410 miles of river flow and thousands of acres of natural habitat in the Connecticut River Basin. The study identifies dam management modifications for environmental benefits while maintaining beneficial human uses. After more than \$1 million in investments by the Federal Government, this study is entering its final year, ahead of schedule and under budget. We respectfully request \$300,000 to complete the critical final phase of this study, enabling the use of study products in a Federal Energy Regulatory Commission relicensing of five dams what influence flow on a 175-mile reach of the river.

The Conservancy would like to thank the subcommittee for supporting the restoration of large scale restoration programs over the last decade. These programs have been essential to restoring and maintaining some of America’s most precious and imperiled ecosystems. We are also appreciative of past support for smaller-scale projects that provide cumulative benefits and serve as powerful demonstrations of effective restoration.

PREPARED STATEMENT OF THE RED RIVER VALLEY ASSOCIATION

Madam Chair and members of the subcommittee: I am Dan York, Red River Valley Association (RRVA) President, and pleased to represent the Red River Valley Association, 629 Spring Street, Shreveport, Louisiana. Our organization was founded in 1925 with the express purpose of uniting the citizens of Arkansas, Louisiana, Oklahoma, and Texas to develop the land and water resources of the Red River Basin.

The resolutions contained herein were adopted by the Association during its 87th Annual Meeting in Shreveport, Louisiana, on February 23, 2012, and represent the combined concerns of the citizens of the Red River Basin area as they pertain to the goals of the Association. A summary of the Civil Works projects and requested funding is included in this testimony.

The President’s fiscal year 2013 budget included \$4.731 billion for the Civil Works programs. This is \$269 million less than what the Congress appropriated in fiscal year 2012. The administration fails to recognize Corps of Engineers’ (COE) critical role as stewards of our Nation’s water resources, and the vital importance of our water resources infrastructure to our economic and environmental well-being. The problem is also how the administration distributes funds. A few projects received the full “Corps Capability” to the detriment of many projects that receive no funding. The \$4.731 billion level does not come close to the real needs of our Nation. A more realistic funding level to meet the existing needs of the Civil Works program is \$6 billion for fiscal year 2013. The traditional Civil Works programs remain at the low, unacceptable level as in past years. These projects are the backbone to our Nation’s infrastructure for waterways, flood prevention, water supply, recreation, and ecosystem restoration. We remind you that Civil Works projects are a true “jobs program” in that up to 85 percent of project construction funding is contracted to the private sector; 100 percent of the construction, as well as much of the architect and engineering work. Not only do these projects provide jobs, but provide economic development opportunities for our communities to grow and prosper, creating permanent jobs.

We want to point out that we appreciate the funding the Congress enacted in the fiscal year 2012 Consolidated Appropriation Act and fiscal year 2012 supplemental. We encourage the Congress to increase the “water” share of the total Energy and Water Bill closer to the \$6 billion Corps capability.

We have great concerns over the issue of “earmarks”. Civil Works projects are not earmarks. Civil Works projects go through a process; reconnaissance study, feasibility study, benefit to cost ratio test, EIS, peer review, review by agencies, public review and comment, final Chief of Engineer approval, authorization by all of the

Congress in a Water Resources Development Act (WRDA) bill and signed by the President. WRDA 2007 added an independent review of major projects. No other Federal program goes through such a rigorous approval process. Each justified project “stands alone”, are proven to be of national interest and should be funded by project. For most projects there is local sponsor cost sharing during the feasibility study, construction, and for operations and maintenance (O&M). Those who have contributed, in most cases—millions of dollars—to the process, must have the ability to have a say for their projects to get funded. That voice is through their congressional delegation. We believe that earmarks are not in the national interest, but it does not pertain to the Civil Works program. For civil works it is an issue of priority of projects to be funded and who will determine that, Office of Management and Budget or the Congress. We hope the Congress takes back their responsibility to set civil works priorities and to determine how its citizens’ tax dollars are spent.

The Inland Waterways Trust Fund (IWTF) is inadequately funded by the existing fuel tax rate. There is no doubt that something must be done to increase the revenue in the fund. The needs of the IWTF should be analyzed and determine what increase to the existing fuel tax would maintain the necessary income flow to keep projects funded from the IWTF. The final proposal must be fair to tributary waterways and be applied equally to all industries using the waterways.

I would now like to comment on some of our specific requests for the future economic well being of the citizens residing in the four State Red River Basin regions.

Navigation.—The J. Bennett Johnston Waterway is living up to the expectations of the benefits projected. We are extremely proud of our public ports, municipalities, and State agencies that have created this success. This upward “trend” in usage will continue as new industries commence operations. A major power company, CLECO, has invested \$1 billion in its Rodemacher Plant near Boyce, Louisiana, on the lower Red River and has started moving more than 2.5 million tons of “petroleum coke” and limestone, by barge. This project is a reality and there are many more industries considering using our waterway and locating at the ports.

We have a serious issue for the J. Bennett Johnston Waterway O&M in the President’s budget. The administration allocated \$8,434,000 for fiscal year 2013, \$2,566,000 less than what is required for 24/7 lock operations and dredging. This drastic reduction will directly impact the ability to conduct maintenance dredging and the authorized 9-foot channel will not be maintained. It is difficult to understand why the administration would fund O&M at the \$11 million range for 5 years and suddenly make a drastic reduction that will have such a negative impact on a waterway that has yearly increased its tonnage. If the required funding level of at least \$11 million is not appropriated the waterway may actually shut down to all traffic and industry will see the waterway as unreliable and choose alternative modes of transportation, impacting ports, and jobs.

The administration is introducing a new metric to determine lock operations. The hours of operations for each lock would be determined by the number of commercial lockages per year. Reducing the hours of operations will discourage industry from using the Waterway; therefore, further reducing the number of lockages sending the Waterway into a lower-use status. Instead of finding ways to close down waterways the administration should be promoting initiatives to increase waterborne transportation. The Congress must stop these destructive actions.

Red River Navigation Into Southwest Arkansas Feasibility Study.—This region of Southwest Arkansas and Northeast Texas continues to suffer major unemployment and this navigation project, although not the total solution will help revitalize the economy. Due to the time lapsed in the study the “freight rates” calculated a number of years ago they must be re-evaluated. To date the local sponsor, Arkansas Red River Commission, has invested more than \$4 million to cost share in this study. Since no funding has been appropriated for this study the Commission will fully fund a private company to conduct a full investigation to insure all benefits have been identified. This feasibility study has been ongoing for more than 10 years and the Commission is making every effort to bring it to a successful conclusion. The administration and the Congress needs to make the Federal contribution and the same commitment the local sponsor and State of Arkansas has made.

Flood Prevention.—What will happen when we ignore our levee systems? We know the Red River levees in Arkansas do not meet Federal standards, which is why we have the authorized project line item, “Red River Below Denison Dam, TX, AR & LA”. Now is the time to bring these levees up to standards, before a major flood event.

We continue to consider flood control a major objective and request you continue funding the levee rehabilitation projects ongoing in Arkansas. Out of 11 levee sections, 5 have been completed and brought to Federal standards. The Red River

Levee District (AR) is prepared to provide lands, easements, and rights of way for the next major rehabilitation of the Lafayette County levees.

The levees in Louisiana have been incorporated into the Federal system; however, they do not meet current safety standards. These levees do not have a gravel surface roadway, threatening their integrity during times of flooding. It is essential for personnel to traverse the levees during a flood to inspect them for problems. Without the gravel surface the vehicles will cause rutting, which can create conditions for the levees to fail. A gravel surface will insure inspection personnel can check the levees during the saturated conditions of a flood.

Bank Stabilization.—One of the most important, continuing programs, on the Red River is bank stabilization in Southwest Arkansas and North Louisiana under the authorized project; Red River Emergency Bank Protection. We must stop the loss of valuable farmland that erodes down the river and interferes with the navigation channel. In addition to the loss of farmland is the threat to public utilities such as levees, roads, electric power lines and bridges; as well as increased dredging cost in the navigable waterway in Louisiana. These bank stabilization projects are compatible with subsequent navigation into Arkansas, and we urge that they be continued in those locations designated by COE to be the areas of highest priority.

Water Quality.—The Assistant Secretary of the Army (Civil Works), in October 1998, agreed to support a re-evaluation of the Wichita River Basin tributary of the Chloride Control Project. The re-evaluation report was completed and the Director of Civil Works signed the Environmental Record of Decision. The plan was found to be economically justified. Then the ASA (CW) directed that construction would not proceed until a local sponsor was found to assume 100 percent of the O&M for the project. The 2007 WRDA bill included language that clarified that all aspects of this project will be at full Federal expense, to include O&M. Over the past years, there has been a renewed interest by the Lugart-Altus Irrigation District to evaluate construction of Area VI, of the Chloride Control Project, in Oklahoma. They have obtained the support of many State and Federal legislators, as well as the Oklahoma Governor in support of a re-evaluation report. The western areas of Texas and Oklahoma are water deprived and sorely need the Chloride Control Project. The need for water quality and quantity will increase over time and this project will address those needs, as long as Federal funding is appropriated to keep the project moving ahead.

Project Funding Requests.—Included in this testimony are tables displaying the Civil Works projects in the Red River Valley and the appropriation needs for fiscal year 2013.

Thank you for the opportunity to present this testimony and project details of the Red River Valley Association on behalf of the industries, organizations, municipalities and citizens we represent throughout the four State Red River Valley region. The Civil Works program directly relates to national security by investing in economic infrastructure. If waterways are closed companies will not relocate to other parts of the country—they will move over seas. If we do not invest now there will be a negative impact on our ability to compete in the world market threatening our national security.

Grant Disclosure.—The Red River Valley Association has not received any Federal grant, sub-grant or contract during the current fiscal year or either of the 2 previous fiscal years.

RED RIVER VALLEY ASSOCIATION OPERATION AND MAINTENANCE PROJECTS

(In thousands of dollars)

Project	Fiscal year 2012 appropriations	Red River Valley Association fiscal year 2013 request	President's fiscal year 2013 budget
DE Queen Lake, Arkansas	1,654	3,393	1,870
Dierks Lake, Arkansas	1,393	2,213	1,567
Gillham Lake, Arkansas	1,319	1,437	1,463
Millwood Lake, Arkansas	2,507	6,690	2,680
Bayou Bodcau Reservoir, Louisiana	2,016	1,891	1,041
Bayou Pierre, Louisiana	23	36	24
Caddo Lake, Louisiana	215	522	216
Wallace Lake, Louisiana	234	997	232
J. Bennett Johnston Waterway, Louisiana	11,165	25,633	8,434
Basic Annual Operation and Maintenance	7,565	12,230	.....
Backlog Maintenance	(w/Suppl 3,600)	13,403	.....

RED RIVER VALLEY ASSOCIATION OPERATION AND MAINTENANCE PROJECTS—Continued

(In thousands of dollars)

Project	Fiscal year 2012 appropriations	Red River Valley Association fiscal year 2013 request	President's fiscal year 2013 budget
Old River, Louisiana (MR&T)		21,647	8,050
Broken Bow Lake, Oklahoma	2,017	7,025	2,425
Hugo Lake, Oklahoma	1,519	1,716	1,716
Pine Creek Lake, Oklahoma	1,229	1,053	1,053
Sardis Lake, Oklahoma	982	3,801	3,801
Waurika Lake, Oklahoma	1,507	1,616	1,616
Chloride Control, Area VIII, Texas	1,562	1,529	1,529
Denison Dam and Lake Texoma, Texas	6,803	13,837	7,137
Basic Annual Operation and Maintenance		6,393	
Backlog Maintenance		7,444	
Estelline Springs, Texas	43	42	42
Lake Kemp, Texas—Total Need	179	241	241
Basic Annual Operation and Maintenance		214	
Reallocation Study		27	
Pat Mayse Lake, Texas	1,187	2,421	1,148
Jim Chapman Lake, Texas	1,555	4,553	1,736
Lake of the Pines, Texas	3,393	8,848	3,529
Wright Patman Dam and Lake, Texas	3,771	12,888	3,513

RED RIVER GENERAL INVESTIGATION AND CONSTRUCTION GENERAL PROJECTS

(In thousands of dollars)

	Fiscal year 2012 appropriations	Red River Valley Association fiscal year 2013 request	President's fiscal year 2013 budget
Studies (GI)			
Navigation into Southwest Arkansas: Feasibility		302	
Red River Waterway, Louisiana—12' Channel, Recon		100	
Bossier Parish, Louisiana		270	
Cross Lake, Louisiana Water Supply Supplement			
Southeast Oklahoma Water Resource Study: Feasibility		500	
Washita River Basin, Oklahoma		500	
Southwest Arkansas Ecosystem Restoration: Recon Study		47	
Cypress Valley Watershed, Texas		175	
Sulphur River Basin, Texas		1,000	
Wichita River Basin above Lake Kemp, Texas: Recon		100	
Red River Above Denison Dam, Texas and Oklahoma: Recon		100	
Red River Waterway, Index, Arkansas to Denison Dam		100	
Mountain Fork River Watershed, Oklahoma and Arkansas, Recon			
Walnut Bayou, Little River, Arkansas		100	
Little River County/Ogden Levee, Arkansas, Recon		100	
Red River Waterway, Index to Denison, Bendway			
Construction General (CG)			
Red River Waterway: J.B. Johnston Waterway, Louisiana	1,000	22,000	2,000
Chloride Control Project, Texas and Oklahoma		8,500	
Texas—7,500/Oklahoma—800	¹ 7,200	² 1,300	
Red River Below Denison Dam; Arkansas and Louisiana	90	18,000	
Bowie County Levee, Texas			
Red River Emergency Bank Protection		20,000	
McKinney Bayou, Arkansas, PED			
Continuing Authority Program (CAP)			
Big Cypress Valley Watershed, Texas: Section 1135			
Palo Duro Creek, Canyon, Texas: Section 205		100	
Millwood, Grassy Lake, Arkansas: Section 1135		100	
Miller County Levee, Arkansas: Section 1135			
Oklahoma Comprehensive Water Planning: Section 22		500	

¹ Texas

²Oklahoma

DEPARTMENT OF THE INTERIOR

BUREAU OF RECLAMATION

PREPARED STATEMENT OF THE ASSINIBOINE AND SIOUX TRIBES OF THE FORT PECK RESERVATION AND DRY PRAIRIE RURAL WATER

FISCAL YEAR 2013 BUDGET REQUEST

The Assiniboine and Sioux Tribes of the Fort Peck Reservation and Dry Prairie Rural Water greatly appreciate \$7.5 million that is included in the Bureau of Reclamation's (BOR) fiscal year 2013 budget request to continue construction of the Fort Peck Reservation Rural Water System. However, this level of funding is far below the need and project capacity for fiscal year 2013. Thus, we respectfully request \$29 million within BOR fiscal year 2013 rural water program for this project, which will enable us to complete this project within the authorization time.

Fiscal year 2013 funds will be used to construct critical elements of the Fort Peck Reservation Rural Water System, Montana, (Public Law 106-382, October 27, 2000). The amount requested is based on need to complete transmission pipelines across the Fort Peck Indian Reservation and deliver regional water to the Reservation and Dry Prairie. The request is within capability to spend funds in fiscal year 2013 as set out in Table 1.

Good construction progress has been made on the Reservation and will continue into 2013. By the end of fiscal year 2012, the project will:

- complete the main transmission pipelines from the water treatment plant (WTP) to Wolf Point;
- complete the main transmission system from Wolf Point to Frazer;
- complete the main transmission system from Poplar to Brockton;
- nearly complete the main transmission system from Brockton to the Big Muddy River, the first interconnection point with Dry Prairie;
- serve rural homes of tribal members and others between Brockton and Frazer, that, when complete, will serve 75 percent of the Reservation design population with safe and adequate water; and
- complete the Fort Kipp interim water project, poorest water quality in the region.

Dry Prairie has continued to extend distributions projects in Valley County on the west side of the project and in Roosevelt and Sheridan Counties on the east side and has added several hundred new users.

TABLE 1.—FISCAL YEAR 2013 FUNDING REQUEST,
FORT PECK RESERVATION RURAL WATER SYSTEM (PUBLIC LAW 106-382)

[In thousands of dollars]

Sponsor/Project Feature	Federal	Non-Federal	Total
FORT PECK TRIBES (MAIN TRANSMISSION PIPELINES)			
Brockton to Big Muddy Mainline	725	.....	725
Brockton to Big Muddy Zone 1 Branches	750	.....	750
Wolf Point to Poplar Zone 1 Branches	1,425	.....	1,425
Wolf Point to Frazer Zone 1 Branches	3,905	.....	3,905
Frazer to Porcupine Creek	8,346	.....	8,346
FP Electrical, Meters, SCADA	2,114	.....	2,114
Subtotal	17,265	.....	17,265
DRY PRAIRIE (MAIN TRANSMISSION PIPELINES AND BRANCHES)			
E Medicine Lake	1,883	595	2,478
ML to Plentywood	2,333	737	3,070
Big Muddy to Culbertson	108	34	142

TABLE 1.—FISCAL YEAR 2013 FUNDING REQUEST,—Continued
FORT PECK RESERVATION RURAL WATER SYSTEM (PUBLIC LAW 106–382)

[In thousands of dollars]

Sponsor/Project Feature	Federal	Non-Federal	Total
FP Boundary to Scobey	7,499	2,368	9,867
DP Electrical, Meters, Easements	752	238	990
Subtotal	11,823	3,734	15,557
Total	29,088	3,734	32,822

FUNDING STATUS AND NEEDS

As shown in Table 2, the project will be 44-percent complete at the end of fiscal year 2012 this includes the completion of the regional WTP. The construction contract for the final phase will be completed in mid-year 2012. The Project has also completed:

- the extension of the raw water pipeline from the regional intake to the new WTP;
- the pipeline between the new WTP and the tribal headquarter community of Poplar;
- the pipeline between the WTP and the community of Wolf Point; and
- part of the project from Wolf Point to Frazer.

TABLE 2.—FUNDING STATUS AND NEEDS

[Dollars in thousands]

Total Federal funding authority (October 2011)	\$295,719
Federal funds appropriated through fiscal year 2012:	
Energy and Water Appropriations	\$83,532
ARRA Allocation	\$46,249
Total	\$129,781
Percent complete	43.89
Amount remaining after fiscal year 2012:	
Total authorized (October 2010)	\$165,938
Overhead adjustment for extension to fiscal year 2020	\$215,579
Adjusted for inflation to fiscal year 2020 at 4.54% annually	\$261,903
Years to complete	8
Average annual required to end in fiscal year 2020, requires amendment to extend	\$32,738
Fiscal year 2013 amount requested	\$29,088

While the project has made great strides and efficiently used every \$1 made available to get to where we are, we are still less than 50-percent complete, which translates into approximately \$166 million (in 2010 dollars) of construction that must be completed. Currently, the project is \$13 million underbudget and can be completed within the authorized construction ceiling if appropriations are adequate to complete on the statutory schedule of 2015, which we recognize as not realistic. However, the cost of extending the project construction to fiscal year 2020, for example, 5 years beyond the authorized ceiling, is an additional \$50 million. We urge the Congress to address the problem of inadequate budgeting of projects that are well advanced in construction.

PROPOSED ACTIVITIES

The fiscal year 2013 request (\$29.088 million) is needed to properly utilize the WTP and distribute water to all communities along the main transmission line within the Fort Peck Indian Reservation and is within the capability of the project. The fiscal year 2013 funds will:

Fort Peck Indian Reservation

- complete the main transmission pipelines along the southern boundary of the project;
- serve the Reservation communities and all rural homes within the first pressure zone along the main transmission throughout the Reservation; and
- permit delivery of water outside the Reservation to improve water quality and operation within the reservation by:
 - reducing flushing needs and costs;
 - reducing disinfection needs and costs; and
 - reducing potential for formation of disinfectant by-products.

Dry Prairie

- initiate construction of pipeline from northern boundary of Reservation to Scobey; and
- complete the main transmission pipeline and branches from Medicine Lake to Plentywood.

Jobs

- create an estimated 233 full-time equivalent (FTE) construction jobs in an area of Montana with low per capita income, high unemployment, and high under-employment (based on 8 FTEs per \$1 million).

ADMINISTRATION'S SUPPORT

The project has reached 44-percent completion over a period of 12 years and needs greater funding support to complete the project between 2015 and 2020. Congressional support is needed for the authorized BOR rural program to complete projects in a more timely manner.

The tribes and Dry Prairie have worked extremely well and closely with BOR since the authorization of the project in fiscal year 2000. The Commissioner, Regional and Area Office of BOR have been consistently in full agreement with the need, scope, total costs, and the ability to pay analysis that supported the Federal and non-Federal cost shares. There have been no areas of disagreement or controversy in the formulation or implementation of the project. As stated above, the project is under budget currently by more than \$13 million.

Cooperative agreements have been developed and executed between BOR and the tribes and between BOR and Dry Prairie. Those cooperative agreements carefully set out goals, standards, and responsibilities of the parties for planning, design, and construction. All plans and specifications are subject to review by BOR pursuant to the cooperative agreements. The sponsors collaborate to undertake activities that assure proper oversight and approval by BOR. Each year the tribes and Dry Prairie, in accordance with the cooperative agreements, develop a work plan setting out the planning, design, and construction activities, and the allocation of funding to be utilized on each project feature.

Clearly, the Fort Peck Reservation Rural Water System is well-supported by BOR. The Congress authorized the project based on the Final Engineering Report that was formulated in full cooperation and collaboration with BOR, and major project features are successfully under construction with excellent oversight by the Agency.

PREPARED STATEMENT OF AURORA WATER

Dear Chairwoman Feinstein and Senator Alexander: I request your support for an appropriation for fiscal year 2013 of \$8,387,000 to the Bureau of Reclamation within the budget line item entitled "Endangered Species Recovery Implementation Program" for the Upper Colorado Region, consistent with the President's recommended budget. Substantial non-Federal cost-sharing funding is occurring pursuant to Public Law 106-392, as amended. This appropriation will allow continued funding in fiscal year 2013 for the Upper Colorado River Endangered Fish Recovery Program and the San Juan River Basin Recovery Implementation Program as authorized by Public Law 106-392. These two successful ongoing cooperative partnership programs involve the States of Colorado, New Mexico, Utah, and Wyoming; Indian tribes; Federal agencies; and water, power, and environmental interests.

The requested Federal appropriations are critically important to these efforts moving forward. The past support of your subcommittee has greatly facilitated the success of these multistate, multiagency programs. I thank you for the subcommittee's past support and request the subcommittee's assistance for fiscal year 2013 funding to ensure the Bureau of Reclamation's continuing financial participation in these vitally important programs.

PREPARED STATEMENT OF BOARD OF WATER WORKS OF PUEBLO, COLORADO

Dear Chairwoman Feinstein and Senator Alexander: I request your support for an appropriation for fiscal year 2013 of \$8,387,000 to the Bureau of Reclamation within the budget line item entitled "Endangered Species Recovery Implementation Program" for the Upper Colorado Region, consistent with the President's recommended budget. Substantial non-Federal cost-sharing funding is occurring pursuant to Public Law 106-392, as amended. This appropriation will allow continued funding in fiscal year 2013 for the Upper Colorado River Endangered Fish Recovery Program and the San Juan River Basin Recovery Implementation Program as authorized by Public Law 106-392. These two successful ongoing cooperative partnership programs involve the States of Colorado, New Mexico, Utah, and Wyoming; Indian tribes; Federal agencies; and water, power, and environmental interests.

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PREPARED STATEMENT OF CENTRAL UTAH WATER CONSERVANCY DISTRICT

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PREPARED STATEMENT OF CITY OF FARMINGTON

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PREPARED STATEMENT OF COLORADO RIVER BASIN SALINITY CONTROL FORUM

Waters from the Colorado River are used by approximately 35 million people for municipal and industrial purposes and used to irrigate approximately 4 million acres in the United States. Natural and man-induced salt loading to the Colorado River creates environmental and economic damages. The Bureau of Reclamation

(BOR) has estimated the current quantifiable damages at about \$300 million per year. The Congress authorized the Colorado River Basin Salinity Control Program (Program) in 1974 to offset increased damages caused by continued development and use of the waters of the Colorado River. Modeling by BOR indicates that the quantifiable damages would rise to more than \$500 million by the year 2030 without continuation of the Program. The Congress has directed the Secretary of the Interior to implement a comprehensive program for minimizing salt contributions to the Colorado River. BOR serves as the lead Federal agency in implementing the program. BOR primarily institutes salinity control through its Basinwide Program. Funding levels have fallen behind in recent years, and a funding level of \$14.5 million is required in fiscal year 2013 to prevent further degradation of the quality of the Colorado River and increased downstream economic damages.

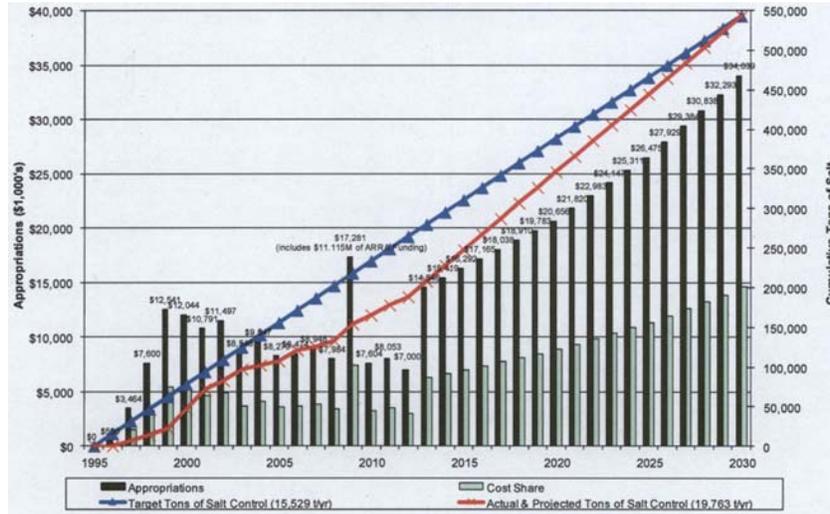
Environmental Protection Agency (EPA) has identified that more than 60 percent of the salt load of the Colorado River comes from natural sources. The majority of land within the Colorado River Basin is administered by Bureau of Land Management (BLM). In implementing the Colorado River Basin Salinity Control Act (Act) in 1974, the Congress recognized that most of the salts in the Colorado River originate from federally owned lands. Title I of the Salinity Control Act deals with the United States commitment to the quality of waters being delivered to Mexico. Title II of the Act deals with improving the quality of the water delivered to U.S. users. This testimony deals specific with title II efforts. In the early years of the program, BOR implemented salinity control in large projects which were funded with specific line item amounts. In 1995, the Congress amended the act and created BOR's Basinwide Program. Under this program, BOR funds proposals which will decrease the salt load to the Colorado River. Most of the received proposals target off-farm irrigation distribution systems such as canals and laterals. It is generally more efficient for BOR to perform the off-farm distribution system improvements prior to Natural Resources Conservation Service (NRCS) treating the on-farm acres with salinity control practices (i.e., BOR pipe a canal or lateral prior to NRCS putting a pressurized sprinkler system on farm). Shortfalls in recent basinwide funding have led to inefficiencies in the implementation of the overall program. The funding amount identified above and in the graph below are required to get the Basinwide Program back on pace with the overall program implementation.

Concentrations of salt in the Colorado River cause approximately \$300 million in quantified damages and significantly more in unquantified damages in the United States and result in poor water quality for United States users. Damages occur from:

- a reduction in the yield of salt-sensitive crops and increased water use for leaching in the agricultural sector;
- a reduction in the useful life of galvanized water pipe systems, water heaters, faucets, garbage disposals, clothes washers, and dishwashers, and increased use of bottled water and water softeners in the household sector;
- an increase in the cost of cooling operations and the cost of water softening and a decrease in equipment service life in the commercial sector;
- an increase in the use of water and the cost of water treatment, and an increase in sewer fees in the industrial sector;
- a decrease in the life of treatment facilities and pipelines in the utility sector;
- difficulty in meeting wastewater discharge requirements to comply with National Pollutant Discharge Elimination System permit terms and conditions and an increase in desalination and brine disposal costs due to accumulation of salts in groundwater basins; and
- increased use of imported water for leaching and cost of desalination and brine disposal for recycled water.

The Colorado River Basin Salinity Control Forum (Forum) is composed of gubernatorial appointees from Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming. The Forum is charged with reviewing the Colorado River's water quality standards for salinity every 3 years. In so doing, it adopts a Plan of Implementation consistent with these standards. The Plan of Implementation, as adopted by the States and approved by EPA, calls for 368,000 tons of additional salinity control measures to be implemented by BOR by 2030, or approximately 20,000 tons of new control each year. Based on current cost levels, BOR's funding under its Basinwide Program needs to be \$14.5 million. The level of appropriation requested in this testimony is in keeping with the adopted Plan of Implementation. If adequate funds are not appropriated, significant damages from the higher salt concentrations in the water will be more widespread in the United States and Mexico.

BASINWIDE PROGRAM: FUNDING BASED ON CONTROLLING 19,763 T/YR BEGINNING IN FISCAL YEAR 2013



In summary, implementation of salinity control practices through BOR's Basinwide Program has proven to be a very cost-effective method of controlling the salinity of the Colorado River and is an essential component to the overall Colorado River Basin Salinity Control Program. Continuation of adequate funding levels for salinity within this program will prevent the water quality of the Colorado River from further degradation and significant increases in economic damages to municipal, industrial, and irrigation users.

PREPARED STATEMENT OF THE COLORADO RIVER BOARD OF CALIFORNIA

This testimony is in support of fiscal year 2013 funding for the Department of the Interior for the title II Colorado River Basin Salinity Control Act of 1974 (Public Law 93-320). In the Act, the Congress designated the Department of the Interior, Bureau of Reclamation (BOR) to be the lead agency for salinity control in the Colorado River Basin. For nearly 28 years this very successful and cost-effective program has been carried out pursuant to the Colorado River Basin Salinity Control Act and the Clean Water Act (Public Law 92-500). California's Colorado River water users are presently suffering economic damages in the hundreds of millions of dollars per year due to the River's salinity.

The Colorado River Board of California (Board) is the State agency charged with protecting California's interests and rights in the water and power resources of the Colorado River system. In this capacity, California participates along with the other six Colorado River Basin states through the Colorado River Basin Salinity Control Forum (Forum), the interstate organization responsible for coordinating the Basin States' salinity control efforts. In close cooperation with the U.S. Environmental Protection Agency (EPA) and pursuant to requirements of the Clean Water Act, the Forum is charged with reviewing the Colorado River's water quality standards every 3 years. The Forum adopts a Plan of Implementation consistent with these water-quality standards. The level of appropriation being supported by this testimony is consistent with the Forum's "2011 Plan of Implementation" for continued salinity control efforts within the Colorado River Basin. If adequate funds are not appropriated to BOR's Basinwide Program, significant damages associated with increasing salinity concentrations of Colorado River water will become more widespread in the United States and Mexico.

The Plan of Implementation, as adopted by the States and approved by EPA, calls for 368,000 tons of additional salinity control measures to be implemented by BOR by 2030, or approximately 20,000 tons of additional salinity control measures each year. Based on current program cost levels, BOR's funding under its Basinwide Pro-

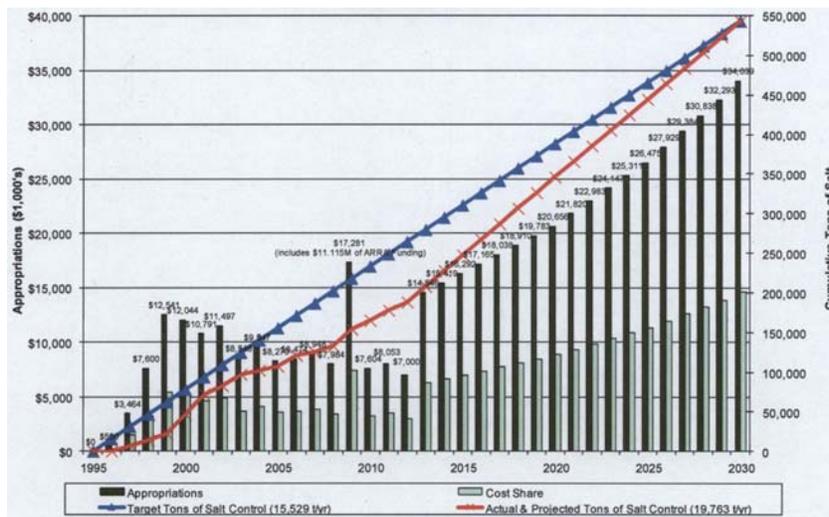
gram needs to be at least \$14.5 million. This level of appropriation requested in this testimony is in keeping with the adopted “2011 Plan of Implementation”.

Waters from the Colorado River are used by approximately 35 million people for municipal and industrial purposes and used to irrigate approximately 4 million acres of agricultural lands in the United States. Currently, the salinity concentration of Colorado River water causes about \$300 million in quantifiable damages in the United States annually. Economic and hydrologic modeling by BOR indicates that the quantifiable damages could rise to more than \$500 million by the year 2030 without the continuation of Basinwide salinity control measures as identified in the “2011 Plan of Implementation”. Significant unquantified damages also occur. For example, damages occur from:

- a reduction in the yield of salt-sensitive crops and increased water use for leaching in the agricultural sector;
- a reduction in the useful life of galvanized water pipe systems, water heaters, faucets, garbage disposals, clothes washers, and dishwashers, and increased use of bottled water and water softeners in the household sector;
- an increase in the use of water for cooling, and the cost of water softening, and a decrease in equipment service life in the commercial sector;
- an increase in the use of water and the cost of water treatment, and an increase in sewer fees in the industrial sector;
- a decrease in the life of treatment facilities and pipelines in the utility sector;
- difficulty in meeting wastewater discharge requirements to comply with National Pollutant Discharge Elimination System permit terms and conditions, an increase in desalination and brine disposal costs due to accumulation of salts in groundwater basins, and fewer opportunities for recycling and reuse of the water due to groundwater quality deterioration; and
- increased use of imported water for leaching and the cost of desalination and brine disposal for recycled water.

Some of the most cost-effective salinity control opportunities occur when BOR can improve irrigation delivery systems in a coordinated fashion with the activities of the U.S. Department of Agriculture’s (USDA) programs working with landowners to improve on-farm irrigation systems. With the USDA’s Environmental Quality Incentive Program, more on-farm funds are available and it continues to be important to ensure that there are adequate BOR funds available to maximize BOR’s effectiveness in addressing water delivery system improvements. Shortfalls in recent Basinwide Program funding have led to inefficiencies in the implementation of the overall salinity control program. The funding amount identified above, and in the following graph, are required to get the Basinwide Program back on pace with the implementation schedule identified in the “2011 Plan of Implementation”.

BASINWIDE PROGRAM: FUNDING BASED ON CONTROLLING 19,763 T/YR BEGINNING IN FISCAL YEAR 2013



In addition, the Colorado River Board recognizes that the Federal Government has made significant commitments to the Republic of Mexico and to the seven Colorado River Basin States with regard to the delivery of quality water pursuant to the 1944 Water Treaty with Mexico. In order for those commitments to be honored, it is essential that in fiscal year 2013, and in future fiscal years, that the Congress provide funds to the BOR for the continued operation of current projects.

The Colorado River is, and will continue to be, a major and vital water resource to the nearly 20 million residents of southern California, including municipal, industrial, and agricultural water users in Ventura, Los Angeles, San Bernardino, Orange, Riverside, San Diego, and Imperial counties. The protection and improvement of Colorado River water quality through an effective salinity control program will avoid the additional economic damages to users in California and the other States that rely on the Colorado River.

PREPARED STATEMENT OF THE COLORADO RIVER ENERGY DISTRIBUTORS ASSOCIATION

Dear Chairwoman Feinstein and Senator Alexander: We request your support for an appropriation for fiscal year 2013 of \$8,387,000 to the Bureau of Reclamation within the budget line item entitled "Endangered Species Recovery Implementation Program" for the Upper Colorado Region, consistent with the President's recommended budget. Substantial non-Federal cost-sharing funding is occurring pursuant to Public Law 106-392, as amended. This appropriation will allow continued funding in fiscal year 2013 for the Upper Colorado River Endangered Fish Recovery Program and the San Juan River Basin Recovery Implementation Program as authorized by Public Law 106-392. These two successful ongoing cooperative partnership programs involve the States of Colorado, New Mexico, Utah, and Wyoming; Indian tribes; Federal agencies; and water, power, and environmental interests.

The requested Federal appropriations are critically important to these efforts moving forward. The past support of your subcommittee has greatly facilitated the success of these multistate, multiagency programs. We thank you for the subcommittee's past support and request the subcommittee's assistance for fiscal year 2013 funding to ensure the Bureau of Reclamation's continuing financial participation in these vitally important programs.

PREPARED STATEMENT OF THE COLORADO RIVER ENERGY DISTRIBUTORS ASSOCIATION

Dear Chairwoman Feinstein and Ranking Member Alexander: On behalf of the Colorado River Energy Distributors Association (CREDA), I respectfully request that the subcommittee appropriate \$11,387,000 to maintain capital projects and base funding activities for the Upper Colorado River and San Juan River Recovery Implementation Programs (RIP).

CREDA is a nonprofit organization representing consumer-owned utilities, political subdivisions, State agencies, tribes and rural electric cooperative utilities in Arizona, Colorado, Nevada, New Mexico, Utah, and Wyoming, serving more than 4 million electric consumers. CREDA's member utilities purchase more than 85 percent of the power produced by the Glen Canyon, Flaming Gorge, Aspinall Unit Dams, and other features of the Colorado River Storage Project (CRSP).

As purchasers of the power generated at CRSP facilities, CREDA's members pay more than 95 percent of the costs of these multipurpose projects. Changes in the operation of these facilities to provide for the recovery of the endangered fish have resulted in significant costs to the power users.

CREDA members are willing participants in the recovery programs, which have been a model of Federal/non-Federal collaboration and participation. However, the most recent authorization (Public Law 106-392) to use CRSP power revenues to provide annual base funding for the RIP expired at the end of fiscal year 2011. There is currently no legislative authorization to use CRSP power revenues for other than those activities authorized by Public Law 106-392. However, stakeholders continue to seek legislation to extend the use of CRSP power revenues for base funding from fiscal year 2012-2019.

CREDA is extremely troubled by the administration's fiscal year 2013 Bureau of Reclamation (BOR) budget which says, "In the absence of legislation to extend this specific authority, BOR may rely on existing authority to continue the use of CRSP power revenues or use appropriated funds to ensure full base funding." It is inappropriate for the administration to continue use of power revenues without a specific authorization, and despite repeated inquiries CREDA has not been informed by BOR what "existing authority" is being referred to in the budget request language.

To maintain uninterrupted annual/base funding for the RIP, CREDA supports Federal appropriations in the amount of \$11,387,000 to fund not only the administration's request for capital projects, but an additional nonreimbursable \$3 million for base funding activities. CREDA requests that, in the absence of a specific authorization, the subcommittee expressly prohibit the use of CRSP power revenues for activities beyond those authorized by Public Law 106-392.

We request your support for an appropriation for fiscal year 2013 of \$8,387,000 to the BOR within the budget line item entitled "Endangered Species Recovery Implementation Program" for the Upper Colorado Region, consistent with the President's recommended budget. Substantial non-Federal cost-sharing funding is occurring pursuant to Public Law 106-392, as amended. This appropriation will allow continued funding in fiscal year 2013 for the Upper Colorado River Endangered Fish Recovery Program and the San Juan River Basin Recovery Implementation Program as authorized by Public Law 106-392. These two successful ongoing cooperative partnership programs involve the States of Colorado, New Mexico, Utah, and Wyoming; Indian tribes; Federal agencies; and water, power, and environmental interests.

The requested Federal appropriations are critically important to these efforts moving forward. The past support of your subcommittee has greatly facilitated the success of these multistate, multiagency programs. We thank you for the subcommittee's past support and request the subcommittee's assistance for fiscal year 2013 funding to ensure the BOR's continuing financial participation in these vitally important programs.

PREPARED STATEMENT OF COLORADO SPRINGS UTILITIES

Dear Chairwoman Feinstein and Senator Alexander: I request your support for an appropriation for fiscal year 2013 of \$8,387,000 to the Bureau of Reclamation within the budget line item entitled "Endangered Species Recovery Implementation Program" for the Upper Colorado Region, consistent with the President's recommended budget. Substantial non-Federal cost-sharing funding is occurring pursuant to Public Law 106-392, as amended. This appropriation will allow continued funding in fiscal year 2013 for the Upper Colorado River Endangered Fish Recovery Program and the San Juan River Basin Recovery Implementation Program as authorized by Public Law 106-392. These two successful ongoing cooperative partnership programs involve the States of Colorado, New Mexico, Utah, and Wyoming; Indian tribes; Federal agencies; and water, power, and environmental interests.

The requested Federal appropriations are critically important to these efforts moving forward. The past support of your subcommittee has greatly facilitated the success of these multistate, multiagency programs. I thank you for the subcommittee's past support and request the subcommittee's assistance for fiscal year 2013 funding to ensure the Bureau of Reclamation's continuing financial participation in these vitally important programs.

PREPARED STATEMENT OF THE COLORADO WATER CONGRESS

Dear Chairwoman Feinstein and Senator Alexander: I request your support for an appropriation for fiscal year 2013 of \$8,387,000 to the Bureau of Reclamation within the budget line item entitled "Endangered Species Recovery Implementation Program" for the Upper Colorado Region, consistent with the President's recommended budget. Substantial non-Federal cost-sharing funding is occurring pursuant to Public Law 106-392, as amended. This appropriation will allow continued funding in fiscal year 2013 for the Upper Colorado River Endangered Fish Recovery Program and the San Juan River Basin Recovery Implementation Program as authorized by Public Law 106-392. These two successful ongoing cooperative partnership programs involve the States of Colorado, New Mexico, Utah, and Wyoming; Indian tribes; Federal agencies; and water, power, and environmental interests.

The requested Federal appropriations are critically important to these efforts moving forward. The past support of your subcommittee has greatly facilitated the success of these multistate, multiagency programs. I thank you for the subcommittee's past support and request the subcommittee's assistance for fiscal year 2013 funding to ensure the Bureau of Reclamation's continuing financial participation in these vitally important programs.

PREPARED STATEMENT OF DENVER WATER

Dear Chairwoman Feinstein and Senator Alexander: On behalf of Denver Water, I request your support for an appropriation for fiscal year 2013 of \$8,387,000 to the Bureau of Reclamation within the budget line item entitled "Endangered Species Recovery Implementation Program" for the Upper Colorado Region, consistent with the President's recommended budget. Substantial non-Federal cost-sharing funding is occurring pursuant to Public Law 106-392, as amended. This appropriation will allow continued funding in fiscal year 2013 for the Upper Colorado River Endangered Fish Recovery Program and the San Juan River Basin Recovery Implementation Program as authorized by Public Law 106-392. These two successful ongoing cooperative partnership programs involve the States of Colorado, New Mexico, Utah, and Wyoming; Indian tribes; Federal agencies; and water, power, and environmental interests.

The requested Federal appropriations are critically important to these efforts moving forward. The past support of your subcommittee has greatly facilitated the success of these multistate, multiagency programs. I thank you for the subcommittee's past support and request the subcommittee's assistance for fiscal year 2013 funding to ensure the Bureau of Reclamation's continuing financial participation in these vitally important programs.

PREPARED STATEMENT OF GRAND VALLEY WATER USERS' ASSOCIATION

Dear Chairwoman Feinstein and Senator Alexander: I request your support for an appropriation for fiscal year 2013 of \$8,387,000 to the Bureau of Reclamation within the budget line item entitled "Endangered Species Recovery Implementation Program" for the Upper Colorado Region, consistent with the President's recommended budget. Substantial non-Federal cost-sharing funding is occurring pursuant to Public Law 106-392, as amended. This appropriation will allow continued funding in fiscal year 2013 for the Upper Colorado River Endangered Fish Recovery Program and the San Juan River Basin Recovery Implementation Program as authorized by Public Law 106-392. These two successful ongoing cooperative partnership programs involve the States of Colorado, New Mexico, Utah, and Wyoming; Indian tribes; Federal agencies; and water, power, and environmental interests.

The requested Federal appropriations are critically important to these efforts moving forward. The past support of your subcommittee has greatly facilitated the success of these multistate, multiagency programs. I thank you for the subcommittee's past support and request the subcommittee's assistance for fiscal year 2013 funding to ensure the Bureau of Reclamation's continuing financial participation in these vitally important programs.

PREPARED STATEMENT OF IRRIGATION AND ELECTRICAL DISTRICTS ASSOCIATION OF ARIZONA

The Irrigation and Electrical Districts Association of Arizona (IEDA) is pleased to present written testimony regarding the fiscal year 2013 proposed budgets for the Bureau of Reclamation (BOR) and the Western Area Power Administration (WAPA).

IEDA is an Arizona nonprofit association whose 25 members and associate members receive water from the Colorado River directly or through the facilities of the Central Arizona Project (CAP) and purchase hydropower from Federal facilities on the Colorado River either directly from WAPA or, in the case of the Boulder Canyon Project, from the Arizona Power Authority, the State agency that markets Arizona's share of power from Hoover Dam. IEDA was founded in 1962 and continues in its 50th year to represent water and power interests of Arizona political subdivisions and other public power providers and their consumers.

BUREAU OF RECLAMATION

IEDA has reviewed the BOR budget and found, not unexpectedly, that it does not address the enormous backlog of needs of the agency's aging infrastructure. We support the important projects and programs that are included in the proposed budget. We are especially mindful that the Yuma Desalting Plant is an essential element of the problem solving mechanisms being put in place for the Colorado River and especially the Lower Colorado River. Problem solving on the Lower Colorado River will be substantially improved by using the plant as a management element.

We also wish to call to the subcommittee's attention to several other issues of concern to us and Arizona water and power customers.

First, we are concerned that the Congress has not extended the Upper Colorado River Recovery Implementation Plan. That Plan focuses on recovering three endangered fish in the Colorado River and its tributaries above Lake Powell. It is a three-party agreement:

- Federal agencies with appropriations;
- monies from the four Upper Colorado River Basin States (Colorado, New Mexico, Utah, and Wyoming); and
- power revenues from our members and other Colorado River Storage Project customers.

Without the extension there are no Federal appropriation dollars to continue the program. This breaks the “deal” that we cut to keep the Endangered Species Act (ESA) from being used to attack our water and hydropower. No money, no plan. BOR appropriations should be provided but, if not, the subcommittee should recognize that the Plan is suspended and neither the power users nor the States have any obligation to continue it. BOR shouldn’t try to backdoor money for this use. The subcommittee should hold them accountable.

Second, we continue to be concerned about BOR’s spending on post-9/11 security costs. The Congress gave BOR specific directions on this subject several years ago. That included adjustments for declines in the Consumer Price Index and non-reimbursability of certain costs. However, the Congress did not instruct BOR with regard to how this program should be implemented. Like many reaction programs, this program experienced some overreaction. We believe a close review of the ongoing levels of staffing and other expenses is in order.

WESTERN AREA POWER ADMINISTRATION

IEDA has reviewed the proposed budget for the WAPA. We wish to call the subcommittee’s attention to the limited appropriation for construction funding proposed for fiscal year 2013. We believe this shortfall is irresponsible. WAPA has more than 17,000 miles of transmission line for which it is responsible. It has on the order of 14,000 megawatts of generation being considered for construction that would depend on that Federal network. The existing transmission facilities cannot handle all of these proposals. Moreover, the region is projected, by all utilities operating in the region, to be short of available generation in the 10-year planning window that utilities and Western use.

The appropriation proposed in this category cannot come even close to keeping existing transmission construction going. Repairs and replacements will have to be postponed and considerable hardships to local utilities that depend on the Federal network are bound to occur. In WAPA’s Desert Southwest Region, our region, work necessary just to maintain system reliability will have to be postponed.

The President’s budget, once again, assumes that unmet capital formation needs will be made up by WAPA’s customers. We would be the first to support additional customer financing of Federal facilities and expenses through the Contributed Funds Act authority under BOR law that is available to WAPA. However, programs utilizing non-Federal capital formation require years to develop. One such program that was proposed by the Arizona Power Authority in a partnership with Western died because it was enmeshed in bureaucratic red tape at the Department of Energy. There is no way that WAPA customers can develop contracts, have them reviewed, gain approval of these contracts from WAPA and their own governing bodies, find financing on Wall Street and have monies available for the next fiscal year. It is just impossible, especially in this economy. Moreover, scoring and “cut/go” rules are providing major disincentives for WAPA’s customers and others in this regard.

There also are impediments to using existing Federal laws in facilitating non-Federal financing of Federal facilities and repairs to Federal facilities and the Congress should examine them. Artificially designating customer funding for construction, in lieu of real solutions, is bad public policy and should not be countenanced. We urge the subcommittee to restore a reasonable amount of additional construction funding to WAPA so it can continue to do its job in keeping its transmission systems functioning and completing the tasks that it has in the pipeline that are critical to its customers throughout the West.

However, there is one subject about which we urge you not to provide funding. On March 16, 2012, Secretary of Energy Steven Chu announced that WAPA would be participating in a gigantic Energy Imbalance Market (EIM) in the Western United States. This is an untested, unanalyzed, unproven boondoggle being promoted to force utilities in the West to add layer upon layer of bureaucracy over their existing operations, when doing so elsewhere has only escalated electricity costs and hampered economic recovery. We urge you to expressly prohibit WAPA from funding

this attack on the West's economy and require peer-reviewed scientific and economic analysis before any money is spent to facilitate WAPA's participation in an EIM.

CONCLUSION

Thank you for the opportunity to submit this written testimony. If we can provide any additional information or be of any other service to the subcommittee, please do not hesitate to get in touch with us.

PREPARED STATEMENT OF THE JICARILLA APACHE NATION

Dear Chairwoman Feinstein and Senator Alexander: On behalf of the Jicarilla Apache Nation, I request your support for an appropriation for fiscal year 2013 of \$8,387,000 to the Bureau of Reclamation within the budget line item entitled "Endangered Species Recovery Implementation Program" for the Upper Colorado Region, consistent with the President's recommended budget. Substantial non-Federal cost-sharing funding is occurring pursuant to Public Law 106-392, as amended. This appropriation will allow continued funding in fiscal year 2013 for the Upper Colorado River Endangered Fish Recovery Program and the San Juan River Basin Recovery Implementation Program as authorized by Public Law 106-392. These two successful ongoing cooperative partnership programs involve the States of Colorado, New Mexico, Utah, and Wyoming; Indian tribes; Federal agencies; and water, power, and environmental interests.

Jicarilla has been an active participant in these programs since 1992 and the requested Federal appropriations are critically important to these efforts moving forward. The past support of your subcommittee has greatly facilitated the success of these multistate, multiagency programs. I thank you for the subcommittee's past support and request the subcommittee's assistance for fiscal year 2013 funding to ensure the Bureau of Reclamation's continuing financial participation in these vitally important programs.

PREPARED STATEMENT OF THE OGLALA SIOUX RURAL WATER SUPPLY SYSTEM; WEST RIVER/LYMAN JONES RURAL WATER SYSTEM; ROSEBUD RURAL WATER SYSTEM; AND THE LOWER BRULE RURAL WATER SYSTEM

FISCAL YEAR 2013 REQUEST

The Mni Wiconi Project beneficiaries respectfully request \$23.137 million in appropriations for construction and \$12.224 million for operation, maintenance, and replacement (OMR) activities for fiscal year 2012, a total request of \$35.361 million:

FISCAL YEAR 2013 TOTAL REQUEST

	Amount
Construction	\$23,137,000
OMR	12,224,000
Total	35,361,000

The construction request includes \$0.960 million for Bureau of Reclamation oversight, and the OMR request includes \$1.447 million for oversight.

CONSTRUCTION FUNDS

Construction funds would be utilized as follows:

Project area	Construction request fiscal year 2013
Oglala Sioux Rural Water Supply System:	
Core	(¹)
Distribution	\$13,838,000
West River/Lyman-Jones RWS	2,231,000
Rosebud RWS	7,068,000

Project area	Construction request fiscal year 2013
Total	23,137,000

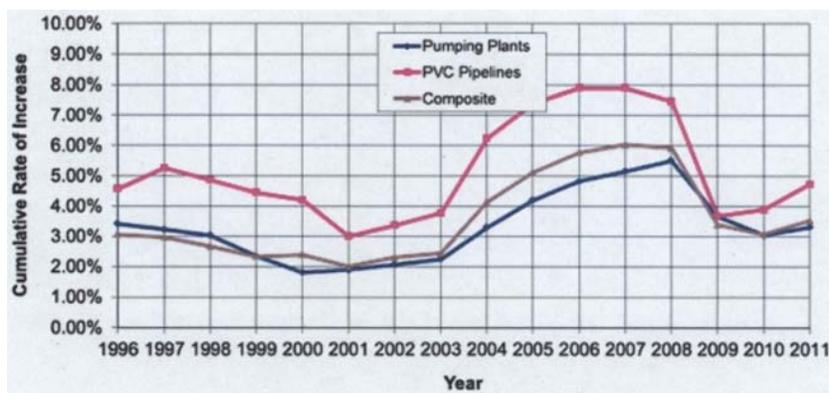
¹ Complete.

As shown in the table below, the project will be 95-percent complete at the end of fiscal year 2012. Construction funds remaining after fiscal year 2012 will total \$23.137 million within the current authorization (in October 2010 dollars). The funds will not be adequate to complete the project as originally planned.

Total Federal Construction Funding (October 2011 dollars)	\$471,300,000
Estimated Federal spent through fiscal year 2012	\$448,163,000
Percent spent through fiscal year 2012	95.09%
Amount remaining after 2012 (estimated 2013 dollars)	\$23,137,000
Completion fiscal year (Statutory Fiscal Year 2013; Public Law 110-161)	2013

Cost indexing over the last 5 years has averaged 4.72 percent for pipelines and last year was 7.83 percent. Pipelines are the principal components yet to be completed (see following chart).

RATE OF CONSTRUCTION COST INCREASE FOR ANNUAL AND 5-YEAR RUNNING AVERAGES SINCE 1992, BUREAU OF RECLAMATION



The extension of the project from 2008 to 2013 did not provide for budgeting of Reclamation oversight, administration and other “overhead” costs, which will total \$22.472 million by the end of 2013. These costs have been and will continue to be incurred at the expense of construction elements. The slow pace of budgeting and appropriations has caused the diminishment of construction elements to cover non-construction overhead costs.

The support of the administration to allocate adequate discretionary funds in fiscal year 2012 and budget adequately for fiscal year 2013 to enable the allocation of remaining authorized funds is recognized and greatly appreciated.

The request will create an estimated 210 full-time equivalent (FTE) construction jobs and 94 OMR jobs in an area of the nation with the lowest per capita income and deepest poverty.

Poverty is the harbinger of the severe healthcare crisis facing the Indian people in the Northern Great Plains. The present value of extra costs of healthcare during the lifetime of each 24,000 members of the Indian population in the Mni Wiconi Project is estimated at \$1.12 to \$2.25 billion (in 2010 dollars). The costs are based on extraordinarily high rates of mortality due to heart disease, cancer and diabetes. The Mni Wiconi Project has the direct effect of employing part of our unemployed and underemployed Indian population and creates the necessary infrastructure for more employment in indirect commercial and industrial development. This will reduce poverty, mortality, and the national cost burden of Indian healthcare.

OGLALA SIOUX RURAL WATER SUPPLY SYSTEM

Core System

The Oglala Sioux Tribe has completed the core system that serves all distribution systems of West River/Lyman-Jones, the Rosebud Sioux Tribe, the Lower Brule Sioux Tribe, and the Oglala Sioux Tribe.

Distribution System

The Pine Ridge Indian Reservation will continue to receive more water from the Oglala Sioux Rural Water Supply System (OSRWSS) core system in fiscal year 2012. Major segments of the main transmission system will be completed across the Reservation and connect many of the larger communities with safe and adequate drinking water. OSRWSS pipelines now deliver water from the Missouri River to the communities of Georgetown, Wanblee, Crazy Horse School, Lakota Fund Housing, and Potato Creek Community and the large number of rural homes between the communities. The communities of Hisle, Kyle, Manderson, Red Shirt, Porcupine, and Wounded Knee can be served with Missouri River water by the end of 2012.

Fiscal year 2013 will be another historic year, but considerable work remains to distribute the water supply throughout the Reservation. More than 40 percent of the project's population resides on the Pine Ridge Indian Reservation, and only 85 percent of the distribution system will be complete at the end of 2012. The Reservation public received its first Missouri River supply in 2009 after waiting 15 years for construction of core facilities to the Reservation.

Project funds in fiscal year 2013 will continue building the on-Reservation transmission system. Funding will be used for transmission and service line development east of Pine Ridge Village between Wakpamni, Batesland, and Allen and south toward the Nebraska State line. This area has been deferred in the past due to funding constraints. The supervisory control and data acquisition (SCADA) facilities will be installed with state-of-the-art electronic equipment.

As set forth above, activity on the Pine Ridge Indian Reservation in fiscal year 2013 continues to focus on constructing the transmission system that serves as the "backbone" of the Project on the Reservation from the White River in the northeast corner of the Reservation to Pine Ridge Village. The Tribe will continue focus on the disinfection requirements to blend Missouri River water and high-quality groundwater without creating harmful contaminants. State-of-the-art designs are being implemented for water quality control.

The Oglala Sioux Tribe is supportive of the funding request of other sponsors.

WEST RIVER/LYMAN-JONES RURAL WATER SYSTEM

West River/Lyman-Jones (WR/LJ) RWS projects for fiscal year 2013 include standby generation facilities, storage reservoirs, SCADA, and cold storage additions.

The upper Midwest and specifically the Mni Wiconi project area regularly experience power outages as the result of winter weather conditions. Regulatory authorities in South Dakota have recommended standby generation as the result of state-wide power outages experienced during the winters of 2005–2006 and 2009–2010. The Bureau of Reclamation has concurred in the addition of standby generation to the Mni Wiconi plan of work. WR/LJ has outlined a 3-year standby generation project schedule.

Water storage needs include an elevated tower in the Reliance service area, a ground storage reservoir in Mellette County, and supplemental storage in the Elbon service area.

SCADA capability provides accurate and efficient transmission of data and allows remote control of pumping and storage facilities. The WR/LJ SCADA system will be completed using the requested funding.

Storage facilities at the Murdo and Philip operations centers will complete the building components of the WR/LJ project.

Previous Federal appropriations to the Mni Wiconi project have made possible the delivery of much needed quality water to members of the West River/Lyman-Jones RWS and to the livestock industry in the project area. This would not have been possible without State and Federal assistance.

ROSEBUD SIOUX RURAL WATER SYSTEM

The Rosebud Sioux Tribe is faced with difficult decisions on how best to use the remaining authorized construction ceiling for the Rosebud Sioux Rural Water System or Sicangu Mni Wiconi. It has been more than 20 years since the tribe completed its Needs Assessment and engineering plan. There have been significant changes in the tribe's development plans and their water resources since 1993. The

use of the remaining \$7.068 million in construction funding strikes a balance between recent developments and original plan developed 20 years ago.

The majority of funds will go toward completion of the Sicangu Village Pipeline. This project extends the water system to the new housing area being developed in the southern portion of the Reservation near the Nebraska border. While potential demands for this area were included in the original plan a pipeline from the north was not envisioned because it was believed that the High Plains (also known as "Ogallala") aquifer was capable of providing a reliable source of high-quality water. Development of local wells has proven otherwise and the increased demands have required bringing surface water south to the area.

While lack of sufficient yield from the aquifer is the primary problem at Sicangu Village, the problem is exacerbated by high concentrations of nitrates at two schools north of the housing area. The tribe is attempting to leverage Mni Wiconi funding with Indian Health Service and Environmental Protection Agency funds to address the issue and provide water that meets primary safe drinking water standards for the schools.

The last major project in fiscal year 2013 will be the replacement of the treatment facility for the Rosebud well field. This facility was constructed prior to Mni Wiconi and is "showing its age". While the facility has been used since 1997 as a core component of the Sicangu Mni Wiconi and even treated water that was exported to the WR/LJ service area, the Bureau's current policy does not allow for replacement under the replacement, additions, and extraordinary (RAX) maintenance program. The project completion plan proposed by the project sponsors would allow RAX funding under the OMR portion of the appropriations to be used to upgrade existing system components such as this and allow construction funds to be used for completion of the distribution system.

The remainder of the authorized ceiling and fiscal year 2013 appropriations will be used for small additions to the distribution system and service lines and connections, all of which are constructed through the Tribe's force account program.

OPERATION, MAINTENANCE, AND REPLACEMENT

The sponsors will continue to work with Reclamation to ensure that their budgets are adequate to properly operate, maintain, and replace respective portions of the core and distribution systems. The sponsors will also continue to manage OMR expenses. The administration's budget for fiscal year 2013 is virtually the same as requested by the sponsors.

FISCAL YEAR 2013 OPERATION, MAINTENANCE, AND REPLACEMENT

Project area	Request
Oglala Sioux Rural Water Supply System:	
Core	\$3,440,000
Distribution	3,400,000
Lower Brule	1,560,000
Rosebud RWS	2,377,000
Reclamation	1,447,000
Total	12,224,000

The project has been treating and delivering more water each year from the OSRWSS Water Treatment Plant near Fort Pierre as construction has advanced in the Rosebud, WR/LJ, and Oglala service areas. Completion of significant core and distribution pipelines has resulted in more deliveries to more communities and rural users. The need for sufficient funds to properly operate and maintain the functioning system throughout the project has grown as the project has now reached 95-percent completion. The OMR budget must be adequate to keep pace with the system that is placed in operation.

With completion of construction imminent in fiscal year 2013, emphasis will shift to operation, maintenance, and replacement as the primary budgeting need. Adherence to a proper level of operation, maintenance, and replacement funding is manifest. Budgeting by the United States to ensure that aging features of the constructed project are protected is not only sensible but properly executes the responsibilities of the United States as trustee to the Indian people. While the budgeting by the administration was adequate this year, budgeting has not been adequate in several of the past years. The concern is that aging components of critical project facilities will not be properly repaired and replaced due to budget limitations.

The Lower Brule Rural Water System (LBRWS) is essentially complete with all major components such as the water treatment plant, booster stations, and tanks/reservoirs in full operation. As a result, LBRWS's operation and maintenance portion of the budget has reached a baseline amount to which only slight adjustments along with inflation should be made each year. The portion of the LBRWS OM&R budget that is somewhat variable is the RAX maintenance items. LBRWS will continue to work with the Bureau of Reclamation and the other sponsors to prioritize their needs and ensure that their system is operating to the standards that have been established over the past several years. With that in mind, the LBRWS request for OM&R for fiscal year 2013 is \$1,560,000.

The RSRWS expanded the areas served from surface water significantly in 2011 and 2012. In 2012 the connections to provide surface water to the town of Mission were completed. Early in fiscal year 2013 the pipeline and pumping station delivering surface water to Sicangu Village will be completed. The new pumping stations increase operational costs for energy, maintenance, and personnel. In addition, energy costs increases have significantly impacted Rosebud for electrical costs and vehicle expenses. With the oldest parts of the system in service for 15 years replacement costs covered under RAX are also becoming more significant. RAX funds must be included in the Mni Wiconi Project appropriations because they are not funded through the Bureau's RAX program.

OSRWSS will incur costs of replacement and sludge removal at the water treatment plant in fiscal year 2013. The Reclamation budget does not provide for routine replacements, which threatens the capital investment in the project. OSRWSS needs to replace 12 flocculation drives, 8 effluent valves, 2 pump variable frequency drive pumps, chemical feed pumps, and numerous other parts that Reclamation only includes in its RAX account for extraordinary, not routine maintenance. The replacement costs in our request are \$958,000, which will ensure that obsolete parts are traded out. The balance of the \$3.440 million request is for normal operation and maintenance. Further, OSRWSS staff will anticipate a salary adjustment to accommodate competitive wages for South Dakota.

The on-reservation OSRWSS OMR expenses will be substantially higher with higher pumping rates, unanticipated costs with pump houses repair and higher water consumption as new systems are built and communities are connected. On-reservation staff will anticipate a salary adjustment to accommodate competitive wages for South Dakota as their jobs have become more technical, which requires a higher base wage. On-reservation has not received RAX money since fiscal year 2009 so there is a back log of items that fall in RAX maintenance.

The Mni Wiconi Project tribal beneficiaries respectfully request appropriations for OMR in fiscal year 2013 in the amount of \$12.224 million, which is virtually the same as the President's budget.

PREPARED STATEMENT OF THE NATURE CONSERVANCY

Dear Chairwoman Feinstein and Senator Alexander: I request your support for an appropriation for fiscal year 2013 of \$8,387,000 to the U.S. Bureau of Reclamation (Reclamation) within the budget line item entitled "Endangered Species Recovery Implementation Program" for the Upper Colorado Region, consistent with the President's recommended budget. Substantial non-Federal cost-sharing funding is occurring pursuant to Public Law 106-392, as amended. This appropriation will allow continued funding in fiscal year 2013 for the Upper Colorado River Endangered Fish Recovery Program and the San Juan River Recovery Implementation Program as authorized by Public Law 106-392. These two successful ongoing cooperative partnership programs involve the States of Colorado, New Mexico, Utah, and Wyoming; Indian tribes; Federal agencies; and water, power, and environmental interests.

I thank you for the subcommittee's past support and request the subcommittee's assistance for fiscal year 2013 funding to ensure Reclamation's continuing financial participation in these vitally important programs.

PREPARED STATEMENT OF THE NORTHERN COLORADO WATER CONSERVANCY DISTRICT

Dear Chairwoman Feinstein and Senator Alexander: I request your support for an appropriation for fiscal year 2013 of \$8,387,000 to the Bureau of Reclamation within the budget line item entitled "Endangered Species Recovery Implementation Program" for the Upper Colorado Region, consistent with the President's recommended budget. Substantial non-Federal cost-share funding is occurring pursuant to Public Law 106-392 as amended. This appropriation will allow continued

funding in fiscal year 2013 for the Upper Colorado River Endangered Fish Recovery Program and the San Juan River Basin Recovery Implementation Program as authorized by Public Law 106–392. These two successful, ongoing, cooperative partnership programs involve the States of Colorado, New Mexico, Utah, and Wyoming; Indian tribes; Federal agencies; and water, power, and environmental interests.

The requested Federal appropriations are critically important to these efforts moving forward. The past support of your subcommittee has greatly facilitated the success of these multistate, multiagency programs. I thank you for the subcommittee's past support and request the subcommittee's assistance for fiscal year 2013 funding to ensure the Bureau of Reclamation's continuing financial participation in these vitally important programs.

PREPARED STATEMENT OF THE SAN JUAN WATER COMMISSION

Dear Chairwoman Feinstein and Senator Alexander: I request your support for an appropriation for fiscal year 2013 of \$8,387,000 to the Bureau of Reclamation within the budget line item entitled "Endangered Species Recovery Implementation Program" for the Upper Colorado Region, consistent with the President's recommended budget. Substantial non-Federal cost-sharing funding is occurring pursuant to Public Law 106–392, as amended. This appropriation will allow continued funding in fiscal year 2013 for the Upper Colorado River Endangered Fish Recovery Program and the San Juan River Basin Recovery Implementation Program as authorized by Public Law 106–392. These two successful ongoing cooperative partnership programs involve the States of Colorado, New Mexico, Utah, and Wyoming; Indian tribes; Federal agencies; and water, power, and environmental interests.

The requested Federal appropriations are critically important to these efforts moving forward. The past support of your subcommittee has greatly facilitated the success of these multistate, multiagency programs. I thank you for the subcommittee's past support and request the subcommittee's assistance for fiscal year 2013 funding to ensure the Bureau of Reclamation's continuing financial participation in these vitally important programs.

PREPARED STATEMENT OF THE SOUTHERN UTE INDIAN TRIBE

Dear Chairwoman Feinstein and Senator Alexander: On behalf of the Southern Ute Indian Tribe, I am writing to request your support for an appropriation for fiscal year 2013 of \$8,387,000 to the Bureau of Reclamation within the budget line item entitled "Endangered Species Recovery Implementation Program" for the Upper Colorado Region, consistent with the President's recommended budget. Substantial non-Federal cost-sharing funding is occurring pursuant to Public Law 106–392, as amended. This appropriation will allow continued funding in fiscal year 2013 for the Upper Colorado River Endangered Fish Recovery Program and the San Juan River Basin Recovery Implementation Program as authorized by Public Law 106–392. These two successful, ongoing, cooperative partnership programs involve the States of Colorado, New Mexico, Utah, and Wyoming; the Southern Ute Indian Tribe; the Ute Mountain Ute Indian Tribe; the Navajo Nation; the Jicarilla Apache Nation; Federal agencies; and water, power, and environmental interests.

The requested Federal appropriations are critically important to these efforts moving forward. The past support of your subcommittee has greatly facilitated the success of these multistate, multiagency programs. The Tribe thanks you for the subcommittee's past support and requests the subcommittee's assistance for fiscal year 2013 funding to ensure the Bureau of Reclamation's continuing financial participation in these vitally important programs.

PREPARED STATEMENT OF THE SOUTHWESTERN WATER CONSERVATION DISTRICT

Dear Chairwoman Feinstein and Senator Alexander: I request your support for an appropriation for fiscal year 2013 of \$8,387,000 to the Bureau of Reclamation within the budget line item entitled "Endangered Species Recovery Implementation Program" for the Upper Colorado Region, consistent with the President's recommended budget. Substantial non-Federal cost-sharing funding is occurring pursuant to Public Law 106–392, as amended. This appropriation will allow continued funding in fiscal year 2013 for the Upper Colorado River Endangered Fish Recovery Program and the San Juan River Basin Recovery Implementation Program as authorized by Public Law 106–392. These two successful ongoing cooperative partner-

ship programs involve the States of Colorado, New Mexico, Utah, and Wyoming; Indian tribes; Federal agencies; and water, power, and environmental interests.

The requested Federal appropriations are critically important to these efforts moving forward. The past support of your subcommittee has greatly facilitated the success of these multistate, multiagency programs. I thank you for the subcommittee's past support and request the subcommittee's assistance for fiscal year 2013 funding to ensure the Bureau of Reclamation's continuing financial participation in these vitally important programs.

PREPARED STATEMENT OF THE STATE OF UTAH

Dear Chairwoman Feinstein and Senator Alexander: On behalf of the State of Utah and Utah's Colorado River water users, I respectfully request your support for the appropriation to the Bureau of Reclamation for the Upper Colorado River Endangered Fish Recovery Program and the San Juan River Basin Recovery Implementation Program. These two programs are provided for in the budget line item entitled "Endangered Species Recovery Implementation Program".

The Upper Colorado and San Juan recovery programs are highly successful collaborative conservation partnerships working to recover the four species of endemic Colorado River fish on the Federal endangered species list; while at the same time water use and development have been able to continue in our growing western communities. These programs are unique efforts involving the States of New Mexico, Colorado, Utah, and Wyoming; Indian tribes; Federal agencies; and water, power, and environmental interests. They are achieving Endangered Species Act (ESA) compliance for water projects and fully complying the interstate river compacts and the participating States' water law.

Since 1998, the two programs, collectively, have provided ESA section 7 compliance (without litigation) for more than 2,100 Federal, tribal, State, and privately managed water projects depleting more than 3.7 million acre-feet of water per year. Substantial non-Federal cost-sharing funding exceeding 50 percent is embodied in both programs.

Each year in support of these two regionwide cooperative recovery programs, the State of Utah requests the subcommittee's assistance. It is absolutely essential that fiscal year 2013 funding be provided within the Bureau of Reclamation's budget appropriation to assure that agency's continued financial participation as directed by Public Law 106-392, as amended.

On behalf of the State of Utah, I thank you for the past support and assistance of your subcommittee; it has greatly facilitated the ongoing and continuing success of these multistate, multiagency programs vital to providing water for Utah.

PREPARED STATEMENT OF THE STATE OF WYOMING

Dear Chairwoman Feinstein and Senator Alexander: I am requesting your support for fiscal year 2013 appropriations to the Bureau of Reclamation for the Upper Colorado River Endangered Fish Recovery Program and the San Juan River Basin Recovery Implementation Program. These two programs are provided for in the budget line-item entitled "Endangered Species Recovery Implementation Program". The Upper Colorado and San Juan recovery programs are highly successful collaborative conservation partnerships working to recover the four species of endemic Colorado River fish such that they can each be removed from the Federal endangered species list. At the same time, these programs have provided the means for water use and development to continue in our growing western States.

These two programs are unique efforts involving the States of Colorado, New Mexico, Utah, and Wyoming; Indian tribes; Federal agencies; and water, power, and environmental interests. They continue to achieve Endangered Species Act (ESA) compliance for Federal and non-Federal water projects and are fully complying with interstate river compacts and the participating States' water law. Recognizing the need for fiscal responsibility, I must also point out that the participants would all be spending much more in ESA-related costs in the absence of these programs.

Since 1988, these programs, collectively, have provided ESA section 7 compliance (without litigation) for more than 2,300 Federal, tribal, State, and privately managed water projects that use more than 3.72 million acre-feet of water per year. Substantial non-Federal cost-sharing, which exceeds 50 percent, is embodied in both programs.

The State of Wyoming requests the subcommittee's assistance in support of these two regionwide cooperative recovery programs each year. It is essential that fiscal year 2013 funding be provided within the Bureau of Reclamation's budget appro-

priation to assure that the agency can continue to meet its financial participation requirements, which were set forth in Public Law 106–392, as amended.

On behalf of the State of Wyoming, I thank you for your consideration on my request. I also thank you for the past support and assistance of your subcommittee, which have greatly facilitated the ongoing and continuing success of these multistate, multiagency programs that are vital to the recovery of the endangered fish and providing necessary water supplies for the growing Intermountain West.

PREPARED STATEMENT OF THE TRI-COUNTY WATER CONSERVANCY DISTRICT

Dear Chairwoman Feinstein and Senator Alexander: The Tri-County Water Conservancy District Board requests your support for an appropriation for fiscal year 2013 of \$8,387,000 to the Bureau of Reclamation within the budget line item entitled “Endangered Species Recovery Implementation Program” for the Upper Colorado Region, consistent with the President’s recommended budget. Substantial non-Federal cost-sharing funding is occurring pursuant to Public Law 106–392, as amended. This appropriation will allow continued funding in fiscal year 2013 for the Upper Colorado River Endangered Fish Recovery Program and the San Juan River Basin Recovery Implementation Program as authorized by Public Law 106–392. These two successful ongoing cooperative partnership programs involve the States of Colorado, New Mexico, Utah, and Wyoming; Indian tribes; Federal agencies; and water, power, and environmental interests.

The requested Federal appropriations are critically important to these efforts moving forward. The past support of your subcommittee has greatly facilitated the success of these multistate, multiagency programs. We thank you for the subcommittee’s past support and request the subcommittee’s assistance for fiscal year 2013 funding to ensure the Bureau of Reclamation’s continuing financial participation in these vitally important programs.

PREPARED STATEMENT OF THE UPPER GUNNISON RIVER WATER CONSERVANCY DISTRICT

Dear Chairwoman Feinstein and Senator Alexander: I request your support for an appropriation for fiscal year 2013 of \$8,387,000 to the Bureau of Reclamation within the budget line item entitled “Endangered Species Recovery Implementation Program” for the Upper Colorado Region, consistent with the President’s recommended budget. Substantial non-Federal cost-sharing funding is occurring pursuant to Public Law 106–392, as amended. This appropriation will allow continued funding in fiscal year 2013 for the Upper Colorado River Endangered Fish Recovery Program and the San Juan River Basin Recovery Implementation Program as authorized by Public Law 106–392. These two successful ongoing cooperative partnership programs involve the States of Colorado, New Mexico, Utah, and Wyoming; Indian tribes; Federal agencies; and water, power, and environmental interests.

The requested Federal appropriations are critically important to these efforts moving forward. The past support of your subcommittee has greatly facilitated the success of these multistate, multiagency programs. I thank you for the subcommittee’s past support and request the subcommittee’s assistance for fiscal year 2013 funding to ensure the Bureau of Reclamation’s continuing financial participation in these vitally important programs.

PREPARED STATEMENT OF THE UTE MOUNTAIN UTE TRIBE

Dear Chairwoman Feinstein and Senator Alexander: I request your support for an appropriation for fiscal year 2013 of \$8,387,000 to the Bureau of Reclamation within the budget line item entitled “Endangered Species Recovery Implementation Program” for the Upper Colorado Region, consistent with the President’s recommended budget. Substantial non-Federal cost-sharing funding is occurring pursuant to Public Law 106–392, as amended. This appropriation will allow continued funding in fiscal year 2013 for the Upper Colorado River Endangered Fish Recovery Program and the San Juan River Basin Recovery Implementation Program as authorized by Public Law 106–392. These two successful ongoing cooperative partnership programs involve the States of Colorado, New Mexico, Utah, and Wyoming; Indian tribes; Federal agencies; and water, power, and environmental interests.

The requested Federal appropriations are critically important to these efforts moving forward. The past support of your subcommittee has greatly facilitated the success of these multistate, multiagency programs. I thank you for the subcommittee’s

tee's past support and request the subcommittee's assistance for fiscal year 2013 funding to ensure the Bureau of Reclamation's continuing financial participation in these vitally important programs.

PREPARED STATEMENT OF THE UTAH WATER USERS ASSOCIATION

Dear Chairwoman Feinstein and Senator Alexander: I request your support for an appropriation for fiscal year 2013 of \$8,387,000 to the Bureau of Reclamation within the budget line item entitled "Endangered Species Recovery Implementation Program" for the Upper Colorado Region, consistent with the President's recommended budget. Substantial non-Federal cost-sharing funding is occurring pursuant to Public Law 106-392, as amended. This appropriation will allow continued funding in fiscal year 2013 for the Upper Colorado River Endangered Fish Recovery Program and the San Juan River Basin Recovery Implementation Program as authorized by Public Law 106-392. These two successful ongoing cooperative partnership programs involve the States of Colorado, New Mexico, Utah, and Wyoming; Indian tribes; Federal agencies; and water, power, and environmental interests.

The requested Federal appropriations are critically important to these efforts moving forward. The past support of your subcommittee has greatly facilitated the success of these multistate, multiagency programs. I thank you for the subcommittee's past support and request the subcommittee's assistance for fiscal year 2013 funding to ensure the Bureau of Reclamation's continuing financial participation in these vitally important programs.

PREPARED STATEMENT OF THE WYOMING STATE ENGINEER'S OFFICE

Dear Chairwoman Feinstein and Ranking Member Alexander: This letter is sent in support of fiscal year 2013 funding for the Bureau of Reclamation's (BOR) Colorado River Basin Salinity Control Project—Title II Program. A total of \$14,500,000 is requested for BOR's fiscal year 2011 activities to implement BOR's Basinwide authorized Colorado River Basin salinity control program. Failure to appropriate these funds will directly result in significant economic damages being accrued by United States and Mexican water users.

The State of Wyoming also supports funding for Salinity Control Program general investigations as requested within BOR's Colorado River Water Quality Improvement Program (CRWQIP) budget line-item. It is important that BOR has properly-funded planning and administration staff in place, so that the program's progress can be monitored, necessary coordination among Federal and State agencies can be accomplished, and future projects and opportunities to control salinity can be properly planned. Maintaining the Colorado River water quality standards for salinity is essential to allow users in the seven Colorado River Basin States to continue to develop Compact-apportioned waters.

In addition to the funding identified above for the implementation of BOR's program, the State of Wyoming urges the Congress to appropriate funds, as requested by the administration, to maintain and operate completed salinity control facilities, including the Paradox Valley Unit. At facilities located within the Paradox Valley of Colorado subsurface saline brines are collected below the Delores River and are injected into a deep aquifer through an injection well. The continued operation of this project, and the Grand Valley Unit, are funded primarily through the Facility Operations activity.

The Colorado River provides municipal and industrial water for nearly 33 million people and irrigation water to approximately 4 million acres of land in the United States. The River is also the water source for some 3 million people and 500,000 acres in Mexico. The high concentration of total dissolved solids (e.g., the water's salinity concentration) in the water limits users' abilities to make the greatest use of this water supply. This remains a major issue and continuing concern in both the United States and Mexico. The water's salinity concentration especially affects agricultural, municipal, and industrial water users. BOR presently estimates direct and computable salinity-related damages in the United States amount to more than \$300 million per year.

The Environmental Protection Agency's (EPA) interpretation of the 1972 amendments to the Clean Water Act required the seven Basin States to adopt water quality standards for salinity levels in the Colorado River. In light of the EPA's regulation to require water quality standards for salinity in the Basin, the Governors of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming created the Colorado River Basin Salinity Control Forum as an interstate coordination mechanism in 1973. To address these international and regionally important salinity prob-

lems, the Congress enacted the Colorado River Basin Salinity Control Act of 1974. Title I addressed the United States obligations to Mexico to control the River's salinity to ensure the United States water deliveries to Mexico are within the specified salinity concentration range. Title II of the act authorized control measures upstream of Imperial Dam and directed the Secretary of the Interior to construct several salinity control projects, most of which are located in Colorado, Utah, and Wyoming.

Title II of the act was again amended in 1995 and 2000 to direct BOR to conduct a basinwide salinity control program. This program awards grants to non-Federal entities, on a competitive-bid basis, which initiate and carry out salinity control projects. The basinwide program has demonstrated significantly improved cost-effectiveness, as computed on \$1 per ton of salt basis, as compared to the prior BOR-initiated projects. The Forum was heavily involved in the development of the 1974 Act and its subsequent amendments, and continues to actively oversee the Federal agencies' salinity control program efforts.

During the past 38 years, the seven-State Colorado River Basin Salinity Control Forum has actively assisted the Federal agencies, including BOR, in implementing this unique and important program. At its October 2012 meeting, the Forum recommended that BOR seek to have appropriated and should expend \$14,500,000 through its Basinwide Program for Colorado River Basin salinity control in fiscal year 2013. We strongly believe the combined efforts of the salinity control efforts of BOR, Department of Agriculture, and the Bureau of Land Management constitute one of the most successful Federal/State cooperative non-point source pollution control programs in the United States.

The State of Wyoming greatly appreciates the subcommittee's support of the Colorado River Salinity Control Program in past years. We strongly believe this important basinwide water quality improvement program merits continued funding and support by your subcommittee. Thank you in advance for inclusion of this letter in the formal hearing record concerning fiscal year 2013 appropriations.

DEPARTMENT OF ENERGY

PREPARED STATEMENT OF THE AMERICAN COUNCIL FOR AN ENERGY-EFFICIENT ECONOMY

Dear Chairwoman Feinstein and Ranking Member Alexander: We write today to encourage the subcommittee to continue funding for the Department of Energy's (DOE) Combined Heat and Power (CHP) activities within the Advanced Manufacturing Office of the Energy Efficiency and Renewable Energy Office. CHP has been funded at the \$25 million level for several years, and we encourage that level of funding to continue in fiscal year 2013 for development and deployment activities. This is the only CHP funding in the entire Federal Government.

CHP—sometimes called cogeneration—is an integrated application of technologies for the simultaneous, on-site production of electricity and heat. It represents a cost-effective, near-term opportunity to improve our Nation's energy, environmental, and economic future. Currently, two-thirds of U.S. power generation fuel energy is simply thrown away as waste heat. CHP can be deployed in all 50 States, is fuel flexible, comes in many sizes, and for many applications; therefore, some CHP technologies are ready-for-market transformation activities while others are still in the development stages. In total, according to an Oak Ridge National Laboratory Report, these technologies can save 5.3 gigawatts of energy by the year 2030, the equivalent of one-half of all residential energy use in the United States today.

Secretary Chu described DOE as "bullish on CHP" in his February 16 testimony to the Senate Energy and Natural Resources Committee. He talked about his recent visit to the new CHP system at the Texas Medical Center in Houston, which, like many medical centers, universities, and cities is served by a district energy system. With DOE's support, a highly efficient CHP system producing steam and chilled water was recently installed at the medical center that saved customers more than \$9 million in the first year. In the fiscal year 2013 budget request, DOE has significantly changed both the focus and the presentation of their budget. What was "Industrial Technologies Program" has now become "Advanced Manufacturing Office" and the structure provides maximum flexibility for funding. The budget justifications, therefore, contain no mention of continued work on CHP. We believe this is an oversight and urge continued funding for this important program to address development, demonstration, and market transformation activities in CHP. Given the efficiency, environmental and grid reliability benefits of CHP and district energy, it is important that DOE programs specifically address development, deployment, and market barriers related to these systems.

Thank you for your attention to this request.

National Organizations

Alliance for Industrial Efficiency
American Council for an Energy-Efficient Economy
American Gas Association
Energy Solutions Center
International District Energy Association
Mechanical Contractors Association of America (MCAA)
Sheet Metal and Air Conditioning Contractor's National Association (SMACNA)
U.S. Clean Heat and Power Association

Alaska

University of Alaska, Fairbanks

Arizona

Affiliated Engineers, Inc.
NRG Energy Center Phoenix
NRG Energy Center Tucson

California

Affiliated Engineers, Inc.
Capstone Turbine Corporation

Chem-Aqua, Inc.

Goss Engineering, Inc.

Leva Energy

NRG Energy Center San Diego

NRG Energy Center San Francisco

Solar Turbines Incorporated

Syska Hennessy Group, Inc.

University of California, San Francisco

Vanderweil Engineers

Veolia Energy

Colorado
Colorado State University

Connecticut
COWI North America Energy
Fibrelite
The Hartford Steam Company

Delaware
ICETEC Energy Services
NRG Energy Center Dover

Florida
Affiliated Engineers, Inc.
Chem-Aqua, Inc.
ONICON Incorporated
Syska Hennessy Group, Inc.
TMEnergyLLC

Georgia
Chem-Aqua, Inc.
RMF Engineering, Inc.
Syska Hennessy Group, Inc.

Iowa
Statistics & Control, Inc.

Illinois
Affiliated Engineers, Inc.
Caterpillar
Eastern Illinois University
Energy Resources Center, University of
Illinois at Chicago IL
Energy Solutions Center
Gas Technology Institute
Recycled Energy Development
Stoneham Consulting
Syska Hennessy Group, Inc.

Indiana
Applied Engineering Services
Chem-Aqua, Inc.
Citizens Energy Group

Massachusetts
Syska Hennessy Group, Inc.
UMass Medical School
Vanderweil Engineers
Veolia Energy

Maryland
Affiliated Engineers, Inc.
CPF Underground Utilities, Inc.
Evapco, Inc.
Piping & Corrosion Specialties, Inc.
RMF Engineering, Inc.
Veolia Energy

Michigan
Detroit Thermal
Veolia Energy

Minnesota
Cummins Power Generation
District Energy St. Paul
Ever-Green Energy
FVB Energy, Inc.
Kattner Associates LLC
NRG Energy Center Minneapolis
Uponor

Missouri

Burns & McDonnell Engineering
Company, Inc.
Veolia Energy

North Carolina
Affiliated Engineers, Inc.
RMF Engineering, Inc.
SPX Flow Technology Systems
Syska Hennessy Group, Inc.

Nebraska
Energy Systems Company

New Hampshire
TVC Systems
Waldron Engineering & Construction,
Inc.

New Jersey
Blue Sky Power
Chem-Aqua, Inc.
Concord Engineering
DCO Energy LLC
Energenic-US LLC
Integrated CHP Systems
Joseph Technology Corporation
Kessler Ellis Products
NRG Energy Center Princeton
Syska Hennessy Group, Inc.
Thermo Systems LLC
Veolia Energy

Nevada
Chem-Aqua, Inc.
Southwest Gas Corporation
Vanderweil Engineers

New York
Alstom Energy Group
Cool Systems
GI Endurant LLC
Hudson Technologies
Tricon Piping Systems, Inc.
Vanderweil Engineers
Veolia Energy
Waldron Engineering of NY, P.C.

Ohio
Bahnfleth Group Advisors, LLC
The Medical Center Company
Youngstown Thermal

Oklahoma
Oklahoma Natural Gas Company
Veolia Energy

Oregon
Veolia Energy

Pennsylvania
Center for Building Performance &
Diagnostics, Carnegie Mellon
University
Elliott Group
NRG Energy Center Harrisburg
NRG Energy Center Pittsburgh
Philadelphia Gas Works
The Pennsylvania State University
Vanderweil Engineers
Veolia Energy

South Carolina
RMF Engineering, Inc.

Texas

Affiliated Engineers, Inc.
 Chem-Aqua, Inc.
 Siemens Energy, Inc.
 Syska Hennessy Group, Inc.
 Thermal Energy Corporation

Utah

Aquatherm, Inc

Virginia

APPA: Leadership in Educational
 Facilities
 Resource Dynamics Corporation
 Syska Hennessy Group, Inc.
 Vanderweil Engineers

Washington

Affiliated Engineers, Inc.
 Cascade Power Group
 Infinia Corporation
 VA:W

Washington, DC

Environmental and Energy Study
 Institute
 Syska Hennessy Group, Inc.

Wisconsin

Affiliated Engineers, Inc.
 Syska Hennessy Group, Inc.

 PREPARED STATEMENT OF THE AMERICAN GEOSCIENCES INSTITUTE

To the Chairwoman and members of the subcommittee: Thank you for this opportunity to provide the American Geosciences Institute's (AGI) perspective on fiscal year 2013 appropriations for geoscience programs within the subcommittee's jurisdiction. The President's budget request for the Department of Energy (DOE) research programs provides important and modest investments in research and development (R&D) that will help sustain energy resources for economic growth of resilient communities. AGI strongly supports the wise investments in the Office of Science (\$5 billion) and Energy Efficiency and Renewable Energy (\$2.3 billion). AGI requests at least \$5 million in additional funding for the Science Graduate Fellowship Program within the Office of Science's Workforce Development for Teachers and Scientists (\$14.5 million fiscal year 2013 request) which are zeroed out in the President's proposal.

AGI is concerned about the limited investments in oil and natural gas R&D within the Office of Fossil Energy. Oil and natural gas supply 62 percent of our Nation's energy (2010 consumption from Energy Information Administration) and will continue to play a major role in the future. These investments will drive innovation to support and improve safe and effective domestic development of cleaner fossil fuels. The bulk of DOE's oil and gas R&D investments go to institutions of higher education for training and research. The United States has a substantial workforce and significant investments in oil and natural gas research, development, exploration, and production. Steady, but modest Federal investments in fossil energy R&D with a longer-term strategic plan would benefit the academic, private, and public sectors.

The Office of Fossil Energy suffers from an unbalanced portfolio that focuses primarily on coal, faces uncertainty about direction and investments, and receives inconsistent funding. We ask for the subcommittee's support for oil and gas, unconventional natural gas, methane hydrates, and carbon sequestration R&D so the Nation can develop a diverse portfolio of energy resources while enhancing carbon mitigation strategies to secure clean, affordable, and secure energy supplies for now and the future.

AGI is a nonprofit federation of 50 geoscientific and professional societies representing more than 250,000 geologists, geophysicists, and other Earth scientists. Founded in 1948, AGI provides information services to geoscientists, serves as a voice for shared interests in our profession, plays a major role in strengthening geoscience education, and strives to increase public awareness of the vital role the geosciences play in society's use of resources, resilience to hazards, and the health of the environment.

DEPARTMENT OF ENERGY'S OFFICE OF SCIENCE

The DOE Office of Science is the single largest supporter of basic research in the physical sciences in the United States, providing more than 40 percent of total funding for this vital area of national importance. The Office of Science manages fundamental research programs in basic energy sciences, biological and environmental sciences, and computational science and, under the budget request, would receive \$5 billion in fiscal year 2013. AGI asks that you support this funding level.

The President's request would provide \$14.5 million for Workforce Development for Teachers and Scientists, a program to ensure that DOE and the Nation have a sustained pipeline of highly skilled and diverse science, technology, engineering,

and mathematics (STEM) workers. AGI strongly supports investments in geoscience education, training and workforce development within DOE and other Federal agencies. We are concerned that the request is \$5 million less than fiscal year 2012 enacted and that DOE proposes no funding for the Science Graduate Fellowship program. We would encourage support for graduate student fellowships through DOE to allow students to complete advanced training and to ensure a skilled workforce in energy-related sciences.

DEPARTMENT OF ENERGY'S ENERGY EFFICIENCY AND RENEWABLE ENERGY

Within Energy Efficiency and Renewable Energy, the President's fiscal year 2013 budget request would increase investments for R&D for many renewable energy resources. AGI applauds the \$65 million requested for geothermal R&D and greatly appreciates previous support from the Congress for this key alternative energy resource. The geothermal research program within the Renewable Energy account, which funds Earth-science research in materials, geofluids, geochemistry, geophysics, rock properties, reservoir modeling, and seismic mapping, will provide the Nation with the best research to build a successful and competitive geothermal industry. AGI supports the Energy Innovation Hub focused on critical materials and hope this hub will consider ways to improve exploration, extraction and processing of necessary raw materials as well as replacement materials.

DEPARTMENT OF ENERGY'S FOSSIL ENERGY RESEARCH AND DEVELOPMENT

AGI urges the subcommittee to provide more balanced support for the Fossil Energy R&D portfolio in the fiscal year 2013 Energy and Water Development appropriations bill. Many Members of Congress have strongly emphasized the need for a responsible, diversified, and comprehensive energy policy for the Nation. The growing global competition for fossil fuels has led to a repeated and concerted request by the Congress to ensure the Nation's energy security. The President's proposal, which provides no funding for oil R&D or for unconventional fossil energy, is short sighted and inconsistent with congressional and public concerns. No funding for oil and unconventional fossil energy R&D will hinder our ability to achieve energy stability and security.

The research dollars invested in petroleum R&D go primarily to universities, State geological surveys, and research consortia to address critical issues like enhanced recovery from known fields and unconventional sources that are the future of our natural gas supply. This money does not go into corporate coffers, but it helps American businesses remain competitive by giving them a technological edge over foreign companies. All major advances in oil and gas production can be tied to research and technology. AGI strongly encourages the subcommittee to ensure a balanced and diversified energy research portfolio that does not ignore the Nation's primary sources of energy for the near future, fossil fuels.

Thank you for the opportunity to present this testimony to the subcommittee.

PREPARED STATEMENT OF THE AMERICAN PUBLIC POWER ASSOCIATION

The American Public Power Association (APPA) respectfully requests funding for the Renewable Energy Production Incentive, Power Marketing Administrations, storage for high-level nuclear waste, the Nuclear Loan Guarantee Program, the Department of Energy Water Power Program, energy conservation, weatherization, clean coal, fuel cells, fuel and powering systems, the Navajo Electrification and Demonstration Program, and the Federal Energy Regulatory Commission.

APPA is the national service organization representing the interests of more than 2,000 municipal and other State and locally owned electric utilities in 49 States (all but Hawaii). Collectively, public power utilities deliver electricity to 1 of every 7 electric consumers (approximately 46 million people), serving some of the Nation's largest cities. However, the vast majority of APPA's members serve communities with populations of 10,000 people or less.

We understand that the Congress is operating in a tight fiscal environment. APPA's priority is to support programmatic requests that bring down costs, conserve resources, or benefit our public power customers in other ways. We appreciate the opportunity to submit this statement outlining our fiscal year 2013 funding priorities within the jurisdiction of the Energy and Water Development, and Related Agencies subcommittee.

Renewable Energy Production Incentive.—APPA is disappointed that the administration and the Congress have decided to stop funding the Renewable Energy Production Incentive (REPI). REPI was the first attempt by the Congress to provide

comparable renewable incentives to the nonprofit electric utility industry, and we continue to seek comparability to this day. The elimination of funding for the REPI program was a step backward in this process. Defunding not only decreases incentives for new production, but utilities who had been receiving the funding are stranded mid-program. Five million dollars would restore funding to the program for fiscal year 2013, but any funding would help restore payments to those already approved for the incentive.

POWER MARKETING ADMINISTRATIONS

Power Marketing Administration Proposals.—The President's National Commission on Fiscal Responsibility and Reform proposed a measure for all four Power Marketing Administrations (PMAs) that would have had the effect of raising the rates for PMA customers. We appreciate that the fiscal year 2013 request did not include this type of proposal.

Purchase Power and Wheeling.—We urge the subcommittee to authorize appropriate levels for use of receipts so that the Western Area Power Administration (WAPA), the Southeastern Power Administration (SEPA), and the Southwestern Power Administration (SWPA) can continue to purchase and wheel electric power to their municipal and rural electric cooperative customers. Although appropriations are no longer needed to initiate the purchase power and wheeling (PP&W) process, the subcommittee continues to establish ceilings on the use of receipts for this important function. The PP&W arrangement is effective, has no impact on the Federal budget, and is supported by the PMA customers who pay the costs. We support an increase over the funding levels of the administration's budget for fiscal year 2013, which are as follows:

- \$243 million for Western Area Power Administration (WAPA);
- \$88 million for Southeastern Power Administration (SEPA); and
- \$41 million for Southwestern Power Administration (SWPA).

Construction.—We urge the subcommittee to authorize appropriate levels of funding for the construction budgets of WAPA, SEPA, and SWPA. These budgets have continued to decrease over the years; however, this funding remains critical to the operation and maintenance of the PMAs.

Storage for High-Level Nuclear Waste.—APPA is disappointed that the administration has provided little funding for nuclear waste disposal or storage in the budget request. We support the work and the findings of the Blue Ribbon Commission on America's Nuclear Future and hope that the administration and the Congress start working to implement the recommendations.

Nuclear Loan Guarantees.—APPA is disappointed with the administration's cancellation of the Nuclear Loan Guarantee program and requests that the Committee restore funding to this important program.

Department of Energy Waterpower Program.—APPA was extremely disappointed that funding for water power was decreased to \$20 million (from \$59 million in fiscal year 2012) while most other renewable resources were increased in the administration's fiscal year 2013 request. APPA believes there should be parity among renewable resource funding. APPA requests \$100 million for fiscal year 2013 for the DOE's Water Power Program. At a time when utilities around our country must focus on finding carbon-free sources of energy because of pending State and Environmental Protection Agency regulations, the importance of hydropower research and development is more important than ever before. Not only is hydropower a renewable resource, but it can be used as baseload generation to back up more intermittent renewables such as wind and solar power.

Energy Conservation.—APPA appreciates the funding increases for energy efficiency programs provided in the President's budget. The budget funding levels for fiscal year 2013 are as follows:

- Building technologies: \$310 million;
- Advanced manufacturing: \$290 million;
- Federal Energy Management Program: \$32 million; and
- Vehicle technologies: \$420 million.

We urge the subcommittee to maintain these funding levels. While these requests are all lower than the President's fiscal year 2012 requests, they still represent increases over current funding levels.

Weatherization and Intergovernmental Activities.—We are pleased that the administration has requested \$139 million for the Weatherization program in fiscal year 2013, a significant increase from fiscal year 2012, and we encourage the subcommittee to maintain that level of funding.

Clean Coal Power Initiative and FutureGen.—APPA is disappointed that the budget did not include funding for large scale commercial applications of carbon cap-

ture and sequestration technology. We encourage the subcommittee to include funding for Clean Coal Power Initiative (CCPI) and FutureGen. APPA strongly believes that, as the need for clean energy increases, the FutureGen project, or something similar, will be critical in nearing us to the goal of the world's first near-zero-emissions coal fired plant. We urge the subcommittee and the Congress to work with the administration on finding an appropriate role and funding level for the FutureGen project and CCPI.

Fuel Cells.—APPA was disappointed that the administration requested zero funding for fuel cell related research and development. We urge the subcommittee to allocate additional funding for this program for fiscal year 2013.

Fuels and Power Systems.—We recommend these funding levels for the following programs:

- Innovations for existing plants: \$84 million;
- Advanced integrated gasification combined cycle: \$80 million;
- Turbines: \$45 million;
- Carbon sequestration: \$150 million;
- Fuels: \$25 million; and
- Advanced research: \$48 million.

Navajo Electrification Demonstration Program.—APPA supports full funding for the Navajo Electrification Demonstration Program at its full authorized funding level of \$15 million. The purpose of the program is to provide electric power to the estimated 18,000 occupied structures in the Navajo Nation that lack electric power. This program has been consistently underfunded.

Federal Energy Regulatory Commission (FERC).—The fiscal year 2013 budget requests \$305 million for FERC, the same level as current funding. APPA supports this funding level.

PREPARED STATEMENT OF THE AMERICAN SOCIETY FOR MICROBIOLOGY

The American Society for Microbiology (ASM) is pleased to submit the following statement on the fiscal year 2013 appropriation for science programs at the Department of Energy (DOE). ASM is the largest single life science organization in the world with more than 38,000 members.

The administration's fiscal year 2013 budget request of \$5 billion for DOE's Office of Science (SC) is a minimal 2.4-percent increase more than the fiscal year 2012 enacted level. We urge the Congress to approve increased resources for the research and development (R&D) managed by the SC, one of three Federal agencies identified as crucial to the future of our Nation's global competitiveness in science and technology. The SC sponsors research by multidisciplinary teams from various government institutions, academia, and the private sector. It leads the Nation in energy and environmental research and is the largest Federal sponsor of basic research in the physical sciences. DOE SC contributes to sectors of the U.S. economy, such as biotechnology, alternative energy, and environmental sciences. DOE-funded researchers and programs discover innovative technologies, methods, and commercial products that serve national priorities like climate change, environment cleanup, and renewable energy.

DOE research initiatives are producing results not possible in other research settings. Two examples are the 46 Energy Frontier Research Centers established by the SC in 2009 at universities, national laboratories, and other U.S. institutions to advance basic energy related research and the three Bioenergy Research Centers created in 2007 to focus on next-generation biofuels. DOE facilities also provide non-DOE researchers with invaluable tools that might otherwise be inaccessible like the advanced xray beam sources currently being used by industry to study the enzyme RNA polymerase II, a project based on Nobel prize winning DOE research with potential for stopping RNA viruses causing polio, hepatitis, and other infectious diseases.

SC oversees high-impact projects divided among R&D programs focused on advancing physics, computing, biology, chemistry, environmental sciences and other disciplines. It manages 10 DOE national laboratories and promotes education programs to encourage future scientists and engineers. Extramural SC funding supports about 25,000 researchers at nearly 300 U.S. universities and colleges. In fiscal year 2013, an estimated 26,500 researchers from industry, national laboratories, universities, and other nations are expected to use SC lab facilities, accessing one-of-a-kind instruments for their own research.

In addition, DOE technology transfer efforts yield exemplary successes of commercial products arising from federally funded inventions. DOE announced in February that eight of its national laboratories will participate in a pilot program expediting

the transfer of DOE intellectual property rights to private companies. The newly designed Agreements for Commercializing Technology will make it easier for companies to partner with the laboratories and are expected to help U.S. businesses create new products and jobs in the science and technology sector.

DEPARTMENT OF ENERGY FUNDING STIMULATES NOVEL APPROACHES TO BIOLOGY
BASED RESEARCH

The Biological and Environmental Research (BER) program within the SC is a source of groundbreaking research in genomics, climate change, greenhouse gas emissions, biofuels, contaminants in the environment and the interfaces between physical and biological sciences. Under the current DOE Strategic Plan, BER is tasked with delivering new renewable energy technologies, utilizing basic biological research to create efficient biofuels processes. BER also is expected to add significantly to our understanding of the role of microbes in geochemical cycling of carbon, nitrogen, sulfur and metals, processes that are critical to understanding climate and environmental processes.

The BER program receives about \$625 million in the fiscal year 2013 request, a small 2.6-percent increase over fiscal year 2012. We urge the Congress to approve the administration's DOE budget that includes the resources for essential BER research. The budget increase is marked for developing synthetic biology tools and technologies, analyzing experimental data sets, and conducting climate studies in the Arctic. In fiscal year 2013, 65 percent of the BER budget will support research projects, while the remaining 35 percent will fund scientific user facilities that include the Atmospheric Radiation Measurement (ARM) Climate Research Facility, the William R. Wiley Environmental Molecular Sciences Laboratory (EMSL), and the Joint Genome Institute (JGI).

The fiscal year 2013 budget would support the diverse R&D portfolios of BER's two divisions: the Biological Systems Science Division and the Climate and Environmental Sciences Division, allocated about \$310 million and \$316 million, respectively. In fiscal year 2013, resources will be increased for research on climate change in arctic and tropical regions, as well as for a shift in emphasis from global climate modeling to smaller, regional models. The funding on systems sciences will increase investments in the development of synthetic biology tools, computational analyses of genomic datasets and biodesign technologies.

BER contributions include the Human Genome Project initiated in the 1980s and some of the Nation's earliest climate change models. BER has significantly shaped our understanding of technical fields like genomics and natural phenomena like microbial communities and their interactions with the environment. BER-funded projects also have elucidated the biogeochemical processes at work under the Earth's surface that are critical to advances in both energy and environmental research.

DEPARTMENT OF ENERGY FUNDING ADVANCES RESEARCH IN GENOME SCIENCES,
BIOFUELS, AND BIOTECHNOLOGY

The BER programs biological systems sciences have a diverse R&D portfolio, focused on applying advances in systems biology research in support of DOE strategies in energy, climate, and the environment. BER supports the DOE Bioenergy Research Centers, which clearly are succeeding as innovation incubators for genetics based R&D and alternative energy development. The overarching goal of these research programs is a complete scientific portrait from the molecular to the community level of plants and microbes with potential to solve societal challenges like clean energy and pollutant decontamination. Another optimal outcome would be sufficiently detailed knowledge to develop predictive, computational models of these living systems necessary to enable synthetic biology approaches for biofuels production and understand roles of microbes in environmental and climate processes.

Funding for BER research effectively combines interdisciplinary science with powerful new tools like bioinformatics and imaging technologies developed through past DOE appropriations. Microorganisms are frequently integral components in BER-funded projects that have implications for preserving healthy environments. One example is the DOE Joint Genome Institute project that recently identified previously unknown methane producing microbes in permafrost soils, which could become a major problem through their release of greenhouse gases as climate change thaws the Earth's arctic regions. Arctic permafrost, where these microbes are abundant, sequesters an estimated 1.6 trillion metric tons of carbon. BER-supported systems biology knowledgebase, which is community driven cyberinfrastructure for sharing and integrating data and analytical tools to accelerate predictive biology.

Ongoing DOE research is aggressively seeking new biomass sources for biofuel production, to reduce demand on corn and other food plants considered too valuable for non-food purposes.

In 2011, microbiology related results reported by DOE investigators included the following examples supported by BER genome science programs:

- BER-funded researchers sequenced many fungal genomes, which contain enzymes that break down cellulose and lignin, the two most abundant biopolymers on Earth, in order to harness these capabilities for industrial applications such as biofuels production. Another application is biopulping for the paper industry, which requires that the lignin be degraded while leaving the cellulose untouched. Forest products such as pulp and paper account for 5 percent of the Nation's gross domestic product.
- BER supported researchers have developed technologies that could be used to rewrite the genetic code of a living cell. Such technology could enable scientists to design cells that build proteins not found in nature, or engineer bacteria that are useful for bioenergy and environmental cleanups.
- Researchers completed an advanced metabolic model of the alga *Chlamydomonas reinhardtii* that should expedite development of algae as a viable source of renewable bioenergy.
- Genetically engineered *E. coli* have been manipulated to improve the bacteria's synthesis of terpene, a precursor of several biofuels, by 120 percent. Other scientists have modified *E. coli* and yeasts to produce the terpene called bisabolane as a promising biofuel precursor, one found to be relatively nontoxic to the microbes; unlike other biofuels like ethanol that can limit commercially viable biofuel production. Alternatively, scientists also have inserted a novel fatty acid synthesis enzyme into *E. coli*, a first step in biodiesel production from fatty acids.
- BER-funded researchers, using integrated genomics technologies, discovered that microorganisms play crucial roles in regulating soil carbon dynamics through several microbially mediated feedback mechanisms. This demonstrated the importance of microbial communities in projecting future climate warming. Such studies are fundamental to understanding ecosystem responses to climate change and provides a mechanistic basis for carbon climate modeling.

DEPARTMENT OF ENERGY FUNDING SUPPORTS INNOVATIVE STUDIES OF THE ENVIRONMENT

BER also sponsors research that ranges widely from molecular to field scale studies of various threats to our environment. BER manages two scientific user facilities (ARM and EMSL) and supports three strategic research areas in environmental sciences: atmospheric systems, climate and earth system modeling, and environmental system science. BER-funded researchers investigate environmental challenges like increased levels of greenhouse gases and heavy metal soil contaminants.

Several currently active CESD projects illustrate the division's unique expertise using microbial systems to protect and improve our environment:

- BER-funded researchers found that the films from some bacteria and pili nanofilaments from bacteria have electronic conductivities, which are comparable to those of synthetic metallic nanostructures. They can also conduct over distances on the centimetre scale. The property of allowing electron transport across long distances could revolutionize nanotechnology and bioelectronics.
- Using EMSL equipment, a DOE university team was the first to describe the molecular structure of proteins in *Shewanella oneidensis* that allow the bacterium to transfer an electrical charge. The proteins exist within small "nanowires" constructed by the bacteria that extend through their cell walls and trap minerals. The discovery is a step toward potentially using microbes as a source of electricity, perhaps as microbial fuel cells. The results also have possible relevance to microbial cleanup of environmental contaminants.
- BER supported researchers found that the dual role of dissolved organic matter in mercury reduction and complexation in anoxic environments where both bacterial methylation and DOM reduction occur. Such studies, provide mechanistic insights into the factors controlling mercury species transformation, geochemical cycling and especially toxic methylmercury production, which are critical to mercury remediation in groundwater.

CONCLUSION

ASM recommends that the Congress approve the proposed fiscal year 2013 budget, in support of the DOE's SC. DOE science programs routinely generate discoveries of economic and societal impact that serve the DOE mission, often by collabo-

rating with non-DOE partners or sponsoring multidisciplinary research teams. SC also maintains unique lab facilities and institutes with robust capabilities to solve difficult, large scale problems. We ask the Congress to recognize these invaluable contributors to the economy, environment and public health by supporting increased funding for the fiscal year 2013 DOE budget.

PREPARED STATEMENT OF THE AMERICAN SOCIETY OF AGRONOMY, CROP SCIENCE SOCIETY OF AMERICA, AND THE SOIL SCIENCE SOCIETY OF AMERICA

Dear Chairwoman Feinstein, Ranking Member Alexander, and members of the subcommittee: The American Society of Agronomy (ASA), Crop Science Society of America (CSSA), and the Soil Science Society of America (SSSA), are pleased to submit comments in strong support of enhanced public investment in the Department of Energy's (DOE) Office of Science for fiscal year 2013. Specifically, ASA, CSSA, and SSSA urge the subcommittee to support DOE's Office of Science at a level of \$5 billion for fiscal year 2013, as requested in the President's proposed budget (a 2.6-percent increase over the fiscal year 2012 level). A strong level of funding will enable the Office of Science to continue to deliver the scientific discoveries and major scientific tools that transform our understanding of nature and advance the energy, economic, and national security of the United States.

ASA, CSSA, and SSSA represent more than 18,000 members in academia, industry, and government, as well as 13,000 Certified Crop Advisers. The largest coalition of professionals dedicated to the agronomic, crop, and soil science disciplines in the United States, ASA, CSSA, and SSSA are dedicated to utilizing science in order to meet our growing food, feed, fiber, and fuel needs. With an ever-expanding global population and increasing food demands, investment in food and agriculture research is essential to maintaining our Nation's food, economic and national security.

DEPARTMENT OF ENERGY'S OFFICE OF SCIENCE

ASA, CSSA, and SSSA understand the challenges the Senate Energy and Water Development Appropriations Subcommittee faces with the tight budget for fiscal year 2013. We also recognize that the Energy and Water Development Appropriations bill has many valuable and necessary components, and we applaud the subcommittee for the support provided to the DOE Office of Science. For fiscal year 2013, ASA, CSSA, and SSSA recommend a funding level of \$5 billion.

The Congress approved the America Creating Opportunities to Meaningfully Promote Excellence in Technology, Education, and Science (America COMPETES) Reauthorization Act of 2010 (Public Law 111-358), recognizing that an investment in basic (discovery) scientific research is essential to providing America with the brainpower necessary to maintain a competitive advantage in the global economy and keep U.S. jobs from moving overseas. Such an investment is necessary to keep U.S. science and engineering at the forefront of global research and development in the biological sciences and geosciences, computing, and many other critical scientific fields. The Office of Science supports graduate students and postdoctoral researchers early in their careers. Nearly one-third of the Office of Science's research funding goes to more than 300 colleges and universities nationwide. The Office of Science also reaches out to America's youth in grades K-12 to help improve student's knowledge of science, mathematics, and understanding of global energy and environmental challenges. The recommended funding level of \$5 billion is critical to ensuring our energy self-sufficiency and addressing major environmental challenges. In addition, a funding level of \$5 billion will allow the Office of Science to:

- maintain and strengthen DOE's core research programs at both the DOE national laboratories and universities;
- provide support for Ph.D.'s, postdoctoral associates, and graduate students;
- ensure maximum utilization of DOE research facilities; and
- allow the Office of Science to develop and construct the next-generation facilities necessary to maintain U.S. leadership in scientific research.

BASIC ENERGY SCIENCES

Within the DOE Office of Science, the Basic Energy Sciences (BES) program is a multipurpose, scientific research effort that fosters and supports fundamental research to expand the scientific foundations for new and improved energy technologies and for understanding and mitigating the environmental impacts of energy use. The research disciplines that the BES program supports include condensed matter and materials physics, chemistry, soil, mineralogical, and geosciences. These

subjects influence virtually every aspect of energy production, conversion, transmission, storage, efficiency, and waste mitigation.

ASA, CSSA, and ASSA support funding the subprogram of Chemical Sciences, Geosciences, and Biosciences within the BES at a level of \$349.4 million in fiscal year 2013. The Geosciences Research program supports research focused on developing an understanding of fundamental Earth processes that are a foundation for improved advanced energy and environmental technologies. Specifically, we support the Geosciences program to expand geochemical research and computational analysis of complex subsurface fluids and solids.

BIOLOGICAL AND ENVIRONMENTAL RESEARCH

Also within the DOE Office of Science, the Biological and Environmental Research (BER) program has advanced environmental and biological knowledge that supports national security through improved energy production, international scientific leadership, and research that improves the quality-of-life for all Americans. BER supports these vital missions through competitive and peer-reviewed research at national laboratories, universities, and private institutions. ASA, CSSA, and SSSA support the funding of BER at the President's requested level of \$625.3 million for fiscal year 2013. A variety of programs within BER are essential to continued biological systems science fundamental research, geochemical observations, and determining environmental sustainability of our energy production systems. A few of these programs are further highlighted below:

- ASA, CSSA, and SSSA support funding the Office of Climate and Environmental Sciences within BER at a level of \$315.6 million. This funding will support essential subsurface biogeochemical research and basic research on the fate and transport of contaminants in the subsurface.

- ASA, CSSA, and SSSA support the increase included in the President's budget for the Genomic Science Program at a level of \$188.1 million for fiscal year 2013. The Joint Genome Institute (JGI) is an essential lab where synthetic molecular toolkits are developed to predict, construct, and test new biological systems for clean-energy solutions. It also uses plant and microbial systems biology to pursue breakthroughs needed to develop cellulosic biofuels.

Thank you for your consideration of our requests.

PREPARED STATEMENT OF AMERICAN SOCIETY OF PLANT BIOLOGISTS

On behalf of the American Society of Plant Biologists (ASPB), we submit this statement for the official record to support the requested level of \$4.992 billion for the Department of Energy (DOE) Office of Science for fiscal year 2013. The testimony highlights the importance of biology—particularly plant biology—as the Nation seeks to address energy security and other vital issues.

ASPB recognizes the difficult fiscal environment our Nation faces but believes investments in scientific research will be a critical step toward economic recovery. We would also like to thank the subcommittee for its consideration of this testimony and for its support for the basic research mission of the DOE Office of Science.

ASPB is an organization of approximately 5,000 professional plant biology researchers, educators, graduate students, and postdoctoral scientists with members in all 50 States and throughout the world. A strong voice for the global plant science community, our mission—achieved through work in the realms of research, education, and public policy—is to promote the growth and development of plant biology, to encourage and communicate research in plant biology, and to promote the interests and growth of plant scientists in general.

FUEL, FOOD, ENVIRONMENT, AND HEALTH—PLANT BIOLOGY RESEARCH AND AMERICA'S FUTURE

Plants are vital to our very existence. They harvest sunlight, converting it to chemical energy for food and feed; they take up carbon dioxide and produce oxygen; and they are the primary producers on which all life depends. Indeed, plant biology research is making many fundamental contributions in the areas of domestic fuel security and environmental stewardship; the continued and sustainable development of better foods, fabrics, pharmaceuticals, and building materials; and in the understanding of basic biological principles that underpin improvements in the health and nutrition of all Americans.

In particular, plant biology is at the center of numerous scientific breakthroughs in the increasingly interdisciplinary world of alternative energy research. For example, interfaces among fundamental and applied plant biology, engineering, chem-

istry, and physics represent critical frontiers in both basic biofuels research and bioenergy production. Similarly, with the increase in plant genome sequencing and functional genomics, the interface of plant biology and computer science has become essential to our understanding of complex biological systems, ranging from single cells to entire ecosystems.

Despite the fact that foundational plant biology research—the kind of research funded by agencies such as the DOE—underpins vital advances in practical applications in energy, agriculture, health, and the environment, the amount of money invested in understanding the basic function and mechanisms of plants is relatively small. This is especially true considering the significant positive impact crop plants have on the Nation's economy and in addressing some of our most urgent challenges like energy and food security.

Understanding the importance of these areas and to address future challenges, ASPB organized the Plant Science Research Summit in September 2011. With support and funding from the National Science Foundation, U.S. Department of Agriculture, DOE, and the Howard Hughes Medical Institute, the Summit brought together representatives from across the full spectrum of plant science research to identify critical gaps in our understanding of plant biology that must be filled over the next 10 years or more to address the grand challenges facing our Nation and our planet. The grand challenges identified at the Summit include:

- To fuel the Nation's future with clean energy, improvements are needed in current biofuels technologies, including breeding, crop-production methods, and processing.
- To feed everyone well, now and in the future, advances in plant science research will be needed for higher yielding, more nutritious varieties able to withstand a variable climate.
- Innovations leading to improvements in water use, nutrient use, and disease and pest resistance that will reduce the burden on the environment are needed to allow for increases in ecosystem services such as clean air, clean water, fertile soil, and biodiversity benefits like pest suppression and pollination.
- For all the benefits that advances in plant science bestow—in food and fiber production, ecosystem and landscape health, and energy subsistence—to have lasting, permanent benefit they must be economically, socially, and environmentally sustainable.

In spring 2012, a report from the Plant Science Research Summit will be published. This report will further detail priorities and needs to address the grand challenges.

RECOMMENDATIONS

Because of our membership's extensive expertise and participation in the academic, industry, and government sectors, ASPB is in an excellent position to articulate the Nation's plant science priorities as they relate to bioenergy and, specifically, with regard to recommendations for bioenergy research funding through the DOE's Office of Science.

Within the Office of Science, the programs in Biological and Environmental Research (BER) and Basic Energy Sciences (BES) are crucial to understanding how basic biological processes work. For this reason ASPB is supportive of the fiscal year 2013 request to fund BER at \$625.3 million and BES at \$1.8 billion. Sustained funding for these programs is vital as the discoveries made in these areas will ultimately be the foundation for the next fuels and technologies we use in our daily lives.

In addition:

- We commend the DOE Office of Science, through their programs in BES and BER for funding the Bioenergy Research Centers and the Energy Frontier Research Centers. These centers provide a model for collective science innovation that complements DOE's essential investment in individual investigator and small group science. ASPB strongly encourages funding for the DOE Office of Science that would be specifically targeted to the funding of individual or small group grants for bioenergy research.
- Photosynthetic research is one clear example of an interface between the physical sciences and biology. The DOE Office of Science has been the major source of funding for fundamental studies of photosynthesis, which is the primary source of chemical energy on the planet. However, the current funding available for photosynthetic research is not commensurate with the central role that photosynthesis plays in energy capture and carbon sequestration. Hence, ASPB calls for the Office of Science to expand its research portfolio in the area of photosynthesis and carbon capture.

—Considerable research interest is now focused on the processing of plant biomass for energy production. If biomass crops, including woody plants, are to be used to their full potential, extensive effort must be expended to improve our understanding of their basic biology and development, as well as their agronomic performance. Therefore, ASPB calls for DOE to support research targeted at efforts to increase the utility and agronomic performance of bioenergy feedstocks.

Thank you for your consideration of our testimony on behalf of the American Society of Plant Biologists.

PREPARED STATEMENT OF ASME

Madam Chairwoman, ranking member, and members of the subcommittee: The Energy Committee (EnComm) of ASME's Technical Communities is pleased to provide this testimony on the fiscal year 2013 budget request for research and development (R&D) programs in the Department of Energy (DOE).

INTRODUCTION

ASME is a more than 120,000-member nonprofit, worldwide educational, and technical society. It conducts one of the world's largest technical publishing operations, holds more than 30 technical conferences and 200 professional development courses each year, and sets some 600 industrial and manufacturing standards, many of which have become de facto global technical standards. The Energy Committee of ASME's Technical Communities comprises 64 members from 10 ASME Divisions, 2 Institutes and Codes & Standards, representing approximately 40,000 of ASME's members.

ASME has long advocated a balanced portfolio of energy supplies to meet the Nation's energy needs, including advanced clean coal, petroleum, nuclear, natural gas, waste-to-energy, biomass, solar, wind, and hydroelectric power. ASME also supports energy-efficient building and transportation technologies, as well as transmission and distribution infrastructure sufficient to satisfy demand under reasonably foreseeable contingencies. Only such a portfolio will allow the United States to maintain its quality of life while addressing future environmental and security challenges. Sustained growth in the energy systems on which the United States depends will also require stability in licensing and permitting processes not only for power generating stations but also for transmission and transportation systems.

FOSSIL ENERGY

The fiscal year 2013 budget request of \$650.7 million for fossil energy represents a \$86.3 million, or 15.3 percent, increase compared to the fiscal year 2012 appropriation. Fossil Energy (FE) research and development (R&D) would rise by 21.3 percent, or \$73.8 million to \$420.6 million. After 3 years of substantial budget cuts for FE, the EnComm is pleased to see that the administration is seeking to finally build upon the \$3.4 billion that was devoted to FE R&D as part of the American Recovery and Reinvestment Act (ARRA).

After proposing the elimination of funding for Natural Gas Technologies in last year's budget request, this year the administration has requested a \$2 million, or 13.4 percent increase for the program that would bring it to \$17 million in fiscal year 2013. Unconventional Fossil Energy Technologies would again be targeted for elimination by the administration in fiscal year 2013, after receiving less than \$5 million in funding for fiscal year 2012, and no funding in fiscal year 2011. The United States has access to significant unconventional gas resources with the potential to provide abundant, affordable, clean low-carbon energy source for years to come. Prior FE R&D has contributed to making this possible. However, this potential will not be realized unless this resource can be produced reliably, economically, safely, and with minimal environmental impact. Accomplishing this task and keeping the United States in the forefront of unconventional fossil energy technology will require an investment in basic research, technology development, and investments in advances in low-impact environmental technologies that will not be undertaken by industry in the current economic climate. The budget for these efforts should be maintained at least at the fiscal year 2010 level.

The EnComm encourages a restoration of funding for coal research programs to at least the levels appropriated for fiscal year 2010. The EnComm is very disturbed by the lack of research in basic coal combustion and in research that is needed to support the next generation of coal-fired plants. The use of coal today and in the future is vital to providing for a sustainable energy future. The current funding lev-

els significantly hinder the ability to keep the United States in the forefront of coal technology. Coal is and will remain a critical resource for our Nation and its economy; and we must continue to invest in technological advancements that will reduce environmental impacts for this energy. The use of more efficient processes for coal combustion, such as advanced integrated gasification combined cycle (IGCC) technology, combined with carbon sequestration will allow the United States to utilize its coal resources in a more environmentally sound and cost-effective manner. We encourage strong and consistent funding for these programs now and in future years.

ADVANCED RESEARCH PROJECTS AGENCY-ENERGY

The EnComm supports the \$325 million budget request for the Advanced Research Projects Agency-Energy (ARPA-E), a \$50 million or 27.5 percent increase over the fiscal year 2012 appropriated amount. ARPA-E received its first funding as part of ARRA, but has stood out quickly among its fellow DOE programs. ARPA-E represents a significant opportunity for the United States to cultivate technological breakthroughs related to energy sources, and uses. A steady commitment to ARPA-E has begun to encourage new energy technology innovation, and the EnComm believes that this is a worthwhile endeavor for the DOE as we seek to accomplish technological breakthroughs in energy technology research.

NUCLEAR ENERGY

The EnComm is discouraged to see a 10.3 percent, or \$88.2 million reduction in the fiscal year 2013 DOE Office of Nuclear Energy budget request. Total funding for fiscal year 2013 would fall to \$770 million. The EnComm remains convinced that nuclear energy will hold an important role in the Nation's energy future, and that programs like Reactor Concepts, and Fuel Cycle R&D need sustained funding to aid the Nation's transition to a low-carbon energy future. The current proposed lack of funding may adversely impact the ability of the current U.S. fleet to continue to operate past its 60-year life. The loss of funding may also contribute to the loss of the U.S. nuclear technology competitive edge to overseas concerns. The Energy Committee remains interested in how the proposed Reactor Concepts RD&D program distinguishes itself from the traditional R&D program under the Office of Nuclear Energy. The administration's invocation of an "all-of-the-above" energy strategy at this year's State of the Union Address should be reflected in this budget request. President Obama has again proposed the creation of a national "clean energy standard" of 80 percent by 2035 the EnComm believes very strongly that sustained increases in nuclear power research are justified in light of this goal.

ENERGY EFFICIENCY AND RENEWABLE ENERGY

The Office of Energy Efficiency and Renewable Energy (EERE) manages America's investments in research, development, and deployment of DOE's diverse energy efficiency and renewable energy applied science portfolio. The fiscal year 2013 request of \$2.37 billion, which is a \$527 million, or 29.1 percent increase over the fiscal year 2012 appropriated amount of \$1.81 billion, demonstrates that the administration would like to restore EERE to pre-Budget Act levels (Public Law 112-25). Most of the key EERE programs, including Biomass, Solar, Wind, Geothermal, Building Technologies, Vehicle Technologies, and Advanced Manufacturing technologies, would receive substantial increases in funding to support the growth of renewable energy and energy efficiency. The EnComm is particularly pleased to see large increases for both the Advanced Manufacturing program (\$290 million, or a 150.9 percent increase), formerly known as the Industrial Technologies Program (ITP), as well as the Building Technologies Program (\$310 million, or a 41.4 percent increase).

The EnComm believes that the development of transportation fuel systems that are not petroleum-based is a critical part of our future national energy policy. The fiscal year 2013 budget for biomass and bio-refinery systems R&D is slated to receive a \$70.7 million increase to \$270 million for fiscal year 2013, 35.5 percent above the fiscal year 2012 appropriated amount. We are also pleased to see the \$91 million, or 27.7 percent increase in the effort related to vehicle technologies emphasizing plug-in hybrid electric vehicles. However, the EnComm is concerned about the current level of mandated use of ethanol-based fuels.

The integration of all cost-effective electric generating technologies into the operation of the electricity distribution system is critical to economic operation of the national electric grid. The EnComm believes that R&D related to the integration of the electric grid and its control as a truly national system is imperative for the

growth of effective and economic energy generation technologies, and we encourage full funding for such research.

SCIENCE

The mission of the Office of Science (SC) is the delivery of scientific discoveries and major scientific user facilities and tools to transform our understanding of nature and to advance the energy, economic, and national security of the United States.

During these difficult budget times, the EnComm is pleased with the request for the Office of Science. The fiscal year 2013 budget proposal of \$5 billion is an increase of \$118 million, or 2.4 percent, from the fiscal year 2012 appropriation. As successive budget cycles come and go, the Nation seems to be getting further away from the funding trajectory mandated in the "America COMPETES Reauthorization Act of 2007" (Public Law 111-358). Science programs in high-energy physics, fusion energy sciences, biological and environmental research, basic energy sciences, and advanced scientific computing, serve, in some small way, every student in the country. These funds support not only research at the DOE laboratories, but also the work at a large number of universities and colleges. We believe that basic energy research will also improve U.S. energy security over the long term, through its support for R&D on cellulosic ethanol and other next-generation biofuels, advanced battery and energy storage systems, and fusion. Fusion Energy Sciences, High Energy Physics, and Nuclear Physics would receive decreases under this budget, with specific cuts to domestic fusion in favor of honoring the Nation's commitments to International Thermonuclear Experimental Reactor (ITER). The EnComm respects the Office of Science's goals related to microbiological sciences, computer science, and basic energy sciences but urges a restoration of funding for these reduced programs at fiscal year 2011 levels. The Energy Committee supports the budget request for the Office of Science in the amount of \$5 billion.

OTHER DEPARTMENT OF ENERGY PROGRAMS

DOE is also very active in areas outside of R&D. The environmental remediation program that funds the decommissioning and decontamination of old DOE facilities is one such research area. The EnComm questions the advisability of flat funding for the Environmental Management program. The Yucca Mountain (YM) Waste Repository is a critical part of the future of nuclear energy and the use of uranium as a resource for energy usage in the present and foreseeable future. The EnComm is concerned that the cancellation of the YM repository program will result in a difficult, and more costly, search for a new repository that will likely encounter similar obstacles. DOE and the Congress should honor their commitments with regard to disposal of Spent Nuclear Fuel. The EnComm has read the Blue Ribbon Commission (BRC) on America's Nuclear Future report and will be closely monitoring any efforts in the Congress toward implementing the BRC's recommendations. The coming resurgence in the commercial nuclear arena is likely to deplete the trained professionals available for this program as engineers choose to move to the more stable commercial environment. The Congress should appropriate the funds to ensure that this work is accomplished in an expeditious manner.

CONCLUSION

Members of the EnComm consider the issues related to energy to be one of the most important issues facing our Nation. There is an urgent need for a strong and coherent energy policy. The EnComm is concerned that without a National Energy Policy the proposed and ongoing research will not be utilized to its full potential. We applaud the administration and the Congress for their understanding of the important role that scientific and engineering breakthroughs will play in meeting our energy challenges. In order to promote such innovation, strong support for energy research will be necessary across a broad range of technology options. DOE research can play a critical role in allowing the United States to use our current resources more effectively and to create more advanced energy technologies.

Thank you for the opportunity to offer testimony regarding both the R&D and other parts of the proposed budget for the DOE. The EnComm is pleased to respond to requests for additional information or perspectives on other aspects of our Nation's energy programs.

PREPARED STATEMENT OF APS TECHNOLOGY, INC.¹

Madam Chairwoman and honorable Senators: Seven years ago, I submitted testimony² regarding proposed cuts to the Department of Energy (DOE) budget for oil and gas exploration research. Much has happened since 2005, all of which reinforces the need for such funding. I wish to address, in particular, the cuts to the National Energy Technology Laboratories (NETL).

I wish to make perfectly clear that my company, APS Technology, Inc., has benefited from these programs. We have completed two cost-sharing research contracts^{3,4} from the NETL, one Small Business Innovation Research (SBIR)⁵ and one Small Business Technology Transfer (STTR)⁶ grant. This support has been critical to the growth of APS and its introduction of new products for the industry.

I will not repeat the general justifications that you know so well—the necessity of our striving toward energy independence or near-independence; the importance of new technologies to reaching this goal, while protecting the environment, et cetera. While these are clearly important considerations, I would rather focus on three particular aspects from my personal experience:

- an outstanding success story;
- the changes in the business environment for oil and gas exploration; and
- some reasons that DOE support for oil and gas research and development is more important today than ever.

A SUCCESS STORY—TELECO OILFIELD SERVICES INC.

In his State of the Union Address,⁷ President Obama reminded us that “it was public research dollars, over the course of 30 years, that helped develop the technologies to extract all this natural gas out of shale rock—reminding us that government support is critical in helping businesses get new energy ideas off the ground.” One of these key enabling technologies was measurements-while-drilling (MWD) and the leader in MWD was my former company, Teleco Oilfield Services Inc.

In 1972, I began this new venture with the support of my then employer, Raymond Engineering⁸ and the European oil company, SNPA.⁹ The sole purpose of this new company was to develop and commercialize this new MWD technology. Even then, before there was a commercial tool, the industry recognized MWD as a transformative technology. By transmitting data to the surface in real time from the bottom of a well as it was being drilled, it would open the door to directional and horizontal drilling, real-time analysis of the oil and gas content of a well, steering the well within a pay zone, things unheard of then that are now standard operating procedure in oilfields around the world.

In 1978, dozens of companies were trying to develop these systems,¹⁰ including large corporations within the oil industry and without. Most, however, were unsuccessfully trying to adapt existing wireline technology to the much more severe environment within a well during drilling. Teleco took the opposite approach;¹¹ it adapted the proven reliable military and space technology of Raymond Engineering and applied it to the new environment in an effort to attain the reliability needed for such service.

In 1975, after several years of intense and expensive self-funded development, Teleco was ready to build and field test its first prototype tools. The combination of their complexity and the requirement that they work in an extreme environment made this a prohibitive task. The oil companies were unwilling to invest in this technology without a successful field test. It was at this time that the company applied for, and received, \$2 million in development funding from the DOE. With these funds, the field testing could proceed and proved successful.

¹9 Laser Lane, Wallingford, Connecticut 06492. <http://aps-tech.com/>.

²Testimony to the House Committee on Appropriations Subcommittee on Energy and Water Development, submitted March 6, 2005.

³DE-FC26-02NT41664, “Drilling Vibration Monitoring and Control System”.

⁴DE-FC26-04NT15501, “Novel High-Speed Drilling Motor for Oil Exploration & Production”.

⁵DE-FG02-02ER83368, “Rotary Steerable Motor System for Deep Gas Drilling”.

⁶DE-AC26-98FT40481, “Downhole Fluid Analyzer”.

⁷<http://www.whitehouse.gov/photos-and-video/video/2012/01/25/2012-state-union-address-enhanced-version#transcript>.

⁸Now a part of Kaman Corporation.

⁹Société Nationale des Pétroles d'Aquitaine, now a part of Total.

¹⁰*cf.*, “MWD: State of the Art”, series of articles in the *Oil & Gas Journal*, 1978.

At this point, six major oil companies¹² provided an additional \$0.9 million funding in return for future repayment through the company's sales. These funds allowed the commercial launch of MWD in 1978.

As anticipated, the commercial introduction of MWD by Teleco revolutionized oil and gas exploration, first primarily offshore, but now on land as well. What was the role of the DOE in this success? MWD would have certainly been developed in time, but it took more than 2 years for other companies to enter the market. The Teleco system remained the leader in reliability over its entire existence. The support of the DOE was critical to making the leap from a laboratory demonstration to fully commercial systems in use worldwide. Thus, the small investment by the DOE led directly to the development of a company and an industry that served to improve the efficiency and safety of oil and gas exploration, led to many advances that help restrain the price of oil including such innovations as horizontal drilling, and created thousands of jobs in the United States.

CHANGES IN THE OIL AND GAS INDUSTRY OVER THE PAST FOUR DECADES

In the past four decades, the oil and gas industry has undergone dramatic changes. In the 1970s the major production companies were the principal sources of new technology for the industry. Exxon, Mobil, Texaco, and ARCO, to name a few, maintained research facilities staffed by the most experienced experts in their fields. These companies developed many of the key innovations in the drilling and well logging industry despite their recognition that, as commodity producers, they were neither equipped to market, nor particularly interested in, technology per se. This was the province of the oil service companies, to whom the producers licensed their use, often giving nonexclusive, royalty-free licenses to any company that requested them.

In the ensuing decades, the industry has consolidated. For example, all of the companies mentioned above have either merged or been acquired since then, also consolidating their research programs. In the volatile oil and gas industry, it difficult to justify to shareholders investments in long-term programs that will not produce any direct revenues or competitive advantage. Thus, companies have striven to "right size" their organizations, often at the expense of research.

A similar contraction has taken place in the oilfield services business. New technologies were once transferred from the producers, developed by the major service companies, or introduced by small, specialized companies (such as Numar¹³ or Landmark Graphics¹⁴). Many of the researchers laid off in the consolidation of the producers' research labs found their way to service companies. The service companies also acquired many of the smaller companies, such as those listed above. Now, after significant consolidation and downsizing on the part of the service companies, and under the continuous, short-term scrutiny of the market, even they are cutting the costs associated with long-term development.

To cite one example, Schlumberger has closed its world-renowned Schlumberger-Doll Research Center in Ridgefield, Connecticut, and relocated to Cambridge, Massachusetts. They have transferred much of the work previously done by industry experts to university professors, research associates, and students. The service companies are also outsourcing many high-risk projects to small companies such as APS.

In this environment, the growth and success of a Teleco would be impossible. The large companies have become more risk-averse and oriented toward current revenues. Small companies lack the resources to pursue high-risk, long-term developments. The government, through the DOE, is the backer of last resort for these efforts.

CURRENT NECESSITY FOR DEPARTMENT OF ENERGY SUPPORT

The U.S. oil and gas province is quite mature. Production of oil peaked in the 1970s and gas production is nearly at its peak. To produce additional reserves, technical progress is needed in two areas:

- drilling safely in deeper waters offshore requires new methods for dealing with the increased temperatures and pressures in the formations; and
- producing oil and gas from the prolific shale deposits we possess requires sophisticated horizontal drilling⁵ and monitoring³ equipment.

Some of the technology for these areas is being supported by the Research Partnership to Secure Energy for America (RPSEA), of which we are a member. These programs, however, tend to be on a larger scale and less suited for small businesses.

¹²Exxon, Shell, Chevron, Conoco, Amoco, and Placid.

¹³Now a part of Halliburton Corp, see: http://www.halliburton.com/news/archive/1997/corpnews_093097.jsp.

¹⁴Now a subsidiary of Halliburton Corp, see: <http://www.lgc.com>.

DOE R&D support, through NETL, which requires cost-sharing by the applicant and outside sources, is an ideal model for a stimulant to small business and technological growth. To cite one example, consider our Drilling Vibration Monitor and Control System,³ currently entering commercial service. In 2002, NETL launched the Deep Trek initiative, aimed at developing new technologies to reduce the cost of deep gas drilling. After review by outside experts of both a pre-application and application, APS was granted a Cooperative Agreement to develop this new tool, with the DOE paying 75 percent of the first phase.

During this period we designed and modeled this tool, which senses the vibration of the bit and drillstring, and continually adjusts the stiffness of an active vibration damper located above the bit. As a result, the bit does not bounce off bottom, and applies the optimal force to enhance the rate of drilling.

Phase II drilling tests have shown¹⁵ that use of this tool can increase the drilling speed by 10–50 percent, and significantly extend the life of drill bits and other downhole components. None of this development would have been possible without DOE support. APS was not in a position to fund it; the major service companies were not interested until there was an indication of value to the end user and the production companies needed something more concrete before investing in the technology.

Now, with the help of these tests made possible by DOE support, there is considerable customer interest. This product should lead to major improvements in efficiency for the oil and gas drilling industry, and growth for our company. For example, APS has been recognized as one of the fastest-growing technology companies in Connecticut for the past 9 years. We are in the midst of a hiring boom and plan to increase our U.S. employees by 60 during 2012.

In summary, DOE research initiatives are essential to “prime the pump” of new technology development. This is even more important in these times of high fuel prices, “lean” corporations and increased dependence on foreign oil sources. I urge you, in the strongest possible terms, to maintain or increase the funding for these programs. Thank you.

PREPARED STATEMENT OF CARNEGIE MELLON UNIVERSITY

Madam Chairwoman, ranking member, and members of the subcommittee: My name is Timothy McNulty, and I am the Associate Vice President for Government Relations at Carnegie Mellon University. The great progress being made in America’s pursuit of energy independence is a product of the synergy between the entrepreneurial strength of our energy sector and strategic research investments that have fundamentally changed the very nature of production. As our pursuit of energy independence gains momentum, it is critical to continue funding the programs that best foster this dynamic. A prime example of such a program is section 999, the Ultra-Deepwater and Natural Gas Supply Research and Development Program created by the Energy Policy Act (EPA) of 2005.

The section 999 program supports the dynamic research of the Strategic Center for Natural Gas and Oil at the National Energy Technology Laboratory (NETL SCNGO), as well as a consortium of U.S. energy research universities, industry, and independent research organizations under the Research Partnership to Secure Energy for America (RPSEA). This approach ensures that the program engages partners from across the United States and fully utilizes the capabilities of the Nation’s fossil energy lab, which has a long history of strong collaboration with industry and a proven track record of moving technology from discovery to commercialization. The RPSEA partnership brings the best of highly competitive research to bear on the fundamental industry challenges that the United States must address in order to realize the full potential of new energy sources safely and effectively.

At NETL, research is underway to address the central technological and basic scientific questions that will support continued expansion of shale production. These include novel techniques for water quality and treatment, research on well distribution and optimization, modeling to predict induced seismicity, and pre-competitive research on new end-use products and markets for natural gas.

This research program also benefits from a unique collaboration between the National Lab and five universities—Carnegie Mellon University, Penn State University, Virginia Tech University, the University of Pittsburgh, and West Virginia University. Working with the Lab, these institutions comprise the NETL Regional University Alliance (NETL RUA), a “virtual” laboratory that taps leading capabilities

¹⁵M.E. Wassell *et al.* “Active vibration damper improves performance and reduces drilling costs”, World Oil, September 2008.

in hydrology, water systems, drilling technologies, and risk assessment from across the region.

The NETL research builds upon recent breakthroughs such as the development of potential new nanoparticles supporting enhanced oil recovery and new ways to model and image multiphase, multifluid flow in shale core. Other major research accomplishments include the development of remote sensing techniques to monitor shallow groundwater salinity, the effective utilization of airborne magnetic surveys to detect the location of unknown wells in an active enhanced oil recovery well in the western United States, and the assemblage of a 3-D geologic framework for the Marcellus Shale using commercially available software.

In addition to aiding the pursuit of energy independence, the section 999 program is also vital to maintaining America's global leadership in energy-related technologies. As the discovery of shale sources continues across the world—on virtually every continent—one aspect of the energy race for the future will clearly be to develop the production-related technologies and expertise that will become a major source of export-related business and job growth.

The question is whether American companies, workers and communities will benefit from leading this development. By bringing together the best of American industry, university and national lab research on practical problem-solving and opportunity-seizing innovation, the section 999 program funding is vital to laying the foundation for American leadership in what will be a major export market of the next two decades.

In essence, the research NETL is leading as part of the section 999 program spans breakthroughs that both extend the boundaries of discovery and production and strive to ensure that this production is undertaken in an environmentally safe manner. This program is critical to advance productivity, to establish the foundation for scientifically based, environmentally sound extraction, and to catalyze new industries related to new energy extraction.

The Congress's support for restoring funding of section 999 in fiscal year 2012 was greatly appreciated and needed. It is enabling practical results that make a difference in both production and scientifically based environmental protection. Continued support of the section 999 program by restoring the full \$50 million in funding for fiscal year 2013 is respectfully urged as an investment in emerging American energy innovation and continued progress toward environmentally safe energy independence.

PREPARED STATEMENT OF THE COAL UTILIZATION RESEARCH COUNCIL

INTRODUCTION

This statement is submitted on behalf of the membership of the Coal Utilization Research Council (CURC), an organization of coal-using utilities, coal producers, equipment suppliers, universities and institutions of higher learning, and several State government entities interested and involved in the use of coal resources and the development of coal-based technologies (see www.coal.org). Members of CURC, together with the Electric Power Research Institute (EPRI), have developed a Technology Roadmap (Roadmap) that defines the research, development, and demonstration (RD&D) necessary to insure the enhanced utilization of coal in the United States. The recommendations for fiscal year 2013 appropriations discussed in this testimony are keyed directly to the 2012 update of the Roadmap.

COAL UTILIZATION RESEARCH COUNCIL FISCAL YEAR 2013 BUDGET RECOMMENDATION

The President has requested \$241 million for the coal RD&D program in fiscal year 2013, which is \$93 million below the fiscal year 2012 enacted level of \$333 million. This fiscal year 2013 request is nearly 40 percent below the \$389 million fiscal year 2011 appropriated levels. The budget request being made for Fossil Energy represents the only area in Department of Energy's (DOE) budget for which less funding is being requested than the prior year. CURC recommends that the fiscal year 2013 coal research and development (R&D) program be funded at \$372 million (see chart below). Recommended increases in funding would be targeted to specific areas as well as new programs, all of which are keyed to the Roadmap (details below). This recommendation represents an increase of \$131 million over the President's fiscal year 2013 request and \$39 million above the funding level of \$333 mil-

lion (exclusive of the National Energy Technology Laboratory (NETL) in-house R&D program) that the Congress provided in fiscal year 2012.¹

IMPORTANCE OF COAL AND THE DEPARTMENT OF ENERGY FOSSIL ENERGY RESEARCH AND DEVELOPMENT PROGRAM

Coal is essential to the U.S. energy economy. In 2010, coal provided 21 percent of total U.S. energy consumption and 48 percent of U.S. electric power.² The U.S. Energy Information Administration (EIA) projects that coal will continue to provide nearly 40 percent of our Nation's electricity through 2035. Technology has enabled coal to address environmental and economic challenges in the past. The proven formula for success has been the collaborative, cost-sharing efforts of the Government and the private sector. This public and private sector partnership has provided great value to the taxpayer yielding a return of \$13 for every \$1 of Federal funding spent for coal RD&D.³ The National Academies of Science estimated that between 1986 and 2000, the DOE Fossil Energy Program generated \$7.4 billion in economic benefits to this country.⁴ Today, 3 out of every 4 coal plants in United States are equipped with technologies that trace their origins to DOE's program, allowing coal use to increase by more than 63 percent in the United States over the last 30 years while the emissions of SO₂ and NO_x have decreased on the order of 70 percent.⁵

THE ROADMAP

The Roadmap represents a plan for developing technologies that convert coal to electricity and other useful forms of energy and manufacturing feedstocks. The Roadmap describes coal technology advancements that will achieve specific cost, performance, and environmental goals and in doing so, will benefit the Nation's environment, economy, and energy security. A significant conclusion of the Roadmap is that, with the combination of technology development and enhanced oil recovery (EOR), coal-based power plants designed and constructed in 2025 can provide electricity at a price competitive with natural gas and other fuels, and with 75 percent less CO₂ than today's new natural gas-based power plant. Other additional benefits of successfully implementing the Roadmap include aggressive reduction of traditional air pollutants and water use/discharge; and enhanced energy and economic security via production of low-cost power using the largest U.S. domestic energy resource. The key to successful technology development is:

- adequate public support;
- enhanced levels of funding targeted to specific technology areas; and
- a regulatory and public policy framework that supports coal use.

FUNDING NEEDS TO ACCOMPLISH THE ROADMAP

Below is a chart that outlines CURC's proposed funding recommendations compared to the fiscal year 2013 proposed budget for Fossil Energy R&D. These CURC recommendations are targeted to achieving the Roadmap goals by directing funds to specific programmatic activities, including new activities not currently funded by DOE.

Advanced Energy Systems

Advanced Combustion.—CURC recommends a total of \$65 million for the Advanced Combustion program in fiscal year 2013 to develop technologies for advanced combustion platforms, including focused work on waste heat recovery and integration, advanced power cycles, and alternative process configurations. The Roadmap envisions a pathway for the integration of these advanced ultra supercritical (AUSC) materials technologies into new, highly efficient advanced coal systems. CURC recommends \$10 million in fiscal year 2013 for DOE to build upon the successes of the AUSC program and to develop a roadmap that identifies a pathway for moving the AUSC materials work forward and support

¹The CURC figures are exclusive of the NETL coal research and development (in-house R&D) program budget of \$35 million. While an important program, this funding supports salaries for research conducted by NETL in-house and is not a cost-shared program with industry. The Roadmap identifies programs that are undertaken in partnership between industry and government, and therefore, CURC's recommendations are focused on the competitive programs funded in the coal RD&D program.

²Coal plays a similar role in the global energy economy. Between 2000 and 2010, coal accounted for nearly one-half the increase in global energy use, OECD/IEA 2011.

³Fossil Energy Research Benefits, Clean Coal Technology Program, USDOE/NETL.

⁴"Energy Research at DOE, Was it Worth It?", Energy Efficiency and Fossil Energy Research 1978 to 2000, National Academy of Sciences, 2001 Report, pg. 6.

⁵EIA Annual Energy Review 2010, EPA National Air Pollutant Emissions Trends: 1900–1998.

industry efforts in commercializing AUSC technologies. CURC also recommends \$10 million for DOE to initiate a mercury control technology program to develop technologies to allow new combustion plants to meet the mercury emissions standard imposed by Environmental Protection Agency (EPA) on new plants.

Gasification.—CURC recommends \$55 million in fiscal year 2013 to support dry feed system integration and scale up, advanced sensors work, simulation of fast ramp improvements, and refractory testing, as well as focus on the integration of ion transport membrane (ITM) technologies into the power generation process, which is important for overall cost reductions of gasification technologies.

Turbines.—CURC recommends \$24 million for the turbine program in fiscal year 2013 to validate advanced hydrogen turbine technology and components in full turbine test stand demonstrations, and to expand the program to development of components compatible with ITM integration.

Cross-Cutting Research.—In addition to supporting university training and research and computational modeling through the National Risk Assessment Partnership (NRAP) and the Carbon Capture Simulation Initiative (CCSI), CURC recommends \$12.4 million for DOE to initiate a water management program. The Roadmap defines a program to survey the industry's water management practices in order to model water use and management for a variety of coals, process steps and emission limits, and to develop technologies that reduce water withdrawal and consumption. CURC also recommends \$16 million to fund research on breakthrough technologies. The Roadmap characterizes these technologies as “out-of-the-box” thinking, or fundamentally new approaches to solving coal's challenges.

Carbon Capture.—CURC believes that it is a wise public investment to determine how to cost-effectively capture and use/store CO₂ so that we do not eliminate any options for coal in the future, and sees a dual role for continued development of CO₂ capture technology. The first role is the benefit for meeting current and future climate mitigation regulations. States have adopted CO₂ regulatory requirements and on March 27, the EPA has proposed regulatory requirements for CO₂ emissions from new coal-fueled power plants which would require the application of carbon controls. The second role is driven by energy security benefits. If the price of captured CO₂ can be reduced through RD&D, the CO₂ can be used to augment production of domestic crude oil through EOR, thereby increasing the potential to domestically produce trillions of dollars of oil over the next several decades, which would reduce reliance on imported oil and improve the U.S. balance of trade.

Post-Combustion.—For both new and existing power plants, postcombustion capture technology must be made more efficient and cost-effective by reducing parasitic power and capital cost requirements. CURC recommends \$60 million in fiscal year 2013 to develop novel capture process improvements that can support coal power plant retrofits and natural gas combined cycle (NGCC) retrofits equally.

Pre-Combustion.—CO₂ capture for gasification is focused on improved capture processes in order to reduce costs. CURC recommends \$17.4 million for pre-combustion capture work in fiscal year 2013 specifically to pilot new shift catalysts and reactor designs, accelerate hydrogen membrane pilot projects, address CO₂ slurry feed integration, evaluate alternates to warm gas capture, and acquire data and design guidance from current demonstrations.

Carbon Storage.—CURC supports the Regional Carbon Sequestration Partnerships (RCSP), and recommends a follow-on program that builds upon the success of the RCSPs. In our judgment this follow-on program will support the development of a commercial industry necessary for deployment of carbon storage. CURC recommends \$40 million in fiscal year 2013 to initiate a “carbon storage site certification” program intended to characterize and qualify 5 regionally diverse sites that can each accept 50 million tons of CO₂ at a rate of 5 million tons per year.

LOAN GUARANTEE PROGRAM

Demonstration of first-generation technology, as reflected in the projects currently supported by the DOE Clean Coal Power Initiative (CCPI) program and the DOE Loan Guarantee program, are critically important in proving the integration of these technologies. The success of these projects is necessary to support the development of second-generation technologies contemplated in the Roadmap. CURC supports the \$8 billion authorization for DOE to provide loan guarantees to selected fossil energy projects.

DEPARTMENT OF ENERGY PRACTICE OF MORTGAGING

The practice of partial funding of multiyear projects contingent on future appropriations has been a fundamental aspect of DOE's research program for many years and is embodied in DOE's Financial Assistance Regulations. Mortgaging provides DOE the flexibility to fund several projects, to discontinue projects that are not meeting objectives and redirect funds to other meritorious projects that are successfully achieving development targets. Any restriction on the DOE practice of mortgaging will reduce the portfolio of technologies emerging from the program and create public and private investment risks. CURC recommends that the current approach to funding projects be maintained at DOE.

[In thousands of dollars]

Carbon Capture and Sequestration and Power Systems	Enacted		Request	CURC
	Fiscal year 2011	Fiscal year 2012	Fiscal year 2013	Fiscal year 2013
Carbon capture:				
Postcombustion	41,299	55,495	49,035	60,000
Pre-combustion	17,404	13,403	11,403	17,600
Carbon storage:				
Regional Carbon Sequestration Partnerships	77,160	83,190	66,980	56,600
Geological storage	24,946	14,978	11,255	.....
MVAA	8,122	6,738	6,738	.....
Carbon Use/Reuse	967	778	778	.....
Sequestration Science focus area	9,717	9,726	9,726	.....
Carbon storage site certification ¹ .....	.....	.....	.....	40,000
Advanced Compressor ¹ .....	.....	.....	.....	960
Advanced Energy Systems:				
Advanced Combustion Research, including:	30,724	15,942	10,699	65,000
—Advanced Ultra SuperCritical (High Temperature) materials ¹ .....	.....	.....	.....	10,000
—Mercury capture for new plants ¹ .....	.....	.....	.....	10,000
Gasification Research, including:	47,614	39,000	31,905	55,200
—Air Separation and Oxygen Production .....	.....	.....	.....	4,800
Hydrogen turbines	30,106	15,000	12,589	24,800
Hydrogen from coal	11,661	.....	.....	.....
Coal and coal biomass to liquids .....	.....	5,000	.....	.....
Solid oxide fuel cell	48,522	25,000	.....	.....
Cross-cutting research:				
Plant optimization (sensors, controls, NC, materials)	7,789	13,663	7,000	.....
Coal utilization science:				
—Computational system dynamics—National Risk Assessment Partnership	12,462	11,800	7,800	10,000
—Computational Energy science—Carbon Capture Simulation Initiative	11,844	13,371	9,400	10,000
Energy Analyses	4,837	4,950	950	.....
University training and research	3,164	4,000	3,250	4,000
International activities	1,350	1,350	1,350	.....
Water management ¹ .....	.....	.....	.....	12,400
Breakthrough technology research ¹ .....	.....	.....	.....	16,000
Coal R&D subtotal without in-house R&D	389,688	333,384	240,858	371,960
National Energy Technology Laboratory Coal Research and Development (in-house R&D) .....	.....	35,011	35,011	35,011
Coal R&D subtotal with in-house R&D	389,688	368,395	275,869	406,971

¹ Program is CURC-EPRI Roadmap Program and does not have a comparable program in the DOE budget.

PREPARED STATEMENT OF THE COALITION OF NORTHEASTERN GOVERNORS

The Coalition of Northeastern Governors (CONEG) is pleased to share with the subcommittee on Energy and Water Development this testimony on fiscal year 2013 appropriations for the Department of Energy's energy efficiency programs, the Energy Information Administration, and the Northeast Home Heating Oil Reserve. The

governors request fiscal year 2013 funding of no less than the fiscal year 2012 levels for the following Energy Efficiency and Renewable Energy Programs: \$50 million for the State Energy Program and \$220 million for the Building Technologies Program. The governors also ask that you provide at least historic funding levels for the Weatherization Assistance Program. In addition, the governors request at least \$105 million for the Energy Information Administration, and sufficient funding for maintenance and operation of the Northeast Home Heating Oil Reserve.

We recognize that this year the subcommittee faces a very difficult set of choices in this environment of severe fiscal constraints. Continued, adequate Federal funding for these energy programs is a vital step in helping businesses and households across the Nation manage their energy costs, and moving the Nation toward increased energy independence.

STATE ENERGY PROGRAM

The CONEG governors request at least \$50 million for the State Energy Program (SEP) in fiscal year 2013 with these funds provided as base SEP formula funding. This level of base funding is critical for the SEP to continue the successful State-Federal-private sector partnerships for many energy efficiency and conservation programs. The base SEP program is particularly important to smaller States since it allows them to dramatically enhance program delivery and leverage non-Federal resources with Federal funds.

The 56 State and territory energy offices use SEP funds, along with leveraged State and private sector funds, to implement vital energy efficiency, renewable energy, and alternative energy demonstration in energy end-use sectors such as buildings, industry, agriculture, transportation, and power generation. In addition, States use SEP funds to prepare for natural disasters and increase the security of critical energy infrastructure.

States use SEP funds to carry out a wide variety of activities most appropriate for the energy profiles of a State. These may include energy efficiency retrofits and installation of solar systems on State buildings that save taxpayers thousands of dollars in energy costs and reduce carbon emissions. These funds also support public outreach and education to local residents, small businesses, farmers, and others to make them aware of opportunities to reduce energy consumption and energy bills. Using SEP funds, States also work with the private sector to showcase new clean technologies and to invest in renewable energy projects.

The SEP program yields proven energy and economic benefits. The most recent Oak Ridge National Laboratory cost-benefit analysis of the program found that every \$1 in SEP funding yields \$7.22 in annual energy cost savings, \$10.71 in leveraged funding, and annual energy savings of 1.03 million source BTUs. The Department of Energy (DOE) estimates that, based on recent appropriations levels, the SEP program results in an annual energy cost savings of \$300 million.

WEATHERIZATION ASSISTANCE PROGRAM

The CONEG governors request at least historic funding levels in fiscal year 2013 for the Weatherization Assistance Program (WAP). Weatherization is an immediate and effective tool to alleviate the energy burden of low-income households by making their homes more energy efficient. The fiscal year 2010 funding level of \$210 million is the minimum level needed to ensure that States across the country can continue the program's successful efforts to reduce the costs of home energy and increase the safety of these vulnerable households.

Low-income households pay a disproportionate share of their income on energy bills, often spending more than 19 percent of their annual income on home energy compared to just 4 percent for all other households. Through a State-managed network of more than 900 local weatherization providers, WAP makes cost-effective improvements to about 100,000 low-income households annually, permanently reducing energy costs for these vulnerable families.

Cost-effective weatherization measures are tailored to specific homes and climates. Many of these measures are inexpensive yet effective services, such as installing insulation, sealing ducts, and tuning and repairing heating and cooling systems. The program uses the most advanced technologies and diagnostic equipment to develop a comprehensive cost-effective strategy to reduce household energy use. In fall 2011, DOE estimated that these measures save families an average of \$437 annually in heating and cooling costs alone.

In addition to the considerable energy benefits, weatherization services increase the health and safety of low-income homes by detecting carbon monoxide and gas leaks in tested equipment, replacing unsafe equipment, and checking for moisture damage. The program also fosters significant investments in local economies by cre-

ating jobs, offering professional training, and making housing more affordable in communities across the Nation. For every \$1 invested, WAP returns \$2.51 in benefits, including \$1.80 in energy savings, according to DOE.

BUILDING TECHNOLOGIES PROGRAM

The CONEG governors request at least \$220 million for the Building Technologies Program (BTP) in fiscal year 2013. According to DOE, the buildings sector consumes more energy than any other sector in the United States including transportation and industry. The potential energy savings are great. Through partnerships with State and local governments, national laboratories and universities, BTP supports research, demonstration and deployment of technologies and practices to make new and existing buildings less energy intensive. These RD&D partnership activities are a vital complement to other public policy incentives that encourage private sector investments in smart energy use.

In the millions of existing buildings, BTP works to decrease energy consumption through retrofits or replacements that decrease energy use and improve safety and comfort. In new construction, BTP works to make improvements in technologies and techniques for the design, construction and operation of more energy efficient, productive, and affordable buildings.

ENERGY INFORMATION ADMINISTRATION

The governors request at least \$105 million in fiscal year 2013 funding for the Energy Information Administration (EIA). As the independent statistical arm of the DOE, EIA is a leader in providing reliable independent information, analyses and forecasts on U.S. energy production, demand, consumption, imports and prices. The information and analyses provided by EIA are vital to State and Federal policymakers as they develop critical energy and environmental strategies. Consumers rely on EIA's widely-available information and forecasts to make a variety of energy and household-related decisions.

Increasingly complex global energy factors have greatly increased EIA's workload. Continued adequate appropriations in fiscal year 2013 will ensure that EIA can provide the most accurate reliable information at the level of detail needed by policymakers and consumers to make informed decisions.

NORTHEAST HOME HEATING OIL RESERVE

The CONEG governors request sufficient fiscal year 2013 funding for maintenance and operation of the Northeast Home Heating Oil Reserve. The Northeast is uniquely dependent on home heating oil. More than 25 percent of northeast homes use fuel oil for heating. These homes account for more than 80 percent of residential heating oil use nationwide, making the region particularly vulnerable to the effects of supply disruptions and price volatility.

In the event of a supply disruption, the Reserve provides a buffer that allows additional time for supplies to reach the region. Reserve locations are strategically placed throughout the region to respond rapidly and efficiently to any emergency supply interruption.

SUMMARY

In summary, the CONEG governors request that the subcommittee provide at least \$50 million for the State Energy Program for the base SEP formula program, \$220 million for the Building Technologies Program, at least historic funding levels for the Weatherization Assistance Program, at least \$105 million for the Energy Information Administration, and sufficient funding for maintenance and operation of the Northeast Home Heating Oil Reserve.

PREPARED STATEMENT OF CUMMINS INC.

OFFICE OF ENERGY EFFICIENCY AND RENEWABLE ENERGY

Office of Vehicle Technologies

Advanced Combustion Engine Research and Development

Advanced Technology Powertrain—Light Duty.—Increase the administration's request of \$55.2 million by \$5 million to bring the program total to \$60.2 million in fiscal year 2013. \$58.02 million was appropriated in fiscal year 2012. The Advanced Combustion Engine research and development (R&D) program includes important research areas for diesel and gasoline engines to develop more energy efficient and

environmentally friendly technologies. The Department of Energy (DOE) has launched the “Supertruck” Initiative which includes the Advanced Technology Powertrain—Light Duty (ATP-LD) program. The goals of ATP-LD program are to deliver a standard light-duty pickup truck which can achieve at least 40 percent improvement in fuel economy over the state-of-the-art gasoline engines while meeting Tier 2 Bin 2 tailpipe emissions (the same emissions standard required for gasoline powered vehicles). Diesel engine R&D is critically important to improve energy-efficiency and environmentally friendly technologies. This is accomplished through a better understanding of combustion processes which enable the use of significantly less petroleum while meeting or exceeding customer value. When this technology has fully penetrated the market, 40-percent fuel economy enhancement in light-duty trucks and SUVs would reduce U.S. petroleum consumption by more than 1.5 million oil barrels/day and greenhouse gas (GHG) emissions by more than 0.5 million metric tons/day with energy security and trade balance benefits. Innovative high-risk technologies, such as low-temperature combustion, variable-valve actuation, closed-loop selective catalytic reduction (SCR) controls, lightweight structural and advanced materials are planned. The funding increase will help address significant technology hurdles in the areas of on-board diagnostics, parasitic loss reduction, aftertreatment requirements, minimizing fuel penalty due to the aftertreatment, and the use of renewable fuels. Without the increased funding, research activities would be significantly limited.

Advanced Manufacturing Office (Formerly Industrial Technologies Program)

Next Generation Manufacturing Processes

Combined Heat and Power Generation—Advanced Reciprocating Engine Systems.—Support administration’s request of \$198.7 million for fiscal year 2013. \$62.1 million was appropriated in fiscal year 2012. Next Generation Manufacturing Processes are cross-cutting activities which focus on energy efficient processes and reduce energy intensity of manufactured products. The Combined Heat and Power Generation initiative within the Advanced Manufacturing Office includes the important Advanced Reciprocating Engine Systems (ARES) program, a component of distributed generation. The objective of the ARES program is to develop high efficiency, low emissions and cost-effective technologies for stationary engine systems (500–6500 kW) that can use natural gas or domestic renewable resources such as “opportunity” fuels. Natural gas-fueled reciprocating engine power plants are preferred for reliability, low-operating costs, and point-of-use power generation. Opportunity fuels can be renewable fuels (e.g., landfill gases) which exhibit low BTU, lower methane number and varying gas composition. Their use reduces the dependence on high-quality pipe-line natural gas. The technologies goals sponsored by the ARES program are being readied to demonstrate 47-percent engine efficiency (20–40-percent increase from the baseline), higher power densities than current products, with an expected reduction in life-cycle costs and GHG emissions. The administration’s fiscal year 2013 budget will support advanced technological challenges including higher-base engine efficiency, combustion enhancements with low BTU and methane gases, nitrogen oxides (NO_x) reduction, advanced sensors and controls, hardware durability and lower life-cycle costs. The development of distributed power generation supports lower life-cycle energy consumption of manufactured products, national energy security needs, improves protection of critical infrastructure and decreases dependence on the national electrical grid system through point-of-use energy production.

Combined Heat and Power Generation—330kw Packaged Combined Heat and Power System.—Support administration’s request of \$198.7 million for fiscal year 2013. \$62.1 million was appropriated in fiscal year 2012. Next Generation Manufacturing Processes are cross-cutting activities which focus on energy-efficient processes and reduce the energy intensity of manufactured products. The 330kw Packaged CHP System project entails the development of a flexible CHP system that can be deployed to commercial and light industrial (100–500kw) applications at a lower total cost of ownership than current CHP solutions. This project will result in a CHP system that is easy to use and inexpensive to install, offering world class customer support while providing a high efficiency internal combustion engine for a CHP system of this size. CHP systems offer higher system energy-efficiency, lower emissions and overall economic benefits. Modern engine designs operate at significantly lower regulated exhaust emissions. Combined heat and power systems use internal combustion engines to produce electricity at point of use and recover waste heat for heating or cooling purposes. Energy intensity of the CHP customer can be reduced in excess of 35 percent due primarily to more efficient electrical generation and recovered waste heat. The fiscal year 2013 budget will support prototype CHP system development and field testing.

*Basic Energy Sciences**Fundamental Interactions Research*

Predictive Simulation for Internal Combustion Engines.—Support administration’s request of \$71.5 million for fiscal year 2013. \$67.5 million was appropriated in fiscal year 2012. Fundamental Interactions Research builds the fundamental science basis essential for technological advances in diverse range of energy processes. In support of the clean energy agenda, Predictive Simulation for Internal Combustion Engines (PreSICE) program is a simulation and diagnostics study addressing the interplay between combustion chemistry and turbulent flows in combustion systems. This will lead to the development of robust engineering design tools for computational analysis capability. This large-scale computational simulation initiative is targeted at achieving cost-effective means for even greater fuel efficiency. Models will be developed for advanced chemical kinetics, computational fluid dynamics (CFD) and large eddy simulations. These models will simulate advanced combustion regimes, transient events and cycle-to-cycle variability. Development of better solver algorithms will minimize cycle-to-cycle variations and more rapid optimization of overall engine design. The administration’s fiscal year 2013 budget will accelerate the predictive simulation of internal combustion engines.

PREPARED STATEMENT OF THE DIESEL TECHNOLOGY FORUM

The Diesel Technology Forum (DTF) is a not-for-profit organization representing diesel engine and equipment makers, fuel suppliers, and emissions control technology companies. We appreciate the opportunity to submit outside witness testimony regarding certain aspects of the fiscal year 2013 proposed budget of the Department of Energy (DOE), particularly its Vehicle Technologies Program (VTP) and its various budget activities for commercial vehicles such as Advanced Combustion Engine R&D (ACE R&D), batteries and electric drive technologies, vehicle and systems simulation, fuels technology, and materials research.

Diesel engines play a key role in the global economy. A 2011 economic study commissioned by the DTF and completed by Aspen Environmental Group reported that more than 80 percent of all freight is moved throughout the United States by diesel trucks, ships, trains, and intermodal systems. Worldwide, 94 percent of all global trade is powered by diesel engines and equipment. In addition, the diesel industry contributes more than \$480 billion annually to the U.S. economy and provides more than 1.25 million jobs.

Medium- and heavy-duty trucks—the majority of which are powered by diesel engines—consume roughly one-fifth of transportation fuels in the United States. Petroleum consumption for heavy-duty vehicles is expected to increase 40 percent between 2010 and 2035. Increasing the efficiency of these vehicles can lower the costs of land-based freight and the industries that depend on it, while greatly reducing the Nation’s dependence on imported oil.

Last year, we expressed our concern with this subcommittee over the Department’s fiscal year 2012 budget request that would have terminated or delayed commitments under the SuperTruck program, which focuses on improving heavy-duty truck efficiency. Today, we commend the Department for moving forward to meet commitments to prior awards within the SuperTruck program. We are pleased that the fiscal year 2013 Energy Efficiency and Renewable Energy (EERE) budget request proposes to retain the contracted investments in several key budget activity areas that impact heavy-duty diesel engines, commercial vehicles, and truck efficiency programs.

Because of Well-Established Future Need, Proven Past Performance, and Extended Societal Benefits, Funding for VTPs Including ACE R&D, Fuels, Vehicle and Systems Simulation, Batteries and Electric Drive Technology, and Materials Technologies, and SuperTruck Activities Should Be Retained

The subcommittee again faces a difficult task of setting priorities among many competing programs with limited resources. The subcommittee should seek to assure a proper balance between fully funding programs that are known to improve efficiency of existing energy-intensive sectors on a medium-term basis as well as more future-oriented, but uncertain other technologies. The current fiscal year 2013 budget request from DOE EERE properly funds those key heavy-duty vehicle programs and projects that bring a proven track record of real-world fuel savings, and we urge that it be retained.

The commercial vehicle research activities have been cross-cutting in scope and shared risk and benefits between DOE, private industry, the Department of Defense (DOD), Department of Transportation and Environmental Protection Agency (EPA). This suite of programs to make commercial vehicles more energy efficient—the 21st Century Truck Partnership and diesel engine and fuel research—have been among DOE EERE’s most successful investments. They are proven to have helped meet important societal goals of economic growth and small business development (economics of more energy efficient commercial truck acquisition and ownership); cleaner air (reducing diesel engine emissions), reduced reliance on imported oil (increasing truck energy efficiency).

They have also enhanced our national security, through contributing to fuel savings of DOD military vehicles. Fuel accounts for 70 percent of the bulk tonnage transported to the battlefield and reducing consumption by 1 percent leads to 6,500 fewer soldier trips, which has been identified with saving lives on the battlefield through reduced risk in transporting fuel.¹

The Need To Reduce Energy Consumption From Commercial Vehicles is Significant

In August 2011, President Obama announced the finalization of the first-ever fuel economy and greenhouse gas (GHG) reduction standards for medium- and heavy-duty commercial vehicles. This new regulation requires vehicle and engine manufacturers to improve efficiency by anywhere from 7 to 25 percent for model years 2014–2017, with the potential for further reductions beyond 2017.

Reaching these challenging goals will require substantial manufacturer investment in the next several years at a time when economic recovery and market potential for heavy-duty commercial trucks has shown some recent positive signs but still remains tentative. More than ever, the combined collaborative approach of the DOE program of shared research toward common energy-saving objectives is needed and necessary to assure continued progress and increase the speed of development, deployment of technologies, and societal benefits.

While manufacturers are already well at work to meet these aggressive and brand new regulatory requirements, continued collaboration and partnership within truck research programs that are funded at the committed levels will enable more rapid development and deployment of these advanced technologies than could have been accomplished without the collaborative government and industry partnership. This translates into greater reductions in energy use and savings to the economy and reduced emissions occurring earlier than predicted as well.

The 21st Century Truck Partnership and Related Research Programs Have Been Recently Reviewed and Found To Be of Significant Value and High Performance

The prestigious National Research Council of the National Academy of Sciences recently conducted an exhaustive review of the government industry partnership program for commercial truck efficiency. In a 2011 pre-publication report,² the independent NAS review panel noted that:

“Given the Federal regulatory requirements to reduce emissions and fuel consumption, it seems the sharing of research and development (R&D) costs between the government and U.S. manufacturers of trucks and buses or heavy-duty vehicle components are appropriate to develop new technologies. Thus, the 21CTP is providing access to the extraordinary expertise and equipment in Federal laboratories, in addition to seed funding that draws financial commitment from the companies to push forward in new technology areas.” (Page S-3)

“The 21CTP should be continued to help meet the nation’s goal of reduced fuel consumption in the transportation sector.” (Page S-3)

“The three (see note) SuperTruck projects will be the flagship projects under the 21CTP for fiscal year 2011 through fiscal year 2014; the goals are in concert with recommendations made in the 2008 NRC Phase 1 report.” (Page S-12)

(NOTE: After the NAS report was drafted, one additional project was added (for a total of four) which falls into the same category as the projects mentioned.)

The existing DOE EERE Commercial Vehicle and Engine Programs have delivered substantial and proven economic, environmental and energy saving benefits:

¹Bochenek, Grace. U.S. Army Tank Automotive Research Development and Engineering Center, 2010.

²Review of the 21st Century Truck Partnership, Second Report, 2012. National Academy of Sciences, National Research Council Pre-publication copy accessed from National Academies Web site March 22, 2012. http://www.nap.edu/catalog.php?record_id=13288 ISBN-10: 0-309-22247-8; ISBN-13: 978-0-309-22247-1.

For every \$1 invested, advanced combustion research delivered \$53 in benefits. According to a May 2010 study³ previous advanced combustion research for laser and optical diagnostics along with combustion modeling undertaken by DOE and now in commercial vehicles on the road today saved 17.6 billion gallons of diesel fuel over a 12-year period (1995–2007); a 4.5-percent savings in fuel consumption over what would have occurred without the program investments. This translates into a monetized saving of \$34.5 billion in 2008 dollars, and reduction of more than 177 million tons of CO₂ prevented.

The established goal of improving fuel economy by 20 percent for commercial vehicles in the ACE R&D has the potential to save more energy than the electrification of 1 million cars. Past investments have contributed to diesel engine manufacturers being able to meet the most stringent emissions standards on record, resulting in today's clean diesel technology with near zero emissions of ozone forming compounds (nitrogen oxides) and particulate matter. The total health and environmental benefits in terms of savings in air pollution and energy savings exceed \$70 billion according to the previously referenced May 2010 study.

Fully Funding Commercial Vehicle Research Budgets Assures Continued Gains and That Will Help Expedite Fuel-Saving Technology Development and Deployment

Given the substantial progress made in the 21st Century Truck Program, a framework of continuous progress has been developed over time that is a predictive indicator of potential future success. Adequate DOE program funding can assure that the commercial vehicle, engine, and SuperTruck program goals of 50 percent increase in freight efficiency (ton-miles per gallon) will be more likely to be met. Truck and engine manufacturers face the unique challenge of competing societal demands of improved efficiency and near-zero emissions while meeting customer demands for lowest cost of operation. Significant investments in research are required but there are diminishing opportunities to recoup the substantial investments needed to meet these goals with only an average 200,000–250,000 heavy-duty trucks sold annually. Federal research investment in high-risk research is vital to the industry. DOE R&D programs are usually a 50–50 cost share between government and industry and this Federal match encourages companies to spend their R&D dollars in the United States. A fully funded SuperTruck program can assure these goals are more likely to be accomplished earlier than if companies alone shoulder larger research demands.

CONCLUSIONS

There is an incontrovertible and established need to improve energy efficiency of the Nation's commercial vehicles. Commercial diesel-powered trucks are the backbone of the U.S. economy and the prime movers of the Nation's goods movement system, and will be for the foreseeable future. Fuel consumption in this sector is projected to continue to grow with the economy. Past EERE engine and vehicle efficiency programs have delivered substantial and well-documented economic, energy and environmental benefits to society. To assure uninterrupted progress of these efforts, we urge that the subcommittee retain the proposed fiscal year 2013 budget request for the committed levels of SuperTruck and related program funding.

An adequate Government funding stream for the suite of VTPs like SuperTruck and the ACE R&D, Fuels Technologies, Batteries and Electric Drive Technologies, Vehicle and Systems Simulation, and Materials must be retained at DOE requested levels to assure continued progress and accelerate development and deployment of energy saving technologies. Any reductions to the fiscal year 2013 EERE proposed funding will jeopardize continued progress at an especially critical time as the industry moves to meet new GHG emissions and fuel efficiency goals, near-zero emissions levels along with competing customer demands with the backdrop of a weakened and recovering economy.

The diesel engine is the prime mover of America's transportation, infrastructure, and goods movement today and for the foreseeable future. The 21st CTP has made substantial contributions to the new near-zero emissions performance of diesel engines in commercial trucks and with the continued investments will assure further efficiency gains to meet future societal goals.

We appreciate the opportunity to file these comments.

³Link, Albert N. Retrospective Benefit-Cost Evaluation of U.S. DOE Vehicle Combustion Engine R&D Investments, Department of Economics, University of North Carolina at Greensboro; May 2010.

PREPARED STATEMENT OF THE EDISON ELECTRIC INSTITUTE

The Edison Electric Institute (EEI) respectfully submits this written testimony for the record to the Senate Appropriations Subcommittee on Energy and Water Development. We appreciate this opportunity to share our views on some of the Department of Energy's (DOE) programs for the fiscal year 2013.

EEI is the association of U.S. shareholder-owned electric companies. Our members serve 95 percent of ultimate electricity customers in the shareholder-owned segment of the industry and represent approximately 70 percent of the U.S. electric power industry.

EEI has long advocated for an "all-of-the-above" energy strategy. Different regions of the country use different fuel mixes to generate electricity. Embracing a diverse and balanced energy portfolio is crucial to reliable, affordable electricity. Therefore, we respectfully ask the subcommittee to direct sufficient resources toward these critically important activities.

FOSSIL ENERGY

As the administration notes in its Office of Fossil Energy budget request, "the United States has 25 percent of the world's coal resources, and fossil fuels currently supply over 90 percent of the Nation's energy". Accordingly, EEI urges the subcommittee to ensure that fossil energy research, development, and demonstration (RD&D) receive as much funding as possible under the tight budget constraints of the subcommittee's allocation. We further urge the preservation and funding of fossil fuel loan guarantee authorities pending completion of the Section 1703 Program review by the U.S. Department of Treasury.

EEI urges strong support for carbon capture and storage (CCS) and advanced coal technology programs. Just this week, the Environmental Protection Agency (EPA) issued a proposal that effectively would require CCS on new coal-fired power plants, even though the technology is not commercially viable. CCS commercialization is still in the future, but demonstration technologies hold great promise, and we are working with the Congress and the administration to develop policies that will accelerate commercial availability and deployment. Coal is an important domestic energy resource; given this recent EPA rulemaking, commercially available CCS technologies are essential for coal to be a viable part of a diverse and balanced electric generation portfolio.

In addition to coal, EEI strongly advocates for adequate funding of policies that allow the ready access to affordable natural gas for electric generation, including environmentally responsible development of shale resources by the gas industry throughout the United States. Natural gas is an increasingly important source for electric generation, especially given its availability and low prices. As a result, our industry is a strong proponent of developing our natural gas resources.

NUCLEAR ENERGY

Given that nuclear energy is the Nation's largest source of carbon-free electricity production, and that construction of new plants will create tens of thousands of jobs, EEI urges strong support for the nuclear power loan guarantee program. Under DOE's implementation, participating borrowers pay the entire credit subsidy costs, making this program different from other loan programs administered by the Department.

EEI respectfully requests the subcommittee to oppose DOE's imposition of its decontamination and decommissioning tax on electric utilities for the cleanup of uranium enrichment facilities. As in past years, the administration is seeking this tax under a program in which the industry has already met its financial obligations while the Federal Government failed to pay its required share of the cleanup funds.

EEI strongly supports nuclear R&D, including funding for the Energy Innovation Hub on modeling and simulation of advanced nuclear reactor operations. In addition to this essential investment, we urge funding for the acceleration of technology development and commercialization of small modular nuclear reactors (SMRs). EEI supports DOE's announced cost-shared program with private industry to support SMR design and licensing.

ELECTRIC TRANSPORTATION

The need for fuel diversity carries over into the transportation sector, where plug-in electric vehicles (PEVs) give Americans the choice to fill up at the pump or recharge their battery at home. Using domestically produced electricity to fuel a range of both on-road and off-road transportation uses has the potential to transform our Nation's transportation fleet. Electric transportation funding will help our

country reduce its dependence on foreign oil, thereby increasing our Nation's energy security.

EEI supports the DOE's Clean Cities program, which has brought together thousands of stakeholders in States across the Nation to support the deployment of alternative fuel vehicles and infrastructure. We are also supportive of the recently announced EV-Everywhere program, which will bring down the cost of batteries, charging infrastructure and electric vehicles so they are affordable for more families.

In 2011, according to the Oil Price Information Service, Americans spent more than \$480 billion on gasoline, paying an average of more than \$3.50-per-gallon, both record amounts. Already this year, gas prices are more than \$4-per-gallon in many cities. Electrifying the Nation's light-duty vehicle fleet, which accounts for roughly 45 percent of total U.S. oil consumption, would reduce oil imports by more than 3 million barrels per day in 2030.

Another benefit of electric transportation is that real electricity prices historically have been more stable than real prices for both gasoline and natural gas. Electricity is produced domestically, using a wide variety of energy resources, which contributes to its greater price stability. Unlike oil and gas, electricity does not experience price volatility due to political instability or changes in the global markets.

SMART GRID

EEI urges robust funding of DOE's efforts to continue the deployment and commercialization of smart grid technologies. Research and development are also keys to accelerating America's shift to an information-enabled electricity grid. Modernizing the grid will increase operational efficiency, improve reliability, and provide more control and situational awareness both for utilities and their customers.

More than 90 percent of EEI's members are involved in grid modernization activity. As of September 1, 2011, electric utilities in more than 43 States have installed 27 million digital smart meters. Sixty-five million smart meters—covering 54 percent of U.S. households—are expected to be deployed by 2015.

DOE's smart grid program is a public-private partnership. To date, DOE funding has been matched by contributions of more than \$5.5 billion from the private sector. In a time of large budget deficits, the subcommittee must ensure that funds are used to the greatest effect. We respectfully request that the subcommittee continue its support of these investments to achieve substantial cost savings and security in the Nation's grid.

ENERGY INNOVATION HUBS

EEI supports essential funding for DOE's Energy Innovation Hubs. Each of these Hubs will speed research and shorten the path from technological development to commercial deployment of highly promising energy-related technologies. Specifically, we support the Cyber Security Energy Delivery Systems Hub that conducts R&D activities addressing vulnerabilities within the Nation's electricity delivery system to reduce risk of energy disruptions due to cyber attacks. In addition, we support the Energy Efficient Building Systems Design Hub and the Battery/Energy Storage Hub, which will develop utility-sited energy storage as well as new batteries with improved lifetimes and strong capacities for expanding the range of electric vehicles while decreasing manufacturing cost.

For fiscal year 2013, in particular, we support funding for DOE's proposed Electricity Systems Hub. This new Hub would bring together a multidisciplinary team of researchers to address barriers to modernization, both short-term and long-term, at critical points in the various regions. Establishing this Energy Innovation Hub is important to facilitating and accelerating the process of integrating power flows, information flows, markets, and regulation in a way that complements grid modernization and other ongoing efforts. More importantly, the Hub approach will promote technological innovation and, ultimately, lower electricity costs through better utilization of utility assets.

TRANSMISSION AND RENEWABLE ENERGY

New transmission lines are increasingly needed to maintain reliability and relieve congestion. However, obtaining regulatory approvals for new facilities is a complex process, and often leads to costly delays, particularly when siting involves Federal lands.

EEI supports the administration's efforts to improve Federal coordination and ensure timely review of proposed renewable energy projects and transmission lines through the formation of two interagency Rapid Respond Teams, one for transmission and one for renewables.

The Rapid Respond Team for Transmission would accelerate the permitting review of seven proposed transmission lines that cut through 12 States. These projects will help increase electric reliability, integrate renewable energy projects and create thousands of jobs. In Pennsylvania and New Jersey, for example, PPL Electric Utilities (PPL) and Public Service Electric and Gas Company (PSE&G) have proposed a power line project which includes an approximately 145-mile long 500-kV transmission line from the Susquehanna Substation in Pennsylvania to the Roseland Substation in New Jersey, and several substations in both Pennsylvania and New Jersey. The project is expected to be in service in the spring of 2015, creating more than 2,000 new jobs in these two States alone.

PREPARED STATEMENT OF THE ELECTRIC DRIVE TRANSPORTATION ASSOCIATION

The Electric Drive Transportation Association (EDTA) is the cross-industry trade association promoting the advancement of electric drive technology and electrified transportation, and we are writing regarding the fiscal year 2013 request for the Department of Energy's (DOE) Vehicle Technologies and other electric drive programs.

Our members represent the entire value chain of electric drive, including vehicle manufacturers, battery and component manufacturers, utilities and energy companies, and smart grid and charging infrastructure developers. Collectively, we are committed to realizing the economic, national security, and environmental benefits of displacing oil with hybrid, plug-in hybrid, battery, and fuel cell electric vehicles.

Since we import nearly 50 percent of the oil used in the transportation sector— at a cost of more than \$1 billion per day—there is a strategic and economic imperative to move toward domestically generated electricity as an alternative to oil. The need is already clear to families and businesses paying almost \$4 gallon (and in some places more) for gasoline and diesel fuel today. Energy Information Administration (EIA) projects barrel prices more than \$100 through 2013. Over the longer term, increasing global demand will put even great upward pressure on prices. The implications for the economy are also clear: every \$10 per barrel increase costs the economy approximately \$75 billion.

Electric drive vehicles are being introduced into the market place in numerous configurations, including passenger cars, commercial trucks, buses, tractors, and ground support equipment. For instance, more than a dozen plug-in electric drive vehicles will be on sale by the end of 2012. These vehicles can provide substantial fuel savings and reduced emissions while contributing to our energy and economic security. Federal support for research, development and deployment can accelerate achievement of those benefits.

The American Energy Innovation Council, a group of U.S. industry leaders working to “foster strong economic growth, create jobs in new industries and re-establish America’s energy leadership” concluded in their 2011 report that Federal participation in energy innovation was imperative because “ready access to reliable affordable forms of energy is not only vital for the functioning of the larger economy, it is vital to people’s everyday lives and significantly impacts the country’s national security and environmental well-being”.

The Department’s Vehicle Technologies program promotes innovation in transportation through public/private partnerships and it leverages private sector investments. Working with the diverse stakeholders of the electric drive industry, DOE is helping to accelerate technology breakthroughs, promoting investment in manufacturing capacity and speeding deployment of electric drive vehicles and infrastructure.

We support the goals of the proposed EV Everywhere grand challenge to bring down electric vehicle costs and increase electric range and fast charging capability through expanded research in batteries and power electronics, electric drive motors and components, and advanced charging technologies. Specifically, we support the requested increase for Batteries and Electric Drive Technology and Vehicle and Systems Simulation and Testing activities that are advancing next generation charging, systems integration, and codes and standards for vehicle to grid communication.

The Vehicle Technologies program also conducts critical research and development activities to advance electrification of the medium- and heavy-duty fleet, including hybrid, plug-in hybrid, battery, and fuel cell electric trucks and buses. Electric drive in the commercial and transit fleet has great potential for fuel savings and emissions reductions: putting just 10,000 hybrid electric trucks to work would reduce diesel fuel use by 7.2 million gallons per year and reduce air pollutants and carbon dioxide emissions by 83,000 tons. We ask that the subcommittee direct meaningful

resources toward program activities, including work with industry partners, to reduce component costs and further enhance performance.

Fuel cell vehicles are also critical assets in the advanced vehicle portfolio. Fuel cell cars, trucks and nonroad vehicles will provide “zero emission/zero petroleum” options that are integral to meeting national goals for energy security and reduced pollution. The budget request points out that foreign industries are growing rapidly and that “sustained support of the [Hydrogen and Fuel Cell] program and continued progress toward its goals help enable the U.S. to maintain leadership in fuel cell manufacturing and hydrogen production technology. Success of the program will also support domestic employment and economic growth as well as increase our options for clean power”.

The industry is meeting aggressive cost, performance and deployment milestones as it pushes toward commercialization in 2015. The ongoing partnership with DOE has already yielded substantial component cost reductions including reducing the cost of automotive fuel cells by more than 30 percent and doubling their durability. The industry is pushing vigorously toward commercialization in 2015. Specifically, we ask that funding for fuel cell electric vehicles and infrastructure deployment activities in Technology Validation and in early market development, including education and other testing and enabling activities, be provided at levels sufficient to enable the industry to build on technology and market achievements to meet 2015 commercialization targets.

Finally, we strongly support the Department’s deployment programs, including Clean Cities’ work with local and regional coalitions to expand deployment of electric drive vehicles (hybrid, plug-in hybrid, battery, and fuel cell electric vehicles), other alternative fuel vehicles, and recharging/fueling infrastructure as a path to increased energy security. These efforts have a demonstrated record of success and we support expansion of these partnerships and allocation of additional resources for communities deploying electric drive vehicles and recharging infrastructure.

Acknowledging the material budgetary constraints that the subcommittee faces, we respectfully request that the Committee direct the resources to the DOE’s electric drive programs that are proportionate to the cost of our foreign oil dependence and that will enable the Department to build on its success, in partnership with the private sector, in accelerating the achievement of a secure and sustainable transportation sector.

We thank you for your consideration.

PREPARED STATEMENT OF THE FEDERATION OF AMERICAN SOCIETIES FOR
EXPERIMENTAL BIOLOGY

The Federation of American Societies for Experimental Biology (FASEB) respectfully requests a fiscal year 2013 appropriation of \$5.1 billion for the Department of Energy Office of Science (DOE SC). As you know, DOE SC funding in recent years has failed to reach the levels authorized in the America COMPETES Acts of 2007 and 2010. FASEB’s broader goal is to support sustainable growth and a return to a funding trajectory reflective of the COMPETES reauthorization.

As a federation of 26 scientific societies, FASEB represents more than 100,000 life scientists and engineers, making it the largest coalition of biomedical research associations in the United States. FASEB’s mission is to advance health and welfare by promoting progress and education in biological and biomedical sciences through service to its member societies and collaborative advocacy. FASEB enhances the ability of scientists and engineers to improve—through their research—the health, well-being, and productivity of all people.

DOE SC is the lead Federal agency supporting fundamental energy research and the Nation’s largest supporter of basic research in the physical sciences. In addition to supporting research at more than 300 universities and institutions in all 50 States, DOE SC funds and manages 10 world-class national laboratories. Research and development user facilities located at these national laboratories provide more than 26,000 researchers with access to particle accelerators, advanced light sources, supercomputers, and other state-of-the-art instrumentation. The large-scale scientific tools at DOE SC facilities serve as invaluable resources to academic and government scientists, and they are also critical to the research and development capabilities of more than 40 Fortune 500 companies, including Exxon Mobil, Ford Motor, Boeing, and Pfizer.

A source of abundant, safe, and sustainable energy is essential for the Nation’s future, and fundamental research supported by DOE SC provides the basis for discovering new energy technologies that can replace fossil fuels and reduce U.S. dependency on foreign oil. DOE SC-funded scientists and engineers are also making

extraordinary discoveries in other areas of energy research that improve health, protect the environment, create economic opportunities, and strengthen national security. For example, a team of DOE SC-funded scientists have determined that certain bacteria can help facilitate the cleanup of toxic uranium particles by converting them to forms easily collected from the environment. Understanding the process by which these bacteria interact with materials is important for increasing and improving their use in contamination removal techniques. Other researchers supported by DOE SC have identified the gene that controls ethanol production in a well-studied microorganism, a breakthrough that could expand the availability of biofuels and reduce reliance on imported energy sources. Discovery of a single gene responsible for ethanol production allows scientists to begin engineering more efficient biomass crops and microorganisms capable of generating higher ethanol yields at reduced costs.

In addition to its strong research programs, DOE SC supports user facilities that benefit the entire research community by providing unparalleled scientific and technological capabilities. For example, powerful xray light sources at DOE SC-supported national laboratories were used by the pharmaceutical company Plexxikon to develop a new drug treatment for malignant melanoma, the deadliest form of skin cancer. In this instance, scientists used the bright light sources to determine the molecular structure of a mutated protein, enabling the design and optimization of a drug to prevent the uncontrollable spread of cancer cells. Researchers from the life sciences community account for almost 40 percent of all researchers using the DOE SC Basic Energy Sciences light source facilities, many of which are studying proteins involved in other diseases such as Alzheimer's disease, bird flu, and hepatitis. The number of researchers using DOE SC facilities grew from 20,241 in fiscal year 2007 to 25,876 in fiscal year 2010, an increase of 27.8 percent. In recent years, the agency's funding has failed to keep pace with the growing demand for user facility access.

DOE SC instrumentation and technical expertise make efficient use of precious research resources, bringing researchers across the Nation access to cutting-edge technologies without duplication or prohibitive cost to institutions. The agency's national lab system advances strategic national goals and creates a research infrastructure unlike any other in the world. With its crucial mission, national labs, and unique scientific facilities, investment in DOE SC programs should be one of our highest research priorities. Now is the time to provide robust Federal funding for DOE SC to support the fundamental energy research required to overcome the Nation's most pressing challenges.

Thank you for the opportunity to offer FASEB's support for DOE SC.

PREPARED STATEMENT OF THE FERMI NATIONAL ACCELERATOR LABORATORY

We are the Executive Committee of the Users Organization of the Fermi National Accelerator Laboratory (Fermilab), located outside of Chicago, Illinois. We represent the approximately 3,000 scientists who perform research at Fermilab—our country's premier particle-physics laboratory. Also known as high-energy physics (HEP), our field is the study of the fundamental particles that are the building blocks of the universe, as well as their role in astrophysics, and the accelerators used in their study.

Eight U.S. national laboratories are actively engaged in HEP research. They operate facilities used by scientists and students from hundreds of U.S. universities, from other national laboratories, and from dozens of foreign institutions. Of these laboratories, Fermilab is the only one that is dedicated exclusively to HEP.

The Department of Energy (DOE) Office of Science supports HEP research at U.S. national laboratories and universities. More than 160 U.S. institutions in 43 States host physicists, astrophysicists, engineers, and accelerator scientists who work in HEP. More than one-half of these institutions are funded through the DOE Office of Science.

We urge the Senate to support sustained funding for fundamental science within the DOE Office of Science. We request that the portfolio of funding for fundamental research be balanced. HEP research is a key part of these programs and yields valuable benefits to our Nation as described below.

Our field is undergoing a transition, Fermilab's Tevatron accelerator program having come to a conclusion in 2011 after an extremely successful three decades. New programs are underway or just beginning that will provide the basis for vibrant, world-class research at Fermilab for the next several decades. This transition is a critical time for our field in the United States and requires sustained funding in order to maintain our role in world HEP research.

IMPACT OF BUDGET CUTS

Continued funding of science research is critical to our Nation. Severe budgetary cuts will have devastating effects that will be felt for decades. Science opportunities will be delayed or lost to other nations. Our reputation as the place to be for the best and brightest will be damaged.

We are therefore pleased that the administration's request for fiscal year 2013 includes a modest increase for the DOE Office of Science. However, we are concerned about the cuts for Fermilab included in that request: \$30 million, or approximately 8 percent. This will require layoffs or furloughs. A large Fermilab project that will be key to sustaining our field in the United States over the next decade, the Long-Baseline Neutrino Experiment (LBNE), will be delayed. Such projects are critical to the near- and medium-term future of the laboratory and the U.S. HEP program.

The proposed cuts come at a time when Fermilab has closed the Tevatron program, resulting in cuts in fiscal year 2012 as well. This was done in order to consolidate resources so as to focus on new projects, especially LBNE. The resulting savings ought to be reinvested at Fermilab, in order to maintain the United States' pre-eminent HEP facility at the forefront of world HEP.

The largest and longest-lasting impact will be in our training of the next generation of scientists. Significant cuts will force us to train fewer students. They will demoralize our current students and post-docs, and some will quit. And we will no longer attract the best students. It will take a long time to recover from even a short-term cut to funding. These young people will be the foundation on which our economic growth depends. Without the advanced training offered by fields such as HEP, they will lack the skills to develop the next technology or the next new industry. Or they will be trained in other countries, and that innovation will occur overseas. It is critical that we remain attractive to United States and foreign students now and in the future.

VALUE OF HIGH-ENERGY PHYSICS RESEARCH

In our modern economy, science and technology (S&T) drive growth, as detailed in the National Academies' report, "Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future", its 2010 update, *Rising Above the Gathering Storm Revisited*, the recent book, *Knowledge and the Wealth of Nations*, and many other publications. Continued leadership in S&T fields is critical to our economic growth, national security, and position vis-à-vis the rest of the world. Innovation by a highly trained workforce is key.

Without new technological developments within the United States, our economy will not grow and other countries will surpass us. But the most revolutionary technologies often require revolutions in our fundamental knowledge and understanding, or are invented in the research struggle of our most talented minds in pursuit of testing, measuring, and understanding new ideas and concepts. As an example, no one could have predicted the nature of our current society from the first studies of the electron at the dawn of the 20th century; however, we would not be communicating via email, fax, cellphone, or text messages without them. It has also famously been said that the light bulb could not have been invented by incremental improvements to the candle! Revolutionary technologies arise from new ways of thinking about society's problems—often derived from new experiments that ask new questions that cannot be answered using existing technology.

HEP strives to understand the most fundamental aspects of nature. While we can rarely predict the outcome, the quest for such knowledge has always led to numerous technological advances, a few of which are described below. What is predictable, is that we will educate and train some of the best and brightest students, who will contribute to our Nation in many different arenas.

VALUE OF TECHNOLOGY DEVELOPMENT

While the primary purpose of HEP research is not the creation or development of new technology, our work often requires it in order to accomplish our goals. Many of our experiments require technology that does not exist before the project is undertaken. Therefore, many of our researchers spend a significant part of their careers advancing high-tech particle detectors, developing complex computing algorithms, inventing new kinds of particle accelerators, or pushing the limits of high-speed electronics. Without continuous innovation, we would not be able to complete our experiments. And once these advances are made, they are often used in fields as diverse as medicine, materials research, and manufacturing.

An example is the construction of the Fermilab Tevatron accelerator, which reigned as the world's most powerful device of its kind for nearly three decades. It

required more than 1,000 superconducting magnets, placed around a 4-mile ring. Creating superconducting magnets requires superconducting wire. At the start of the project in the 1970s, it was known how to make such wire, but the industry needed in order to make it on a large scale did not exist. Fermilab researchers helped to build up that industry and advance its production techniques through a very successful joint government/business venture. Once the accelerator was complete in 1983, these businesses looked around to see what other projects could use superconducting wire. MRI machines that are now commonly used for medical imaging are an example. Because of the work of Fermilab in building the Tevatron, starting in the 1980s, commercial MRI scanners have now become widespread.

A current experiment led by Fermilab scientists is the Dark Energy Survey (DES). This requires a digital camera larger than any ever built. Its technological developments will ultimately influence the digital cameras available at your local electronics store as well as devices no one has yet dreamed up. A current research and development (R&D) effort by a university/national laboratory collaboration is inventing new, cost-effective particle detectors with unique power to resolve events on the picosecond (trillionth-of-a-second) time-scale. These will also doubtless lead to new industrial, research, and medical applications.

High-energy physicists have invented particle accelerators and continue to steward their development. Our work requires the most powerful particle accelerators that can be built. However, thousands of smaller accelerators are now used in many areas of technology. Of more than 30,000 particle accelerators throughout the world, only a small fraction are dedicated to HEP. Most are used by industry or for medical treatment and diagnosis. The tire industry, for example, now uses particle accelerators to treat their tires, reducing both the amount of rubber needed (by 3 pounds per tire) and the amounts of chemicals used in the production process. This industry is both more efficient and better for our environment because of the application of particle accelerators. This success was unanticipated in the early days of accelerator development. Industrial accelerator applications now range from the manufacture of shrink-wrap plastic to the processing of industrial coatings and automobile parts.

VALUE OF SCIENCE EDUCATION

The United States has long been the destination of choice for the best science students from around the world. Our universities provide an education that is second to none. Our national laboratories provide research opportunities that are unavailable elsewhere. Fermilab is an excellent example of this. Numerous students from foreign institutions travel to Fermilab to complete their research. Many of these students then choose to stay in the United States after completing their degrees.

Our students learn a variety of skills that are applicable in numerous fields. They learn to work on problems to which the answer is unknown and to adapt to unforeseen challenges. They learn skills in computer programming, data analysis, simulation of complex problems, and electronics development, among others. They learn to work in teams as members of international collaborations, finding innovative solutions to challenging problems. They learn how to take a project from start to finish, write a document detailing it, and present it to an audience. The complex analytical thinking necessary to solve problems in fundamental science can't be taught in a classroom, but is nonetheless crucial for solving problems in business and industry in the 21st century.

Many of our students choose to continue their immediate careers as postdoctoral associates. This provides a postgraduate education that further develops their skills. , docs generally take on more complex projects and develop leadership and management skills. Most HEP experiments involve 20 to 2,000 scientists and face challenges that are similar to those in many businesses.

Scientists trained in HEP work in telecommunications, software development, aerospace, education, medicine, government, and finance, to name a few. About 90 percent of our Ph.D. students enter new fields. Private businesses are the largest and most diverse employers of scientists trained in high-energy physics. Several former HEP researchers have founded or led small and large companies, including Richard Wellner, chief scientist at Univa UD, a cloud management software company; Francisco Vaca, CEO of Vaca Capital Management LLC; George Coutrakon, former director of operations at Loma Linda University Medical Center and now technical director of the Northern Illinois Proton Treatment and Research Center; Homaira Akbair, CEO of SkyBitz, a satellite-based tracking company; Rolland Johnson, founder and president of Muons, Inc., an accelerator R&D company; and Nagesh Kulkarni, CEO of Quarkonics Applied Research Corp., a business and technology consulting company.

Our researchers are engaged in education at all levels and understand the importance of scientific literacy in our society. For example, hundreds to thousands of public lectures are given around the country by high-energy physicists each year. Our scientists visit local schools to share the excitement of science through physics demonstrations or presentations of their work. The QuarkNet program, funded through the National Science Foundation, trains K–12 teachers in 28 States in cutting-edge research that they can take into the classroom. More than 38,000 students attend Fermilab education activities each year.

SUMMARY

Scientific research in general, and HEP in particular, provides value to our Nation that will be lost without sustained funding from the U.S. Government. The knowledge that is gained will lead to future innovation that will maintain our world-class scientific capabilities. The path to that knowledge will lead to advances in technology that will help sustain our economic recovery. And the education of students from the United States and abroad will provide the knowledgeable workforce that will carry us through the next half-century.

It is critically important to maintain our world-class position in scientific research. The repercussions of severe cuts will be felt for a long time. We urge the Senate Appropriations Committee to support the President's request to maintain our scientific research program for the long-term health of the Nation, and to restore funding to HEP and priority projects at Fermilab in order to reinvest in this core discovery scientific discipline.

PREPARED STATEMENT OF THE GAS TURBINE ASSOCIATION

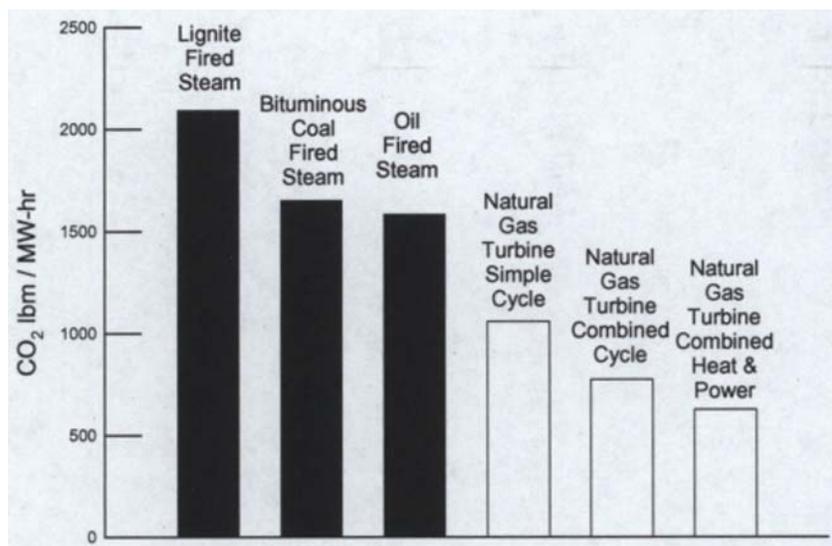
The Gas Turbine Association (GTA) appreciates the opportunity to provide the United States Senate Committee on Appropriations Subcommittee on Energy and Water Development with our industry's statement recommending fiscal year 2013 funding levels for the Department of Energy (DOE).

GTA respectfully recommends that the fiscal year 2013 appropriation for DOE Office of Fossil Energy include \$20 million for the Hydrogen Turbines Program to meet critical national goals of job creation, fuel conservation, greenhouse gas reduction, fuel flexibility (including syngas and hydrogen), and criteria pollutant reduction. A spending level of \$20 million is more appropriate than the administration's recommendation \$12.6 million considering that the fiscal year 2012 spending level was \$14.6 and years of under-funding for Gas Turbine Technologies is resulting in our Nation's loss of leadership in this important industry. A spending level of \$12.6 million will result in pushing out the timeline for the development and deployment of environmentally advanced gas turbines by several years.

Federal investment in research and technology development for advanced gas turbines that are more efficient, versatile, cleaner, and have the ability to burn hydrogen-bearing reduced carbon synthetic fuels and carbon-neutral alternative fuels is needed to ensure the reliable supply of electricity in the next several decades. Japan and China are quickly moving into leadership positions in this industry which in the United States has been responsible for hundreds of thousands of research and development (R&D), engineering, manufacturing and field service jobs for the past 75 years. Japan is consistently investing more than \$80 million per year, and China has recently announced an indigenous F class gas turbine (F class represents 50 percent of the gas turbine market). If our Nation continues to underfund research and development efforts in gas turbine technology, the resulting loss of jobs and U.S. technology will be long-term and possibly permanent.

We believe that a modest Federal investment in future gas turbine technologies will be repaid many times over in reduced electricity costs, increased flexibility and increased reliability for our Nation's consumers. In addition, we believe that additional funding should be directed at encouraging university based research that will "jump-start" the careers of future engineering graduates in the gas turbine industry.

The gas turbine industry's R&D partnership with the Federal Government has steadily increased powerplant efficiency to the point where natural gas fired turbines can reach combined cycle efficiencies of 60 percent, and quick-start simple cycle peaking units can reach 46 percent. The gas turbine's clean exhaust can be used to create hot water, steam, or even chilled water. In such combined heat and power applications, overall system efficiency levels can reach 60 to 85 percent lower heating value (LHV).

CO₂ EMISSIONS

Gas turbines are both more efficient and typically burn lower carbon fuels compared to other types of combustion-based power generation and mechanical drive applications. The Nation needs to reinvigorate the gas turbine industry/government partnership in order to develop new, low-carbon powerplant solutions. This can be done by funding research to make gas turbines both efficient and more capable of utilizing hydrogen and synthetic fuels as well as increasing the efficiency, durability and emissions capability of natural gas fired turbines. If the Congress provides adequate funding to DOE's turbine R&D efforts, we believe technology development and deployment will be accelerated to a pace that will allow the United States to achieve its emissions and energy security goals.

GTA respectfully requests \$20 million in fiscal year 2013 appropriations for the Fossil Energy Hydrogen Turbines Program to meet critical national goals of job growth, fuel conservation, fuel flexibility (including natural gas, syngas and hydrogen), greenhouse gas reduction, and criteria pollutant reduction.

PREPARED STATEMENT OF GE ENERGY

OVERVIEW

The following testimony is submitted on behalf of GE Energy (GE) for the consideration of the subcommittee during its deliberations regarding the fiscal year 2013 budget requests for the Department of Energy (DOE). GE recognizes that particularly difficult choices must be made in fiscal year 2013. These budget pressures make it essential that the subcommittee prioritize those programs that will contribute to economic growth and jobs creation and support core technology development. GE recommends:

- in the Fossil Energy program, increased investment in pre-combustion carbon capture and gasification systems;
- in Energy Efficiency and Renewable Energy, full funding of the budget requests for solar and wind technologies;
- in Electricity Delivery and Energy Reliability, full funding of the budget request for research and development; and
- in Nuclear Energy, full funding for the Small Modular Reactor Licensing Technical Support program and additional amounts for research and development (R&D) in Advanced Reactors Concepts and Small Modular Reactor Advanced Concepts.

FOSSIL ENERGY

Coal Program: Carbon Capture, Pre-Combustion Capture

GE is concerned that the funding reductions proposed in gasification systems and pre-combustion carbon capture will negatively affect programs that are critically important to the future of power generation from coal. These programs are on the path to improve the cost and performance of Integrated Gasification Combined Cycle (IGCC) technology to enable IGCC to be a cost-competitive option for low-carbon power generation.

IGCC is capable today of achieving the emissions standards of the Environmental Protection Agency (EPA) mercury and air toxics standards and new source performance standards for new coal plants without additional R&D. Compared with conventional coal plants, IGCC consumes less water, produces useful coal byproducts, and can co-produce valuable transportation fuels and chemicals that reduce oil imports. With its proven, pre-combustion carbon capture, IGCC also provides CO₂ useful for enhanced oil recovery (EOR) at lower cost compared to combustion coal technology.

GE therefore recommends that fiscal year 2013 funding for Carbon Capture: Pre-combustion Capture be increased by \$6 million to \$17.4 million. This increased funding is needed to:

- continue key programs that have met their early goals;
- develop alternative capture processes; and
- provide for new competitive solicitations.

GE also recommends that fiscal year 2013 funding for Advanced Energy Systems: Gasification Systems be increased by \$5.7 million to \$37.6 million. This increased funding is needed to support the next phase of R&D focused on reducing IGCC cost, increasing performance and improving availability.

Clean Coal Power Initiative

The Clean Coal Power Initiative (CCPI) is the key vehicle for commercial validation of technology emerging from the DOE R&D programs and from industry. Current CCPI projects are supporting first generation gasification and IGCC technology. DOE has not announced plans for a future CCPI solicitation. GE recommends that DOE move forward with the development of a CCPI-4 solicitation in preparation for the commercial demonstration of second-generation technologies, and that a modest level of funding for this solicitation be provided in fiscal year 2013. A CCPI-4 solicitation should focus on demonstration of technology that is specifically optimized for EOR so as to provide a revenue stream that will reduce the operating cost impact that could be a deterrent to cost-share participation by industry.

Advanced Energy Systems, Hydrogen Turbines

According to the DOE's 2011 performance report, the advanced turbine program has made consistent progress toward fully mitigating the cost and performance penalty associated with carbon capture. The funding reductions proposed in the fiscal year 2013 budget request will:

- delay completion of Phase II development;
- curtail Phase III implementation and prototype validation; and
- significantly scale back important university research.

GE, therefore, recommends that fiscal year 2013 funding for Advanced Energy Systems: Hydrogen Turbines be increased to \$20 million. This amount would still represent a 33 percent reduction from the fiscal year 2011 funding level, but would better balance program needs and accomplishments.

Water Management

Large amounts of water are needed to produce or extract energy, and large amounts of energy are needed to treat or transport water. EPA is preparing to finalize its proposed rules for cooling water intake structures under section 316(b) of the Clean Water Act, which underscores the important linkage between water use and energy generation. In addition, CO₂ capture can increase raw water usage by up to 125 percent, depending on the underlying technology. DOE has set aggressive goals of reducing freshwater withdrawals and consumption 50 percent by 2015 and 70 percent by 2020. Federal support for water-related R&D is necessary if these goals are to be reached. Unfortunately, the fiscal year 2013 budget does not contain any new funding for Water Management activities within the fossil energy program.

GE believes that Federal investment in R&D for innovative water reuse technologies and demonstration projects is warranted. In addition to R&D focused on cooling tower blowdown water reuse, Flue Gas Desulphurization wastewater reuse and recovery, and ash pond solids reduction, treatment and reuse of source water for and flowback/produced water from unconventional oil and natural gas production would further reduce environmental impacts and operational costs of upstream en-

ergy processes. Advancement of reuse/treatment technologies for the conversion of impaired wastewater streams into renewable water sources in areas of water scarcity could reduce the need to use energy to transport water over long distances and to support electricity generation.

ENERGY EFFICIENCY AND RENEWABLE ENERGY

Wind

GE supports full funding of the DOE's fiscal year 2013 request for wind energy. The cost of wind energy has declined significantly in recent years due to technological advances and manufacturing scale, both of which have benefited from past DOE R&D support. However, the decline in the price of natural gas generation accentuates the need for continued technological advances to support wind affordability and reliability. DOE funding support is critical for catalyzing next-generation innovations in both onshore and offshore wind. Related work in wind resource assessment and system integration will further enable higher levels of wind deployment and penetration.

Solar

GE supports full funding of the DOE's fiscal year 2013 request for solar energy. DOE research programs have been central to recent cost declines in solar electricity, and the SunShot Initiative to achieve cost-competitiveness with other electricity sources is both ambitious and necessary. While solar cost-competitiveness will not be accomplished through DOE funding support alone, the Government can play an essential role in leveraging additional industry and university research. GE also welcomes the PV Program's focus on lowering costs through conversion efficiency and manufacturing process improvements, as well as the overall program's investigation of balance-of-system issues.

Fuel Cells

R&D is required to develop advanced fuel cell technologies to drive efficiency to make this technology more commercially viable. Research into combined cycle technologies using fuel cell and aero derivatives or natural gas reciprocating engines is needed to achieve efficiency goals of 90 percent or greater.

ELECTRICITY DELIVERY AND ENERGY RELIABILITY

Research and Development

GE supports the fiscal year 2013 budget request for OE Research and Development. R&D on grid modernization technologies will advance reliable, affordable, efficient, and secure delivery of electric power to industrial, commercial, and residential customers, while at the same time preparing the grid to support greater quantities of renewable energy. Integration of traditional electric grid infrastructures with modern IT computer and communications systems will be necessary, and GE continues to work closely with national and international standards development organizations in the development of grid interoperability standards. Cybersecurity remains a fundamental design principle of this effort.

In order to reduce risk and accelerate the adoption of new advanced grid modernization technologies, R&D funding will be required for the development of modeling, simulation, and visualization of both the transmission and distribution networks. Advanced modeling capabilities will serve as a critical tool in the modernization of the electric grid by assisting grid operators in identifying the technical limits of conventional grid technologies, and facilitating development of new technologies and solutions to respond to a changing energy mix and an increasingly responsive consumer base. In addition, advanced modeling capabilities can enable grid operators and power systems planners to aggregate, analyze, and act upon the vast quantities of data collected by grid modernization technologies. DOE should expand industry participation in programs to develop modeling and computational capabilities for grid applications to fully leverage work already underway.

In conjunction with modeling and simulation research, R&D is required to develop advanced grid analytics software to optimize grid efficiency and reliability, including "Big Data" storage and real time analysis and exascale computing. Research into broadband wireless technologies will be required to collect the field data required in "real time." Research into low costs sensors will be needed to monitor the status of a modern grid.

Energy Storage

GE endorses the requested funding for further research into energy storage technologies. The fiscal year 2013 budget request appropriately broadens the scope of

interest to include innovations in new battery chemistries. This could lead to radical improvements in energy storage performance. Electricity storage is a critical technology to enable both deployment of electric vehicles and improvements in grid stability and efficiency through utility-scale storage.

Equal attention should be given to both electric vehicles and storage. The requirements of utility-scale storage are quite different from those of electric vehicles. GE recommends inclusion of research into large-scale energy storage into this line item. This includes all potential storage modalities such as compressed air, pumped hydro, and flywheel technologies.

In addition, investment should be made in research into broader applications of storage technologies such as ancillary services, including frequency regulation service to balance supply and demand on the transmission system as addressed in Order No. 755 issued by the Federal Energy Regulatory Commission in October 2011, energy arbitrage, and peak shaving.

NUCLEAR ENERGY

Next Generation of Nuclear

GE Hitachi Nuclear Energy (GEH) wholeheartedly supports the efforts of DOE's Office of Nuclear Energy to research and develop the next generation of nuclear technologies for carbon free electricity generation and for the management of used nuclear fuel. In support of both of these goals, the Congress should provide the requested \$65 million for the cost-shared, industry partnership Small Modular Reactor Licensing Technical Support program ("SMR program") for fiscal year 2013. At the direction of the Congress, DOE opened the SMR program competition to all advanced reactor technologies providing 300 MW or less of power. GEH concurs with the Congress that a fleet of advanced reactor SMRs will play a key role in meeting the country's energy security, economic, and carbon-free, baseload generation goals. Recognizing the high cost and extreme importance associated with the design certification and licensing of first-of-a-kind SMR designs, GEH recommends that the SMR program, in which industry is providing a minimum 50-percent contribution, be funded at the requested amount.

Advanced reactors, like GEH's PRISM reactor, can provide secure and clean baseload electricity while benefitting the back end of the fuel cycle. For this reason, it is important that the Reactor Concepts research, development, and demonstration program be provided sufficient funding. In particular, the Advanced Reactors Concepts and Small Modular Reactor Advanced Concepts R&D subprograms, which are facing 43-percent and 34-percent funding cuts, respectively, should be expanded. Both of these subprograms focus on high-value research to address near term challenges such as demonstration, simulation and training programs, and the application of advanced modularization and construction techniques to help reduce new plant capital costs.

GEH further supports the funding of National Nuclear Security Administration's Nonproliferation Policy and International Security program. International civil nuclear cooperation is fundamental to implement our nonproliferation policy goals and to keep viable our domestic commercial nuclear capabilities. Recognizing the importance of U.S. commercial nuclear exports in achieving our nonproliferation objectives, GEH supports increasing the fiscal year 2013 budget for the Nonproliferation Policy subprogram.

PREPARED STATEMENT OF THE NATIONAL ASSOCIATION OF STATE ENERGY OFFICIALS

Chairperson Feinstein and members of the subcommittee: I am Malcolm Woolf of Maryland and chair of the National Association of State Energy Officials (NASEO). NASEO is submitting this testimony in support of funding for a variety of Department of Energy (DOE) programs. Specifically, we are testifying in support of no less than \$50 million for the base, formula State Energy Program (SEP). We urge the subcommittee to strive for the \$125 million figure, which is equal to the fiscal year 2012 authorization. SEP is the most successful program supported by the Congress and DOE in this area. This should be base program funding, with no competitive portion, which focuses primarily on DOE's internal priorities. SEP is focused on working with private business to help facilitate direct energy project development, where most of the resources are expended. SEP has set a standard for State-Federal cooperation and matching funds to achieve critical Federal and State energy goals. The base SEP funds are the critical linchpin to help States in building on these activities and expanding energy-related economic development, much as SEP has done for 30 years. We also support the \$210 million level for the Weatherization Assistance Program (WAP). These programs are successful and have a strong record of

delivering savings to low-income Americans, homeowners, businesses, and industry. We also support the budget request for the Energy Information Administration (EIA) of \$116.4 million. EIA's State-by-State data is very helpful. EIA funding is a critical piece of energy emergency preparedness and response, and there are significant EIA responsibilities under the Energy Independence and Security Act (EISA). NASEO continues to support funding for a variety of critical buildings programs, including Building Codes Training and Assistance, ENERGY STAR, and residential energy efficiency at least at the fiscal year 2012 level, and Building Codes at a \$15 million funding level. NASEO also supports funding for the Office of Electricity Delivery and Energy Reliability (OE) at the level of the fiscal year 2013 budget request. Specific funding should be provided for the Division of Infrastructure Security and Energy Restoration of no less than \$18 million, which funds critical energy assurance activities. We also strongly support the research and development (R&D) function and Operations and Analysis function within OE. The industries program (now renamed the Advanced Manufacturing program) should be funded at least at the fiscal year 2012 level, to promote efficiency efforts and to maintain U.S. manufacturing jobs.

Formula SEP funding provides a basis for States to share best practices among themselves. These best practices (even without stimulus funds) allow States to get a great deal accomplished. These types of activities include energy financing programs, revolving loans, utility-based programs, energy service performance contracts, et cetera. We greatly appreciate the support of the subcommittee for SEP in the past.

In January 2003 (and updated in 2005), Oak Ridge National Laboratory (ORNL) completed a study and concluded, "The impressive savings and emissions reductions numbers, ratios of savings to funding, and payback periods . . . indicate that the State Energy Program is operating effectively and is having a substantial positive impact on the nation's energy situation". ORNL found that \$1 in SEP funding yields:

- \$7.22 in annual energy cost savings;
- \$10.71 in leveraged funding from the States and private sector in 18 types of project areas;
- annual energy savings of 47,593,409 million source BTUs; and
- annual cost savings of \$333,623,619.

Energy price volatility makes the program more essential as businesses and States work together to maintain our competitive edge.

STIMULUS FUNDING IMPLEMENTATION

We have been working closely with DOE to implement the American Recovery and Reinvestment Act (ARRA) programs as quickly as possible. We have had regular calls with all the State energy officials to address implementation questions. We have also had a series of regional conference calls among the States, and we have seven regional coordinators helping to share best practices among the States. NASEO is sharing best practices and providing information to officials at all levels of government in order to more effectively coordinate this effort. We are convinced that these funds are helping to assist the private sector to implement major positive changes in the U.S. economy that will improve all sectors of the economy. NASEO believes it is important to maintain base levels of appropriations for critical programs, such as SEP and Weatherization, in order to avoid a huge decrease in funding after a rapid stimulus increase.

With respect to ARRA spending for SEP, of the \$3.1 billion appropriated, all the work is being implemented quickly. The deadlines set forth in the statute will be satisfied. We and DOE have worked through the barriers that slowed spending, including National Environmental Policy Act (NEPA) compliance, Davis-Bacon wage rates, Buy-American clauses, historic preservation, lead paint requirements, and general procurement issues. It is important to stress that the key figures are the "commitment" and "contracted" amounts, because that is when people get hired and work commences. States generally do not pay until projects are actually completed and milestones are met. We do not pay-up front in most cases. In economics jargon, the Federal spending figure is actually a lagging indicator. Of the ARRA funds dedicated to SEP and Energy Efficiency and Conservation Block Grant (EECBG), approximately \$1 billion has been dedicated to energy financing programs in cooperation with the private sector. This has the greatest long-term potential.

Examples of Successful State Energy Program Activities.—The States have implemented thousands of projects. We have previously supplied to subcommittee staff examples of programs and projects implemented. Here are a few representative examples.

Alabama's SEP funds are being used to support the purchase and installation of energy efficient equipment in 118 Alabama K-12 schools. The energy improvements have generated cost-savings exceeding \$1 million a year. The Talladega County Board of Education replaced 31 heating, ventilation, and air conditioning (HVAC) units in 17 schools. The new efficient units are saving the district more than \$75,000 annually. Winston County Board of Education replaced 14 HVAC units in two of its schools with new efficient units which are saving the school more than 20 percent on electricity costs a year.

Alaska collected benchmarking data on 1,300 public facilities in order to identify high-energy using buildings. A total of 351 public buildings with a high Energy Use Index were identified and are undergoing Investment Grade Audits, which will pinpoint specific energy improvement projects. These energy measures will be funded through a loan program where the project's debt service will be paid entirely through the energy cost savings.

California is improving energy efficiency in State-owned buildings through the State Property Revolving Loan Fund Program. This sustainable loan program is supporting energy upgrades in more than 60 buildings located throughout the State—including energy retrofit projects in 18 California Highway Patrol Offices. As a result, a field office in Oakland now has energy efficient lights that are saving nearly \$21,000 a year in energy costs. The Oakland lighting project will pay for itself in cost savings in just more than 2 years.

Illinois is promoting the development of renewable energy and energy efficiency manufacturers and supply-chain businesses in the State. Since 2010, the Green Business Development Grant Program has awarded grants to 25 Illinois manufacturers that have expanded into the green technology sector by retrofitting their manufacturing processes. Ingersoll Machine Tools, Inc., a Rockford-based manufacturer of aviation components, used a Green Business grant to purchase and retrofit equipment so it can also produce wind turbine components. The retooling effort created 87 new jobs at Ingersoll. Funk Linko has been producing light poles at its Chicago Heights facility since 1925. With a Green Business grant the company retooled its existing steel mill equipment to produce components for wind power generation.

The Iowa State Energy Office provided a \$1.7 million matching grant funded by SEP to support the Sun Prairie Vista Court Apartments in reducing energy use by implementing and documenting the performance of new, energy-efficient technologies that include, for example, variable speed pumps, thermal solar collectors for hot water, and induction exterior lighting. To measure the benefits of the efficiency upgrades, the apartment complex will monitor before and after results, including real-life information on energy use. Tenants are benefiting from the energy efficiency improvement. The demonstration project employed approximately 21 individuals and produces projected annual energy savings of \$111,417.

In Kentucky \$14 million has been dedicated to the Green Bank of Kentucky for energy efficiency financing for public buildings. To date, 11 Green Bank loans have funded energy upgrades in 61 public buildings. The Kentucky Department of Veterans Affairs used a Green Bank loan for energy upgrades in three of its facilities—Thomas-Hood, and the East and West Kentucky Veterans Centers. These facility improvements are generating annual energy cost savings of \$195,000, and \$23,000 annually in water savings. The savings will repay the Green Bank loan in less than 12 years and after that all further savings will directly benefit the taxpayers of Kentucky.

Louisiana's Transportation Efficiency and Alternative Fuels Program awarded a grant to Bossier City for two publicly accessible Compressed Natural Gas fueling stations and the purchase of 10 heavy duty compressed natural gas (CNG) vehicles for the city's fleet. The Bossier City project has resulted in the displacement of approximately 270,000 gallons of diesel or gasoline per year and created 10 new jobs.

Maine's Home Energy Savings Program, which launched in 2010, has to date resulted in approximately 5,000 residential energy audits with more than 3,000 of these homeowners receiving rebates for whole house energy upgrades. More than 100 licensed construction companies have been certified to participate in the program, which has resulted in excess of \$27 million worth of residential energy retrofit projects. These energy improvements are saving homeowners an average of 40 percent in energy costs, or approximately \$1,454 per year, amounting to savings of approximately 405 gallons of heating oil per year.

Mississippi's public buildings program is helping to finance energy-saving upgrades through performance contracting in 10 public institutions. The participating public sector partners include the Biloxi School District, Cleveland School District, Desoto County, Jefferson County, Lawrence County School District, Mississippi State Hospital, Monroe County School District, Claiborne County, Alcorn County School District and Hollandale School District. Under the program, 149 public build-

ings, representing more than 3 million square feet of space, have been completed. The Biloxi Public Schools project was completed in October 2011 and is expected to save more than \$275,000 a year in utility costs.

Montana improved its recycling infrastructure in communities throughout the State with the purchase of equipment to collect, store, and transport recyclables to market and assist local businesses use the materials collected. A total of 19 recycling projects were funded through the Montana Recycling Infrastructure Grants program, including recycling collection bins in Libby, Troy, Colstrip, St. Ignatius, Ronan, Polson, Bozeman, Havre, Shelby and at sporting events, performances and tradeshows held on the campus of Montana State University.

New Jersey supported the development of six combined heat and power (CHP) projects at commercial and industrial customers. Results include a 3.2 megawatt (MW) CHP project at the National Gypsum Company facility in Burlington. Other projects include a 9.5 MW cogeneration unit at the DSM Nutritional Products facility in Belvidere, a 1.1 MW gas engine generator at Ocean City College, and a 4.6 MW cogeneration plant for the new University Medical Center at Princeton. All totaled, nearly 35 MW of clean-energy production has resulted from this SEP-funded program.

Rhode Island's Deliverable Fuels Program provides incentives and rebates for energy retrofits to customers who heat their homes and businesses with oil, propane, or other deliverable fuels. The program launched in August 2010, and in the first 6 months 1,431 audits had been conducted statewide. Of these audits, 546 customers implemented recommended heating system replacements or other energy saving measures. These initial retrofits will reduce heating oil consumption by 2 million gallons over the next 20 years, saving these customers a combined \$7 million through lower heating bills.

South Carolina's public building energy retrofit program has resulted in energy efficiency improvements in 579 buildings statewide. The buildings represent nearly 21 million square feet of public building space and include 32 2- and 4-year colleges, 22 State agencies and 85 school districts. Williamsburg Technical College used a grant from this program to upgrade lighting and replace outdated HVAC units. These upgrades will pay for themselves in energy costs savings in less than 2 years and will help the college save more than \$30,000 annually going forward.

South Dakota conducted energy audits of all State-owned buildings. Based on the audit's data, grants, and loans were executed to implement cost-effective projects in 55 public buildings. A boiler replacement in the 100-year-old State capitol building complex is among the completed projects. The boiler replacement is projected to save taxpayers more than \$2 million in energy costs over the life of the new equipment.

Tennessee's Volunteer State Solar Initiative's grant programs have awarded a total of 236 grants to date and more than \$40 million of private funds have been leveraged. The grant-funded projects have added approximately 6.5 MW of solar power to the grid.

Texas' Transportation Efficiency Program awarded 16 grants for the synchronization of traffic signals and/or the replacement of traffic signal lights with LEDs. A major traffic synchronization project in Missouri City retimed and synchronized traffic signals at 44 intersections on 120 lane miles of six major roads. This one project is saving an estimated 47,000 hours annually for people traveling those roads during weekday rush hour.

The Washington Community Energy Efficiency Pilot Program has to-date retrofitted 1,154 commercial buildings representing nearly 1.2 million square feet, and more than 8,000 residential structures throughout the State. In addition, it created the foundation for a sustainable residential and non-residential energy retrofit industry and workforce in the State of Washington.

PREPARED STATEMENT OF THE NATIONAL ASSOCIATION FOR STATE COMMUNITY SERVICES PROGRAMS

The National Association for State Community Services Programs (NASCSPP), urges the U.S. Senate Committee on Appropriations Subcommittee on Energy and Water Development to fund the Department of Energy's (DOE) Weatherization Assistance Program (WAP) at \$210 million. In these difficult budgetary times, we understand that tough decisions have to be made. However, WAP is proven, cost-effective, measurably successful, and vital to the Nation's energy security and energy efficiency movements, delivering savings to low-income Americans, businesses, and industry. WAP faces an uphill battle in the immediate future due to a reduction in funding and leading to the loss of jobs and capacity to assist low-income Americans. It is necessary to fund WAP at this level in order to sustain its historic infrastruc-

ture in and widespread impact on all States and local communities as well as the expanded training and technical assistance expertise and activities enabled with the funding provided by the American Recovery and Reinvestment Act of 2009 (ARRA). This funding level is essential to continue and improve this outstanding program for our citizens. Due to the close of ARRA funding in March 2012 and the severely limited 2012 funding, continued funding is even more critical to allow the WAP Network to fulfill its mandate duties and ensure continued quality and success at pre-Recovery Act levels.

Some examples of the program's accomplishments include:

- Creation and support of more than 13,000 full-time, highly skilled jobs within the service delivery network due to ARRA funds, the second highest in the Nation, with 8,000–10,000 additional jobs from annual grant funding, and many more in related businesses, such as materials suppliers;
- Weatherization of an additional 700,000 homes occupied by low-income families, more than 100,000 homes above projected numbers, due to the ARRA and tens of thousands of more homes through annual appropriations, thereby reducing energy use and associated energy bills;
- Served more than 7.1 million low-income homes since the program's inception, with an additional 38.3 million eligible;
- Saves an estimated 35 percent of consumption for the typical home, with savings continuing year-after-year and actual \$1 savings increasing as fuel prices increase;
- Saves \$437 in first year energy savings for households weatherized;
- Returns \$2.51 for every \$1 spent in energy and nonenergy benefits over the life of the weatherized home;
- Serves as a foundation for residential energy efficiency retrofit standards, technical skills, and workforce training for the emerging broader market;
- Supports communities through local purchasing and jobs created nationwide;
- Reduces residential and power plant emissions of carbon dioxide by 2.65 metric tons/year per home; and
- Decreases national energy consumption by the equivalent of 24.1 million barrels of oil annually.

WAP is the largest residential energy conservation program in the Nation and serves an essential function by helping low-income families reduce their energy use. The program was developed in the late-1970s as a response to rapidly rising energy costs associated with oil shortages created by oil embargoes. The Congress acknowledged that low-income families were particularly vulnerable to increased energy price fluctuations and created the program to assist those families by reducing the cost to heat their homes. WAP was institutionalized within the Department of Energy in 1979 and today operates in all 50 States, the District of Columbia, five U.S. territories, and several Native American Tribes. Approximately 1,000 local agencies provide services in every political jurisdiction of the country using direct hire crews and local contractors to do the work, thus investing in local businesses and communities. These network providers use program funds to improve the energy efficiency of low-income dwellings, utilizing the most advanced technologies and testing protocols available in the housing industry. Since the Program's inception, more than 7.1 million homes have been weatherized using Federal, State, utility, and other monies.

WAP is still as relevant now as it was when it was formed in response to the energy crisis 30 years ago. The savings to America's most vulnerable citizens are significant and make a huge, immediate difference in their lives. These families have an average energy burden—the percentage of their income needed to pay residential energy bills—around 15 percent of their income as compared to around 3 percent for non-low income households, or five times greater. And the poorest families have a much higher energy burden than that. For example, in the State of California, Subcommittee Chair Dianne Feinstein's home State, there are more than 718,000 households below 50 percent of the Federal poverty level, making less than \$12,000 per year for a family of four. Those families have an energy burden of 36.5 percent—more than one-third of their income. With lower energy bills, these families can increase their usable income and buy other essentials like food, shelter, clothing, medicine, and healthcare and thus investing in local businesses and communities. WAP provides a positive return on investment to meet its primary objectives of making homes warmer in winter and cooler in summer and creating safer and healthier indoor environments.

Because of the advanced diagnostics and technology developed in WAP, the program is the foundation for the emerging green energy efficiency retrofit workforce. There are approximately 25,000 jobs in the Weatherization network, with many more supported in related businesses, such as material suppliers. These jobs are

good, living wage jobs, which are more important than ever due to the economic downturn in the housing and construction industries. Workers are highly trained and receive on-going instruction to further develop their skills. WAP is at the core of the larger energy-efficiency retrofit market, and its training curricula, methods, and centers play an integral role in developing tools and techniques and a workforce. WAP managers, trainers, and technical experts figure prominently in the Recovery through Retrofit initiative, contributing their expertise to the Workforce Guidelines for Residential Energy Efficiency Workers and playing a key role in the development of standardized training curricula, worker certifications, and training facility accreditations.

In order to sustain the program, it is critical that the WAP maintain adequate funding so the network can continue to provide jobs and support local economies as well as promote energy efficiency nationwide. The fiscal year 2012 level of \$68 million is not enough to continue nationwide coverage of the program and continued low funding will result in the loss of jobs, investment of local business, and energy efficiency services that ensure the health and safety of families across the country.

NASCSP urges the subcommittee to fund WAP at \$210 million for fiscal year 2013. The WAP remains a crucial component of our Nation's energy future. WAP is a clearly proven investment, has provided significant energy savings, and has helped more than 7.1 million families live in safer, more comfortable living conditions. This is a program that has proved its worth and effectiveness for more than 30 years. NASCSP looks forward to working with subcommittee members in the future as we attempt to create energy self-sufficiency and good jobs for millions of American families through these invaluable national programs.

PREPARED STATEMENT OF THE NATIONAL CARBON CAPTURE CENTER

Madam Chairwoman and members of the subcommittee: Southern Company operates the Department of Energy's (DOE) National Carbon Capture Center (NCCC) (<http://nationalcarboncapturecenter.com>) at the Power Systems Development Facility (PSDF) in Wilsonville, Alabama for DOE's National Energy Technology Laboratory (NETL). The NCCC is the world's premier research and development (R&D) facility for cost-effective carbon dioxide (CO₂) capture technologies for use at coal and natural gas fired power generation and industrial facilities. With the completion of its construction in 2011, research is now underway to screen the more than 300 capture technologies already identified and to ensure development of those concepts most likely to be commercially successful. To accomplish this, the NCCC is collaborating with technology developers world-wide as well as industrial, utility, and fuel co-funding partners¹ and is bringing to the Nation a proven technology development business model at a scale that is more cost-effective than large demonstrations of single technologies. As the NCCC begins its first full year of operation in 2012, this partnership respectfully requests the support of the Congress for the fiscal year 2013 DOE budget request at the fiscal year 2012 enacted levels for the annual operating costs of its NCCC.

I would like to thank the Senate for its past support of the NCCC and request the subcommittee's continued support of the DOE's Fossil Energy R&D core budget. At a time when our country's economy is recovering, we need to assure continued utilization of domestically produced, low-cost, coal and natural gas based power generation. DOE's Fossil Energy R&D efforts have already produced significant results to advance coal-based power. DOE's core R&D budgets, combined with investments by the private sector assure a sustainable technology base on which to address the environmental and economic challenges facing coal and natural gas use in the future. Operation of the NCCC in partnership with DOE will benefit the Nation by developing cost-effective CO₂ capture technology for fossil-fueled power generation by teaming with technology developers and accelerating commercial deployment of viable technologies.

The NCCC's CO₂ capture efforts address all three areas of DOE's CO₂ capture goals concerning postcombustion capture for conventional plants, pre-combustion capture for coal gasification power plants, and advanced oxy-combustion processes which produce a more CO₂-rich flue gas than conventional combustion for easier CO₂ capture. Southern Company also supports the goals of the Clean Coal Technology Roadmaps developed by the Electric Power Research Institute (EPRI) and the Coal Utilization Research Council (CURC). These Roadmaps identify the tech-

¹Current NCCC participants include Southern Company; the Electric Power Research Institute (EPRI); American Electric Power; Luminant; NRG; Peabody Energy; Arch Coal, Inc.; and Rio Tinto.

nical, economic, and environmental performance that advanced clean coal technologies can achieve over the next 25 years.

The NCCC offers a flexible applied R&D test facility which provides commercially representative flue gas and syngas and the necessary infrastructure in which developers' technologies are installed and tested to generate data for performance verification under industrially realistic operating conditions. This effort is a less costly way to bridge the gaps between fundamental R&D and more costly large-scale commercial demonstrations. By operating a unique, but central R&D test facility, available to all CO₂ technology developers, redundancy in testing sites and equipment is minimized and cost-effective use of R&D funds is achieved.

SUMMARY

The United States has historically been a leader in energy research. Adequate funding for fossil energy R&D programs, including environmental and climate change technologies, will provide our country with secure and reliable energy from domestic resources while protecting our environment. Current DOE Fossil Energy Research and Development programs, if adequately funded, will assure that a wide range of electric generation options are available for future needs. The Congress faces difficult choices when examining near-term effects on the Federal budget of funding energy research. However, EIA projects that coal will continue to fuel our country well into the future, and continued support for coal-based energy research will be essential to the long-term environmental and economic well being of the United States. Prior DOE clean coal technology research has already provided the basis for a 25-fold return in consumer benefits over research costs. To realize potentially even greater consumer benefits, the critically important R&D program in the CURC-EPRI Clean Coal Technology Roadmap must be implemented.

One of the key national assets for achieving these benefits is the NCCC. The fiscal year 2013 funding for the NCCC will provide operations, maintenance, and modification of the facilities to test technologies that are critical to the development of cost-effective climate change technologies that will enable the continued use of fossil fuels to supply a share of the Nation's energy needs. Any budget cuts in the DOE Fossil Energy Core R&D budget from the fiscal year 2012 enacted levels could proportionately impact the necessary work that will be conducted at the NCCC. A key NCCC feature is its flexibility to test new carbon capture technologies for power generation systems in an integrated fashion and under realistic industrial conditions. The NCCC can evaluate CO₂ capture technologies as they are integrated into actual syngas (from gasification) or flue gas from actual power plant operations. Integrated operation allows the effects of system interactions, typically missed in unintegrated, laboratory-based, component development programs, to be understood. This integration provided by the NCCC is the key to ensuring component technologies are validated before they can be designed into large scale industrial applications. Furthermore, the NCCC is large enough to produce data to support commercial scale designs, yet small enough to be cost-effective (compared to typical large-scale demonstrations) and adaptable to a variety of technology research needs. The major accomplishments at the NCCC/PSDF to date and the current test program planned by DOE and the NCCC's industrial participants are summarized below.

PRIOR ACCOMPLISHMENTS

The PSDF test-bed has operated successfully for many years in support of DOE's advanced coal program. The two significant achievements are:

- a new gasifier design (Transport Integrated Gasification (TRIGTM)) suitable for use with low-rank fuels, which represent more than one-half of the total coal reserves in the United States and the world; and
- hot gas filtration to improve energy efficiency.

These two technologies have progressed to commercialization with integrated gasification combined cycle (IGCC) power plants being built at Kemper County, Mississippi, and Dong Guan, China. Other highlights of the test program included development of novel pressurized coal feed and ash removal systems, and sensors and controls automation improvements. In some instances, testing has eliminated technologies from further consideration. Such screening is valuable in that it concentrates R&D efforts on those technologies most likely to succeed and is an essential part of managing the U.S. DOE's financial resources.

NATIONAL CARBON CAPTURE CENTER CURRENT TEST PROGRAM

Building on success with TRIGTM, the NCCC/PSDF facility has refocused its mission on supporting the development and scale-up of cost-effective, commercially via-

ble carbon capture technologies for fossil-fueled power plants through collaboration with the DOE and third-party technology developers. Most of the current CO₂ capture technologies are being developed at laboratory- or bench-scale under ideal conditions. Continued R&D under realistic field conditions are needed to validate laboratory results and identify technical issues that are not present under ideal conditions. In collaboration with technology developers, the NCCC makes available coal-derived syngas gas and flue gas to carry out applied R&D on components or small pilot-scale systems to bridge gaps between fundamental R&D and large-scale commercial demonstration. This provides for a cost effective, seamless transition for promising technologies to migrate from laboratory into commercial demonstrations. And importantly, NCCC postcombustion test results are applicable to both coal and natural gas applications, new and existing.

The NCCC is a unique applied R&D test facility containing two major sets of infrastructure to support CO₂ capture technology development:

- an existing pilot-scale coal gasification facility that produces syngas for pre-combustion CO₂ capture technology evaluation; and
- a Post-Combustion Carbon Capture Center (PC4) which enables testing of capture technologies on flue gas from an adjacent fossil-fueled power plant.

Both are readily adaptable to test a variety of technologies at multiple scales and using different coals, providing data for scale-up to commercial applications. This flexibility, in conjunction with real-world operating conditions, allows the NCCC to support developers in advancing the CO₂ capture technologies that are critical to continued use of fossil fuels for power generation. Jointly with the DOE, NCCC has developed a Technology Screening Process which is a key evaluation tool to assess and prioritize technologies for testing at the facility. Currently more than 300 carbon capture technologies have been identified as screening candidates.

Postcombustion.—Today's postcombustion capture technology has been estimated to increase the cost of electricity (COE) by up to 80 percent.² For both new and existing power plants, postcombustion capture technology must be made more efficient and cost-effective by reducing parasitic power and capital cost requirements. In postcombustion capture, CO₂ is separated from the flue gas in a conventional powerplant downstream of the boiler. Many postcombustion capture technologies need to be proven and integrated in an industrial powerplant setting. The PC4 test facility (completed in 2011) was built to accommodate tests of a wide-range of capture technologies from flue gas and includes three major test areas:

- a pilot solvent test unit (PSTU) to test developers' next generation CO₂ absorption solvents;
- a second test bay to support evaluation of fully integrated test systems supplied by technology developers; and
- a bench-scale test area to accommodate small tests of emerging, advanced technologies such as sorbents or membrane systems.

Initial testing at the PC4 began in 2011 when researchers conducted trials with monoethanolamine (MEA) solvent to be used as a baseline to evaluate the performance of advanced CO₂ capture technologies. Solvents being developed by Aker Clean Carbon and Babcock & Wilcox, as well as Membrane Technology Research's membrane-based technology, were also tested. Commitments are in place for the NCCC to provide other advanced technologies a scaled-up testing platform as development progress warrants.

Precombustion.—In precombustion capture, CO₂ is separated from the syngas produced by a coal gasification process, prior to the combustion of the syngas in gas turbine for power generation. CO₂ capture is estimated to increase the COE from an IGCC facility by more than 35 percent.² Reductions in both capital cost and power requirements of CO₂ capture processes are needed for development of efficient and cost-effective pre-combustion technology, and the NCCC is focused on achieving those goals. R&D activities at NCCC for pre-combustion capture include:

Advanced CO₂ Capture Systems.—New solvents, sorbents, and gas separation membrane technologies are being assessed on syngas and are being scaled-up and tested based on fundamental R&D progress by third-party developers.

Water Gas Shift Enhancements.—Water gas shift (WGS) catalyst test results have been conducted which reveal that parasitic steam consumption can be reduced, which in turn increases the net power output of an IGCC plant and reduces COE with CO₂ capture. Results have been supplied to catalyst suppliers and findings are being implemented at a commercial IGCC plant currently under construction. Testing of various WGS catalysts continues.

²“Cost and Performance Baseline for Fossil Energy Plants, Volume 1: Bituminous Coal and Natural Gas to Electricity, Final Report”; NETL, May 2007.

Advanced Syngas Cleanup.—New advanced syngas cleanup systems are being tested for reducing hydrogen sulfide, hydrochloric acid, ammonia, and mercury to near-zero levels.

Oxy-Combustion.—The NCCC is also evaluating the potential benefits of oxy-combustion CO₂ capture using the pressurized transport reactor operating in oxygen combustion mode. Preliminary screening studies have produced favorable results. Detailed system studies, modeling and additional economic analysis are being conducted to evaluate the commercial feasibility of this technology.

Gasification.—In developing a cost-effective advanced coal power plant with CO₂ capture, the NCCC also evaluates opportunities to reduce cost for the entire plant in order to optimize the plant processes with the integration of the CO₂ capture processes. Some of these cost reduction opportunities include technology development for syngas cleanup, particulate control, fuel cells, sensors and controls, materials, and feeders.

CONCLUSION

The collaboration among DOE, technology developers, and private industry is allowing the National Carbon Capture Center to make significant strides toward the next generation of CO₂ capture technologies. These technologies hold the promise of reducing the costs of CO₂ capture to levels necessary to assure that affordable, reliable coal-based electric power can be produced for America's economy, while also meeting all of the environmental challenges associated with fossil fuel use. The Congress should sustain the DOE Fossil Energy R&D budgets at the fiscal year 2012 enacted levels.

PREPARED STATEMENT OF THE NATIONAL COMMUNITY ACTION FOUNDATION

The National Community Action Foundation (NCAF) represents the 900 local Community Action Agencies and their partner organizations that deliver the investments funded by the Department of Energy (DOE) Weatherization Assistance Program (WAP) in low-income homes. We urge the subcommittee to reject the President's fiscal year 2013 budget request for WAP in the Energy Efficiency and Renewable Energy (EERE) budget and, instead, provide \$227.2 million for the fiscal year 2013 program. We also hope the regulation regarding the process for formula allocations will not be set aside as requested.

This figure, \$227.2 million, is equal to the 2008 level; 2008 was the last program year before the massive, one-time expansion to create American Recovery and Reinvestment Act (ARRA) jobs was implemented. Our local members tell us that this is the minimum funding level for delivering a responsible and effective low-income residential efficiency program.

WAP should also continue to play its role as the "incubator" of effective practices for the gradually developing conventional residential efficiency upgrade market; although the administration and many in the Congress have encouraged new demand for conventionally financed home energy upgrades by those with credit and assets, that market and the practices of the firms serving it has not yet matured. To deliver a high-impact, well-managed, low-income program, and set benchmarks for performance, energy savings, and transparent oversight, Weatherization must maintain the worker training, cutting-edge equipment and software, and the skilled managers and monitors. DOE Weatherization remains a valuable national resource because it serves as a model for quantifying investments, verifying performance, and provides the benchmark energy audit tools, testing, and verification protocols.

Energy Efficiency and Renewable Energy Budget Priorities.—First, we would like to address the issue of priorities in the EERE budget request. The request reflects a preponderance of research and development (R&D), of incentives and of some commercialization activities that, together, are intended to promote a "market transformation" in the near future and a technological transformation in the distant future. We believe the priorities demonstrated are impractical in general and unfair to a large part of the population. The lower priority which the budget gives to testing the results of building efficiency research as well as other research is a mistake. The results of the R&D that past years' appropriations have produced should be verified and moved to general use through deployment by real workers in real-world buildings. Further, offering taxpayer-financed incentives for consumers who can afford to invest in new homes and industry with credit to buy efficient equipment are only appropriate if a robust program can be maintained for the most inefficient of the millions of homes whose occupants lack the cash and credit to invest on their own.

Energy Efficiency and Renewable Energy Claims About Lower-Income Consumers' Borrowing.—Secretary Chu's testimony before this subcommittee on March 14 suggests that the DOE's request erroneously assumes that large numbers of low-wage working families and retirees will be served by the minimal program requested because new types of lending will be available to such consumers so that they may buy their own improvements. Madam Chairman, the Department analysts are poorly informed about the financial situation of the WAP-eligible households, all of whom have incomes far below the median income of their State. The problem is not that they lack credit, which most do; the problem is that they lack adequate resources and income flow to purchase even immediate necessities.

Minimum Program Capacity.—There is size and capacity threshold below which WAP can no longer function as an effective national program. It takes funding at least the level size of the 2008 pre-ARRA program to run a WAP that has trained, skilled, and well-equipped workers, with even more experienced energy auditors and with local and State inspectors checking and directing their work.

As the subcommittee is well aware, the 2008 funding level we are requesting represented a drop from the program's resources a few years earlier. For some States, it meant less than a full-time monitor for the entire State and is still inadequate; however, our local members want you to know that. Given a similar core program, they are committed to finding enough additional partners with resources to serve every county in the Nation; however, with less to build on, they will not be able to offer utilities, building owners, and other investors the certainty of a well-trained, well-equipped workforce whose work will be backed by both local and State quality assurance. With the foundation of funding at the pre-ARRA period level, \$227.2 million, community action will expand or develop partnerships with States; housing, economic development and public health organizations; utilities; and all manner of other local partners to create a robust and diversified portfolio of resources delivered as single, customized packaged to the dilapidated older homes on their waiting list.

Maintaining a Nationwide Program and Formula.—At the proposed funding level, some States' formula allotments are particularly inadequate. Moreover, the administration requested a renewal of the one-time authority the subcommittee provided for 2012 which allows the Secretary to establish a formula without benefit of public regulatory process as required by law. We believe the subcommittee was wise to allow it in 2012 when information about uncosted balances was relevant and remained closely held by the Department. However, we believe it would be a major mistake to set aside the statute a second year in a row. It has turned out that the Department's information flow from States about uncosted balances was flawed at both ends. High-performing States now face imminent close-out of services, while other States are still catching up to large balances but received 2012 funds. More important, States must plan far ahead to match legislative and budgetary requirements; more instability in the WAP system will not contribute to good performance.

Significant Private Partnerships Depend on the Programs' Competence and Transparency.—In 2008, the leveraged resources, including Low-Income Home Energy Assistance Program (LIHEAP) dedicated funds and nearly as much from private utility partnerships, amounted to almost three times the Department of Energy Weatherization Assistance funding the Congress provided. The reason partners turned funds over to Weatherizers to deliver on low-income communities was the robust Federal program foundation that gave local and private investors the confidence to allow their resources to be combined with Weatherization delivery. Federal standards, training, procedures, and oversight requirements, including financial, assure our partners that their funds go where they intend, that homes will not receive two or three different kinds of evaluations and measures, that their jobs will be inspected, and that there will be transparent accounting of each kind of funding at the end.

Proven Capacity Should Not Be Wasted.—As Secretary Chu testified to this subcommittee, the program delivered investments and ARRA jobs at a dramatically higher scale than predicted, surpassing its total production goal last year, coming in under budget and ahead of the schedule planned. Weatherization ranked second in job creation last quarter. Now our production is at about 100,000 more homes than planned for delivery—700,000—and a number of States are still delivering homes.

NCAF is certainly aware of the delivery problems that affected a few of the recipients of the ARRA Weatherization expansion in a few of the States represented on the subcommittee. Our organization worked closely with DOE to raise quality and performance among our members. We are confident these efforts worked, and we stand behind the Secretary of Energy's testimony to several committees, including most recently the Committee on Oversight and Government Reform (3/20/2012) that serious problems existed in only 3 percent of the homes that have been weatherized

since 2010. All of these cases are being resolved, at no further taxpayer expense, by the responsible parties.

Worker Skills and Standards.—Community Action is exceptionally proud of the training it provided and the meaningful jobs organizations filled with more than 20,000 construction industry workers, all of which added up to between 14,000 and 16,000 full-time jobs per quarter until major layoffs began this past winter as ARRA funds were exhausted. There is still considerable work to do using prior year funds or ARRA in many States for at least the next 6 months. After that, fewer and fewer States will be able to sustain their workforce, their quality control, and their State oversight through the end of the 2012 fiscal year.

The Weatherization Program leaders and field experts have worked for 2 years with to develop definition of retrofit worker jobs skills, the training required to achieve such DOE skills, and formal work specifications for all key tasks involved in retrofitting residential buildings of all types. Together with others in the emerging industry, we have developed a yet-to-be implemented credentialing hierarchy which could transform the sector of the building trades that has been delivering energy retrofits in conjunction with housing upgrades without benefit of common definitions and skill specifications.

Industry Training Capacity Is Built With Weatherization Assistance Program Funds.—Weatherization has a network of tested of training centers which serve not only the public sector program but also the utility industry. Among the most distinguished is Montana State University. NCAF was fortunate to be able to contribute funding (which the Exxon-Mobil Corporation generously donated to us) to underwrite a unique initiative in Montana that produced hours of video and other online training built by these legacy centers and several partners in higher education. These videos are now available nationwide to introduce the industry to potential workers and to train those in the field in a number of the required skills. It also resulted in models of developing new small businesses to provide high-quality energy audits in rural America in Oregon and in Virginia. Many of the others have others have recently contributed to the intellectual capital and training tools for the entire industry.

Worker and Contractor Access to Opportunity and Training.—It is a great accomplishment that tens of thousands of newly unemployed workers have left the program with skills and credentials they would never have gained were it not for their experience with the ARRA Weatherization program. The Weatherization program has served as an employment “gateway” to future opportunity for homebuilding industry workers who came in with only conventional skills, including many workers who were considered “nontraditional” in the construction field. The administration’s inadequate request means this door slams shut.

CONCLUSION

We urge you not to accept the administration’s request; it represents the end-stage of access to Weatherization assistance for lower-income families; within a very short period such low funding would also spell the end of utility-community partnerships that assure skillful delivery of coordinated investments.

We hope the subcommittee will take a different direction and continue to build on the firm foundation that already exists for WAP by allocating \$227.2 million in fiscal year 2013. Thank you for considering our concerns.

PREPARED STATEMENT OF THE NATIONAL CONSUMER LAW CENTER

The National Consumer Law Center (NCLC) is a nonprofit organization which, during its 35 years of existence, has advocated for policies that assist low-income families and seniors who struggle to pay their energy bills. NCLC strongly recommends that the Senate approve a funding level for the low-income Weatherization Assistance Program (WAP) of \$250 million for fiscal year 2013.

Because low-income families often live in older and poorly weatherized homes,¹ they tend to consume more energy than absolutely necessary. Living in poorly

¹ According to data from the U.S. Energy Information Administration, 2005 Residential Energy Consumption Survey, 40 percent of households at or below 100 percent of the Federal poverty level lived in housing units constructed before 1960. Less than 30 percent of households living above the poverty level lived in housing constructed prior to 1960. Housing constructed before 1960 was not subject to the stricter energy codes that apply to more recently constructed housing. In addition, newer construction is more likely to use newer, more energy-efficient heating, cooling, lighting, and refrigeration equipment.

weatherized houses leads to higher energy bills and places these families at much greater risk of having their utility services terminated for non-payment.² Families can find themselves without adequate heat in the winter, without lights, or without the ability to prepare food, simply because their energy bills are exorbitantly high.³ At the extreme, house fires can result when families lose access to gas, electricity, or delivered heating fuels and instead resort, out of desperation, to unsafe heating sources and the use of candles.⁴

Over the past 3 years, WAP has helped 860,000 households to reduce their energy bills,⁵ while also increasing the comfort and health of those living in those homes.⁶ Weatherization generally decreases energy usage—and energy bills—an average of 25 percent (with a wide variation above and below that average).⁷ DOE estimates that the average household's annual heating bill will be reduced by \$437 as a result of receiving weatherization.⁸

Over those same 3 years, many States across the country have built up the infrastructure to reach far more low-income homes each year than before ARRA appropriated \$5 billion for WAP.⁹ Under ARRA, States received approximately \$1.6 billion per year over a 3-year period. Prior to that, annual funding for the program was between \$224 million and \$243 million in all but 1 year since fiscal year 2002. States not only increased the number of households served several fold, but also had to bring on new contractors and make sure new employees were properly trained.

Choosing Massachusetts as one example, the State received approximately \$5 million annually in the years immediately prior to ARRA. Under ARRA, the State will spend out its entire \$125 million grant from DOE. Spending has increased eight fold on an annual basis. While the initial production goal was to weatherize approximately 17,000 units, the State will actually weatherize 20,000 units. The quality of the weatherization work has been closely monitored by the local nonprofits that retain the weatherization contractors and by the State Department of Housing and Urban Development. In addition, auditors from the Massachusetts Office of the Inspector General, from the Federal Department of Energy, and from the Massachusetts Recovery and Reinvestment Office have all monitored the program more closely than in any year prior to ARRA, and found no instances of shoddy workmanship or financial fraud or mismanagement.¹⁰ Massachusetts has also helped develop a training pipeline for those interested in working within WAP and, more broadly, in the green energy field.¹¹

²Electric and natural gas service disconnection rates are much higher in low-income households than middle- or high-income households. In California, for example, the low-income disconnection rate in 2010 was 5.5 percent, compared with 2.9 percent for non-low-income households. (CA Division of Ratepayer Advocate, "Status of Energy Utility Service Disconnections in California", March 2011, p. 2.)

³2011 National Energy Assistance Survey Summary Report, National Energy Assistance Directors' Association, Nov. 2011. Available at www.neada.org.

⁴John R. Hall, Jr., *Home Fires Involving Heating Equipment* (January 2010) at ix and 33. Also, 40 percent of home space heater fires involve devices coded as stoves.

⁵Testimony of DOE Secretary Steven Chu Before the Committee on Oversight and Government Reform, U.S. House of Representatives, March 20, 2012, p. 3.

⁶Various studies have shown that weatherization can result in reductions in a range of health problems, including asthma and bronchitis. See, e.g. National Center for Healthy Housing/Enterprise Community Partners, Inc., "Case Study: Creating Green and Healthy Affordable Homes for Families Living at Viking Terrace, Worthington, Minn." (2010). That study showed significant declines in bronchitis, sinusitis, and asthma (in adults) and respiratory allergies and ear infections (in children) following renovations that employed "green and healthy" principles.

⁷L. Berry & M. Schweitzer, "Metaevaluation of National Weatherization Assistance Program Based on State Studies, 1993–2002" (Oak Ridge National Lab, RNL/CON-488). Ex. Summ., p. x. The authors found that WAP achieved energy savings in gas-heated households of 21.9 percent of the average pre-weatherization consumption of natural gas for all end uses and 30.8 percent of pre-weatherization space heating consumption.

⁸U.S. Department of Energy, *Weatherization Assistance Program*, <http://www1.eere.energy.gov/wip/wap.html> (last updated January 30, 2012).

⁹The American Reinvestment and Recovery Act (ARRA), Public Law 111–5, section 2, division A, title IV, 123 Stat. 138.

¹⁰According to the Massachusetts Department of Housing and Community Development (DHCD), the State grantee of the Federal WAP funds, DHCD has met with the State Office of Inspector General (OIG) twice for formal interviews and with DOE WAP monitors four times during ARRA. The State OIG has also visited all of the State's WAP subgrantees. Despite this close monitoring, no instance of fraud has been identified nor have any "significant findings" been made. Rather, the Massachusetts WAP network has been praised by its DOE monitoring team for "operat[ing] as a strong cohesive unit with good internal and external support." DHCD has also been cited for taking a "measured, prudent approach to preparing for the ARRA Weatherization Program".

¹¹The Bureau of Labor Statistics (BLS) recently issued a report, "Green Goods and Services Summary" noting that in 2010, "3.1 million jobs in the United States were associated with the

While no one expects that the Congress will fund WAP in fiscal year 2013 near the ARRA level of approximately \$1.6 billion per year, NCLC calls upon the Senate to recommend a funding level that will ensure that the funding is adequate to maintain a network of agencies that can deliver high-quality weatherization services and achieve substantial energy savings in each home served. We believe that funding below \$227 million, the level in fiscal year 2008, would completely fail to meet that goal. We urge the Senate to appropriate no less than that amount, and strongly recommend an appropriation of \$250 million. Even at a \$250 million level, virtually all States will have to substantially dismantle the infrastructure that they successfully built up over the past 3 years. State agencies across the country will be serving far fewer households than in any of the past 3 years, leaving many needy and eligible households literally and figuratively in the cold. The network of contractors and workers who now possess the skills this country needs to help us move towards a cleaner and greener energy future will find itself without work.

The Congress must recognize that below the pre-ARRA funding level, funding for WAP can be so low that States will not have the minimum amount necessary to adequately oversee and deliver weatherization services. There is a threshold below which States will not have the resources to provide the financial oversight and training that is needed to run a high-quality program, as well as actually providing the funding local agencies need to carry out the weatherization work. Moreover, as funding levels fall, States will likely reduce not only the number of households served, but also the number or level of energy efficiency measures delivered to each home, leaving the full weatherization work that the house needs incomplete.¹²

This country is still in the grips of a serious economic downturn that leaves fully 1 in 12 Americans unemployed.¹³ Moreover, the nominal unemployment rate (8.3 percent) excludes the more than 1 million workers who the Bureau of Labor Statistics counts as having given up looking because they are convinced the jobs just are not out there,¹⁴ well more than double the number of discouraged workers in 2008. According to a Pew Fiscal Analysis Initiatives report, 4 million workers (more than the entire population of Oregon) were unemployed for 1 year or longer, as of December 2011.¹⁵ Hard-working families who have been trying their hardest but are still unable to get work need the assistance of the Federal Government to get their energy bills down to more affordable levels. This is precisely the wrong moment to cut back too far on this much-needed program. Cutting back too deeply on WAP will also lead to substantial layoffs among the weatherization workforce at a moment when this country needs to build the green workforce. In the last quarter of 2011, as reported in January 2012, WAP ranked second among 200 Federal ARRA-funded programs in terms of job creation.¹⁶ WAP not only reduces energy bills for low-income households, but creates good jobs and helps build local economies.

In summary, NCLC strongly recommends that the Senate approve a funding level for WAP of \$250 million for fiscal year 2013.

production of green goods and services,” comprising “2.4 percent of total employment in 2010.” Green jobs (including “weatherizing and retrofitting projects that reduce household energy”) now make up 6.8 percent of construction jobs, according to the BLS report, available at: <http://www.bls.gov/news.release/ggqcew.htm>.

¹²This has been true historically: many homes weatherized pre-ARRA were only partially weatherized due to lack of funding; most States chose to reach more households rather than fully weatherize a smaller number of homes. For this reason, the Congress allows homes partially weatherized before 1994 to receive additional weatherization services. 42 U.S.C. 6865(c)(2). Post-ARRA, it is likely that a large percentage of households served by WAP will once again be only partially weatherized.

¹³Bureau of Labor Statistics, “Unemployment Rate”, available at: <http://data.bls.gov/cgi-bin/surveymost> (accessed March 22, 2012).

¹⁴Bureau of Labor Statistics, “Not in Labor Force”, available at: <http://data.bls.gov/cgi-bin/surveymost> (accessed March 22, 2012)

¹⁵Pew Economic Policy Group Fiscal Analysis Initiative, “Five Long-Term Unemployment Questions” (February 1, 2012), question 1.

¹⁶Recovery.Gov, “Track the Money”, available at: <http://www.recovery.gov/Pages/TextView.aspx?data=jobSummaryProgram&topnumber=200&qtr=2011Q4> (accessed March 22, 2012).

PREPARED STATEMENT OF THE NATIONAL HYDROPOWER ASSOCIATION

The National Hydropower Association (NHA)¹ appreciates the opportunity to submit this statement on the Association's priority programs within the Energy and Water Development Appropriations bill. The statement focuses on NHA's support of \$59 million for the Department of Energy's (DOE) Water Power Program and its research and development (R&D) fiscal year 2013 initiatives. The Water Power Program dedicates its efforts to research, test, and develop breakthrough technologies and other sector innovations to increase generation of renewable, reliable, and affordable electricity from water resources.

This statement also provides support for two other areas:

- additional funding to increase hydropower generation on the Federal system (Army Corps of Engineers and Bureau of Reclamation facilities); and
- funding for the Energy Policy Act of 2005 (EPAct 2005) hydropower incentives.

NATIONAL HYDROPOWER ASSOCIATION REQUESTS \$59 MILLION IN FISCAL YEAR 2013
FUNDING FOR THE DEPARTMENT OF ENERGY WATER POWER PROGRAM

Funds should be directed with continued support of initiatives across all hydropower technology sectors. The types of technologies covered—conventional hydropower, pumped storage, marine and hydrokinetic (MHK), and conduit technologies—unlock clean energy from our country's rivers, oceans, tides, and water conveyances.

In recognition of the tremendous constraints on the Federal budget, NHA's proposed fiscal year 2013 level of \$59 million represents no increase over the congressionally adopted fiscal year 2012 level and is a significant reduction from recent NHA requests. The Association also supports the fiscal year 2012 funding breakdown of \$25 million directed to hydropower and \$34 million directed to MHK.

MAKING THE CASE FOR FEDERAL RESEARCH AND DEVELOPMENT SUPPORT

Over the last 30 years, the Department of Energy's R&D budget for all energy technologies (renewable, fossil, and nuclear) has declined precipitously.² For the Water Power Program, the numbers are even more discouraging. Always one of the smallest of the Office of Energy Efficiency and Renewable Energy programs, in 2007–2008 the Water Power Program was zeroed out. The administration's fiscal year 2013 budget request would now cut funding by 66 percent.

Federal Government R&D support is needed to promote hydropower development nationwide. Conducting business as usual will not provide the opportunity to fully realize the untapped potential available throughout the country.

For MHK technologies, the R&D need is easy to demonstrate. The United States lags far behind Europe in its investment to harness ocean energy potential. While strides are being made, there are few actual U.S. MHK projects, and those in existence are at early-stage commercialization and deployment.

However, for conventional hydropower technologies, the R&D case is no less strong and the need no less urgent. Some argue hydropower is a "mature" technology and not a candidate for R&D support particularly in a constrained budgetary environment. This is a false choice.

Though a proven, reliable technology, hydropower owners, and operators are always seeking ways to increase generating efficiencies, improve water use, enhance environmental performance, and develop better operating regimes. And now the industry looks to address new issues resulting from the ever-changing electricity market and the challenges posed by integration issues and grid reliability concerns.

Hydropower, like the automobile, is a technology that has transformed over the course of a century. No one argues that the government should stop investing in auto R&D—improving fuel efficiency and economy, safety, incorporating new materials, et cetera. The same holds true for continuing advancements in the hydropower sector. Since the re-establishment of the Water Power Program in 2008, the Department of Energy has begun several initiatives across the sector. These include:

- Assessing resource potential (MHK, nonpowered dams, conduits);
- Reducing the cost of energy;
- Advancing technology readiness (new turbine designs for conventional, MHK and conduit applications, as well as other equipment and operational improvements);

¹NHA is a nonprofit, national trade association dedicated to promoting the Nation's largest renewable electricity resource and advancing the interests of the hydropower, pumped storage and new ocean, tidal, conduit and in-stream hydrokinetics industries.

²2006 GAO Report: "Key Challenges Remain for Developing and Deploying Advanced Energy Technologies to Meet Future Needs" (GAO-07-106).

- Ensuring environmental responsibility (technology advancement to analyze and mitigate potential impacts);
- Quantifying hydropower's value to the grid (determining how to increase the use of wind and solar through greater grid flexibility and stability utilizing hydropower for integration); and
- Advancing hydropower upgrades (analyze, assess and maximize generation at existing facilities).

It is these types of initiatives and strategies that will propel the hydropower and MHK industries forward, enhancing their contribution to the Nation's electricity portfolio.

DEPARTMENT OF ENERGY WATER POWER PROGRAM GOAL: 15 PERCENT OF ELECTRICITY
FROM WATER RESOURCES

NHA commends and supports the DOE Water Power Program's new vision for water power technologies to provide 15 percent of the Nation's energy by 2030.³ Like the goal established to support increased wind generation, this is a fitting goal and one that recognizes hydropower's role in achieving our country's push to substantially increase clean-energy generation over the next 20 to 30 years.

Ultimately, for clean-energy policies to succeed, support for increasing generation from all water power resources, conventional, pumped storage, and MHK, is critical.

Not only does increasing hydropower generation provide more clean energy megawatts to the grid, but it also increases the amount of grid reliability, stability, and integrations services that hydropower provides in order to enhance the penetration of variable energy resources.

This is yet another area where Europe leads the United States. Experience on the continent has clearly shown that increasing variable energy generation requires access to energy storage. And that demand in Europe is being met with storage from both conventional hydropower and pumped storage projects.

NHA believes the hydropower industry is primed for growth to provide these services; and this leads to an important R&D discussion. While hydropower and pumped storage projects can provide regional and grid-scale energy storage and other ancillary services, doing so will require projects to operate in new ways and modes, and in some cases, utilize new technologies.

As such, several R&D questions (ones that the DOE is positioned to help answer) include:

- What is the impact of wear and tear on existing technologies due to new operational regimes to provide the needed ramping rates and other integration services?
- Does the United States have the technology in place to meet this challenge?
- Is there new technology better suited for this purpose? If so, where? If not, what innovations are needed in components, equipment, facilities to improve performance?

As more is asked of the hydropower system to provide the ancillary services needed to meet clean-energy goals, more questions and R&D needs are sure to come into focus. The DOE Water Power Program will fulfill a crucial role in collaborating with the industry to make this transformation a reality.

OTHER SPECIFIC RESEARCH AND DEVELOPMENT NEEDS

Over the last several years, NHA, the Electric Power Research Institute (EPRI), and individual industry members have provided many recommendations for needed data, analyses, research initiatives, and other activities that would help to realize the full potential of the water power sector.

While the following section briefly touches on some of those recommendations, the larger point is that a robust DOE Water Power R&D program is needed. With an industry consisting of facilities owned by: Federal agencies; investor-owned utilities; municipalities and other public power entities; independent power producers; along with new technology developers; the DOE plays an important role in gathering national baseline industry data and serving as a clearinghouse for this information.

Past R&D recommendations included, but are not limited to:

- Advanced materials testing/science for turbines, generators, and other components;
- Meteorological forecasting and optimal dispatch of energy/water systems;
- New turbine designs (including distributed generation applications) and operational regimes;

³DOE Wind and Water Power program brochure: "Water Power for a Clean Energy Future" (p. 2) http://www1.eere.energy.gov/water/pdfs/wp_accomplishments_brochure.pdf.

- Enhanced water quality mitigation technology; fish passage bioengineering and mitigation;
- Study on potential effects of climate change on operations; and
- Updated resource assessments.

SUPPORT FOR INCREASED HYDROPOWER DEVELOPMENT AT FEDERAL FACILITIES

NHA also supports funding efforts within the Army Corps of Engineers Civil Works Programs as well as at the Bureau of Reclamation to operate, maintain, and upgrade their existing hydropower projects and build on their existing non-powered infrastructure.

NHA specifically supports the work of the Corps on its Hydropower Modernization Initiative (HMI) to develop a long-term capital investment strategy. NHA also hopes that both Federal agencies will continue to dedicate resources and staff time to standardize and streamline their permitting responsibilities. Projects that can be developed on Federal facilities are often too-longed delayed to realize the significant energy potential due to the inconsistent support of hydropower development and approaches to working with industry members by agency staff at the local level.

SUPPORT FOR THE FEDERAL HYDROPOWER INCENTIVES OF THE ENERGY POLICY ACT OF 2005

In EPAct 2005, the Congress established incentive payments—subject to congressional appropriations—for the development of new hydropower at existing dams or conduits as well as to increase efficiency of existing hydropower facilities. To date these provisions have not received funding.

NHA supports the provisions, and notes that at the time of passage, new projects in the hydropower industry were rare. Since EPAct 2005, the industry has seen a dramatic increase in interest and support for new development. In 2011 alone, the Federal Energy Regulatory Commission (FERC) issued 135 MW of project approvals and saw more than 1,600 MW of projects file for approval.⁴ These incentives could help bring projects like these online in the coming years.

HYDROPOWER'S ROLE IN AMERICA'S ENERGY PORTFOLIO AND GROWTH POTENTIAL

Hydropower is America's leading source of domestic renewable electricity, providing clean, affordable generation in every region of the country. This reliable and underutilized resource accounted for about 8 percent of total electricity generation and two-thirds of renewable electricity generation in 2011.

Hydropower generation avoids approximately 200 million metric tons of carbon emissions each year. In fact, regions that rely on hydropower as a primary energy source reap the benefits of significantly cleaner air as well as the lowest electricity prices.

While a proven renewable energy resource, hydropower is also an energy resource for our future with tremendous growth potential. One of the many myths about hydropower is that there are no new opportunities for growth in our industry. In fact, the opposite is the case. In addition to the numbers cited above, there are proposed projects totaling more than 82,000 MW before FERC today across all technologies in the waterpower sector.⁵

CONCLUSION

Unlocking the vast hydropower potential of our rivers, oceans, tides, and conduits requires Federal R&D initiatives that make innovative ideas a reality. Continued investment in the DOE Water Power Program will ensure that innovative new technologies and operational advancements come to market, increasing America's clean-energy portfolio and providing the economic benefits and jobs the country needs. With the potential to develop new projects on hundreds of potential sites, hundreds of thousands of jobs will be created through the manufacturing and installation of these projects.

NHA appreciates and strongly supports the work of the Water Power Program and opposes the proposed 66 percent reduction in funding in the fiscal year 2013 budget request. NHA calls upon the Congress to champion R&D investment in hydropower—the Nation's most widely used renewable energy resource that, if properly supported, can provide the foundation of America's clean-energy future.

⁴ <http://hydro.org/wp-content/uploads/2012/01/OEP-Energy-Infrastructure-Update-Dec-2011.pdf>.

⁵ <http://www.ferc.gov/industries/hydropower/gen-info/licensing.asp>.

PREPARED STATEMENT OF NATIONAL INSULATION ASSOCIATION AND INTERNATIONAL
ASSOCIATION OF HEAT AND FROST INSULATORS AND ALLIED WORKERS

FEDERAL FUNDING FOR MECHANICAL INSULATION WILL CREATE IMMEDIATE GREEN
ENERGY JOBS WHILE SAVING ENERGY AND PROTECTING THE ENVIRONMENT

Chairwoman Feinstein, Ranking Member Alexander, and members of the Subcommittee on Energy and Water Development: on behalf of the National Insulation Association (NIA) and the International Association of Heat and Frost Insulators and Allied Workers (International Union), we are writing in support of a programmatic increase of \$500,000 in fiscal year 2013 for the Department of Energy's (DOE) Advanced Manufacturing Program specifically to continue and expand their a national mechanical insulation education and awareness program.

NIA represents 95 percent of the products utilized in the mechanical insulation industry, with members across the country at 800 corporate locations, and the International Union represents more than 25,000 workers and families employed in the mechanical insulation sector across the country. Together, our members, of which the vast majority are small businesses, have more than a century-long track record of providing large- and small-scale, long-term energy efficiency, emissions reductions, cost savings, and safety benefits at manufacturing facilities, power plants, refineries, hospitals, universities, and government buildings across the country.

We have joined together to advocate for a national comprehensive advocacy program for increased use, maintenance, and retrofits of mechanical insulation in the commercial and industrial sectors because of its potential to create tens of thousands of jobs now, reduce carbon emissions, increase energy savings, and provide a safer working environment.

Buildings are responsible for 40 percent of U.S. energy demand and 40 percent of all greenhouse gas emissions, making efficiency gains in this area crucial if we are to markedly reduce America's energy consumption and effectively combat climate change. The industrial sector is similar in energy efficiency opportunities. At the residential level, insulation is well publicized for its efficiency benefits. However, the same cannot be said in the commercial and industrial sectors, which together consume 2½ times more energy than homes, according to the Energy Information Administration (EIA). Commercial and industrial insulation—collectively known as mechanical insulation—has the potential to slash the energy demand for the building and industrial sector.

The Congress has already signaled its support for a mechanical education and awareness program through both the appropriations and authorization process. The Congress directed \$500,000 be allocated in DOE's budget for a mechanical insulation education and awareness campaign in the fiscal year 2010 Energy and Water Development Appropriations bill (Public Law 111-85). This funding was a critical start, and we thank members of the Appropriations Committee for recognizing the value of this program, but more is needed to carry out a successful campaign. Further evidence of the Congress's support for such a program is the inclusion of language to authorize a 5-year, \$3.5 million a year national industrial energy efficiency education and training initiative focused on mechanical insulation in H.R. 2454, the American Clean Energy and Security Act of 2009 (section 275, page 521).

By increasing awareness and use of this energy-saving technology, the Congress will both create jobs now and reduce carbon emissions. Creating jobs, particularly green jobs, is a top priority for the Congress and the administration. Using government data, NIA conservatively estimates that maintenance of insulation at manufacturing facilities and going beyond minimum levels in new construction can generate \$4.8 billion in energy savings per year, reduce 43 million metric tons of carbon dioxide and other greenhouse gas emissions, and create 89,000 jobs annually.

Best of all, these jobs don't require additional research and development. Mechanical insulation opportunities can be easily identified, with potential energy savings and emissions reduction determined with proven DOE-utilized software technology, and in many applications implemented in weeks, making projects truly shovel-ready.

For facility owners and operators, the savings are swift and sustainable; the return on investment from mechanical insulation is typically less than 2 years (and sometimes as little as 6 months). Mechanical insulation also improves infrastructure in the public, educational, and healthcare sectors, among others.

Fiscal year 2013 funding for mechanical insulation education programs is insufficient to make an economic impact in the industrial and commercial sector through energy savings, emissions reduction, and job creation. Increased funding from the Congress in fiscal year 2013 would enable Federal agencies and industry partners to gather more data, work with engineering schools, and reach out to facility man-

agers and owners, engineering and design professionals, and others to educate them about the benefits of increasing their focus on the benefits of mechanical insulation technology. Congressional funding would also ensure the promotion of the most energy-efficient uses of mechanical insulation in new construction, increased education about the energy savings that can be realized through proper maintenance and a renewed focus on retrofitting mechanical insulation in older buildings and manufacturing facilities that together will generate substantial carbon emissions reductions and sustainable jobs.

NIA and the International Union have cumulatively contributed \$3 million in developing and beginning the implementation of the campaign and are full partners with the Energy Department in carrying out meaningful elements to prove and encourage the greater use of mechanical insulation made possible by \$500,000 in fiscal year 2011 funding appropriated by this subcommittee and enacted into law. As such, we have outlined proposed program elements to continue our comprehensive, persuasive awareness campaign to engage and motivate industrial and commercial decisionmakers to take action.

Elements of the program would include:

Education and Awareness

Mechanical Insulation Basics and Energy Assessment Process:

- DOE Industrial Assessment Centers.
- Engineering, HVAC, and Mechanical Design Schools.
- Inspection and Code Officials.

DOE and Other Tool Utilization (Facility Management and Design Professionals):

- Simple Calculators.
- E-Learning Modules.
- 3E Plus®.

Tool Development

Mechanical Insulation and Energy Modeling Programs.
 Building Simulation Programs—The Role of Mechanical Insulation.
 Mechanical Insulation—HVAC Energy Calculator.
 App development of simple calculators.

Data Development

Energy, Environment and Cost Reduction Impact Analysis of Mechanical Insulation:

- Federal agency facilities.
- Armed force facilities.
- Manufacturing sectors.
- Healthcare facilities (hospitals and medical facilities).
- Education (schools and universities—colleges).
- Underground—District heating applications.

Energy and water conservation i.e., Energy—Water nexus.

Research

Materials—Systems:

- New technologies.
- Energy impact comparison on an equivalent basis (including aging) Inclusive of All Mechanical Insulation Type Applications.
- Lifecycle analysis by product group.
- Impact of duct liners and exterior duct wrap on air leakage—Energy efficiency.

NIA, its members, and the International Union are committed to working with the Congress, DOE, other Federal agencies, and key stakeholder groups on these and other initiatives that will lead to greater energy efficiency nationwide. We have formed alliances with engineering and other industry trade organizations and have offered to work with DOE to bring together a coalition to help develop, implement, and provide educational awareness programs established and funded by the Congress.

Thank you for the opportunity to submit testimony in support of a program that is critical to job creation, economic growth, energy savings, and emissions reductions.

PREPARED STATEMENT OF THE NATIONAL RESEARCH CENTER FOR COAL AND ENERGY

Dear Chairwoman Feinstein and Ranking Member Alexander: Thank you for the opportunity to submit our testimony in support of the programs of the Office of Fossil Energy, Department of Energy (DOE) for fiscal year 2013.

INTRODUCTORY COMMENTS

The Office of Fossil Energy programs address two of our Nation's key energy needs:

- Technologies for meeting our current demands for electricity; and
- Ensuring our supplies of petroleum and coal-derived fuels for our transportation, industrial, and residential sectors.

Coal technologies provide more than 40 percent of our electricity generation and are prominent in industrial applications for generating process heat. The control of criteria pollutants and technologies for the management of carbon emissions are important coal programs for protecting our environment, a challenge that becomes increasingly complex as our Nation has legislated tighter limits on our energy-generating processes. Electricity generation based on natural gas fuels, currently providing 26 percent of our electricity generation, relies on components such as gas turbines and fuel cells and on emissions control technologies that were developed under the Fossil Energy program.

However, despite the prominence of fossil fuels in our national energy mix for the present and for the foreseeable future, funding for Fossil Energy programs has been reduced dramatically over the past several years. Based on the fiscal year 2013 recommendations of the administration, overall funding for civilian energy programs would increase by 6 percent compared to fiscal year 2011 enacted funding. However, Fossil Energy, which impacts the vast majority of our energy extraction and utilization activities, would suffer a program reduction of 31 percent. Given our national goal of being more efficient in using our energy resources and being less dependent on imported energy, we recommend that Fossil Energy should be funded at \$634 million for fiscal year 2013. Specific recommendations are provided in the Funding Recommendations section.

BENEFITS OF INVESTMENT IN FOSSIL ENERGY RESEARCH

Our Nation has benefitted from investments in fossil energy research. In a study conducted by the National Research Council (NRC) covering the period from 2000–2020, the NRC concluded that investments in coal research, estimated to be around \$9 billion in 2010 constant dollars, would return around \$14 billion in Federal tax revenues, a ratio of 1.6:1. Related, but incomplete, studies for natural gas show that our cumulative investment of \$352 million from 1978–1999 in coal bed methane, tight gas, and shale gas research have returned cumulative benefits of \$13.13 billion by 2010, a ratio of 37:1. We recommend that the Congress conduct a more thorough study for natural gas as was done by the NRC for clean coal technology programs.

In addition to the financial benefits to the U.S. Treasury, our economy benefits from reduced costs for energy. Programmatic funding supports jobs distributed over every State in our Nation. Research done by our university sector provides workforce training for our current and future fossil energy technology needs.

FUNDING RECOMMENDATIONS

Core Coal Research Programs

The core coal research program consists of a suite of projects in carbon management, the development of advanced energy systems, and cross-cutting research that provides new ideas for both making meaningful evolutionary improvements to present technologies and for developing new, revolutionary technologies that can be game-changers in our energy portfolio. These programs cover the environmental, economic, and efficiency aspects of energy.

We recommend that funding for the core coal research program be maintained at or above \$404 million, a level of funding that has been supported in the past (fiscal year 2010) and is both achievable and necessary for an effective fossil energy research program. Subprogram elements would be distributed as follows:

Carbon Capture (\$85 Million).—Most of the increase (\$16 million) should be directed to existing plants (postcombustion capture) since existing plants will contribute the major portion of electricity generated from coal-based units for the next 20 years. Funds should also be increased for developing advanced (revolutionary) technologies to reduce the cost of capture and for large pilot scale testing to validate the effectiveness of proposed capture technologies.

Carbon Storage (\$114 Million).—Most of the increase in this subprogram should be directed to carbon reuse technologies to use captured CO₂ from power plants for enhanced oil recovery (EOR), a cost-effective way of storing CO₂ in depleted oil reservoirs while simultaneously increasing our production of petroleum to reduce our imports of foreign oil.

Advanced Energy Systems (\$145 Million).—Funding increases should be directed toward advanced combustion systems (+\$25 million), advanced gasification systems (+\$10 million), hydrogen turbines (+\$19 million), coal and biomass to fuels and chemicals (+\$10 million), and fuel cells (+\$25 million).

Cross-Cutting Research (\$60 Million).—Increases are recommended for plant optimization (+\$16 million), computational modeling (+\$5 million), and technical and economic analyses of new plants (+\$7 million). Particular emphasis is recommended for polygeneration applications and advanced design plants.

Natural Gas, Oil, and Unconventional Fossil Energy Technologies

We recommend an increase of \$23 million for the natural gas program and \$10 million for the oil/unconventional fossil energy technologies program. Funding would be allocated as follows:

Natural Gas Technologies (\$25 Million).—Focal areas are shale gas, including resource characterization, drilling technology, and environmental protection.

Gas Hydrates (\$15 Million).—Continue research on the development of this major resource that exceeds our other reserves of natural gas.

Unconventional Fossil Energy Technologies (\$10 Million).—Focal areas would include oil shale resources and enhanced environmental safety, especially for off-shore operations.

In addition, we recommend retention of the Ultra Deepwater and Unconventional Technologies program funded under section 999 of EPAAct 2005, which the administration has recommended for rescission. This program supports competitive, cost-shared research jointly conducted by academic, nonprofit, State government (geological surveys) and industry which serve the needs of small oil and natural gas producers.

Other Programs

Program direction funds support salaries of research and program staff in the headquarters offices and the field offices of the Office of Fossil Energy. We recommend that all program direction funds be allocated under the Program Direction sub-element. The level of funding for fiscal year 2013 should be in excess of \$155 million.

Administration recommendations for Plant and Capital Equipment should be increased to \$17 million and Environmental Restoration should be funded at \$8 million.

CLOSING COMMENTS

The funding requested by the administration for fiscal year 2013 is only 59 percent of the value of the equivalent program in fiscal year 2010. This low level of funding is insufficient to support the fossil energy R&D program the Nation needs to maintain our ability to generate inexpensive electricity or to enhance our ability to produce transportation fuels from our own resources. America's ability to sell its energy technology abroad is also being severely restricted because of insufficient funding to develop revolutionary new research ideas or to successfully demonstrate viable technologies to reduce the financial risk concerns of Wall Street and other financiers. The recommendations for allocating \$634 million in the program elements illustrated above would return funding to 95 percent of fiscal year 2010 levels. We strongly recommend restoration of a robust program of fossil energy research.

We further recommend that the Congress also establish a mechanism to allocate funding on annual basis for the support of demonstration projects necessary to prove out promising fossil energy technologies for commercial development. In the past, \$100 million has been allocated each year until a sufficiently large pool of funds was accumulated to offer a request for proposals for demonstration projects. We request congressional support for establishing a clean coal power initiative account for demonstration programs.

Thank you for your support for fossil energy research and development to maintain America's energy, economic, and environmental strengths.

PREPARED STATEMENT OF THE NUCLEAR ENERGY INSTITUTE

The Nuclear Energy Institute¹ (NEI) supports the administration's request for fiscal year 2013 funding for the Nuclear Regulatory Commission (NRC) (\$1.053 bil-

¹The Nuclear Energy Institute is the industry's policy organization, whose broad mission is to foster the beneficial uses of nuclear technology in its many commercial forms. Its member-

lion), the Department of Energy (DOE) National Nuclear Security Administration (NNSA) Fissile Materials Disposition program (\$921 million), and the DOE Office of Environmental Management (\$5.7 billion). NEI recommends \$117 million more for the DOE Office of Nuclear Energy (\$792 million), and an increase of \$1 million to restore the NNSA Export Control Review and Compliance program to \$12.5 million.

ADOPTING THE RECOMMENDATIONS OF THE BLUE RIBBON COMMISSION ON AMERICA'S
NUCLEAR FUTURE

NEI supports the general policy recommendations of the Blue Ribbon Commission (BRC) on managing used nuclear fuel and high-level radioactive waste. A DOE task force is scheduled to provide a plan on implementing the recommendations to the Congress by the end of July, and industry believes that report should provide a basis for the fiscal year 2013 budget. The following programs deserve support and represent the highest priorities for the nuclear energy industry:

- Fuel Cycle Research and Development—\$191 million (an increase of \$16 million);
- Used Nuclear Fuel Disposition (the BRC recommendations)—\$60 million; and
- Advanced Fuel Research and Development—\$60 million (+\$20 million).

NEI also supports the request of \$10 million derived from the Nuclear Waste Fund to use on used fuel storage and disposal programs at DOE. NEI urges the subcommittee to support the following initiatives using \$10 million from the Nuclear Waste Fund in fiscal year 2013. DOE should:

- Work closely with utilities, and based on work performed by the Department in fiscal year 2012, develop timelines, specifications and costs for the development, licensing, construction, and operation of a consolidated storage facility for spent nuclear fuel and high-level waste;
- Work closely with affected States, Indian tribes, and utilities to develop detailed transportation plans for moving spent nuclear fuel from the sites of nuclear power plants that have ceased operation to a consolidated storage facility;
- Work closely with affected States, Indian tribes, and utilities, to develop and implement a plan for training first responders in preparation for transportation under section 180c of the Nuclear Waste Policy Act of 1982 (42 U.S.C. 10101); and
- Identify communities potentially interested in hosting a consolidated storage facility; and
- Forward to the appropriate committees of the Senate and House of Representatives a budget and authorizing legislation for recommendations from DOE.

Within the DOE Fuel Cycle R&D program, \$5 million should be used in fiscal year 2013 to collect data on the aging characteristics of used nuclear fuel in dry cask storage systems, to support the extended use of these systems, and ensure their transportability after periods of extended storage. The Advanced Fuel R&D program includes the Accident Tolerant Fuel Initiative which is important to long-term light water reactor fuel development and should receive \$60 million in fiscal year 2013.

The nuclear industry remains concerned about the termination of the Yucca Mountain project. The project should proceed and be funded so the technical review of the license application can be completed. Numerous State and local governments and the National Association of Regulatory Utility Commissioners are actively opposing DOE's withdrawal of the application for the Yucca Mountain repository at the NRC and in the courts. We urge the subcommittee to request a specific plan, including the resources required for completing the Yucca Mountain licensing process, assuming the courts rule the application cannot be withdrawn.

URANIUM ENRICHMENT DECONTAMINATION AND DECOMMISSIONING FUND TAX UNDUE
BURDEN ON ELECTRICITY CONSUMERS

The administration's fiscal year 2013 budget proposes to reinstate the uranium enrichment decontamination and decommissioning fund, with a tax on electric consumers of \$200 million a year until 2022. Electric utilities have already paid twice for decontamination and decommissioning at uranium enrichment plants that were originally operated by DOE—first as part of the price for uranium enrichment services from the facilities and again under the Energy Policy Act of 1992. Under the

ship, more than 350 corporate members in 17 countries, includes every U.S. utility that operates a nuclear power plant as well as international utilities, plant designers, architect and engineering firms, uranium mining and milling companies, nuclear service providers, universities, manufacturers of radiopharmaceuticals, universities, labor unions, and law firms.

1992 law, the tax on utilities was to end after 15 years or the collection of \$2.25 billion, adjusted for inflation. The utilities paid this amount in full. Because the industry has fully met its obligation for the cleanup of the government facilities twice already, NEI strongly opposes the administration's proposal. The industry appreciates the support of the subcommittee in rejecting this proposal in prior years and encourages you to continue to oppose this proposal.

ENSURING A STRONG NUCLEAR REGULATORY COMMISSION

An independent, credible regulatory agency is required for public confidence in commercial nuclear energy facilities. During the next couple of years, the NRC must continue its inspection and licensing activities at America's nuclear energy facilities while implementing safety recommendations of the agency's task force based on lessons learned from the Fukushima Daiichi accident. Effectiveness of the five-member commission is essential to ensure NRC staff and licensees alike have clear policy guidance. The commission functions most effectively when it has a full complement of five commissioners, and the nuclear energy industry believes the Congress's highest priority should be ensuring that vacancies on the commission do not occur.

The industry supports fiscal year 2013 funding at the NRC's requested level of \$1.053 billion, an increase of \$15 million above its fiscal year 2012 funding levels. The industry remains concerned, however, at the steep escalation in agency budgets and staffing levels over the last decade, from 2,763 staff in fiscal year 2001 to 3,927 staff proposed in fiscal year 2013, and from \$487 million in fiscal year 2001 to more than \$1 billion proposed in fiscal year 2013. The industry is aware that the agency has \$32 million in unobligated balances from prior years' appropriations. The NRC chairman has suggested that the additional Fukushima-related work would amount to nearly \$30 million in new spending. If the agency does not plan to allocate these funds in this manner, the industry believes that the unobligated balances should be used to reduce licensee fees in future years.

The industry applauds the oversight of the NRC by the Congress to ensure the agency effectively prioritizes its activities and achieves closure on open issues in a timely and appropriate manner. The agency should continue to achieve greater transparency in its budgeting to reveal planned staffing and resource needs by individual divisions. This is particularly true concerning the defense and national interest programs funded by taxpayers in appropriated funds. In any 1 year, the NRC should ensure that these programs are funded at the entire 10 percent of available funds. A firewall should exist between fee-based sources of funds so the user fee is not used as an additional source of funding for appropriated programs. This would demonstrate to the Congress, the public and the industry (which pays 90 percent of the NRC's budget) that the budget fairly reflects industry-specific activities.

Once again, the administration has proposed terminating the Integrated University Program, which supports the Nation's universities and community colleges. This program supports important nuclear science and engineering research and workforce training. Given that more than one-half of America's green jobs in the electric sector are at nuclear energy facilities, it is vital that the Congress provide financial support for students and junior faculty. The NRC program is managed jointly with DOE's Office of Nuclear Energy and DOE's National Nuclear Security Administration and has been authorized by the Congress. NEI supports \$15 million for NRC to continue its participation in the program in fiscal year 2013 and recommends that NRC fund the program at that level.

DEVELOPMENT OF ADVANCED REACTOR AND FUEL TECHNOLOGIES

The DOE Office of Nuclear Energy fiscal year 2013 budget is 12 percent lower than fiscal year 2012 while other DOE non-nuclear programs are funded at much higher levels. Funding was reduced by 17 percent in R&D programs that are vital to the Nation's interest in nuclear energy, science and technology. The cuts in DOE programs hinder the Nation's ability to manage used nuclear fuel and promote key research in innovative reactor concepts. The following programs deserve support and represent the highest priorities for the nuclear energy industry:

- Small Modular Reactor Licensing Technical Support—\$95 million (+\$30 million);
- Light Water Reactor Sustainability Program—\$25 million (+\$4 million);
- Energy Innovation Hub for Modeling and Simulation—\$25 million;
- Integrated University Program—\$5 million (+\$5 million); and
- Next Generation Nuclear Plant—\$41.5 million (+\$20 million).

The Secretary of Energy strongly supports the small modular reactor licensing program and has proposed a 5-year, \$452-million program. Unfortunately, the DOE fiscal year 2013 request of \$65 million falls well short of that obligation, and the

industry requests that funding be increased to \$95 million. DOE made a similar 5-year \$250 million commitment for the Modeling and Simulation Hub and it is vitally important that this program receive the funding necessary to succeed. In addition, the Light Water Reactor Sustainability program that is cost-shared with industry should receive \$4 million more than the DOE fiscal year 2013 request to implement research to extend the licenses of the Nation's operating reactors.

INDUSTRY SUPPORTS THE DEPARTMENT OF ENERGY INNOVATIVE TECHNOLOGIES LOAN
GUARANTEE PROGRAM

The nuclear industry appreciates the support provided by the subcommittee for the DOE loan guarantee program for nuclear energy plants and uranium fuel cycle facilities. NEI urges the subcommittee to maintain the appropriated funds for projects under development for fiscal year 2013.

There is no cost to taxpayers for nuclear energy project loan guarantees, but there is significant benefit to consumers. The use of loan guarantees will lower the overall cost of nuclear energy projects, ultimately reducing the cost of electricity to consumers. Companies granted loan guarantees by DOE for nuclear energy projects must pay a premium for use of the program, plus cover all administrative costs. However, the clean energy loan guarantee program, although essential, is not yet a workable financing platform. NEI urges the subcommittee to exercise its oversight responsibilities on implementation by the executive branch, particularly on the issues of the credit subsidy cost that project sponsors are expected to pay.

ENVIRONMENTAL CLEANUP AND NATIONAL SECURITY

DOE's budget for the Environmental Management Office should be kept at level funding to ensure DOE meets its fiscal year 2013 enforceable environmental compliance milestones. NEI remains concerned about NNSA's part 810 export control rule-making. The industry has identified several issues that will impact the implementation of the program in fiscal year 2013. The NEI urges the subcommittee to consider the impact to the U.S. industry as a result of the inadequate funding of \$11.4 million proposed for fiscal year 2013 for review of export licenses, about \$1 million less than last year. NEI supports the administration's request of \$921 million for the Fissile Materials Disposition program.

PREPARED STATEMENT OF THE NUCLEAR ENGINEERING DEPARTMENT HEADS
ORGANIZATION

Chairwoman Feinstein, Ranking Member Alexander, and members of the subcommittee: on behalf of the faculty and students comprising the nuclear education system in the United States we wish to provide testimony on fiscal year 2013 appropriations for the Department of Energy (DOE) and other relevant agencies under the subcommittee's jurisdiction.

As you begin to develop fiscal year 2013 appropriations legislation, we strongly urge you to reject the administration's request to enact a 10-percent reduction in the research and development (R&D) budget of DOE's Office of Nuclear Energy, and maintain funding for the Integrated University Program at fiscal year 2012 appropriated levels.

The Nuclear Engineering Department Heads Organization (NEDHO) is an alliance of heads and chairs of academic programs emphasizing nuclear and radiological science, engineering, and technology across the United States. NEDHO provides a forum for discussion, coordination, and collaboration on issues such as academic accreditation, funding for scholarships, fellowships, and research, and funding for training and research reactors. NEDHO collaborates with the American Nuclear Society, the Nuclear Energy Institute, the Test, Research, and Training Reactors (TRTR) organization, ABET, and other similar societies and organizations that have a stake in nuclear education. We also have strong interactions with industry and government both of which hire our students and utilize our research results. At present NEDHO's membership includes 43 U.S. academic institutions in 29 States, plus 2 military academies.

NEDHO seeks to inform national decisionmakers on nuclear policy, science and technology, and related education through Hill visits and by providing testimony at various subcommittee hearings. NEDHO's ultimate goal is to preserve our Nation's historic leadership in the nuclear field, and to sharpen our competitive edge in the future by maintaining a tradition of excellence in nuclear academia that is the envy of the world. For decades we have sustained the nuclear enterprise with a highly qualified human resource that led the development of nuclear power as a viable,

safe, and environmentally sound source of energy. Our graduates have also contributed to advances in nuclear medicine and a multitude of industrial applications, for example oil-well logging, and have engaged in international activities in the nuclear security and safeguards arena.

In recent years interest in the nuclear science and engineering education enterprise has been on the rise in the United States driven by three primary factors:

- U.S. economic and energy security;
- global competitiveness; and
- national nuclear security.

First, with regards to U.S. economic and energy security we note that nuclear energy today accounts for 20 percent of the U.S. total electricity supply and more than 70 percent of non-carbon-emitting electricity sources. The U.S. nuclear power industry, under a rigorous yet robust regulatory regime administered by the U.S. Nuclear Regulatory Commission (NRC), has established itself as a safe, environmentally responsible, economic, and highly reliable (about 90 percent capacity factors) provider of electric energy. Available forecasts for uranium ore indicate ample, reliable, and inexpensive supplies for the foreseeable future. The U.S. NRC's recent approval of two new AP 1000 reactors at the Vogtle site in Georgia, and their approval last week of two similar reactors in South Carolina, plus rising interest in Small Modular Reactors (SMR), ushers a new nuclear era in this country after a 30-year hiatus. The improving public perception of the safety of America's nuclear fleet will be sustained by the improved features in new designs and by incorporating lessons learned from Fukushima. Also the prospect of closing the backend of the fuel cycle that has been resuscitated by the Blue Ribbon Commission's report will hopefully kick into high gear to resolve this urgent issue once and for all.

Second, on the global scale many developing and underdeveloped nations are ambitiously seeking to build up their nuclear power capacity, most notably in the two most populated countries in the world, China and India, whose economies are undergoing aggressive growth. A recent presentation by DOE personnel reported on the magnitude of the global market for nuclear power in the foreseeable future as follows: there are more than 430 reactors operating in 30 countries, producing 370 GWe, or about 14 percent of the global electricity supply. There are currently 65 reactors under construction in 15 countries, with 26 of these in China alone. These operating and soon-to-operate reactors comprise a substantial global market for equipment (e.g., turbines, generators, instrumentation), fuel, and services. DOE also notes 154 power reactors planned in 27 countries for the next 8–10 years costing more than \$740 billion, and a total of 331 reactors proposed in 37 countries over the next 15 years at a projected cost of \$1.6 trillion. Not only are the economic rewards of U.S. engagement in this growing global market necessary for providing highly paying jobs for Americans involved in the design, analysis, and potentially construction of new reactors, it is an essential means of spreading high U.S. technical standards in this sensitive industry across the globe. A safety culture that transcends national boundaries and that is based on a solid scientific foundation and supported by decades of excellent American experience is the best guarantee that nuclear power will remain an agent for improving the global environment.

Third, the growing number of nuclear-hopeful nations and the widening footprint of nuclear power raises concerns about nuclear proliferation to historic highs and makes a strong case for developing novel and better detectors and methods for verifying that nuclear materials are only being employed for peaceful purposes. These concerns cannot be addressed solely by controlling the flow of scientific knowledge and underlying technologies and requires a revamped structure that better integrates the technical and policy aspects of this issue. In addition, the continued threat of nuclear terrorism is not likely to abate any time soon and demands the continuous and untiring vigilance of relevant agencies within the U.S. Government.

Common to all these factors is the need for a highly educated nuclear workforce that is aware of national needs and that is well equipped to tackle them. The magnitude of this immense challenge was wisely recognized by the U.S. Congress and two administrations since 2009 when two programs designed to reinvigorate nuclear education in the U.S. were inaugurated: The Integrated University Programs (IUP) and the DOE Nuclear Energy University Programs (NEUP). The Blue Ribbon Commission likewise recognized the importance of U.S. leadership in the nuclear area, and highlighted continued innovation in nuclear technology and workforce development as one of its eight major recommendations.

A decade ago Federal investment in R&D and nuclear education infrastructure was administered by DOE's Office of Nuclear Energy (DOE-NE). Support through scholarships, fellowships, equipment grants, research reactor upgrades, et cetera was crucial to stemming the precipitous decline in the 1990s of nuclear academic programs and university research reactors. In 2008, foreseeing an impending nu-

clear human resource crisis fueled by an aging workforce and the rising prospect of mass retirements DOE-NE created NEUP that directed approximately 20 percent of NE's R&D funding towards universities in support of DOE-NE's research mission. And in 2009 the IUP was instated by the Congress to instill some degree of stability in the funding stream of nuclear education by diversifying sponsorship across three Federal agencies: DOE's NE, DOE's National Nuclear Security Administration (NNSA), and the US NRC. The three arms of IUP were directed to support broad educational objectives via programmatic and non-programmatic awards, and to coordinate their support mechanisms in order to minimize duplication.

In the ensuing years these support schemes have succeeded in reviving nuclear academia, and expanded interest in nuclear research topics into other disciplines, e.g., material science, mechanical engineering, radiochemistry, leading to a fertile interdisciplinary research environment in support of the Nation's research agenda. All awards made via NEUP and IUP are competitive and have seen broad participation from across the Nation. To be specific, the NRC invested its share of IUP in curriculum development (\$5 million), Junior Faculty Development, scholarships and fellowships awarded to selected universities, and support of community colleges (a total of \$10 million). NNSA now dedicates \$5 million in support of the Nuclear Science and Security Consortium led by the University of California, Berkeley, and awards \$10 million in programmatic support of basic research projects relevant to nuclear security.

DOE-NE administers IUP through NEUP in two separate funding streams. First, NEUP spends \$5 million in direct IUP funding on scholarships and fellowships awarded directly to student applicants. This program is distinct in its objectives from NRC's scholarship and fellowship program in that it is designed to attract top talent to the field without regard to the university where they seek their respective degree. While this type of recruitment is likely to raise the overall quality of students in the nuclear field, it is expected to concentrate these students in highly ranked schools creating severe discrepancy among the remaining nuclear academic programs. In contrast, NRC's program empowers awarded departments to use the funds in recruitment of high-quality students that will promote the reputation of the awarded department and ensure a diverse educational foundation that improves the chances of innovative breakthroughs. In addition, DOE-NE has committed up to 20 percent of its R&D funds to support university research via competitive awards of varying levels of programmatic relevance. Some of these funds have been awarded in support of nuclear infrastructure in U.S. universities.

To appreciate the importance of IUP for the revival of nuclear engineering academia in the United States we note that the elements of IUP cover the three primary missions of a research intensive university:

- education (undergraduate and graduate);
- research; and
- service.

In the 3 years since its inception IUP has succeeded in reversing enrollment decline that all but dominated the 1990s, with enrollments continuing to climb even after the Fukushima event, and in revitalizing existing academic programs with several universities starting new nuclear engineering programs from scratch. Sustaining support of IUP sends a clear and loud message to university administrators who need to support nuclear programs and to prospective students that their career investment in this field is desirable and will be rewarded. In contrast, reducing DOE-NE's R&D budget, and eliminating support for IUP sends a confusing message to the same administrators and target students and steers them away from a field that we believe, and we hope you agree, is of prime national interest.

In closing we hope that your subcommittee will reverse this damaging development. Continued funding for NEUP and IUP will protect the great progress achieved in nuclear academic programs in support of our Nation's ability to compete in the global nuclear marketplace and to enhance the safe and secure utilization of nuclear technology for the benefit of humanity.

Thank you.

PREPARED STATEMENT OF THE SACRAMENTO MUNICIPAL UTILITY DISTRICT

Dear Chairwoman Feinstein: On behalf the Sacramento Municipal Utility District (SMUD), I want to thank you again for supporting the Department of Energy's (DOE) Water Power Program and your staff's excellent work in securing \$59 million for the program in fiscal year 2012. I am writing to respectfully request that the Senate Appropriations Committee fund the Water Power Program at the same level of \$59 million for fiscal year 2013. This amount should be directed to support hydro-

power research and development including projects classified as “conventional hydropower”.

Investments during the past few years in what is labeled “conventional” hydropower technologies have resulted in the development of more efficient and environmentally friendly turbines, reduced costs in state-of-the-art small hydropower technology, and advances in technologies to integrate intermittent renewable energy resources into the electric grid. These advances could be lost if the administration’s fiscal year 2013 budget request, which proposes cutting the Water Power Program’s funding level to \$20 million, is enacted and if no R&D funds are designated for conventional hydropower projects.

Northern California electricity customers have benefitted directly from investments made by the Water Power Program. In 2011, SMUD was awarded two multiyear grants, including a \$4.96 million award to assist with initial geotechnical studies for the proposed 400 MW Iowa Hill pumped storage project. While pumped storage technology has existed for some time, SMUD is researching advanced plant control systems featuring variable speed pump generators that have yet to be applied in the United States. Use of this new technology would enhance SMUD’s ability to integrate high levels of intermittent renewable resources such as wind and solar power into our electrical system while maintaining electric reliability.

The DOE also awarded SMUD \$1.49 million to help implement a new low-head modular hydropower unit at the Slab Creek Powerhouse project featuring inward flow reaction turbine technology allowing creative use of existing tunnels to generate power from minimum releases of the existing reservoir.

Each of these grants was awarded based on their ability to contribute to the development of new technologies that produce conventional hydropower more efficiently, reduce costs, and increase sustainable hydropower generation. Both projects will advance innovation in a traditional, carbon-free resource.

Because SMUD’s grants depend on future appropriations, including fiscal year 2013 funding, and to ensure continued Federal investment in these valuable and innovative initiatives, SMUD believes the current level of \$59 million in funding for the Water Power program should be maintained.

Thank you for your attention and support on these issues.

PREPARED STATEMENT OF THE SOCIETY FOR INDUSTRIAL AND APPLIED MATHEMATICS

SUMMARY

This written testimony is submitted on behalf of the Society for Industrial and Applied Mathematics (SIAM) to ask you to continue your support of the Department of Energy (DOE) Office of Science by providing \$4.99 billion in fiscal year 2013. In particular, we urge you to provide significant support for the Applied Mathematics Program within the Office of Advanced Scientific Computing Research (ASCR) within the Office of Science. We also emphasize the importance of support for graduate students, postdoctoral fellows, and early career researchers.

WRITTEN TESTIMONY

We are Dr. Lloyd Nicholas Trefethen, President, and Dr. Reinhard Laubenbacher, Vice President for Science Policy, of the Society for Industrial and Applied Mathematics (SIAM). On behalf of SIAM, we are submitting this written testimony for the record to the Subcommittee on Energy and Water Development of the Committee on Appropriations of the U.S. Senate.

SIAM has approximately 13,000 members, including applied and computational mathematicians, computer scientists, numerical analysts, engineers, statisticians, and mathematics educators. They work in industrial and service organizations, universities, colleges, and government agencies and laboratories all over the world. In addition, SIAM has more than 500 institutional members—colleges, universities, corporations, and research organizations. SIAM members come from many different disciplines, but have a common interest in applying mathematics in partnership with computational science towards solving real-world problems.

First, we would like to emphasize how much SIAM appreciates your subcommittee’s continued leadership on and recognition of the critical role of the DOE Office of Science and its support for mathematics, science, and engineering in enabling a strong U.S. economy, workforce, and society. DOE was one of the first Federal agencies to champion computational science as one of the three pillars of science, along with theory and experiment, and SIAM deeply appreciates and values DOE activities.

Today, we submit this testimony to ask you to continue your support of the DOE Office of Science in fiscal year 2013 and beyond. In particular, we request that you provide the Office of Science with \$4.99 billion, the level requested in the fiscal year 2013 budget request. SIAM is aware of the significant fiscal constraints facing the administration and the Congress this year, but we note that, in the face of economic peril, Federal investments in mathematics, science, and engineering remain crucial as they help to maintain U.S. pre-eminence in innovation, upon which our economy and fiscal health depend.

THE ROLE OF MATHEMATICS IN MEETING ENERGY CHALLENGES

The Nation faces critical challenges in energy, including in energy efficiency, renewable energy, improved use of fossil fuels and nuclear energy, future energy sources, and reduced environmental impacts of energy production and use. As DOE and the research community design a long-term strategy to tackle these issues, the tools of mathematics and computational science (theory, modeling, and simulation) have emerged as a central element in designing new materials, predicting the impact of new systems and technologies, and better managing existing resources. Already, mathematical and computing researchers in universities, national laboratories, and industry are providing insights that propel advances in such fields as nanotechnology, biofuels, genomics, climate modeling, and materials fabrication.

To tackle many of these challenges, DOE must be able to understand complex systems such as the U.S. power grid, the dispersion of nuclear radiation after a disaster, and the Earth's climate system. These and other complex systems have high levels of uncertainty, lack master plans, and are susceptible to breakdowns that could have catastrophic consequences. Understanding complex systems helps mitigate these risks and facilitate the development of controls and strategies to make systems more efficient.

DEPARTMENT OF ENERGY OFFICE OF SCIENCE

Activities within ASCR play a key role in supporting research that begins to fulfill the needs described above. Particularly critical programs include:

- the Applied Mathematics program;
- the Scientific Discovery through Advanced Computing (SciDAC) program; and
- programs to maintain the pipeline of the mathematical workforce.

SIAM supports the \$455.6 million requested for ASCR for fiscal year 2013. SIAM appreciates that the requested increase for fiscal year 2013 would be directed to the Mathematical, Computational, and Computer Sciences Research activity programs, helping to restore balance between research activities and facility investments.

SIAM supports Office of Science plans to fund research to manage ever-growing data volumes in science. The explosion in data available to scientists from advances in experimental equipment, simulation techniques, and computer power is well known, and applied mathematics has an important role to play in developing the methods and tools to translate this shower of numbers into new knowledge.

SIAM also supports funding for research to develop exascale computing and notes that investments in algorithm research and software development are essential to developing the next generation of high-performance computers, realizing the full benefits of these new machines, and transferring those capabilities to industry for broad economic benefit.

SUPPORTING THE PIPELINE OF MATHEMATICIANS AND SCIENTISTS

Investing in the education and development of young scientists and engineers is a major step that the Federal Government can take to ensure the future prosperity and welfare of the United States. Currently, the economic situation is negatively affecting the job opportunities for young mathematicians—at universities, companies, and other research organizations. It is not only the young mathematicians who are not being hired who will suffer from these cutbacks. The research community at large will suffer from the loss of ideas and energy that these graduate students, postdoctoral fellows, and early career researchers bring to the field, and the country will suffer from the lost innovation.

Maintaining the pipeline of the mathematical workforce with programs that fund research and students is especially important because of the foundational and cross-cutting role that mathematics and computational science play in sustaining the Nation's economic competitiveness and national security, and in making substantial advances on societal challenges such as energy. DOE programs support the educational and professional development of the researchers at universities, companies, and the national laboratories who will tackle the research problems needed to change energy usage in this country.

Within the Office of Advanced Scientific Computing Research, the Computational Science Graduate Fellowship program is a highly successful and model program that enables students to receive robust training in mathematics and also learn to interface with a wide variety of other fields. We request that strong support for this program continue, as well as ongoing support for postdoctoral fellows at DOE national laboratories and universities.

CONCLUSION

The programs in the Office of Science, particularly those discussed above, are important elements of DOE's efforts to fulfill its mission. They contribute to the goals of dramatically transforming our current capabilities to develop new sources for renewable and low-carbon energy supplies and improve energy efficiency to ensure energy independence and facilitate DOE's effort to increase U.S. competitiveness by training and attracting the best scientific talent into DOE headquarters and laboratories, the American research enterprise, and the clean-energy economy.

We would like to conclude by thanking you again for your ongoing support of the DOE Office of Science and the actions you have already taken to enable DOE and the research and education communities it supports, including thousands of SIAM members, to undertake the activities that contribute to the health, security, and economic strength of the United States. The DOE Office of Science needs sustained annual funding to maintain our competitive edge in science and technology, and therefore we respectfully ask that you continue your support of these critical programs.

We appreciate the opportunity to provide testimony to the Committee on behalf of SIAM and look forward to providing any additional information or assistance you may ask of us during the fiscal year 2013 appropriations process.

PREPARED STATEMENT OF THE STATE TEACHERS' RETIREMENT SYSTEM, STATE OF CALIFORNIA

SUMMARY

Acting pursuant to congressional mandate, and in order to maximize the revenues for the Federal taxpayer from the sale of the Elk Hills Naval Petroleum Reserve to private industry by removing the cloud of the State of California's claims, the Federal Government reached a settlement with the State in advance of the sale.

The State waived its rights to the Reserve in exchange for fair compensation in installments stretched out over an extended period of time.

In its fiscal year 2013 budget, the administration has requested the appropriation of \$15,579,815 for the final installment of Elk Hills compensation to fulfill the Federal Government's obligations to the State under the Settlement Agreement. The State respectfully requests the appropriation by the Congress of \$15,579,815 of the final Elk Hills compensation payment due to the State.

BACKGROUND

Upon admission to the Union, States beginning with Ohio and those westward were granted by the Congress certain sections of public land located within the State's borders. This was done to compensate these States having large amounts of public lands within their borders for revenues lost from the inability to tax public lands as well as to support public education. Two of the tracts of State school lands granted by the Congress to California at the time of its admission to the Union were located in what later became the Elk Hills Naval Petroleum Reserve.

The State of California applies the revenues from its State school lands to assist retired teachers whose pensions have been most seriously eroded by inflation. California teachers are ineligible for Social Security and often must rely on this State pension as the principal source of retirement income. Typically the retirees receiving these State school lands revenues are single women more than 75 years old whose relatively modest pensions have lost as much as one-half or more of their original value to inflation.

STATE'S CLAIMS SETTLED, AS THE CONGRESS HAD DIRECTED

In the National Defense Authorization Act for fiscal year 1996 (Public Law 104-106) that mandated the sale of the Elk Hills Reserve to private industry, the Congress reserved 9 percent of the net sales proceeds in an escrow fund to provide compensation to California for its claims to the State school lands located in the Reserve.

In addition, in the act, the Congress directed the Secretary of Energy on behalf of the Federal Government to “offer to settle all claims of the State of California . . . in order to provide proper compensation for the State’s claims.” (Public Law 104–106, section 3415). The Secretary was required by the Congress to “base the amount of the offered settlement payment from the contingent fund on the fair value for the State’s claims, including the mineral estate, not to exceed the amount reserved in the contingent fund”. (Id.)

Over the year that followed enactment of the National Defense Authorization Act mandating the sale of Elk Hills, the Federal Government, and the State engaged in vigorous and extended negotiations over a possible settlement. Finally, on October 10, 1996, a settlement was reached, and a written Settlement Agreement was entered into between the United States and the State, signed by the Secretary of Energy and the Governor of California, under which the State would receive 9 percent of the sales proceeds in annual installments over an extended period.

The Settlement Agreement is fair to both sides, providing proper compensation to the State and its teachers for their State school lands and enabling the Federal Government to maximize the sales revenues realized for the Federal taxpayer by removing the threat of the State’s claims in advance of the sale.

FEDERAL REVENUES MAXIMIZED BY REMOVING CLOUD OF STATE’S CLAIM IN ADVANCE
OF THE SALE

The State entered into a binding waiver of rights against the purchaser in advance of the bidding for Elk Hills by private purchasers, thereby removing the cloud over title being offered to the purchaser, prohibiting the State from enjoining or otherwise interfering with the sale and removing the purchaser’s exposure to treble damages for conversion under State law. In addition, the State waived equitable claims to revenues from production for periods prior to the sale. The Reserve thereafter was sold for a winning bid of \$3.53 billion in cash, a sales price that substantially exceeded earlier estimates.

THE CONGRESS SHOULD APPROPRIATE \$15,579,815 FOR FISCAL YEAR 2013 FOR THE FINAL
INSTALLMENT OF ELK HILLS COMPENSATION DUE TO THE STATE

The State’s 9-percent share of the adjusted Elk Hills sales price of \$3.53 billion is \$315,099,815 (after deducting the State’s share of the sales expenses). As the Congress had directed in the 1996 Act that mandated the sale of Elk Hills, 9 percent of the net proceeds were reserved in a contingent fund in the Treasury for payment to the State. To date, the Congress has appropriated seven installments of \$36 million and one installment of \$48 million that was reduced to \$47.52 million by the 1 percent across-the-board rescission under the fiscal year 2006 Defense Appropriations Act, for total appropriations to date of \$299.52 million of Elk Hills compensation owed to the State.

The administration’s budget for fiscal year 2013 requests the appropriation of \$15,579,815 for the Elk Hills School Lands Fund to pay the final installment of Elk Hills compensation due to the State. (Budget of the United States Government, fiscal year 2013—Appendix, at p. 446, Account No. 89–5428–0–2–271). Thus, the provision for Elk Hills compensation is a line item in the Federal budget; it is not an earmark.

The State respectfully requests the appropriation by the Congress of \$15,579,815 to fulfill the Federal Government’s obligation to the State under the Settlement Agreement.

PREPARED STATEMENT OF THE UNIVERSITY CORPORATION FOR ATMOSPHERIC
RESEARCH

On behalf of the University Corporation for Atmospheric Research (UCAR) and the university communities engaged in Earth systems research and education, I submit this written testimony for the record of the Senate Committee on Appropriations, Subcommittee on Energy and Water Development. UCAR is a consortium of 77 research universities that manages and operates the National Center for Atmospheric Research (NCAR) on behalf of the National Science Foundation (NSF) and the university community. I urge the subcommittee to fund the fiscal year 2013 budget request of \$4.992 billion for the Department of Energy (DOE) Office of Science, including \$625.3 million for Biological and Environmental Research, and \$2.337 billion for the DOE Office of Energy Efficiency and Renewable Energy (EERE).

With the following, I highlight several science research and development programs that represent DOE's critical contributions to American leadership in science and technology:

DEPARTMENT OF ENERGY OFFICE OF SCIENCE

The DOE Office of Science directly supports university and laboratory research, increasing the Nation's capacity to understand and advance numerous fields of science, including the atmospheric sciences. More broadly, the DOE's world-class laboratories, the research conducted at the labs, and the scientific facilities accessible to the larger research community through the labs, are centerpieces of the robust innovation ecosystem that keeps the United States an international leader in science and technology and that stimulates the economy through technology development.

Biological and Environmental Research.—The Biological and Environmental Research (BER) program within DOE Science makes fundamental contributions to the Nation's premier Earth system models and data analysis infrastructure that provide the scientific foundation for future decisionmaking on environmental change. Without BER-supported work, we would not know the level of risk that cities, states, and businesses face from long-term weather trends and what societal preparation and adaptation might be needed.

In particular, the Climate and Environmental Sciences program within BER provides indispensable support to the Community Earth System Model (CESM), a comprehensive computer model supported by DOE and NSF to analyze Earth's past, present, and project future climate. CESM is a major contributor to national and international assessments of environmental change. And while CESM is housed and managed at NCAR, it is an open-source climate model, involving contributions and improvements from scientists across the Nation and around the world.

Thanks in part to BER support, CESM is incorporating more complex and realistic representations of the natural and human processes that shape the global climate. For example, the model now has a dynamically coupled carbon and nitrogen cycle component that allows representation of realistic exchanges of CO₂ between the atmosphere, the oceans, and the land surface. This new capability will allow realistic studies of the role of the ocean in absorbing and releasing CO₂ to the atmosphere, thereby obtaining more accurate predictions of future CO₂ concentrations that are fundamental to understanding the nature and magnitude of future changes in global climate. Carbon and nitrogen cycling in CESM provides the means to study in detail the contributions of land use change and vegetation disturbance to local, regional and global climate change. These new capabilities will allow the climate science community to address societally relevant questions in a way that has not been possible in the past.

CESM performs exceptionally well on DOE's modern supercomputers, having been run at high resolutions in one experiment on more than 100,000 processors of the Cray Jaguar-PE system at Oak Ridge National Laboratory. CESM scenario runs are now underway on this and other supercomputers to make projections for the U.N. Intergovernmental Panel on Climate Change's Fifth Assessment Report, expected to be released in 2014.

New in fiscal year 2013, climate and Earth system modeling research at DOE will develop an enhanced validation and verification capability to compare models and measurements against a unified framework using sophisticated software tools. This initiative promises to improve the efficiency of data management and analysis in the field. As in fiscal year 2012, atmospheric scientists will continue to receive grant funding for cutting-edge research on aerosols, clouds, and aerosol-cloud interactions, in order to improve estimates of how these feedbacks impact climate, an area of atmospheric research that can be better understood.

In order to develop more accurate, increasingly realistic, and higher resolution Earth system models, with better environmental predictive capabilities for businesses, stakeholders such as water resource managers, and communities, I urge you to fund the Office of Biological and Environmental Research within the DOE Office of Science at the requested \$625.3 million for fiscal year 2013, including \$315.6 million for Climate and Environmental Sciences within BER.

ADVANCED SCIENTIFIC COMPUTING RESEARCH

According to a 2011 National Research Council report *The Future of Computing Performance, Game Over or Next Level?*, "Virtually every sector of society—manufacturing, financial services, education, science government, the military, entertainment, and so on—has become dependent on continued growth in computing performance to drive new efficiencies and innovation." Within the atmospheric sciences, the

advancement of our science rests on the continued growth of computing performance and capabilities. DOE Science's Advanced Scientific Computing Research (ASCR) delivers needed leading edge computational and networking capabilities to scientists nationwide, enabling the Office of Science and the larger university community to address and answer major scientific questions.

In particular, the atmospheric sciences community depends on the ASCR Leadership Computing Facilities (LCFs), which are available to all researchers for scientific discovery and to address critical engineering challenges. The continued support of these programs is of particular importance to Earth system model development. Representing the complex processes and feedbacks of the Earth's systems, while efficiently harnessing the enormous amount of computing power necessary, requires very advanced software engineering, computer science, and numerical techniques. Because the climate simulations using the CESM (described above) are too computationally intensive to be run at NCAR alone, many computational experiments are run at the LCF's.

At the Oak Ridge National Laboratory Leadership Computing Facility (OLCF), for example, a new 2.33-petaflop Cray XT5 system is already available to the scientific community, and OLCF plans to upgrade it to a 10-petaflop Cray XK6 system in upcoming years. The Argonne National Laboratory Leadership Computing Facility (ALCF) plans to upgrade its IBM Blue Gene/Q supercomputer to a 10-petaflop system this year. Alongside the NCAR-Wyoming Supercomputing Center and its 1.6-petaflop Yellowstone system soon to be delivered to this new facility, these DOE supercomputers will empower atmospheric scientists to push the boundaries of Earth systems modeling science.

In the same way that more powerful telescopes enable new discoveries in astronomy, each major supercomputer upgrade enables new numerical experiences that reveal more details regarding how the Earth system works. This information is critical to efforts to understand and predict regional climate, as well as to develop and assess mitigation and adaptation strategies. A failure to maintain and continue to upgrade these LCFs would seriously undermine the steady progress in this and many other areas of science.

Another important cross-cutting computing program that operates in partnership with ACSR and other programs within DOE Science is the Scientific Discovery through Advanced Computing (SciDAC) program. SciDAC accelerates scientific progress by breaking down the barriers between disciplines and fostering more dynamic partnerships between basic researchers and computational science applications. A SciDAC effort in partnership with BER, for example, is quantifying the uncertainty in next-generation integrated Earth system models in order to dramatically improve our ability to characterize the drivers of global climate and quantify the impact of energy production and use on the environment and human health.

I urge you to fund the Advanced Scientific Computing Research within the DOE Office of Science at the fiscal year 2013 requested level of \$455.6 million and to support SciDAC program throughout the Office of Science budget.

ENERGY EFFICIENCY AND RENEWABLE ENERGY RESEARCH AND DEVELOPMENT

Renewable energy research, development, and technology transfer are among the most important investments we can make to ensure long run economic and environmental sustainability. Renewable energy technology contributes numerous cross-cutting benefits to society, including reducing our dependence on foreign oil and providing energy security, driving innovation and job creation in the energy economy, decentralizing the energy market, providing new high-tech jobs, reducing the human toll on the environment, and improving air quality and public health outcomes. DOE's Energy Efficiency and Renewable Energy (EERE) is at the heart of this transformation.

Our national research universities, in collaboration with DOE laboratories and the private sector, are driving the country's innovation in renewable energy and energy efficiency. One example of such collaboration includes a partnership between NCAR, DOE's National Renewable Energy Laboratory (NREL), and Xcel Energy, Colorado's largest utility company, to develop sophisticated wind forecasts for operational use. These forecasts provide critical information to utilities to:

- help them predict how much wind power will be generated over the next 24 to 72 hours;
- enhance their ability to better integrate wind-generated electricity into the grid; and
- assist with decisionmaking processes regarding whether to power down coal- and natural gas-fired plants when sufficient winds are predicted. To reduce the costs of integrating wind and solar energy into the electrical grid and make re-

newable energy more cost effective, significant improvements in weather forecasting technologies will be required, and additional weather observations in the lower atmosphere will be needed.

Given the critical importance to the Nation of developing economically and environmentally sustainable technologies for energy production, I urge the subcommittee to fund the fiscal year 2013 request of \$2.337 billion for the Office of Energy Efficiency and Renewable Energy.

I want to thank the members of the subcommittee in advance for supporting, through DOE, basic and applied scientific research in the environmental and other Earth sciences. By doing so, you advance the Nation's economic recovery, help stakeholders manage irreplaceable natural resources, and sustain the Nation's global scientific leadership.

PREPARED STATEMENT OF THE URS CORPORATION

Mr. Chairwoman and members of the subcommittee: My name is Dr. Douglas Everett Wyatt, Jr.,¹ and in my capacity as Director of Science Research for URS Corporation supporting the Department of Energy (DOE), Office of Fossil Energy, National Energy Technology Laboratory, I provide this testimony. Specifically, I will address the essential support of the Strategic Center for Natural Gas and Oil, a Program Office within the National Energy Technology Laboratory (NETL) for the Office of Fossil Energy.

The abundant availability of energy, in all of its various forms, has been a primary catalyst for the development of advanced civilization. While this is somewhat a philosophical thought I believe it to be as true today as it was for any time in the past. Simply put, there is no conceivable advanced future for the Nation without increasingly abundant energy. As a scientist for the past 30 years, I am keenly aware that energy can be produced cleanly and utilized efficiently as the following testimony will describe.

No scientist or engineer believes that a single energy source is a viable solution for our national energy needs. We understand the energy systems of the past and present, and can reasonably predict the energy systems of the near future. However, because of the dynamics of discovery and imagination, our ability to predict energy needs and sources beyond six to eight decades is limited but the scientific community can predict energy utilization and resources for the next 30 to 40 years. Oil and natural gas will continue to be a primary energy resource during this time and the research initiatives of the Strategic Center for Natural Gas and Oil strongly supports our Nation's ability to efficiently and cleanly use this resource as part of our global energy mix over the next several decades.

Oil and natural gas exploration, development and production is well-understood by hundreds of oil and gas companies in the U.S. market. Yet only a few of the largest companies, i.e., ExxonMobil, ConocoPhillips, Chevron, have active self-funded research programs addressing new technology and science associated with oil and natural gas production, expansion, and efficiency. These companies, along with the larger industry support companies, i.e., Schlumberger, Halliburton, Weatherford, often support academic research in expanded and efficient oil and gas development, but the vast majority of their research is to develop a competitive advantage in the market; therefore, the knowledge gained is proprietary. Only when partnered with a Federal agency will the research become public. The Strategic Center for Natural Gas and Oil is unique in that it leverages Federal funding to integrate Federal, academic, and commercial research so that new science and technology, supporting national policy and energy needs, is performed with data available to the public. Therefore, I believe that it is critically important for the programs of the Strategic Center for Natural Gas and Oil to be more fully funded and expanded.

¹Douglas E. Wyatt works for the URS Corporation, a global Fortune 500 company and major support contractor to the U.S. Government. URS employs 57,000 people working in program management, engineering, design and construction, in site maintenance and operations, and in decommissioning and decontamination. URS has been named as the largest global environmental company and is consistently in the top ten in engineering and architecture, power, design, construction, transportation, and industrial processes. Wyatt holds a Ph.D. in geological sciences from the University of South Carolina, an MS in geology and geophysics from Vanderbilt University, a BA in physical geography, and BA in zoology from the University of Tennessee. He has more than 140 publications, papers, and presentations. Wyatt has 30 years of experience including oil and gas exploration and production, nuclear energy, geothermal and renewable energy, environmental characterization and in creating and managing large multidisciplinary research programs. He lives in Aiken, South Carolina.

In my capacity as a scientist, with a finger on the pulse of the state of the industry, I believe there are three critical areas in fossil energy oil and gas where a Federal research presence, through the Strategic Center for Natural Gas and Oil, is essential so that:

- technologies are investigated under a variety of conditions and potential impacts are better understood;
- technologies or concepts that may not seem immediately useful or marketable to industry in the short term are evaluated; and
- the broadest distribution of knowledge and data is guaranteed.

The three areas of Federal research with proposed budgets and rationale are:

CO₂ Enhanced Oil and Gas Recovery—The Use of CO₂ in Enhanced Oil Recovery and Residual Oil Zone Production From Historic, Diminished and Depleted Oil Reservoirs.—Enhanced Oil Recovery (EOR) is common practice in the oil industry and CO₂ is currently used for this purpose. However, there are known limits to the capability of the existing technology and utilization issues due to the limited availability of clean CO₂. Current research suggests that there are a variety of high-technology options to improve the effectiveness of CO₂ in the oil reservoir such as chemically altering nanoparticles and enhanced geophysical monitoring of the CO₂-oil interaction. In addition, there is a probability that CO₂ can be beneficially reused as a replacement for water in the hydraulic fracturing of shale and other gas producing geological formations. The utilization of CO₂ in “fracking” operations would eliminate many of the current environmental concerns associated with shale gas production. Other examples of CO₂ use are available. Many new enhanced oil recovery concepts using CO₂ as the working fluid are subject to scientific analysis. I strongly recommend you fund this research program at \$150 million over a 5-year period with \$30 million annually. A \$30 million annual budget would allow for 10 to 20 university research efforts to be completed, a robust extramural research competitive program to be completed, continuation of NETL intramural research, and for a joint industry, academic, Federal partnership to be formed to market and commercialize technologies developed from this program. The U.S. produces approximately 280,000 barrels of oil per day from 114 active fields from CO₂ EOR. Considering the current price of oil, if only 2 extra days’ of oil production were generated from this research, then the value of the new CO₂ EOR oil added to the national daily total would cover the cost of this critical research. However, new research into CO₂ EOR might be expected to produce new efficiencies of 5 to 15 percent and more, above current production. I strongly urge you to fund the Strategic Center for CO₂ Enhanced Oil and Gas recovery research.

Environmentally Safe Development, Production and Utilization of Natural Gas and Oil/Liquids From Unconventional Source Rocks.—The production of massive quantities of natural gas from organic-rich shale source rocks provides our Nation a path to energy independence. The effective use of shale gas has the ability to shift global energy markets to our Nation’s substantial favor. In effect, a vision of our Nation no longer coupled to the global oil market can be realized. The oil and gas industry understands this possibility and is proceeding with the development and production of abundant natural gas. Research into best practices for shale gas reservoir development, new technologies for reservoir stimulation, water disposal, near surface environmental protection, and in the overall utilization of the gas are but a few of the issues that demand attention. All of these research missions are important but two deserve special attention.

Current shale gas reservoir development by hydraulic stimulation, “fracking”, only stimulates a portion of the total shale volume intersected by a horizontal well. It is probable that well bores might be drilled on a closer spacing increasing the volume of rock penetrated and the overall availability of gas. This possibility implies that the current recoverable volumes of natural gas from shale, or other organic rich gas-producing source rocks, might be doubled, or even tripled. Additionally, if wells can be drilled on a denser spacing then it becomes possible to strategically locate wells so that surface and human impacts could be maximized or minimized, depending on the need. Research to validate this concept and to develop best methodologies is required.

New gas utilization concepts and technologies are also particularly important. Natural gas is a very clean and versatile fuel that can be used in fuel cells, chemical looping reactors, or directly burned in internal combustion engines. There are other advanced concepts which could be directly applied to the well-head and production area for electricity and industrial heat generation, converted to useful goods and merchandise such as plastics, among other probabilities. The wide-spread distribution of shale gas reservoirs and the abundant gas produced from a typical shale well implies that it might be possible to use shale gas derived energy in the form of heat

and electricity in small-scale localized transmission grids and funneled into the overall national SmartGrid technology program.

Possibly more important is the use of natural gas as a bridge fuel. Natural gas is a clean burning and abundant fossil fuel that can be used in a variety of existing and new applications, including transportation, to form a bridge from our current fossil energy mix to a future electrified energy mix that is projected over the next several decades. Not only can the gas be burned for heat for internal combustion engines or electrical generators it can be used directly in fuel cell applications to generate electricity. Since natural gas can be compressed, liquefied, and adsorbed it can be used in almost any system requiring electrical or heat energy. It is a natural bridge fuel for our Nation that requires your attention.

There are many recent research successes in the development of environmentally safe natural gas. These include the recent DOE data and support to the Environmental Protection Agency for "fracking" related groundwater issues, the development of potential new nanoparticles supporting gas and oil EOR, and the development of new approaches to modeling and imaging multiphase, multifluid flow in shale and sandstones. However, new research into the utilization of natural gas for new and expanded markets is needed. I recommend that \$300 million funding allocation over a 5-year period be authorized to complete research in this area. A \$60 million annual allocation will allow for a variety of university collaborations consisting of 20 to 40 university research efforts covering a broad spectrum of research needs. A competitive extramural research program of joint industry and joint industry and academia can be completed to insure for the best market and technology applications. Additionally, a small-business industry program to develop, market, and deploy new technologies will insure wide-spread use throughout the industry. Finally, ongoing intramural research at the NETL will insure the brokering of environmental data necessary to insure safe gas development.

Natural Gas Hydrates.—Gas hydrates are the largest source of natural gas, methane, on Earth. Hydrates are ubiquitous on the continental shelves of all major continents and are, therefore, a globally distributed fuel resource. Hydrates are also abundant in arctic sediments. Much research has been done for hydrates and their character and distribution is well known. However, there is still research necessary in hydrate stability, the environmental systems in which they exist, and in the best, most efficient, most environmentally safe method of production. The United States has led global hydrate research, but the world is beginning to develop hydrates for energy. It is important for our Nation to maintain a key role in overall hydrates research. I recommend a \$15 million 5-year program, \$3 million annually, to continue extramural university research and intramural National Energy Technology Laboratory research programs.

PREPARED STATEMENT OF THE WORCESTER POLYTECHNIC INSTITUTE

We have been working with the Department of Energy (DOE) National Energy Technology Laboratory (NETL) for several years developing technology which is efficient and economical for simultaneous hydrogen production and carbon dioxide sequestration. The project has been very successful and is in the final stage of development and commercialization. The project has provided employment opportunity for 8–10 people. The most recent two projects are DE-FC26-07NT43058 (Project title: Composite Pd and Pd Alloy Porous Stainless Steel Membranes for Hydrogen Production and Process Intensification) and Phase I of DE-FE0004895 (Project title: Engineering Design of Advanced H₂-CO₂ Pd and Pd/Alloy Composite Membrane Separations and Process Intensification). We have achieved amazing success for the Phase I project and is ready to move into Phase II to construct pilot scale unit for the production of 100 pounds hydrogen per day and eventually to Phase III to design a plant for the production of 5 tons hydrogen per day. Unfortunately, the funding for Phase II and Phase III was cut and the project will be terminated. This untimely termination of the project not only causes people to lose their employment but also the United States to miss the opportunity to be a leader in simultaneous hydrogen production and carbon dioxide sequestration technology. In addition, it is sad that the technology is so successful due to the successful investment made by the DOE in the past several years has to be discontinued and set us back for several years. Therefore, I would like to urge the subcommittee to restore the appropriation to allow the project to continue and to provide the much needed employment. Moreover, the continuation of the project not only make good use of the U.S. investment already made in the past but also allow the technology to be commercialized to strengthen our prospect of stabilizing the fuel cost and energy independence.

Thank you for your attention and please feel contact me for more information.