ARRA

CLEAN WATER STATE REVOLVING FUND

GREEN PROJECT RESERVE REPORT

Protecting clean water while preserving natural systems, reducing energy, and conserving valuable water resources.

EPA

Clean Water
State Revolving Fund

COVER PHOTO CREDITS: Reclaimed Water Purple Pipes - South Florida Water Management District

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GREEN PROJECT RESERVE REPORT: EXECUTIVE SUMMARY

The American Recovery and Reinvestment Act of 2009 (ARRA) was signed into law by Congress on February 17, 2009 with the goals of preserving and creating jobs, promoting economic recovery, and investing in transportation, environmental protection, and other infrastructure that will provide long-term economic benefits. The bill appropriated $4 billion to the Clean Water State Revolving Fund (CWSRF) and stated that "to the extent there are sufficient eligible project applications, not less than 20 percent of the funds appropriated herein for the Revolving Funds shall be for projects to address green infrastructure, water or energy efficiency improvements or other environmentally innovative activities". This is generally referred to as the Green Project Reserve (GPR).[1]

EPA Administrator Lisa Jackson has called the GPR "one of the most exciting aspects of the Recovery Act" and announced that implementation of the GPR was one of her administration's top priorities.[2] To get the funds to communities as quickly as possible, Congress mandated that all of the SRF money be under contract or construction within one year of ARRA's enactment. With this timeframe in mind, EPA acted quickly to provide information and guidance to states and EPA regions about ARRA implementation. States in turn acted quickly to implement

1. United States Congress (February 17, 2009). *American Recovery and Reinvestment Act, Public Law 111–5*. Retrieved November 7, 2011. Available at: http://www.gpo.gov/fdsys/pkg/PLAW-111publ5/pdf/PLAW-111publ5.pdf
2. U.S. EPA (April 29, 2009). *Testimony of Lisa Jackson, Administrator, U.S. Environmental Protection Agency at Hearing on American Recovery and Reinvestment Act Implementation, Transportation and Infrastructure Committee, United States House of Representatives.* Retrieved June 2, 2010. Available at: http://yosemite.epa.gov/opa/admpress.nsf/6427a6b7538955c585257359003f0230/18fef58afe9e7b46852575a7005600c0!OpenDocument

strategies to address the ARRA requirements by undertaking additional solicitation efforts for GPR projects, establishing partnerships and encouraging cooperative stakeholder and agency efforts, and increasing their education and outreach campaigns. Some states revised their project priority ranking systems to capture GPR elements, and many states offered additional financial subsidization to GPR projects.

The GPR drew significant interest from previous CWSRF recipients and new applicants, and the 20 percent requirement was met by all states. In fact, 47 states and Puerto Rico funded beyond the 20 percent threshold. States have reported $1.1 billion in executed funding agreements for GPR projects, representing 30 percent of total ARRA funding for CWSRF projects, or 50 percent more funds than required. Slightly more than half (54 percent) of GPR funding went to energy efficiency projects, 18 percent for green infrastructure, 14 percent toward water efficiency projects, and 14 percent was allocated to environmentally innovative activities.[3] State/federal ARRA reporting shows that in the short term, these projects have generated thousands of jobs, as well as economic and environmental benefits that will continue to accrue years into the future.

3 . Data downloaded from the EPA Clean Water Benefits Reporting System on January 24, 2011 capturing ARRA GPR data through the quarter ending 12/31/2010.

ENVIRONMENTAL BENEFITS OF THE GREEN PROJECT RESERVE

The inclusion of the GPR in ARRA highlights existing eligibilities within the CWSRF that have rarely or never been funded before. GPR projects can provide numerous direct and collateral environmental benefits and help states address their water quality priorities. Green infrastructure projects can improve water quality by reducing stormwater flow and contaminant loads, leading to reduced wastewater treatment needs for combined sewer systems, reduced flooding, and groundwater recharge. Collateral benefits from green infrastructure projects can include riparian and wildlife habitat restoration, improved air quality and reduced atmospheric CO2, and reduced heat island effect. Green infrastructure can also improve the sustainability of communities by cost effectively addressing local stormwater challenges, increasing opportunities for outdoor recreation and urban gardening, reducing noise pollution, and improving community aesthetics.

Millions of kilowatt hours of energy will continue to be saved each year as a result of ARRA-funded energy efficiency improvements at wastewater treatment plants.[4] Millions of gallons of fresh water will also be saved each year due to renewable energy projects that require less water to generate electricity.[5] These improvements contribute to utility sustainability through reduced operating costs

4. The Massachusetts CWSRF program alone funded energy efficiency projects under ARRA that are expected to realize 29 million kWh of potential energy savings annually. U.S. EPA (December 2009). *Massachusetts Energy Management Pilot Program for Drinking Water and Wastewater Case Study.* Retrieved April 19, 2011. Available at: http://water.epa.gov/aboutow/eparecovery/upload/2010_01_26_eparecovery_ARRA_Mass_EnergyCasyStudy_lowres_10-28-09.pdf
5. Hill, Rachelle. The Intertwined Tale of Energy and Water. *The Water Cooler.* Virginia Water Resources Center. Retrieved April 19, 2011. Available at: http://vwrrc.vt.edu/watercooler/watercooler_apr08.html

and, along with renewable energy sources for wastewater treatment plants, reduced green house gas emissions.

ARRA water efficiency and water reuse and recycling projects reduce the amount of fresh water used for irrigation and as cooling water for treatment plants and other industrial facilities. These types of projects also reduce ground and surface water withdrawals, which degrade habitats in rivers, streams, lakes and shorelines. Water efficiency and conservation projects also help reduce sewage system failures caused by water overwhelming the system.

Groundwater quality and public health have been improved through environmentally innovative projects that replace failing onsite septic systems with decentralized, green solutions. Innovative biosolids projects have reduced residual volume from wastewater treatment and reduced energy costs associated with disposal.

This report examines the performance of the CWSRF ARRA GPR and highlights a number of innovative state approaches to successfully implement the GPR. The lessons learned by EPA and the states through CWSRF ARRA implementation will help states to continue identifying green projects in the future while attracting new applicants to the CWSRF and cementing its status as one of the most effective environmental infrastructure financing programs.

In recent years, environmental issues have become more prominent as national concerns about quality of life and public health protection are increasingly linked to issues such as climate change, water scarcity, and water quality. As a result, the idea of "going green" has been embraced by everyone from car manufacturers to restaurants and hotels to local community groups. The inclusion of the GPR in ARRA capitalizes on this environmental awareness and reflects the widespread interest in promoting green infrastructure.

The GPR specified that each state allocate 20 percent of its ARRA capitalization grant to four categories of projects: green infrastructure, water efficiency improvements, energy efficiency improvements, or environmentally innovative activities. Green infrastructure includes technologies and practices that use natural or engineered systems that mimic natural hydrologic processes to infiltrate, evapotranspirate, and reuse stormwater to improve water quality and enhance overall environmental quality. Examples include green roofs, rain gardens, constructed wetlands, bioretention, and pervious pavement. Water efficiency improvements include conservation practices that deliver equal or better services using less water, such as the use of low-flow fixtures, leak detection equipment, gray water recycling, wastewater reclamation and purple pipe projects, as well as the installation of water meters. Energy efficiency improvement projects are those that substantially reduce energy consumption at Publicly Owned Treatment Works (POTWs), such as the installation of high efficiency replacement motors, or produce clean energy, such as the

installation of wind, solar, geothermal, and biogas combined heat and power systems. Finally, innovative environmental activities are those that demonstrate new and/or innovative approaches to managing water resources to prevent or remove water pollution in an economically and environmentally sustainable way. Examples of environmentally innovative activities include projects that facilitate adaptation of clean water facilities to climate change, projects that identify and quantify the benefits of using integrated water resources management approaches, and decentralized wastewater treatment solutions, which can provide opportunities for onsite wastewater reuse. Eligible GPR activities could include stand-alone projects, or they could be components of larger projects. While the project types identified in the GPR have always been eligible for CWSRF financing, funding of these types of projects has varied by state.

Green Project Reserve Implementation

When implementing ARRA, many states found that they did not have a sufficient number of eligible projects ready to proceed to meet the requirement to provide GPR project funding in an amount equal to 20 percent of their ARRA grant award. Some states had little or no history of funding the types of eligible projects under the GPR because their programs focused on traditional infrastructure projects. In some other states, statutory limitations prevented CWSRF programs from funding certain types of GPR projects or from offering project funding mechanisms like principal forgiveness. As a result, states had to act quickly to implement strategies to address these challenges and did so by:

- Undertaking additional solicitation efforts directed specifically toward garnering more green project applications;
- Establishing partnerships;
- Reaching out to new applicants;
- Adding green components to traditional infrastructure projects;
- Modifying their existing priority scoring systems; and
- Offering subsidization for GPR projects.

The New York State Department of Environmental Conservation passed new rules to expressly add green infrastructure, water efficiency, and other green project activities as required by ARRA to the definition of eligible projects. The emergency rules also allowed for additional subsidization in the form of principal forgiveness or negative interest rate loans.

The Kansas Department of Health and Environment (KDHE) capitalized on the ARRA GPR to encourage soft path, sustainable water management by offering additional subsidization for green infrastructure projects only, an unprecedented shift to their program's funding approach.

These efforts helped to bring in new assistance recipients to CWSRF programs, including more nonprofit organizations, state agencies, universities, and even public libraries. While this proved to be a benefit of the GPR, it also presented unique challenges to states as they spent significant time and effort educating new CWSRF recipients on the mechanics of the CWSRF program.

Green Project Reserve Project Solicitation

To ensure sufficient, high quality GPR projects, many states conducted solicitation efforts to bring more GPR projects to the CWSRF. In many cases states sought to identify GPR eligible projects beyond what was required, in part to provide a buffer in the event that some projects on the priority list could not meet the ARRA deadline of being under contract or construction by February 17, 2010. EPA worked with states to craft strategies to develop and implement GPR outreach and solicitation efforts. Solicitations included briefing papers, mailings, emails and website postings, public announcements, community forums and workshops, and targeted meetings with other state programs and environmental organizations. These efforts were designed both to educate new and existing recipients about ARRA and the GPR and to encourage recipients to start thinking of green design elements and components to incorporate in their traditional infrastructure projects. A targeted and strategic solicitation effort is the cornerstone of all outreach endeavors to educate assistance recipients and stakeholders, draw attention to the various types of projects that are eligible for CWSRF funding, and identify and fund GPR projects.

STATES THAT CONDUCTED A SEPARATE SOLICITATION FOR GPR PROJECTS INCLUDE:

- Alabama
- Alaska
- Iowa
- Kansas
- Hawaii
- Illinois
- Maryland
- Massachusetts
- Louisiana
- Maine
- New Mexico
- Oklahoma
- Mississippi
- Montana
- Rhode Island
- South Carolina
- Oregon
- New York
- West Virginia
- Wyoming
- South Dakota
- Utah
- Georgia

Oklahoma, through the Oklahoma Water Resources Board (OWRB), made a concerted effort to identify projects and meet the GPR requirement. OWRB conducted a separate 30-day solicitation for GPR projects that was sent to existing assistance recipients, as well as environmental and nonprofit organizations, to generate additional interest in GPR projects. Also, because many of the project applications came from assistance recipients that were new to the CWSRF, some of whom were unfamiliar with the process of incurring debt, Oklahoma felt it was important that staff provide guidance and mentoring on program requirements. This was accomplished through multiple face-to-face meetings between OWRB staff and assistance recipients, during which the OWRB staff walked applicants through the CWSRF funding and project planning process. OWRB provided this direct support on a weekly and sometimes daily basis. In addition, OWRB also hired a municipal bond attorney to assist nonprofits in their document preparation and in establishing legal debt authority. According to Jennifer Wasinger, Assistant Chief of the OWRB, "the 30-day solicitation yielded several non-traditional projects for consideration, including two green roofs, two riparian restoration projects, and three water quality improvement projects." In all, the Oklahoma program exceeded its 20 percent GPR requirement through a combination of traditional and innovative green projects.

Establishing New Partnerships and Cooperative Arrangements

Some states used the GPR as an opportunity to encourage cooperative efforts among stakeholders and other state and federal agencies. For example, Hawaii collaborated with other state and federal agencies in its outreach efforts to promote environmentally innovative projects and energy efficiency improvements at wastewater treatment facilities. They coordinated outreach with EPA Region 9, the Hawaii State Department of Health, the Hawaii Department of Water Supply, and the Hawaii Department of Business, Economic Development and Tourism. Representatives from the Hawaii Clean Energy Initiative and the Hawaii Solar Energy Association also sponsored one-day workshops about innovative energy management on four of the Hawaiian Islands. The workshops included presentations to Hawaii's assistance recipients that highlighted how ARRA recipients could save energy and money at their wastewater treatment facilities by implementing GPR projects. The hands-on workshops helped the Hawaiian counties identify green projects at their water treatment facilities as well as upgrades to improve energy and water efficiency. In Maui County, for example, upgrades to the collection system pump stations that produced significant energy savings and improved water quality were implemented. In addition, the information provided in the workshops helped Kauai County identify upgrades to their Waimea Wastewater Treatment Plant that will produce high-quality reclaimed water for use on the more arid regions of the island. Both EPA Region 9 and the Hawaii CWSRF program believe that the information provided in these workshops will result in the continued use of green practices and technologies in future projects.

Iowa and Louisiana employed similar collaboration efforts to attract assistance recipients. Iowa formed partnerships with the County Boards of Health, Soil and Water Conservation Districts, conservation organizations, and farm groups to get the word out about the availability of ARRA funds and to better coordinate funding efforts between local and state agencies. The Louisiana CWSRF program met with stakeholders, including mayors, state representatives, the Louisiana Municipal Association, and the Louisiana Police Jury Association to make them aware of the opportunities provided by ARRA funding. As a result of these outreach efforts, the Louisiana CWSRF received more than 250 applications totaling more than $1.8 billion, more than three times the ARRA requirement.[6]

Reaching Out to New Clean Water SRF Program Applicants

States used the GPR as an opportunity to reach out to new types of applicants and projects. Many states made efforts to reach out to assistance recipients that had never utilized CWSRF funds before. In California, the State Water Board received many proposals from nonprofit organizations for innovative green projects that spanned all four GPR categories. The state worked closely with these organizations to ensure that they were fully aware of CWSRF and ARRA requirements and committed to seeing projects through to completion. The California State Water Board worked with the Association of Bay Area Governments, the San Francisco Estuary Partnership (SFEP), and the City of El Cerrito to construct a series of rain gardens as part of a demonstration project for the City's San Pablo Streetscape Improvements Initiative. This highly visible urban retrofit project, which was completed in summer 2010, utilizes curb cuts to direct stormwater flows into vegetated treatment basins that will treat the runoff from 1.23 acres of impervious area.[7] The rain gardens will be continuously monitored by SFEP to ensure that they maintain their ability to remove contaminants such as PCBs, pesticides, mercury, and suspended sediment. The project will reduce contaminant loadings into Baxter Creek, El Cerrito Creek, and ultimately the San Francisco Bay. The El Cerrito Green Streets Rain Gardens project has been successful due in part to the California State Water Board's role in ensuring that assistance recipients were in compliance with the ARRA requirements. The responsiveness and commitment of the nonprofit organizations involved also contributed to the project's success.

The majority of the CWSRF ARRA GPR projects funded in Maryland were from applicants that had never received SRF funds before; many were homeowner associations, nonprofit organizations, and small communities. Most

6. Louisiana Department of Environmental Quality. *CWSRF News.* Retrieved May 9, 2011. Available at: http://www.deq.state.la.us/portal/NEWS/AmericanRecoveryandReinvestmentAct/CWSRF.aspx
7. San Francisco Estuary Partnership. *El Cerrito Green Streets Rain Gardens.* Retrieved October 7, 2010. Available at: http://www.sfestuary.org/projects/detail.php?projectID=41

of these projects were stand-alone green infrastructure stormwater projects, rather than green components of traditional wastewater treatment projects. These projects are examples of Maryland's effort to actively solicit GPR projects that would help restore Maryland's tidal and non-tidal water resources which is part of the state's larger goal of Chesapeake Bay restoration. To ensure that these projects met ARRA requirements and were under contract by February 17, 2010, Maryland was in frequent communication with these project sponsors, providing step-by-step assistance throughout the funding process.

The use of additional project funding and repayment sources through a collaborative stakeholder approach has the potential to attract new assistance recipients to the CWSRF program. For example, the Cumberland County Soil and Water Conservation District in Maine accepted CWSRF ARRA funds to implement a suite of stormwater management components, such as vegetative bioswales, tree boxes, soil media filters, and discrete underground water quality treatment units to reduce pollutant loadings in Casco Bay after four town councils voted to authorize loans to advance a Watershed Management Plan (WMP) for Long Creek.

The project treats approximately 16.6 acres of impervious cover in an area surrounding Long Creek, an urban impaired stream suffering from significant bank erosion and loss of aquatic life. Under the WMP, private landowners, municipalities, and state agencies like the Maine Department of Transportation may either pay for individual pollution permits or pay a fee to participate in the proposed restoration program. The permit fees are determined based on the area of impervious cover on the property. Because the restoration program had not begun collecting participation

fees at the time of CWSRF funding for the Long Creek ARRA project, the Maine Department of Environmental Protection structured the funding agreement as 100 percent principal forgiveness to be converted back to a loan once the funding mechanism is in place. At such time, 27.7 percent of the loan will remain in principal forgiveness.

Innovative and cooperative funding arrangements such as that for the Long Creek Restoration Project enable communities to fund important projects quickly and provide a valuable model for others to follow. According to Tamara Lee Pinard, Executive Director of the Long Creek Watershed Management District, the timing of ARRA and the funding mechanisms that were offered by Maine's CWSRF program served as a crucial impetus in pulling together the participation efforts among district members, which has allowed the project to be realized.

These efforts to reach new stakeholders and potential assistance recipients are anticipated to yield more returning assistance recipients seeking CWSRF funding in the future.

From Gray to Green: "Greening" Of Traditional Projects

Many states took a two-pronged approach to meeting the GPR requirement: they engaged in additional solicitation efforts, as previously described, and evaluated traditional wastewater treatment projects to identify existing green components or opportunities to add green components. Pennsylvania used its administrative funds to hire a contractor to provide energy audits free of charge to assistance recipients that received CWSRF ARRA funds for traditional wastewater infrastructure projects and was able to quickly approve change orders to add green components to projects. New York partnered with the New York State Energy Research and Development Authority (NYSERDA) to identify opportunities to incorporate energy efficiency improvements into existing wastewater pipe and plant projects scheduled for funding. NYSERDA performed free energy audits on all POTW projects on New York's Intended Use Plan (IUP) that were identified to have energy components. This effort resulted in approximately $92 million in energy saving measures for 25 capital projects that would not otherwise have been identified. Energy efficient measures included in the designs are estimated to result in an estimated energy savings of 16.1 million kWh.[8]

Priority Setting

Many state priority ranking processes would not typically rank GPR projects high enough to be funded without bypassing higher scoring projects. After the passage of ARRA, however, many states acted quickly to modify their priority setting systems to incorporate additional points for GPR projects or project

components in their scoring and ranking process. States such as Kansas, Maine, New Hampshire, and Kentucky added additional criteria to their priority ranking systems to ensure that GPR projects scored high enough to be ranked alongside traditional POTW projects. These efforts proved successful, as all states met or exceeded the 20 percent GPR requirement. Several states had already developed processes to promote sustainability that took energy and water efficiency improvements and green infrastructure

"These funds will support innovative solutions that address environmental threats to our rivers, lakes and streams while also creating new jobs and providing taxpayer savings through reduced energy and water use."
- Former New York Governor David A. Paterson

8. U.S. EPA (August 2010). *Increasing Energy Efficiency through ARRA Funding: New York State Wastewater Initiatives.* Retrieved May 5, 2010. Available at: http://water.epa.gov/infrastructure/sustain/upload/10504-11-NYState-casestudy_v4_highres_1.pdf

into account. For example, the Indiana Finance Authority's "SRF Sustainable Design Checklist" provides a comprehensive system for evaluating project elements. It includes energy reduction, wetlands restoration/creation, and water reuse and reduction, as well as site and material reuse and life-cycle cost analysis. Similarly, the Arizona Water Infrastructure Finance Authority had already developed new sustainability criteria for its Design and Planning Technical Assistance Program. The sustainability criteria award points to projects that incorporate elements such as water conservation, energy efficiency, and green infrastructure. The efforts these states made to incorporate sustainability and green components into water quality projects in advance of ARRA helped streamline their GPR solicitation and funding processes.

NEW YORK'S GREEN INNOVATION GRANT PROGRAM

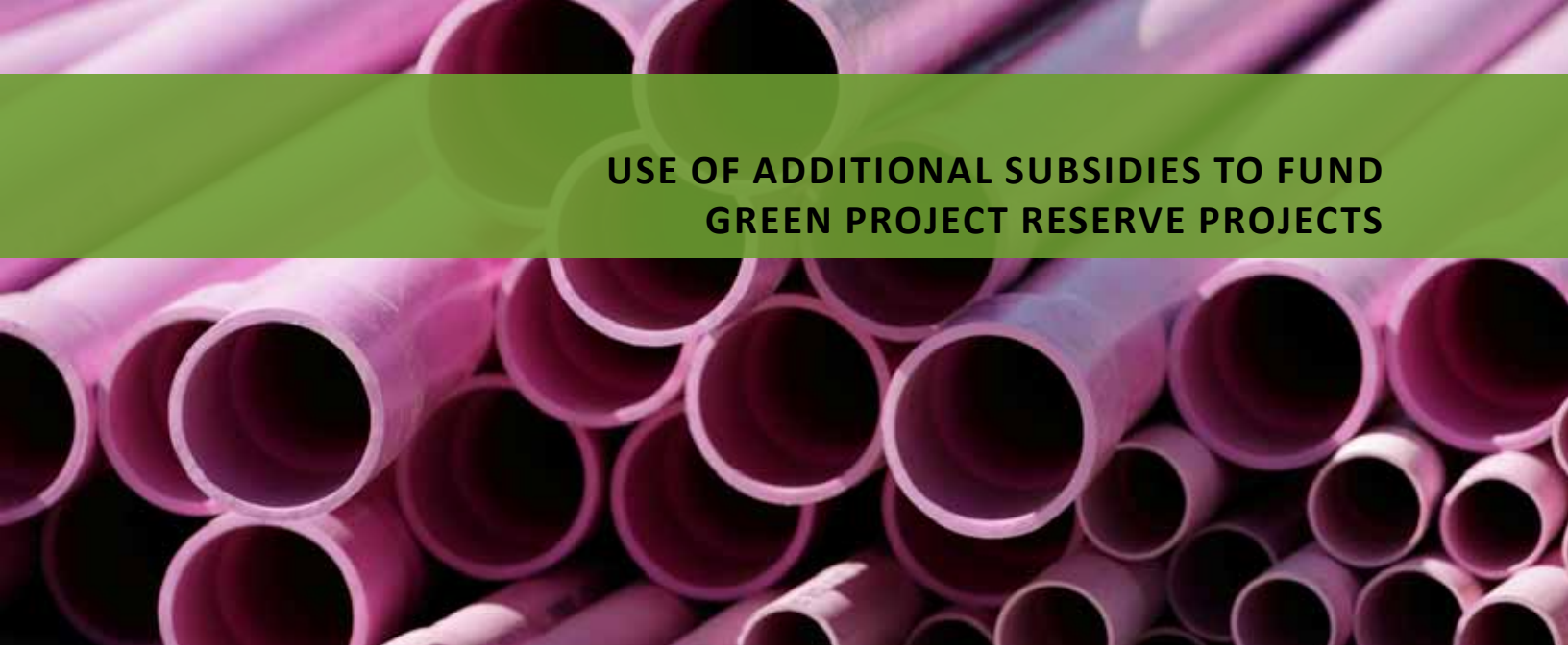
The New York State Environmental Facilities Corporation (EFC) established a new program, the Green Innovation Grant Program (GIGP), to help provide ARRA funding to GPR projects. New York allocated more than $38 million to the GIGP for clean water projects. GIGP funds were directed to GPR-eligible projects that were listed on the state's IUP in a new separate category. Applications were accepted through May 29, 2009 in a separate application and review process.

Eligible applicants included municipalities, state agencies, private and not-for-profit organizations, school districts and soil and water conservation districts. GIGP applications were evaluated based on their readiness to proceed, amount of reduction in energy use, water efficiency, green wet weather infrastructure, or use of innovative green technology.

The EFC received approximately 200 eligible project applications, which were reviewed by an interagency panel that included representatives from the EFC, the New York State Department of Environmental Conservation, the New York State Department of Health and the New York State Energy Research and Development Authority. Thirty-five projects were selected for GIGP funding. Recipients received grants covering up to 90 percent of eligible costs and were required to provide at least 10 percent matching funds.

Former Governor David A. Paterson praised the program and the response rate by saying, "The Green Innovation Grant Program is a giant leap forward in developing the state's 'green' industry. These funds will support innovative solutions that address environmental threats to our rivers, lakes and streams while also creating new jobs and providing taxpayer savings through reduced energy and water use."[9]

9. New York State Governor's Office (October 2009). *Governor Paterson Announces $43 Million in Stimulus Funds for Clean Water Projects.* Retrieved May 9, 2011. Available at: http://www.governor.ny.gov/archive/paterson/press/press_1001091.html



USE OF ADDITIONAL SUBSIDIES TO FUND GREEN PROJECT RESERVE PROJECTS

ARRA included the requirement that states provide 50 percent of their ARRA capitalization grant as additional subsidization in the form of grants, principal forgiveness, or negative interest loans. It is difficult to generalize state subsidization policies and practices because there was considerable variability in the amount of subsidization awarded as well as additional considerations, such as financial capability. However, most states chose to use principal forgiveness to provide additional subsidization for GPR projects. No states offered negative interest loans, and only seven states offered grants.[10]

Over three-quarters (76 percent) of CWSRF ARRA funds awarded were in the form of additional subsidization, well above the fifty percent required by Congress. Nearly all states provided some additional subsidization for CWSRF ARRA GPR projects. Fifteen states provided 100 percent subsidization for all GPR projects.[11]

Providing additional subsidization was a way to attract potential assistance recipients that may not typically apply for SRF funding. Rod Geisler, Chief of the Municipal Programs Section of the Bureau of Water at the Kansas Department of Health and Environment, expressed the view that offering additional subsidization was critical in attracting assistance recipients who would not normally apply for CWSRF funding. Some states expressed concerns about whether these types of recipients would take future CWSRF funding unless it involved principal forgiveness. Technical assistance from states and EPA, combined with a flexible repayment structure may increase the probability that these first-time recipients will come back to the program in the future.

10. States that offered grants include: Arkansas, Connecticut, Maryland, Missouri, New Mexico, New York, Texas.
11. Alaska, Maryland, Pennsylvania, Hawaii, Louisiana, New Hampshire, New Mexico, Massachusetts, Mississippi, Ohio, Oklahoma, Virginia, West Virginia, Wisconsin and Wyoming provided 100 percent subsidization for all GPR projects. This number is based on information reported in the states' Intended Use Plans and the EPA Clean Water Benefits Reporting System.

USING EMERGENCY RULEMAKING AUTHORITY TO PROVIDE ADDITIONAL SUBSIDY

Several states used emergency rules or authority to allow for additional subsidization. The South Dakota Department of Environment and Natural Resources (DENR) met this challenge through the development and adoption of emergency rules that would allow principal forgiveness to be used in its CWSRF program. DENR staff indicated that the principal forgiveness mechanism under ARRA was instrumental in the success of the GPR.

"South Dakota was able to fund a $1.8 million biogas and heat recovery project for the city of Sioux Falls one year ahead of schedule, and the $1.2 million project to the city of Watertown for biofiltration swales and a pervious parking lot would never have been funded without the use of principal forgiveness," said Mike Perkovich, DENR's Engineering Director.

GREEN PROJECT RESERVE ACCOMPLISHMENTS

$1.1 Billion in Green Project Reserve Funding

In just one year, states provided more than $1.1 billion in executed funding agreements for GPR projects.[12, 13] According to the Clean Water Benefits Reporting System, more than half (54 percent) of the GPR funding went toward improving energy efficiency. The energy efficiency category of projects included wastewater treatment plant upgrades with premium efficiency motors and pumps. It also included renewable energy, such as the installation of solar panels, wind turbines, biogas, and combined heat and power (CHP) systems at wastewater treatment facilities, as well as electrical system upgrades to improve energy efficiency. Another 14 percent went toward water efficiency improvement projects that included water treatment and conveyance upgrades for reuse facilities and installation of water meters, among others. Green infrastructure projects accounted for 18 percent of GPR funding and included wet weather management techniques such as bioswales, green roofs, and porous pavement, among others. Another 14 percent of GPR funds went toward environmentally innovative projects, which included the construction of decentralized wastewater systems and treatment facility improvements for biosolids recycling, among others.[14]

NATIONAL GPR FUNDING PER CATEGORY

- Energy Efficiency: $606 M
- Green Stormwater Infrastructure: $209 M
- Water Efficiency: $153 M
- Environmental Innovations: $160 M

Although energy efficiency measures received the most GPR funding, nearly as many green infrastructure projects and project

12. Though all states reported GPR projects up to the 20 percent requirement, many did not include additional projects or portions thereof that qualified for the GPR in their total GPR amount. As a result, the actual amount of ARRA funding for GPR-eligible projects exceeds 30 percent.
13. Out of a total of $4 billion allocated to the CWSRF, $3.8 billion was available for SRF projects.
14. Data downloaded from the Clean Water Benefits Reporting System on January 24, 2011 capturing ARRA GPR data through quarter ending 12/31/2010.

components have been funded. ARRA projects incorporated approximately 278 energy efficiency components, 259 green stormwater infrastructure components, 113 environmentally innovative components, and 103 water efficiency components.[15] Total funding for energy efficiency is significantly higher than total funding for green infrastructure because projects with energy efficiency components are much more capital intensive, on average, than projects with green infrastructure components. This is demonstrated by the fact that the average funding for each energy efficiency project was $2.2 million, while the average funding for each green infrastructure project was less than $1 million.

States Meet the 20 Percent Requirement

Every state reported 20 percent or more GPR funding in the national CWSRF project reporting system – the Clean Water Benefits Reporting (CBR) system. Forty-seven states and Puerto Rico funded beyond the 20 percent GPR requirement of ARRA, resulting in the use of 30 percent of CWSRF ARRA funds for the GPR. Kansas led the way by allocating nearly

NATIONAL AVERAGE GPR FUNDING PER PROJECT OR PROJECT COMPLETION

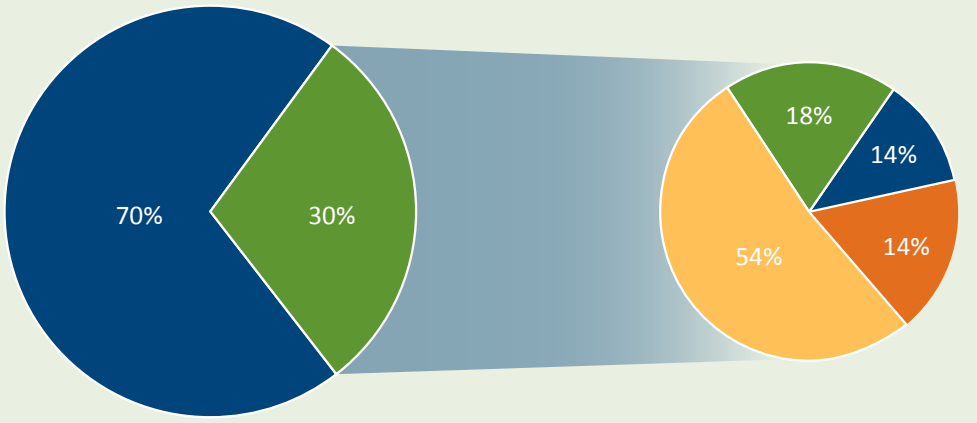
Environmental Innovations: $1.4 M

Energy Efficiency: $2.2 M

Water Efficiency: $1.5 M

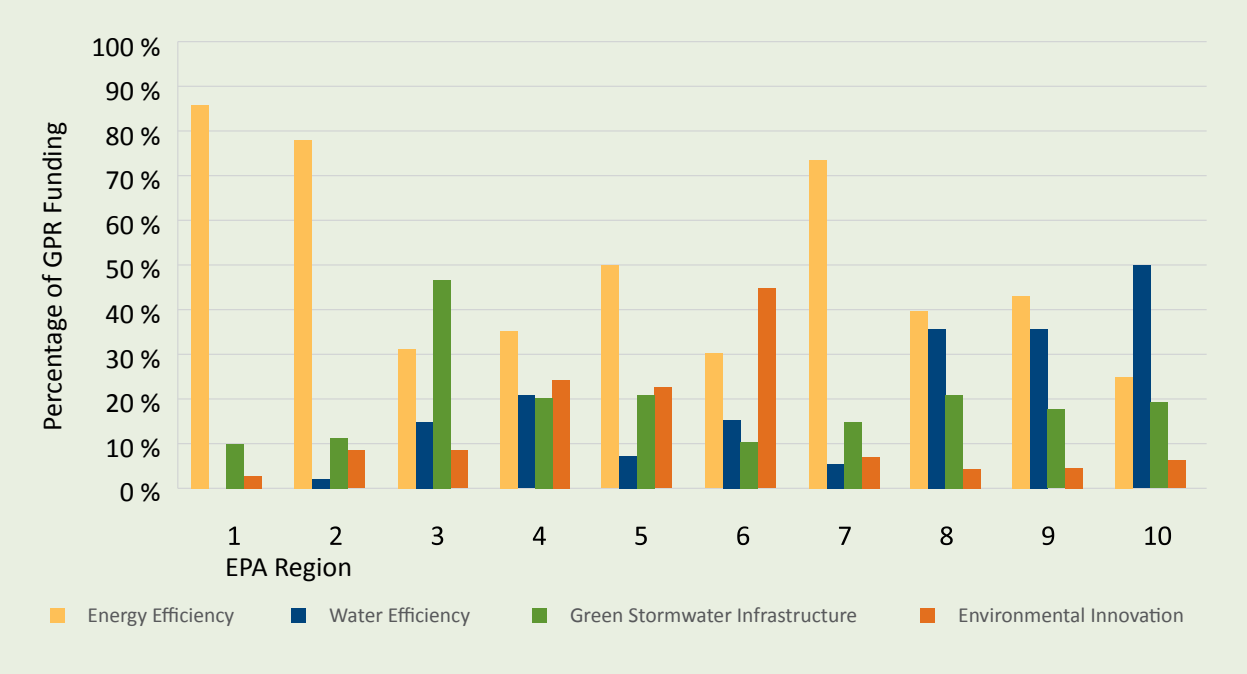
Green Stormwater Infrastructure: $0.8 M

FIGURE 1: ARRA FUNDING FOR CWSRF GREEN PROJECT RESERVE EXCEEDS 20 PERCENT



15. Some projects included components from more than one GPR category. Accordingly, the numbers reported here do not match the number of assistance agreements/total number of projects (649) reported in CBR.

FIGURE 2: PERCENTAGE OF TOTAL CWSRF GREEN PROJECT RESERVE FUNDING PER CATEGORY BY EPA REGION



85 percent of its ARRA CWSRF grant to GPR-eligible projects or project components. This is particularly impressive in light of the fact that Kansas had not previously funded many of these types of projects, particularly green infrastructure projects, before the passage of ARRA.

No other CWSRF program provided more than 50 percent of its ARRA funds to GPR-eligible projects, but five states (Arizona, Arkansas, Hawaii, Massachusetts, and Wisconsin) and Puerto Rico allocated at least 40 percent of their CWSRF ARRA grant award to GPR- eligible projects. Ten other states allocated at least 30 percent of their CWSRF ARRA grant awards to GPR-eligible projects.[16] Figure 2 shows the percentage of total CWSRF GPR funding per category by EPA Region; for more information on the percentage of GPR funding per category by state, see Appendix D.

Improving the Environment

State reporting of projected environmental benefits information is available for $1.1 billion in CWSRF ARRA funded projects that include GPR activities. This information shows that these projects contribute significantly to the protection and restoration of rivers, lakes, and streams throughout the country. For example, $757 million went toward projects that protect water quality and $162 million funded projects to protect and restore public drinking water sources. These projects address water quality goals that include protecting public health, implementing more effective controls of polluted runoff, and promoting water quality on a watershed basis.

16. Alabama, Idaho, Missouri, Nevada, New Hampshire, New Jersey, New Mexico, New York, Utah, and Vermont allocated at least 30 percent of the CWSRF ARRA grant award to GPR projects.

FIGURE 3: CLEAN WATER SRF ARRA FUNDING THAT INCLUDES GREEN PROJECT RESERVE ACTIVITIES

*Data downloaded from the Clean Water Benefits Reporting System on January 24, 2011 capturing ARRA GPR data through quarter ending 12/31/2010.
**Environmental benefits are underreported by states due to incomplete data submission in CBR

Both traditional wastewater infrastructure projects and GPR eligible projects are integral to upholding the water quality goals established by the Clean Water Act. Traditional wastewater facility projects have successfully enabled communities to address point source discharge pollutants, reduce toxic discharges, and achieve compliance for decades. As communities and utilities increasingly realize the environmental benefits of green design and technology, these green alternatives can be incorporated more broadly and with increasing economies of scale to enhance community and utility sustainability. These projects represent a broad suite of project options designed to improve water quality and can work in concert with gray infrastructure investments to enhance the sustainability of wastewater treatment and collection systems. The GPR encourages communities to think holistically about the life-cycle cost reductions of their utilities as well as the collateral environmental benefits these projects can produce: livable and walkable communities, urban green spaces, groundwater recharge, improved air quality, reduced heat island effect, and the restoration of wetland and riparian habitats that are invaluable for the water quality functions they perform.

GPR projects also contribute to long-term sustainability by mitigating the potential impacts of climate change. Energy efficiency improvements at wastewater treatment facilities will mitigate the cause of climate change by reducing demand for energy derived from fossil fuels that produce greenhouse gases. Water efficiency projects, particularly water reuse projects, will allow communities to compensate for diminishing water availability and supplies in some areas. Green infrastructure design will help manage wet weather flow, and other environmentally innovative activities may enhance wastewater treatment and protect facilities from climate change impacts.

Green Infrastructure

GPR projects also contribute to long-term sustainability by mitigating the potential impacts of climate change. By capturing rain where it falls, stormwater runoff flows and non-point source pollutant loads to waterways, as well as combined sewer and sanitary sewer overflow events, are significantly reduced. Through natural infiltration and treatment processes, green infrastructure solutions offer economic benefits to communities by eliminating the need for expensive and energy-intensive stormwater treatment processes. These projects can also provide indirect sustainability benefits. For example, increased plant cover associated with green infrastructure can provide passive recreational opportunities and increases in wildlife habitat, thus improving the livability of an area, resulting in increased property values. Heating and cooling costs can also be reduced. Green roofs are particularly beneficial in this respect. They provide additional insulation in buildings as well as mitigate the urban heat island effect. The increased presence of impervious surfaces causes temperatures to be 1.8 – 5.4°F warmer in urban areas than in less developed areas.[17] Increased plant cover can also be expected to result in an improvement in air quality. This can be attributed to plants filtering pollutants from the air, including carbon dioxide, and reduction in carbon dioxide emissions from heating and cooling.

Many states actively worked to fund green infrastructure projects to mitigate stormwater and nonpoint source pollution. In all, 259 green infrastructure projects or project components were funded with ARRA funds, representing 34 percent of the total number of CWSRF GPR projects funded by ARRA. The majority of these projects included implementation of stormwater BMPs and streambank stabilization and re-vegetation. Other projects included green design elements such as green roofs, pervious pavement, and rain gardens.

Although states in all EPA regions funded green infrastructure projects, Region 3 funded over $44 million – 46 percent of total GPR funding in the Region and 21 percent of national funding for green infrastructure. Pennsylvania funded 34 green infrastructure projects, and Maryland funded 27 green infrastructure projects that will help protect and restore Maryland's tidal and non-tidal water resources as part of the

17. U.S. EPA. *Heat Island Effect*. Retrieved April 19, 2011. Available at: http://www.epa.gov/heatisld/

state's goal of Chesapeake Bay restoration. In Region 7, Kansas promoted innovative green stormwater projects by providing 75 or 100 percent principal forgiveness, as compared to 50 percent principal forgiveness for other green projects such as energy or water efficiency improvements.

Green infrastructure project case studies from New York, Maryland, and Kansas are described below.

UTICA, NEW YORK: IMPROVING WATER QUALITY THROUGH URBAN REFORESTATION

Years ago, a dense canopy of American elm lined the streets of the City of Utica. However, an outbreak of Dutch elm disease in the 1950s killed off the trees, damaging the urban forest and altering the appearance of the city.

In 2002, the city began planting the disease-resistant American Liberty elm in an effort to reintroduce elms to the urban landscape and revitalize the city. Since that time, urban reforestation of the city has advanced significantly, as explained by City of Utica Mayor David R. Roefaro in the fall of 2009:

> **"In just under two years, we've planted more trees than ever before. We've rewritten history with the Elm Tree Project."**

After the passage of ARRA, the City of Utica's urban reforestation efforts received a boost with the help of New York's Green Infrastructure Grant Program (GIGP). The New York CWSRF program provided $646,641 to the City of Utica through the GIGP to reduce stormwater runoff flowing into the Mohawk River and to promote urban revitalization in an economically distressed area by restoring the urban canopy. The project utilizes a number of methods to mitigate stormwater runoff, including the installation of rain barrels at local residences and the planting of over 275 trees in tree pits at various locations throughout the city. The rain barrels will allow homeowners to disconnect their downspouts from the sewer system and reuse water on-site for plant irrigation. The tree pits with associated curb alterations and the tree plantings are designed to collect and use stormwater. The green infrastructure methods used in this project will also assist in the reduction of combined sewer overflows, helping the city comply with a Consent Order to reduce discharges to the Mohawk River.

EDMONSTON, MARYLAND: "ONE OF THE GREENEST STREETS IN THE COUNTRY"

In an effort to address stormwater issues and make its streets more pedestrian friendly, the Town of Edmonston partnered with the Chesapeake Bay Trust to retrofit one of its busiest streets using green infrastructure. The project involves narrowing the two-lane Decatur Street to make room for landscaped areas planted with trees and a variety of native grasses. Porous pavers will replace asphalt along the curbs to allow more rainfall to infiltrate the ground and provide a collateral community benefit by serving as bike lanes. The pavers and the bioswales are expected to absorb approximately 80 percent of the runoff from most rainfall.

EPA Administrator Lisa Jackson was present at the construction launch for this project in fall 2009 and called Decatur Street "one of the greenest streets in the country" noting that Edmonston "can show the way for other communities across America."[18]

The Edmonston green street project is being funded with a $1.1 million CWSRF ARRA loan at zero percent interest.

18. The Baltimore Sun (November 2009). *Remaking Main Street.* Retrieved June 22, 2010. Available at: http://www.baltimoresun.com/features/green/bal-md.gr.street25nov25,0,2052577.story

LENEXA, KANSAS: PROTECTING WATER QUALITY AND BUILDING SUSTAINABLE COMMUNITIES WITH URBAN STORMWATER MANAGEMENT

As part of its Vision 2020 planning strategy, the City of Lenexa emphasizes sustainable, livable communities through the proper management of wastewater and stormwater. Lenexa's visioning strategy specifically identifies the need for innovative stormwater management planning, maintenance programs, efficient methods of irrigation, the use of native landscaping materials that require less water, watershed protection, and continuing environmental education for community stakeholders.[19]

Lenexa received $1.1 million in CWSRF ARRA funds, with $805,073 in principal forgiveness, to fund its Central Green Streamway Project. This project will help Lenexa fulfill its Vision 2020 goals of providing common open space for the community while improving water quality, providing wetland habitats, protecting surface water bodies from nonpoint source pollutants, and beautifying the neighborhood. The project includes a bioengineered streamway, a constructed wetland, native vegetation plantings, and a water reuse irrigation system within the City Center North facility. The streamway will safely convey stormwater from the City Center development through the City Center North development and will enhance infiltration while creating a usable public gathering space. The constructed wetland will help mitigate the impacts of stormwater in various neighborhoods throughout the city. Other components of the project include constructing trails adjacent to the streamway and planting native vegetation for improved water quality.

19. City of Lenexa, Kansas (August 1997). *Lenexa Vision 2020.* Retrieved January 26, 2011. Available at: http://lenexa.com/main/pdfs/Vision2020.pdf

Energy Efficiency

Wastewater treatment systems are among the most energy intensive facilities owned and operated by municipalities. They require an estimated 75 billion kilowatt hours nationally, about 3 percent of annual U.S. electricity use.[20] But these facilities have the potential to achieve 15 to 30 percent energy savings, or 15.75 to 31.5 billion kilowatt hours annually, by incorporating energy conservation measures.[21] Energy efficiency measures reduce long-term energy costs and greenhouse gas emissions at wastewater treatment facilities.

In many cases, thousands of dollars per month can be saved by installing renewable energy systems or improving efficiency at wastewater treatment plants. Utilities can use the cost savings from energy efficiency and renewable energy projects to fund water conservation, stormwater management, and water quality improvement projects. Implementing renewable energy approaches and energy efficiency improvements at existing facilities also promotes utility sustainability by using a "fix-it-first approach" that prioritizes repairs and upgrades to existing infrastructure before expansion. Energy bill savings can be directed to asset management and preventative maintenance, improving environmental protection and the sustainability of infrastructure. These projects can also improve the treatment process by permitting more efficient operations. In the event of a service interruption from a power outage, for example, facilities that operate more efficiently can recover more quickly than facilities with inefficient energy management. Increased efficiency improves the process of

pumping, treating, and discharging wastewater and helps ensure the continued protection and improvement of water quality.

States funded 278 energy efficiency projects or project components, representing 37 percent of the total number of GPR projects funded. Many energy efficiency components were incorporated into projects involving wastewater treatment facility upgrades based on recommendations from energy audits. The majority of these projects involved the installation of renewable energy and combined heat and power systems, as well as more efficient motors, pumps, and blowers. The implementation of these types of projects mitigates the rising costs of traditional energy sources, reduces greenhouse gas emissions, conserves natural resources, protects water quality, and improves the sustainability of our water infrastructure.

States in EPA Regions 2 and 5 led the nation in funding energy efficiency projects by allocating $288 million to them – 78 percent and 50 percent of total GPR funding for these Regions respectively, and 47 percent of national

20. Electric Power Research Energy Institute (1999). *Energy Audit for Water/Wastewater Facilities.* Retrieved August 26, 2010. Available at: http://www.cee1.org/ind/mot-sys/ww/epri-audit.pdf
21. Natural Resources Defense Council (March 2009). *Water Efficiency Saves Energy: Reducing Global Warming Pollution through Water Use Strategies.* Retrieved August 26, 2010. Available at: http://www.nrdc.org/water/files/energywater.pdf

funding for energy efficiency projects. Region 1 states allocated 86 percent of their total ARRA GPR funds toward energy efficiency projects, with Massachusetts directing more than $53 million of its ARRA grant to projects designed to advance its Energy Management Pilot for Drinking Water and Wastewater Treatment Facilities. This pilot program aims to reduce energy use at treatment facilities by 20 percent.

The following ARRA project from Connecticut details some of the benefits of implementing energy efficiency improvements at a WWTP.

HARTFORD, CONNECTICUT: WASTE HEAT RECOVERY PROJECT FOR ELECTRICITY PRODUCTION

Using CWSRF ARRA funds, the Metropolitan District (MDC) in Hartford, CT implemented sludge incinerator upgrades and the construction of a heat recovery facility at the Hartford Water Pollution Control Facility (HWPCF).[22] The HWPCF is the largest wastewater treatment plant in Connecticut. On a daily basis it uses enough electricity to light 35,000 one hundred watt light bulbs.[23] The heat recovery system will take the waste heat from the incinerators and use it to generate steam and electricity for the HWPCF. This project will allow the HWPCF to meet approximately one third of its power demand.

The project received $9.6 million in ARRA funds, $1.9 million of which was provided in the form of a grant. The project also received a $7.8 million loan from base CWSRF program funds, and MDC contributed $13.9 million in local assistance.

22. In order to recover heat from the incinerator to generate electricity.
23. Connecticut Metropolitan District (2010). *A Green Approach to Stormwater Management.* Retrieved January 11, 2012.Available at: http://www.thecleanwaterproject.com/mdcannual2010.pdf

Water Efficiency

Between 1950 and 2000, the U.S. population nearly doubled while the public demand for water more than tripled. Increased water demand put additional stress on water supplies and distribution systems, threatening both human health and the environment. While the population and the demand on freshwater resources are increasing, supply remains constant. Communities that currently struggle to meet public water supply demands may have difficulty meeting agricultural needs for water, and drought-affected areas are at risk of groundwater overdraft as surface supplies dwindle. Sustainable water management is a growing concern in the United States and communities across the country face significant challenges pertaining to water supply and water infrastructure. A government survey has found that at least 36 states are anticipating local, regional, or statewide water shortages by 2013.[24]

Water efficiency is the long-term ethic of saving

24. U. S. General Accountability Office (July 2003). *Freshwater Supply: States' View of How Federal Agencies Could Help Them Meet the Challenges of Expected Shortages.* Retrieved September 15, 2010. Available at: http://www.gao.gov/new.items/d03514.pdf

water resources through the implementation of water-saving technologies and activities. Using water efficiently will help ensure the presence of supplies for future generations, save money, and protect the environment. Many of the water efficiency projects funded by ARRA will indeed conserve this resource, recharge aquifers, help restore the viability of flowing surface water supplies, and continue to encourage responsible and sustainable water management. Additional benefits associated with water efficiency projects include energy savings and deferred or avoided costs to locate additional water supplies and treat and transport the water.

There were 103 water efficiency projects or project components funded by ARRA as part of the CWSRF GPR. Many of these projects involved treatment and conveyance upgrades for wastewater reuse systems. Less common water efficiency projects included the installation of water efficient fixtures and water meters.

The project includes 53,000 linear feet of recycled water supply and return pipeline from the municipal outfall in Jamestown. Over the course of one year, the Jamestown Wastewater Treatment Plant will supply over 500 million gallons of water to the Spiritwood Station facility. This project is estimated to create 70 construction jobs and 24 full-time positions.

The following case study from North Dakota demonstrates the benefits of using reclaimed and recycled wastewater for communities that face water shortages.

JAMESTOWN, NORTH DAKOTA: RECYCLING WATER SAVES MONEY AND ENERGY

The Stutsman Rural Water District in Jamestown, North Dakota, received $5.5 million in CWSRF ARRA funds for a collaborative wastewater reuse project in partnership with Great River Energy (GRE). GRE's Spiritwood Station power plant uses the Best Available Control Technologies (BACT) to control emissions for the production of 99 megawatts of steam-generated electricity and 555,000 pounds of steam heat per hour.

Energy development and production is a major consumer of valuable and scarce water resources in the West, and the Spiritwood Station plant uses up to 1,200 gallons of water per minute for industrial processes. The power plant will utilize treated municipal wastewater produced by the City of Jamestown's Wastewater Treatment Plant for cooling processes and other needs. This project will allow the plant to use recycled wastewater to effectively offset its demand for fresh water.

The project includes 53,000 linear feet of recycled water supply and return pipeline from the municipal outfall in Jamestown. Over the course of one year, the Jamestown Wastewater Treatment Plant will supply over 500 million gallons of water to the Spiritwood Station facility. In addition, this project is estimated to create 70 construction jobs and 24 full-time positions.

Environmentally Innovative Activities

Environmentally innovative projects demonstrate new approaches to sustainably managing water resources. The 113 environmentally innovative projects that were funded using CWSRF ARRA money included a variety of innovative approaches to improving water quality as well as the sustainability and performance of wastewater treatment facilities. The suite of projects funded under this category include, but are not limited to, biosolids recycling, constructed wetlands, and repair and rehabilitation of decentralized systems. The environmental benefits associated with environmentally innovative projects include protecting surface and ground water quality, safeguarding public health, and natural infiltration techniques that reduce energy use and conserve water resources while also creating habitat for flora and fauna. Some of these activities offer collateral benefits through the reduction of waste and the carbon footprint of wastewater utilities, ultimately translating into more sustainable operations and communities.

States in Regions 5 and 6 spent over $85 million in CWSRF ARRA money on environmentally innovative projects – 22 percent and 45 percent of total GPR funding for these Regions respectively, and 53 percent of national funding for environmentally innovative projects. Texas funded one of the largest environmentally innovative projects, a $31 million project involving upgrades at a biosolids recycling facility to enhance the treatment process and expand composting capabilities.

Nearly half of CWSRF environmentally innovative projects were decentralized wastewater solutions to repair or replace failing septic systems. Compared to the construction

and maintenance of larger, centralized treatment plants, the repair or replacement of these more localized systems is frequently much more cost effective, and when properly designed, installed, and managed, can provide the treatment necessary to protect public health and the environment. They can also help outlying communities avoid the costs of pumping water long distances to an existing treatment plant. These systems limit the amount of effluent being deposited into waterways, and protect drinking water resources while also allowing for slower recharge of groundwater.

Decentralized wastewater systems eligible for CWSRF funding include individual onsite disposal systems such as septic systems and cluster systems used to collect, treat and disperse relatively small volumes of wastewater. An individual onsite wastewater treatment system relies on natural processes and/or mechanical components that treat wastewater from a single dwelling or building. A cluster system collects and treats wastewater from two or more dwellings or buildings and conveys it to a treatment and dispersal system located near the dwellings or buildings. Cluster systems are typically under some form of common ownership and are often maintained by a local utility.

OHIO'S HOME SEWAGE TREATMENT SYSTEM PROGRAM

Ohio's CWSRF program funded more decentralized projects under ARRA than any other state. Ohio funded forty-four decentralized wastewater treatment projects as part of its Home Sewage Treatment System (HSTS) program. This program was created as a cost-share assistance program to utilize ARRA funds for the replacement or repair of failing onsite systems to homeowners whose household earnings do not exceed 200 percent of the federal poverty level. The Ohio CWSRF program entered into subsidized loan agreements that included ARRA and other federal and state funds with counties, municipalities or water/sewer districts. Funds were awarded as loan principal forgiveness in an amount equaling 75 percent of the cost of the improvements; the remaining 25 percent of project costs were the homeowner's responsibility. Local government agencies partnered with local health districts to solicit, evaluate, and select local applicants with failing onsite systems in need of repair or replacement. Local health districts were responsible for conducting reviews of proposed system designs and performing site inspections to ensure that system installation complied with local and state rules as well as ARRA requirements. Once the local health district reviewed and approved the completion of the repair or replacement work and made sure all program requirements were met, local government agencies could submit invoices to the Ohio CWSRF program for reimbursement of the eligible system repair or replacement costs.

Local government agencies were responsible for implementing signed agreements between themselves, the system owner, and contractors hired for system design or installation. Agreements detailed the terms and conditions of receipt of the ARRA funds and other requirements. Ohio's HSTS program creatively used state and local partnerships to ensure that ARRA GPR funds were directed to projects that addressed the state's water quality priorities and could be implemented quickly.

Integrating Green Stormwater Infrastructure, Energy Efficiency, and Environmental Innovation

Some states funded projects that incorporate design elements and components from more than one of the four GPR categories. These projects demonstrate the importance of holistic planning when considering water quality and long-term sustainability.

Wastewater systems require significant energy, and water is used in nearly every step of energy production. Thus, saving energy saves water and vice versa. Similarly, green infrastructure reduces the need for energy intensive water treatment by providing natural infiltration and treatment processes that eliminate volume and pollution in stormwater, and green design elements such as green roofs may save energy at facilities by providing additional insulation and reducing the urban heat island effect. As demand for energy and water continues to increase, the need for integration of innovative green design that incorporates effective water

and energy management and conservation will increase as well. The following case study from California demonstrates the exciting possibilities for this type of project implementation.

SAN FRANCISCO, CALIFORNIA: GREEN BUILDING PROVIDES HANDS-ON OPPORTUNITIES AT THE ECOCENTER AT HERON'S HEAD PARK

The EcoCenter at Heron's Head Park is San Francisco's first building that is entirely "off the grid." This 1,500 square foot facility constructed by a California nonprofit organization, Literacy for Environmental Justice, is powered with solar and wind energy, captures and uses rainwater, and treats its own wastewater using constructed wetlands and ultraviolet sterilization lamps. In addition, it features a green roof and native landscaping, which conserve water and prevent stormwater runoff. The purpose of the EcoCenter is to educate visitors about innovative environmental technologies, renewable energy, greenhouse gas reduction, wastewater treatment, and green building materials.

The California State Water Resources Control Board provided Literacy for Environmental Justice with a $350,160 CWSRF ARRA loan, all of which will be forgiven under the principal forgiveness subsidy provision of ARRA. This funded the construction of the green roof, rainwater catchments, native landscaping, and a constructed wetland located inside the building to treat wastewater. ARRA funds also went toward developing educational signage and outreach materials.

This project, located in one of the most historically polluted and poor communities of the Bay Area, had originally been awarded state grant funding. When these grant funds became unavailable due to the recession, this project was put on hold for eight months. With the availability of CWSRF ARRA funding, the EcoCenter was able to obtain the funds it needed to complete this demonstration project and create an estimated 35 new jobs. The EcoCenter opened its doors to the public in April of 2010, generating significant buzz and public interest.

IMPACT OF THE GREEN PROJECT RESERVE ON THE CLEAN WATER SRF BASE PROGRAM

In addition to ARRA, the GPR requirement has also been included in the FY 2010, 2011, and 2012 Appropriations bills. For FYs 2010 and 2011, the bills specified that each state direct 20 percent of its CWSRF capitalization grant to eligible GPR projects. For FY 2012, the GPR amount was reduced to 10 percent for the CWSRF program.

The availability of GPR funding and the benefits of using the CWSRF have been marketed to both new and existing assistance recipients with eligible green projects. States recognize the need to continue their outreach efforts and include an even broader audience, extending beyond wastewater utilities to include nonprofit organizations, educational institutions and even the landscape architecture and design communities. Many states have also encouraged existing assistance recipients to identify GPR eligible projects or redesign/re-engineer traditional wastewater infrastructure projects to add green components. After the passage of ARRA, many states also modified their existing priority ranking systems to incorporate GPR elements into their scoring processes in order to more fully integrate GPR elements into their CWSRF program.

Green Project Reserve Eligibility

EPA has developed annual GPR guidance for FYs 2010, 2011, and 2012 that include eligibility principles and decision-making criteria to help states continue to identify and fund high quality GPR projects. EPA solicited input from the SRF community to incorporate lessons learned from implementing ARRA GPR into guidance for each subsequent year to ensure that states have the flexibility needed to take full advantage of the GPR and address their water quality priorities.

While the same structure for the four GPR categories has been kept in place, the list of categorical projects has been expanded, a list of ineligible projects has been added, and guidelines for developing a business case and examples of projects requiring a business case were included.

Conclusion

Through the enactment of ARRA and the GPR requirement, Congress helped to shift federal and state investment in the water and wastewater sector toward projects that utilize green or soft-path practices to complement and augment gray infrastructure projects, adopt practices that reduce the environmental footprint of water and wastewater treatment systems, enhance water and energy conservation, adopt more sustainable solutions to wet weather flows, and promote innovative approaches to water management problems.

After the passage of ARRA, EPA Administrator Lisa Jackson echoed the call of Congress for innovation in water quality and public health improvement efforts: "Right now, we have greater opportunities to protect public health and the environment than any other time. Now, more than ever, we must be innovative and forward looking. The environmental challenges faced by Americans across our country are immense in scale and urgency. But they will be met."[25]

States embraced the challenges and opportunities of ARRA and achieved new heights in creativity, streamlining, and innovation. As the GPR has continued in the FYs 2010, 2011, and 2012 Appropriations, states have made efforts to identify additional green projects, find opportunities to help assistance recipients go from gray to green, and improved priority setting as well as marketing and outreach efforts. As the GPR continues to evolve, it is clear that the importance of participation and feedback from states cannot be understated as project eligibilities are further defined and environmentally innovative technologies and applications are incorporated into CWSRF projects.

25. U.S. EPA (March 18, 2009). *Administrator Lisa P. Jackson, Remarks to the Association of State Drinking Water Administrators, As Prepared.* Retrieved June 2, 2010. Available at: http://yosemite.epa.gov/opa/admpress.nsf/8d49f7ad4bbcf4ef852573590040b7f6/7ab7e93ea2e3e1ad8525759000726be7!OpenDocument

Appendix A: Clean Water SRF Background and the American Recovery and Reinvestment Act of 2009

In 1987, Congress established the Clean Water State Revolving Fund (CWSRF) through the Clean Water Act Amendments of 1987 to help ensure clean water for all Americans. Today, this highly successful program provides communities with low-cost financing for infrastructure construction and other activities that restore and protect our waterways. Each year since 1988, the federal government has appropriated funds to EPA for the CWSRF program. These funds are distributed to states based on a formula set in the enabling legislation. Today, all fifty states and Puerto Rico have active CWSRF programs. Since the first project received CWSRF financing in 1988, the program has provided over $89 billion in assistance for eligible wastewater infrastructure, nonpoint source and estuary projects. By the end of FY 2011 states had entered into over 30,000 assistance agreements.

On February 17, 2009, Congress passed the American Recovery and Reinvestment Act of 2009 (ARRA) to preserve and create jobs, promote economic recovery, and to invest in transportation, environmental protection, and other infrastructure that will provide long-term economic benefits. The bill appropriated $4 billion to the Clean Water State Revolving Fund. This large and unprecedented appropriation of funds was both a response to the staggering water infrastructure needs in this country and a result of the success of the SRF programs over the last 22 years. ARRA funds were intended to expand on the CWSRF's success in improving the conditions of our waters for public health, recreation, and wildlife while helping to create and sustain jobs. ARRA's goals of preserving and creating jobs and investing in projects that provide long-term environmental and economic benefits brought new opportunities and challenges for the fifty-one state CWSRF programs (all fifty states and Puerto Rico). ARRA included many new requirements, such as the requirement to provide 50 percent of the ARRA funds in the form of additional subsidy, a Buy American provision, a Davis Bacon wage-rate provision, the condition that all projects be under contract or construction by February 17, 2010, and the requirement to establish a Green Project Reserve (GPR).

The GPR specified that each state allocate 20 percent of its ARRA capitalization grant to four categories of projects: green infrastructure, water efficiency improvements, energy efficiency improvements, or environmentally innovative activities. Green infrastructure includes technologies and practices that use natural or engineered systems that mimic natural hydrologic processes to infiltrate, evapotranspirate, and reuse stormwater to improve water quality and enhance overall environmental quality. Examples include green roofs, rain gardens, constructed wetlands, bioretention, and pervious pavement. Water efficiency improvements include reuse or conservation practices that deliver equal or better services using less water, such as the use of low-flow fixtures, leak detection equipment, gray water recycling, wastewater reclamation

and purple pipe projects, and groundwater recharge, as well as the installation of water meters. Energy efficiency improvement projects are those that substantially reduce energy consumption at Publicly Owned Treatment Works (POTWs), such as high efficiency motors; or produce clean energy, such as wind, solar, geothermal, and biogas combined heat and power systems, to provide power to POTWs. Finally, innovative environmental activities are those that demonstrate new and/or innovative approaches to managing water resources to prevent or remove water pollution in an economically and environmentally sustainable way. Examples of environmentally innovative activities include decentralized wastewater treatment solutions, projects that facilitate adaptation of clean water facilities to climate change, and projects that identify and quantify the benefits of using integrated water resources management approaches, to name a few. Eligible GPR activities could include stand-alone projects or components of larger projects.

While the project types identified in the GPR have always been eligible for CWSRF financing, funding of these types of projects has varied by state.

Some states were already funding GPR-eligible projects, so it was not a challenge to integrate the GPR requirement into their existing CWSRF program. For other states, the introduction of the GPR was a major shift that required broadening the focus of their program from traditional wastewater infrastructure to incorporate green technologies and green project components that:

- promote water conservation through reclamation and recycling;
- treat stormwater where it falls with green infrastructure applications such as rain gardens and vegetated swales;
- protect groundwater quality by rehabilitating aging and failing septic systems;
- and reduce demand on fossil fuels through energy efficient upgrades and renewable energy options.

EPA was aware that some states faced challenges in funding green infrastructure, water and energy efficiency improvements, and environmentally innovative activities. EPA acted quickly to provide information and guidance to states on ARRA implementation. EPA released ARRA guidance on March 2, 2009, only two weeks after the bill was passed. The guidance covered all ARRA requirements and included two attachments specific to the GPR – one for the CWSRF and one for the Drinking Water State Revolving Fund (DWSRF). These attachments provided descriptions and examples of projects that categorically qualified for the GPR and projects that required a business case in order to receive GPR funding. EPA also released additional guidance, memos, and examples to assist states in implementing the GPR:

- Memo on Adequate Solicitation for GPR Applications
- Green Project Reserve Questions & Answers

- Guidance on how to develop a business case including Q&As on various GPR-related topics
- Sample Business Case for Energy Efficient Wastewater Pumping
- GPR project case studies from the Arizona Water Infrastructure Finance Authority and the Massachusetts Department of Environmental Protection

EPA also produced a series of webcasts detailing ARRA requirements, including three that focused specifically on the Green Project Reserve. These all took place between March and May of 2009. The webcasts, along with the guidance, memos, and other information can all be found at www.epa.gov/water/eparecovery.

Several states also took the initiative to put together their own webcasts and workshops soon after the passage of ARRA to help potential and existing assistance recipients navigate the ARRA application process and better understand ARRA requirements, including the GPR. For example, the Illinois EPA conducted a webcast to inform their assistance recipients of all ARRA requirements and of their application and implementation process. Illinois EPA also produced a Question & Answers document based on questions received during the webcast. Afterwards, both the webcast and the Q&A were posted on the Illinois SRF website in order to make the information available to communities as soon as possible. In spring 2009, the Alabama Department of Environmental Management held a workshop for potential SRF applicants interested in receiving ARRA funds. The workshop helped to significantly increase the number of applications it received for GPR-eligible projects. Iowa also held an ARRA workshop for assistance recipients with an overview of GPR projects and information about how to develop a business case to demonstrate eligibility for the GPR.

Appendix B: Developing a Business Case

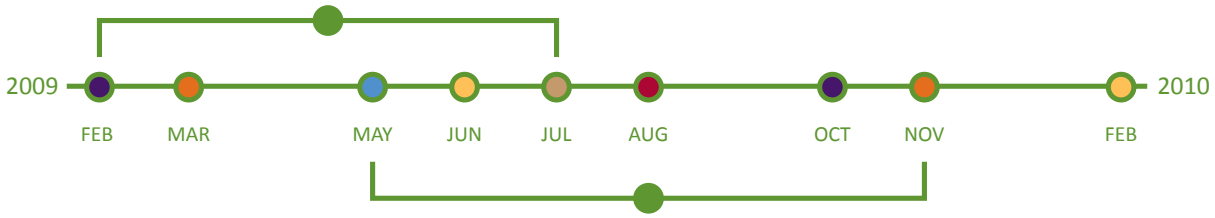
GPR projects not considered categorically eligible could be funded through the GPR if an assistance recipient could present a compelling business case that the project qualified as a green infrastructure, energy efficiency improvement, water efficiency improvement, or environmentally innovative project. A business case documents the quantitative and qualitative justification for judging a project or project component as eligible for the GPR.

Regardless of whether a business case addressed energy or water efficiency improvements, green infrastructure, or environmentally innovative technologies and practices, there were common elements that were incorporated into business cases, including:

- Summary of current conditions and the issues that the project was designed to address;
- Description of why the proposed project was necessary;
- Description of the environmental/water quality benefits that could be expected from the project;
- Summary of all green components anticipated in the project;
- Technical data;
- Eligible costs;
- Rationale for the selection of such green components/technologies/designs.

Effective business cases included clear comparisons between current conditions and the proposed project improvements to demonstrate anticipated environmental and economic benefits. One effective methodology for presenting the kind of quantitative data described above was the Baseline Standard Practices (BSP) tool. This tool was developed by the New York State Environmental Facilities Corporation (EFC) in collaboration with the New York State Energy Research and Development Authority (NYSERDA). The BSP tool provides a comparison of the technology or equipment necessary to achieve specific wastewater treatment performance criteria based upon cost and energy consumption. The EFC used the BSP tool to help develop their business cases for energy efficiency improvement projects at POTWs. These business cases provided a clear explanation as to why and how the project qualified for the ARRA GPR requirement. In addition, their business cases were well organized and easy to read, providing a thorough yet brief discussion of all GPR project components while providing detail on current conditions.

Appendix C: American Recovery and Reinvestment Act Timeline



FEBRUARY 17, 2009: President Obama signs American Recovery and Reinvestment Act of 2009, appropriating $4 billion to the CWSRF to aid in the economic recovery.

FEBRUARY – JULY 2009: EPA conducts more than 10 online webcasts for States and municipalities on ARRA implementation topics, including three specifically focused on GPR implementation.

MARCH 12, 2009: **EPA Webcast:** "SRF Planning for the Green Project Reserve" for state programs.

MAY 14, 2009: **EPA Webcast:** "Accessing the Green Project Reserve" for funding applicants.

MAY 21, 2009: **EPA Webcast:** "Funding Green Stormwater Infrastructure with the Green Project Reserve".

MARCH 2, 2009: EPA publishes final guidance on ARRA implementation.

MARCH 27, 2009: First CWSRF ARRA capitalization grant awarded.

MAY 13, 2009: EPA publishes memo on Adequate Green Project Reserve Solicitation.

MAY – NOVEMBER 2009: State SRF programs, often with assistance from EPA, conduct workshops for ARRA assistance recipients on program requirements, many with particular emphasis on the GPR.

JUNE 4, 2009: EPA publishes CWSRF Green Project Reserve Sample Business Case.

JUNE 17, 2009: ARRA includes goal to have 50 percent of funds under contract or construction within 120 days of the passage of the bill.

JUNE 22, 2009: EPA publishes Green Project Reserve Business Case Principles and Questions and Answers.

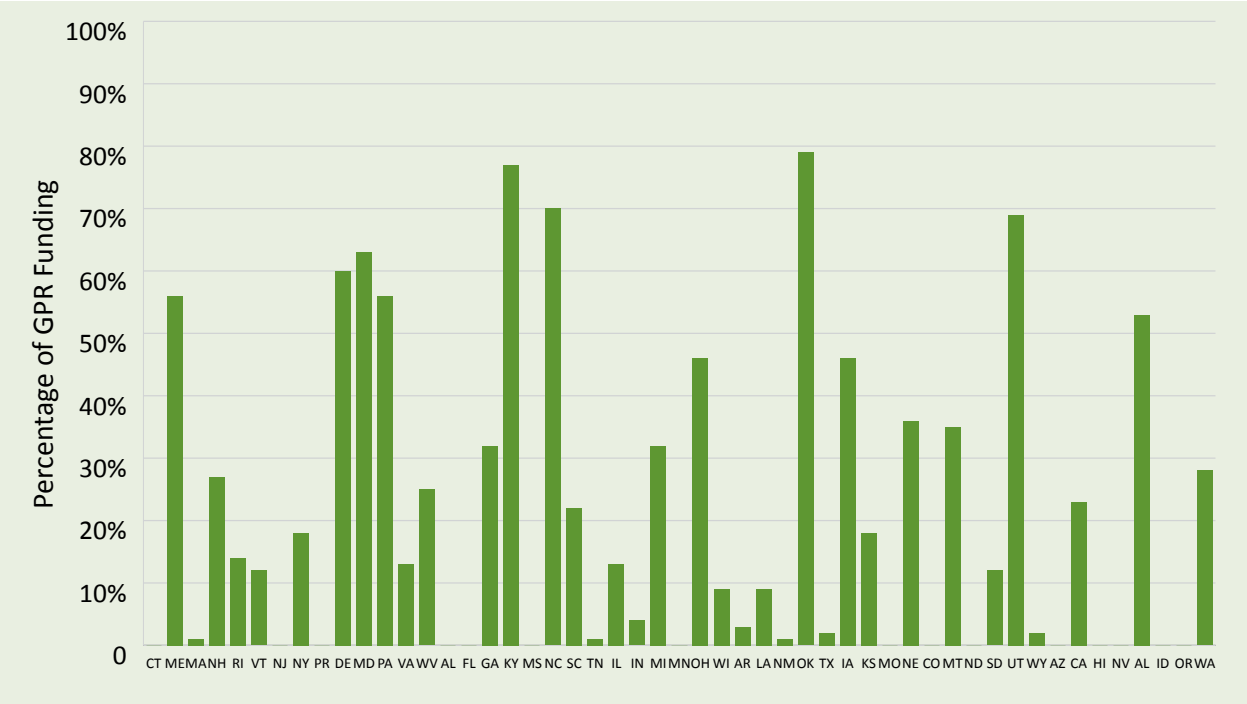
AUGUST 17, 2009: States have the first opportunity to certify that they will not be able to meet the 20 percent Green Project Reserve requirement due to a lack of demand. No such certification requests were submitted.

OCTOBER 13, 2009: CWSRF ARRA funds have been awarded to all 50 states and Puerto Rico.

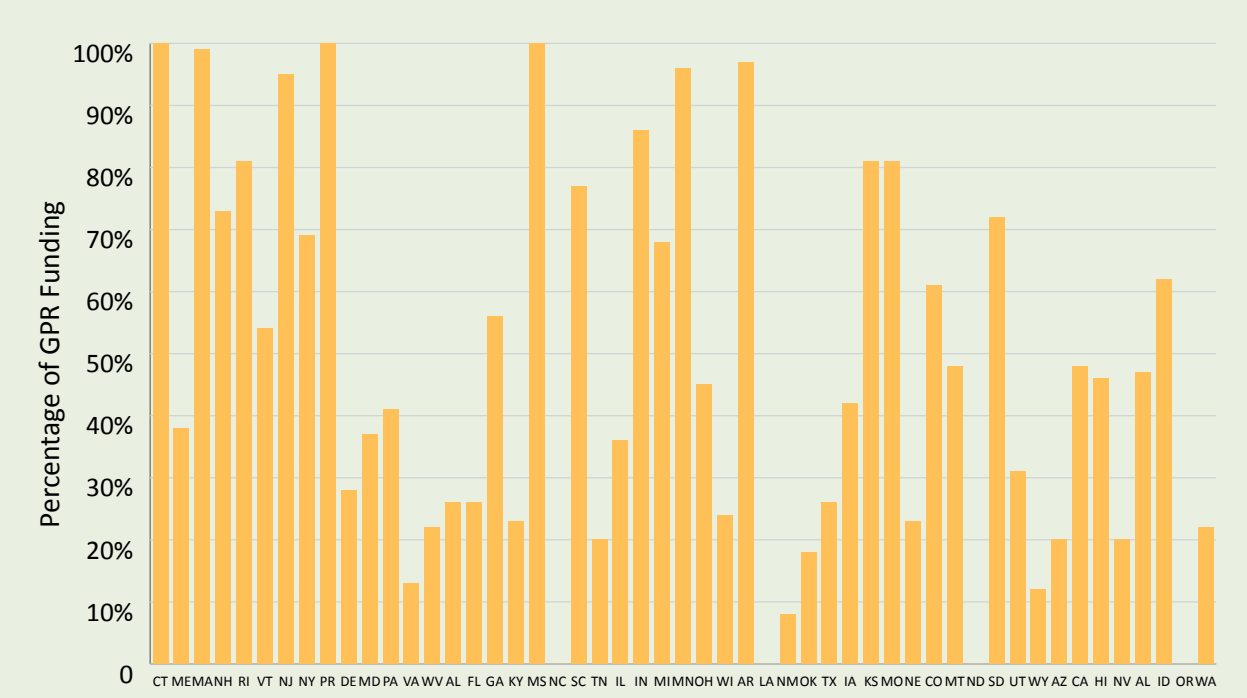
FEBRUARY 17, 2010: All states commit all ARRA funds to projects under contract, and all states commit at least 20 percent of their capitalization grants to green stormwater infrastructure, water or energy efficiency improvements, or environmentally innovative activities.

Appendix D: Percentage of Total CWSRF GPR Funding Per Category By State

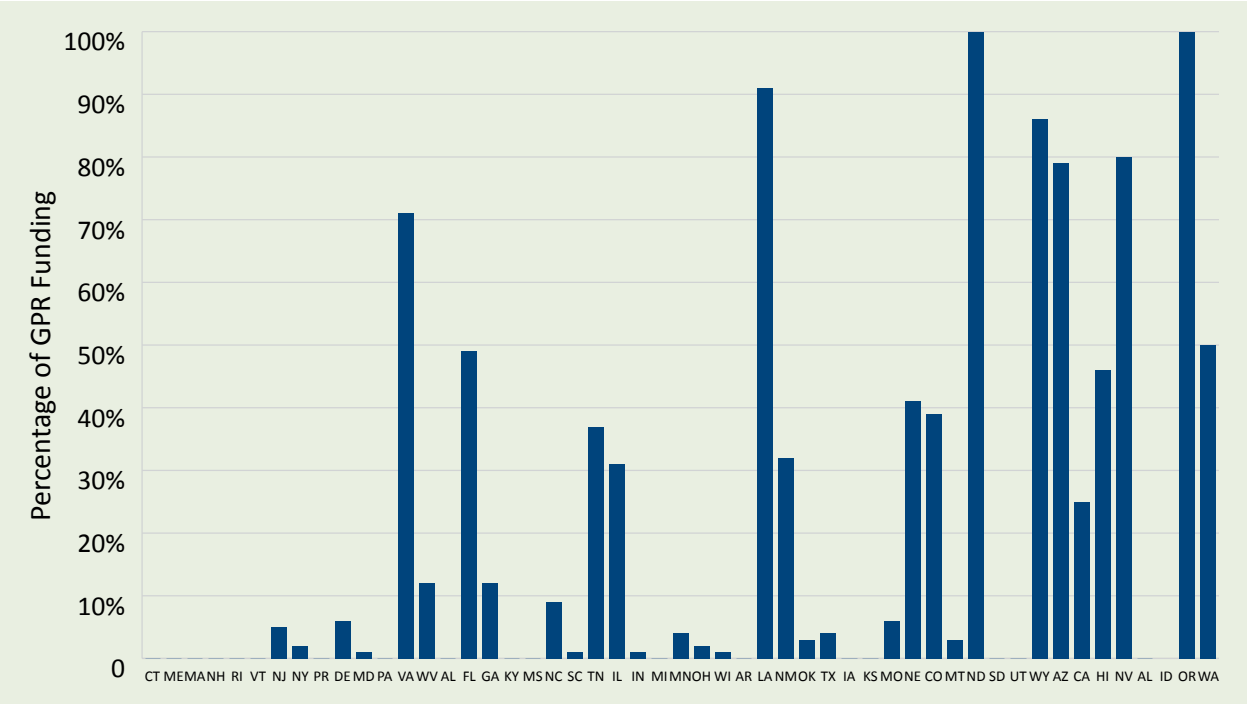
PERCENTAGE OF CWSRF GPR FUNDING FOR GREEN INFRASTRUCTURE BY STATE



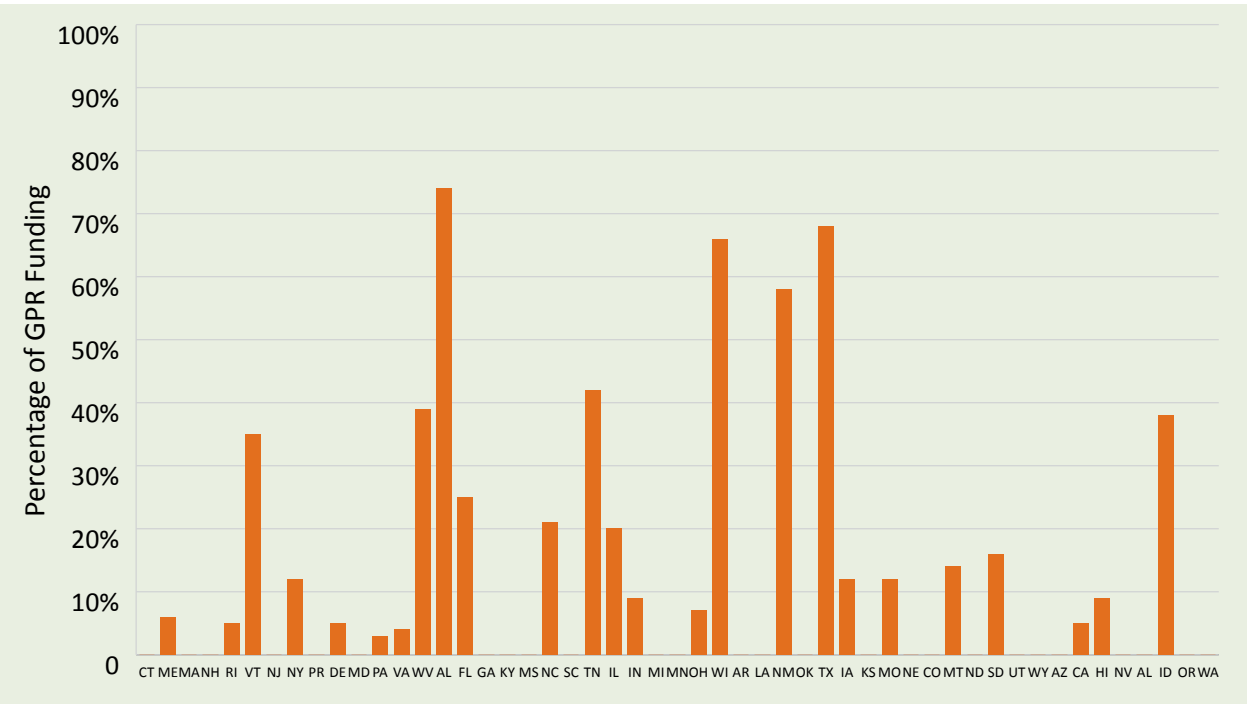
PERCENTAGE OF CWSRF GPR FUNDING FOR ENERGY EFFICIENCY IMPROVEMENTS BY STATE



PERCENTAGE OF CWSRF GPR FUNDING FOR WATER EFFICIENCY IMPROVEMENTS BY STATE



PERCENTAGE OF CWSRF GPR FUNDING FOR ENVIRONMENTALLY INNOVATIVE ACTIVITIES BY STATE



REPORT PHOTO CREDITS

PAGE 6: PERVIOUS PARKING – PRESERVATIONNATION.ORG

PAGE 7: LINDENHURST MEMORIAL LIBRARY, LINDENHURST, NY – LINDENHURST MEMORIAL LIBRARY

PAGE 12: STORMTREAT SYSTEM– CUMBERLAND COUNTY SOIL & WATER CONSERVATION DISTRICT

PAGE 28: ONSITE WASTEWATER TREATMENT SYSTEM – BIOSPHERE CONSULTING

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