

**Statement of Michael L. Connor, Commissioner
Bureau of Reclamation
U.S. Department of the Interior
Before the
U.S. House of Representatives
Committee on Natural Resources
Subcommittee on Water & Power
Hearing:
“Investment in Small Hydropower: Prospects for Expanding
Low-Impact and Affordable Hydropower Generation in the West”
July 29, 2010**

Madam Chairwoman and members of the Subcommittee, I am Mike Connor, Commissioner of the Bureau of Reclamation (Reclamation). I am pleased to provide the views of the Department of the Interior (Department) on the many activities underway during this Administration to develop additional renewable hydropower capacity at existing or new water facilities.

Reclamation has 476 dams and 8,116 miles of canals, and owns and operates 58 hydropower plants. On an annual basis, these plants produce an average of 40 billion kilowatt (kW) hours of electricity, enough to meet the entire electricity needs of over 9 million people on average, and provide the energy equivalent of about 66.8 million tons of coal.¹ Power generated by Reclamation hydropower facilities reduced the amount of carbon dioxide put into the atmosphere by an average of 27 million tons annually compared to the amount of carbon dioxide that would have been put into the atmosphere if that amount of power had been generated through conventional means.² Reclamation is the second largest producer of hydroelectric power in the United States, and today we are actively engaged in looking for opportunities to encourage development of sustainable hydropower capacity which I will describe below. Non-Federal hydropower has been developed on 47 other Reclamation sites through Federal Energy Regulatory Commission (FERC) licenses and Lease of Power Privilege (LOPP) agreements that provide a generating capacity of over 460 megawatts. This non-Federal hydropower coupled with our generation is important to the North American electricity grid as well as to our existing customers, and our efforts to encourage the development of additional hydropower capacity extend primarily to such new FERC or LOPP facilities.

Hydropower is a minimal emission, low-cost source of energy that provides consistent, reliable generation which can be quickly adjusted to meet the various needs of the electric grid. The Department is committed to increasing the generation of environmentally sustainable, affordable hydropower for our electricity supplies. In March 2010 Reclamation signed a Memorandum of Understanding (MOU) with the Department of Energy (DOE) and the U.S. Army Corps of

¹ Standard BTU content conversion factors and 2008 Energy Information Administration (EIA) U.S. consumption data.

² Calculated by multiplying 1.341 pounds CO₂/kWh by 40 billion kW produced by Reclamation to get about 54 billion pounds, and converting this to tons by dividing by 2000 (1 ton=2000 pounds). 1.341 pounds CO₂/KW hour conversion factor is from the “Generation of Electric Power in the United States July 2000 Report” by Energy Information Administration (EIA), Page 5, Table 1.

Engineers (USACE). The MOU focuses on ways to increase renewable energy generation by focusing on development of sustainable, low impact, and small hydropower projects. The MOU recognizes that not every site is appropriate for new production and commits the agencies to a new approach to hydropower that will harmonize the production of renewable hydropower generation with avoidance or reduction of environmental impacts and maintenance or enhancement of the viability of affected ecosystems.

Under the MOU, the three federal agencies will explore opportunities to increase generation of hydropower at existing facilities, look for opportunities to develop generation capacity in currently unpowered dams and conduits, and facilitate the permitting process for hydroelectric power generation by non-Federal interests at Federal facilities. Some of the highlights of the MOU include:

1. A resource assessment identifying specific Federal facilities where new hydropower generation could be installed. This assessment entails, among other things, updating the 2007 report prepared pursuant to Section 1834 of the Energy Policy Act of 2005 (phase one), and evaluating both existing dams and canals or “conduits” for new hydropower development within existing footprints (phase two). Status: phase one is on track for delivery in Fall 2010, phase two in 2011;
2. Surveying Reclamation and USACE existing hydropower facilities to quantify the amount of additional generation that may be possible through uprates or efficiency enhancements. Status: on track for delivery in Fall 2010, with implementation subject to discussions among the Power Marketing Administration and Federal Power customers;
3. Conducting basin-scale analyses to determine opportunities for new low-impact, small hydropower projects, improvements to existing facilities, and opportunities for environmental restoration. Status: a workshop is being planned for September 2010;
4. Collaborating with private companies, states, tribes, nongovernmental organizations and other Federal agencies to explore benefits from a certification program for environmentally friendly hydropower projects. Status: ongoing;
5. Conducting annual Research & Development workshops to highlight current initiatives, results of past efforts, and future goals of each agency. Status: ongoing;
6. Analyzing potential pumped storage sites that could be developed at existing USACE and Reclamation facilities. Status: ongoing;
7. Collaborating to clarify the current permitting process for projects proposed at Federal facilities. Status: ongoing.

The MOU provides a basis to engage with stakeholders, including other Federal agencies, the environmental community, and hydropower interests. Since the MOU was signed in March, numerous meetings have been held to engage with interested parties on ways to increase hydropower generation capacity in an environmentally responsible manner.

The entire MOU is available online at <http://www.usbr.gov/power/index.html> and is attached to this testimony.

Power produced at Reclamation facilities is first used for specific project purposes pursuant to the authorizing statutes. Any power remaining is marketed by the Western Area Power Administration and Bonneville Power Administration to Federal power customers. Some of the revenue collected from the sale of power to all customers is used to finance operations,

maintenance and replacement on Reclamation hydropower facilities and any remainder is deposited into the Treasury towards repayment of project costs or applied to Programs authorized by Congress. Two examples are the San Juan/Upper Colorado River Recovery Implementation Programs, and the Glen Canyon Adaptive Management Program.

Approximately 40% of all hydropower in the United States is currently generated at Federally-owned facilities. Reclamation's hydropower plants play an important role in ensuring the reliability of the electrical power grid in the western United States. Although Reclamation's current hydropower resources have limited flexibility for a variety of reasons, hydropower is valuable as a source of ancillary services such as regulation and load following. Increasing the generation of hydroelectricity to provide these ancillary services will become even more important to electric reliability as larger amounts of intermittent generation sources such as wind and solar come online. An increase of sustainable and environmentally acceptable hydropower generation can also help reduce the generation of greenhouse gasses by reducing our reliance on fossil fuels.

New Hydropower Generation on Existing Facilities

In the FY 2010 Energy and Water Appropriations Act, Congress directed Reclamation to spend \$5 million to "implement the results" of the Section 1834 study referred to earlier from within existing funds. No recommendations were included in the 2007 original report; it only provided a general cost benefit analysis. Reclamation is re-examining the results of the Section 1834 study using updated criteria, including taking into account appropriate environmental considerations. This update to the 1834 study, which is referenced in the MOU, will provide a basis for identifying low-impact, cost-effective opportunities to increase hydropower.

At this time Reclamation owns dams and many miles of canals that do not have hydropower installed, some of which could support hydropower development. While installing hydropower on all of these structures may not be cost effective or environmentally acceptable, there has been increased interest from outside entities to develop some of these sites. Licensing new facilities is accomplished through either a LOPP or a license from FERC. We are evaluating ways to make these processes much more efficient, and have been working with FERC and other interested federal agencies to explore possibilities to streamline the process without sacrificing environmental considerations.

Two Lease of Power Privilege agreements have been issued in the previous year with a total capacity of 4.5 megawatts (MW), and two Federal Register Notices have been issued to initiate the LOPP process for two additional sites with 15 MW of capacity. There have also been initial discussions for lease of power privilege agreements at four other Reclamation sites. Under the FERC licensing process, there has been development interest at several Reclamation sites. Currently, eight FERC licenses have been issued for conventional hydropower development with a capacity of 19 MW, and ten more potential projects have been issued preliminary permits.

Pumped Storage

Reclamation owns and operates three Pumped Storage Hydroelectric plants: Grand Coulee in Washington and Mt. Elbert and Flatiron in Colorado. In 2011, Reclamation will be initiating work to identify other pumped storage opportunities in Reclamation's footprint. This will be

accomplished by collaboration with the Department of Energy on a pumped storage study and review of previously identified and new Reclamation projects that show potential for development or conversion to pumped storage.

In addition, Reclamation and Bonneville Power Administration signed an agreement on June 15 to rehabilitate and uprate the John W. Keys, III Pump Generating plant at Grand Coulee. A rehabilitation study has been completed for the Mt. Elbert Pumped Storage plant. Reclamation is working with its customers to schedule that rehabilitation.

Capacity and Efficiency Gains at Existing Units

Capacity increases and efficiency gains can be accomplished through “uprates” and “rewinds.” Generally, when Reclamation rewinds a generator, the new winding will typically allow for up to a 15% increase in capacity. An uprate normally involves increasing the rating of an entire unit by more than 15%, which, in turn, necessitates reviewing the capability and limits of all of the power equipment from the penstock through the turbine, generator, bus, switchgear, transformer, and transmission system sometimes requiring modification of those components.

Uprates can be accomplished in one of three ways:

1. Increasing the turbine runner efficiency to produce more power with the same amount of water.
2. Increasing the generator and other component capacity to accept excess capacity available from the turbine.
3. Replacing the turbine with one that has a higher flow through capacity.

Over the last thirty years, as a result of uprating, Reclamation has increased its generation capacity by approximately 1,800 MW, an amount that is almost equivalent in magnitude to the installed capacity at Hoover Dam.

Uprates are currently underway in Washington at Grand Coulee Dam’s Third Powerhouse that will increase capacity on units G19 and G20 from 690 MW to approximately 770 MW each, and an additional generating unit has been approved at Black Canyon Dam in Idaho. Uprate studies are also being conducted at Deer Creek Dam in Utah, and the Grand Coulee John W. Keys III Pump-Generating Plant in Washington. The comprehensive study described above that will result from the MOU is focused on the potential for uprate and efficiency gains at all current facilities.

Low-head and Micro Hydropower

Reclamation is also working with stakeholders to facilitate the development of low-head and micro hydropower. Currently Reclamation owns and operates four plants that fall within the definition of low-head hydropower³, at Roza Diversion Dam in Washington, Minidoka Dam in

³ Small and low head hydropower projects are classified in several ways. The Department of Energy defines low-head hydropower as having a drop of less than 66 feet (http://www1.eere.energy.gov/windandhydro/hydro_glossary.html), and the power community is working with projects characterized as ultra low-head, with drops less than 10 feet. FERC has defined small hydropower projects as having capacity less than 5 megawatts, mini hydro as less than 1 megawatt, and micro hydro as less than 100 kilowatts.

Idaho, Nimbus Dam in California, and Boise River Diversion Dam, also in Idaho. We believe more opportunity may exist on facilities Reclamation owns, as well as non-Reclamation facilities that are associated with Reclamation projects. We have provided WaterSMART grants to help develop a low-head hydropower project that would conserve water in addition to generating 0.75 MW of power. We are also looking at other opportunities to generate power in canals and other delivery systems where it makes sense from a water management, financial, and environmental perspective.

In conclusion, Reclamation is playing a strong role in identifying and assisting in sustainable hydropower expansion in the U.S., taking into account appropriate environmental considerations. Along with our partner agencies, we have embarked on a broad array of activities that recognize the importance of the hydropower resource. We hope that these new efforts will provide a lasting contribution to the power supplies of our nation, just as past investments in the water and power infrastructure we rely on today have done, but with appropriate attention to minimizing the impacts to natural hydrology and sensitive species of fish and wildlife. We will look forward to working with the Congress as we continue our efforts to increase development environmentally sustainable hydropower.

Thank you for the opportunity to discuss the prospects for expanding low-impact and affordable hydropower generation. I am pleased to answer any questions the Subcommittee may have.

MEMORANDUM OF UNDERSTANDING FOR HYDROPOWER
Among
THE DEPARTMENT OF ENERGY, THE DEPARTMENT OF THE INTERIOR
And
THE DEPARTMENT OF THE ARMY

Purpose: To help meet the Nation's needs for reliable, affordable, and environmentally sustainable hydropower by building a long-term working relationship, prioritizing similar goals, and aligning ongoing and future renewable energy development efforts between the U.S. Department of Energy (DOE), the Department of the Interior (DOI), and the Department of the Army (DOA), through the U.S. Army Corps of Engineers (USACE) (collectively the "Agencies"), the Agencies enter into this Memorandum of Understanding (MOU).

I. BACKGROUND

As the largest source of renewable electricity generation in the U.S., hydropower provides a wide range of benefits to the Country. Hydropower is a minimal emission, low-cost source of energy that can be relied upon for long-term, stable production of domestic electricity. Hydropower also provides consistent, reliable generation which can be quickly adjusted and dispatched to meet the various needs of the electric grid.

The Agencies recognize that not every site is appropriate for new or increased hydropower production. New hydropower development must be sustainable and take into account the need to maintain healthy river ecosystems. The Agencies also recognize that historically dams have had impacts that go well beyond project boundaries, including significant impacts on ecosystems and the fish and wildlife that inhabit them. This MOU is intended to represent a new approach to hydropower development that will harmonize the production of clean, renewable power generation with avoidance or reduction of environmental impacts and maintenance or enhancement of the viability of ecosystems.

This MOU will focus both on increasing renewable energy generation from Federal hydropower facilities and reducing the environmental impact sometimes associated with historical hydropower development in the United States by focusing on sustainable, low impact, and small hydropower projects. The Agencies will identify specific Federal facilities and lands owned or controlled by the United States that are well-suited as sites for environmentally sustainable hydropower energy development. This new approach to hydropower development will advance projects that are superior in terms of environmental sensitivity to many other types of energy production and development. The Agencies will take advantage of untapped potential by increasing the generation of hydropower at existing facilities and dams through retrofits or modifications to increase hydropower production in a manner that will pose fewer of the potential environmental concerns that may be associated with the development of new dams and hydropower projects. For example, such efforts would include initiating efficiency and/or capacity upgrades at current generation facilities.

The Agencies will also study adding generation capacity to currently unpowered dams or constructed waterways and will prioritize those projects which can be developed at existing facilities and appropriately balance increased energy generation with consideration of environmental impacts. The MOU will also focus on research and development and will promote new technologies, including fish-friendly and low-head turbines.

II. MISSION

The DOE, the USACE, and DOI will seek to use their respective authorities, programs, and resources synergistically to serve the Nation efficiently and effectively. They will work together to (1) support the maintenance and sustainable optimization of existing Federal and non-Federal hydropower projects, (2) elevate the goal of increased hydropower generation as a priority of each Agency to the extent permitted by their respective statutory authorities, (3) promote energy efficiency, and (4) ensure that new hydropower generation is implemented in a sustainable manner. The DOE, the USACE, and DOI will jointly focus each Agency's respective capabilities and resources to make innovative and sustainable improvements to the Nation's renewable energy portfolio, and promote the goal of energy efficiency through water conservation or improved water management.

III. GOALS

The DOE, DOI, and DOA collaboratively intend to develop solutions and best-practices to increase in a sustainable manner U.S. hydropower generation at Federal facilities and seek solutions to meet the integrated energy and water needs of future generations. DOE, DOI, and the DOA express the following energy partnership goals:

1. Enhance environmentally sustainable hydropower development and operation at federally-owned hydropower generation facilities in order to provide clean, reliable, and affordable energy to American consumers.
2. Focus on a new approach to development of hydropower which increases hydropower generation and improves ecosystem function through environmentally sustainable, low impact or small hydropower projects.
3. Identify specific Federal facilities and lands owned or controlled by the United States that are well-suited as sites for environmentally sustainable hydropower energy development, and collaborate on efforts to implement projects at these locations, including joint studies, demonstration projects, and other mutually supported partnership arrangements with private entities, Indian tribes, and state and Federal agencies.
4. Coordinate efforts to assess the potential additional hydropower capacity available at Federal hydropower facilities that is environmentally sustainable,

including fostering an understanding of the potential effects of climate change on future generation capability.

5. Collaborate with Indian tribes, the environmental community, the owners of non-Federal hydropower facilities, Federal and state agencies, and other stakeholders to identify river basins where integrated basin-scale hydropower opportunity assessments could help facilitate the move to a low-carbon future, including both environmental sustainability and the delivery of renewable energy.
6. Emphasize the critical role that hydropower can play in helping to integrate other renewable energy technologies into the U.S. electric grid.
7. Promote an environmentally responsible approach to enhancing hydropower development that recognizes the need to preserve biological diversity, ecosystem function, our natural and cultural heritage, and recreational opportunities, and also recognizes that some geographic locations are not appropriate for new hydropower development.
8. Conduct research and disseminate results from environmental studies, and encourage development of specific standards for and certification of environmentally sustainable hydropower.
9. Work to integrate energy and water policies at the Federal level not only to address the development of hydropower resources, but also to evaluate the use of non-hydropower renewable resources with water management operations, and promote water conservation as a means to realize species conservation, environmental and energy efficiency goals.
10. Investigate ways to responsibly facilitate the permitting process for Federal and non-Federal hydropower generation and other renewable energy projects at federally-owned and Indian Tribe facilities, by increasing coordination among the Agencies that have jurisdiction and reducing unnecessary delay, while ensuring that environmental impacts are fully considered.
11. Share information on renewable energy research and development (R&D) efforts being conducted by each Agency along with any results obtained. Prevent the duplication of efforts and highlight potential areas of collaboration and/or joint funding.
12. Apply collective knowledge and lessons learned from conventional hydropower development, deployment, and management to the emerging in-river hydrokinetic technologies.
13. Increase levels of both formal and informal communication and coordination between officials and staff at multiple levels of each Agency.

IV. ACTION ITEMS AND TARGET COMPLETION DATES

Cooperative management and technical collaboration efforts can help to: (1) improve resource management and protection; (2) improve public services and to make more efficient use of limited public funds; (3) provide a better understanding of all Agencies' goals, objectives, and programs; (4) minimize conflicts; and (5) leverage each Agency's limited resources. The Agencies have identified seven initial opportunities for collaboration and have identified action items to set forth our initial efforts to implement this MOU. As more is learned, other areas of potential cooperation and mutual interest are likely to develop, and this MOU may be modified to identify further actions to carry out the goals of this MOU. The MOU identifies "Champions" who will lead or co-lead implementation efforts.

A. Federal Facility Energy Resource Assessment

Co-Champions: DOE EERE / DOA USACE / DOI Reclamation

Goal: Focus on opportunities at Federal facilities by assessing the potential of additional hydropower generation available at USACE and Reclamation facilities, and collaborate on joint projects to increase generation at identified facilities. Projects considered or undertaken are intended to complement, and not compete or conflict with any ongoing activities or projects at Federal facilities, and will need to involve all affected stakeholders throughout the planning process. Opportunities for increased generation include efficiency and/or capacity upgrades to existing facilities, improvements in water management practices, powering currently unpowered dams or other constructed waterways, and the addition of new pumped storage capacity. Opportunities for increasing generation while improving ecosystem function, such as hydropower production from bypass flows, will also be assessed. Also, the Agencies will assess the potential effects of climate change on Federal hydropower facilities and generation.

Initiative 1: Coordinate ongoing efforts at all three Agencies to improve resource data and identify specific Federal facilities or sites as good candidates for projects to increase hydropower generation (including in-river hydrokinetic projects). Ongoing efforts include, but are not limited to:

- DOE EERE's National Hydropower Assets Assessment Project (NHAAP) to identify the current state of the hydropower infrastructure in the U.S. (age, type, ownership, etc.), generation patterns from these assets, and effects of varying hydrologic conditions on generation.
- DOI Reclamation's efforts to survey its facilities and update the report on Potential Hydropower Development at Existing Federal Facilities under Section 1834 of the Energy Policy Act of 2005. The Section 1834 Report will identify potential environmental concerns. Future development on any Federal facility identified in the Section 1834 Report will include coordination

with the U.S. Fish and Wildlife Service, the National Park Service, and other entities with jurisdiction.

- DOA USACE's/DOI Reclamation's Hydropower Modernization Initiative (HMI) to survey their facilities, quantify the potential additional generation available, and identify the most suitable locations for upgrades. Actual implementation of the HMI will be in consultation with DOE and the Federal Power Marketing Administrations (PMA) and their power customers.

Action Items:

1. Include USACE and Reclamation representatives as members of the NHAAP Advisory Committee, and hold regular meetings to exchange available data/research from all ongoing efforts.
 - a. Product – Hold meetings twice a year
 - b. Schedule – Hold first meeting April 2010
2. As a result of ongoing work, produce a list of USACE and Reclamation facilities and sites best suited for upgrades or projects to increase generation in a sustainable manner.
 - a. Product – Federal Facilities/Sites List
 - b. Schedule – Completed by October 2010

Initiative 2: Explore opportunities for all the Agencies to jointly fund or solicit projects to increase generation at the identified Federal sites and facilities.

Action Items:

1. Develop a proposal with details for how projects identified in the Federal Facilities/Sites List could be funded. Options will include both Federal and non-Federal development at USACE and Reclamation sites and facilities.
 - a. Product – Finalized Proposal
 - b. Schedule – Completed by October 2010

Initiative 3: Coordinate efforts to complete the Hydropower Power Assessment called for in Section 9505 of the Omnibus Public Lands Act of 2009, P.L. 111-11. Evaluate the effects and risks associated with global climate change to water supplies available for hydropower power generation at Federal water projects, in consultation with each of the Federal PMAs, the United States Geological Survey, and other Federal and state authorities as appropriate.

Action Items:

1. Complete a report on the effects of global climate change on water supplies at Federal hydropower facilities and on power sales of the PMAs, based on best available scientific information. The report will include recommendations from the PMAs on potential changes in operation or contracting practices that could address these effects and risks of climate

change. Potential adaption and mitigation strategies will also be identified.

- a. Establish an interagency working group to plan and implement the required assessment and to provide long-term coordination for subsequent reports every 5 years.
- b. Product – Report to Congress
- c. Schedule – Submit Report to Congress by April 2011

B. Integrated Basin Scale Opportunity Assessments

Co-Champions: DOE EERE / DOI Reclamation / DOA USACE

Goal: A new basin-scale approach to hydropower and related renewable development that emphasizes sustainable, low impact or small hydropower and related renewable energies could identify ecosystems or river basins where hydropower generation could be increased while simultaneously improving biodiversity, and taking into account impacts on stream flows, water quality, fish, and other aquatic resources. The Agencies will collaborate with the environmental community, the owners of Federal and non-Federal hydropower facilities, potentially affected Federal land management agencies, Indian tribes and other stakeholders to identify river basins where renewable power generation and environmental sustainability could both be increased, with appropriate consideration of other values. These basin-scale studies will also evaluate whether there are opportunities in the basin to retrofit existing dams to increase generation while improving environmental conditions. The Agencies will build on the existing basin study programs and other ongoing research activities of all participants to investigate how such opportunities could potentially be developed. Activities within this section are intended to complement current initiatives or existing agreements pertaining to facilities and river-basins by providing additional tools, information and/or research for stakeholders.

Initiative 1: Collaborate with appropriate Agencies and stakeholders to (1) develop methodologies, (2) identify suitable river basins, and (3) select one or more basins for a basin-scale opportunity assessment pilot project. Develop consensus on specific actions that could be taken within that basin to achieve an increase in hydropower and related renewable generation *and* improve environmental sustainability.

Action Items:

1. Plan and hold an expert workshop to identify methodologies, tools, and strategies for conducting basin-scale hydropower opportunity assessments. Workshop participants will (1) identify basins suitable for a basin-scale approach with significant hydropower potential and environmental restoration opportunities, and (2) select and prioritize 1-3 basins for basin-scale assessment pilot projects.
2. Conduct one or more basin-scale assessment pilot studies consistent with the findings of the workshop described above, in partnership with representatives

from appropriate environmental NGOs, Federal and state agencies, tribes, the hydropower industry, and other relevant stakeholders.

3. Draft and disseminate a report on the results of the pilot studies that includes a feasibility analysis for expansion of the basin-scale assessment model to other appropriate river basins.
 - a. Product: Hold first workshop May 2010
 - b. Schedule: Produce initial report 3 months after first workshop

C. Green Hydropower Certification

Champion: DOE EERE

Goal: Identification of new hydropower development projects that avoid or reduce environmental impacts. Collaborate with private companies, states, tribes, nongovernmental organizations, and other Federal agencies to explore the benefits of the certification of environmentally friendly hydropower projects, and identify types of hydropower projects that could be included under state or national renewable energy portfolio standards, or could be given other credit for clean energy produced.

Initiative 1: Work with multiple stakeholders and other agencies to review potential criteria and/or other evaluation methods for identifying sustainable, environmentally-friendly hydropower projects.

Action Items:

1. Initiate a series of stakeholder meetings with state and tribal governments, and environmental and other interest groups to gather information on concerns regarding environmental impacts of hydropower generation, and possible solutions/mitigation options. Meetings would be led by DOE, with participation and involvement by USACE, Reclamation, the PMAs, the U.S. Fish and Wildlife Service, the National Park Service, and other Federal agencies, and other industry representatives.
 - a. Product – Conduct 3-4 meetings
 - b. Schedule – Initiate in FY 2010
2. Based on stakeholder meetings, jointly develop a list of recommended criteria or processes that could be used to certify sustainable and environmentally friendly hydropower generation facilities, including conventional or hydrokinetic hydropower developments and/or pumped storage facilities.
 - a. Product – Develop a list of recommended hydropower certification standards or criteria
 - b. Schedule – Initiate in FY 2010

D. Federal Inland Hydropower Working Group

Co-Champions: DOE EERE / DOI

Goal: Convene and participate in a Federal Inland Hydropower Working Group composed of DOE, USACE, DOI, and all other Federal agencies involved in the regulation, management, or development of hydropower assets (including in-river and other emerging hydrokinetic technologies) in rivers and streams in the U.S.

Initiative 1: Hold quarterly, staff-level meetings via teleconference in order to update Federal agencies on the status of all initiatives, efforts, and projects related to hydropower. Also utilize these meetings to update project leads from the DOE, USACE, and DOI on the status of projects and define ongoing action items necessary to complete individual tasks listed in these Guidelines.

Action Items:

1. Involve other Federal agencies in the Working Group, and schedule first meeting.
 - a. Product – Hold teleconference once every 3 months
 - b. Schedule – Initiate in FY 2010

E. Technology Development and Deployment:

Co-Champions: DOE EERE / DOA USACE / DOI Reclamation

Goal: Share information on R&D efforts being conducted by each Agency along with any results obtained. Prevent the duplication of efforts and highlight potential areas of collaboration and/or joint funding.

Initiative 1: Conduct yearly renewable energy R&D workshop to highlight current initiatives, results of past efforts, and future goals of each Agency.

Actions Items:

1. Convene a workshop to discuss ongoing federally funded efforts, initiatives, and technology R&D
 - a. Product – Hold Workshop
 - b. Schedule – Initiate in FY 2010

Initiative 2: Identify potential R&D deployment sites at or near USACE or Reclamation facilities for DOE or jointly funded technology development projects (including in-river and other emerging hydrokinetic technologies).

Actions Items:

1. Initiate a public process to identify facilities
 - a. Product – An evolving list of appropriate facilities based on technologies being developed
 - b. Schedule – Initiate in FY 2011

2. Initiate demonstration projects
 - a. Product – Deploy newly-developed technologies at identified facilities to increase the quantity and/or flexibility of hydropower generation.
 - b. Schedule – Initiate in FY 2011

F. Renewable Energy Integration and Energy Storage:

Co-Champions: DOE EERE / DOI Reclamation

Goal: Emphasize the critical role that hydropower can play in working to integrate other renewable energy technologies into the U.S. electric grid.

Initiative 1: Conduct a technical, economic, and environmental feasibility analysis of environmentally sustainable potential pumped storage sites that could be developed at existing USACE and Reclamation facilities (including both powered and unpowered dams). This analysis will compile and incorporate previous research on pumped storage feasibility.

Action Items:

1. Establish scope and statement of work, coordinate roles of each Agency, and establish timeline for specific deliverables.
 - a. Product – Collaboration Plan/Report
 - b. Schedule – June 2010

Initiative 2: Collaborate with other Federal agencies and various industry stakeholders to assess the amounts and distribution of energy storage needed to effectively integrate other intermittent sources of renewable energy into the U.S. electric transmission grid.

Action Items:

1. Assess and report on all work of this nature occurring in DOE, DOI, and DOA, and coordinate with any similar projects taking place in other Federal agencies or occurring outside the Federal Government.

G. Regulatory Process:

Co-Champions: DOE EERE / DOA USACE / DOI Reclamation

Goal: The Agencies will work together and investigate ways to efficiently and responsibly facilitate the current Federal permitting process for Federal and non-Federal hydropower projects at Federal facilities, within existing authority.

Initiative 1: Collaborate with other Federal agencies to clarify the current permitting processes for projects and development occurring at Federal sites and facilities, and identify the most time-intensive and resource-intensive components of each process. Work with other Federal agencies to identify ways in which processes could be

shortened by reducing unnecessary delay, streamlined or simplified for appropriate projects.

Action Items:

1. Hold a workshop with all Federal agencies involved in the permitting process, including the U.S. Fish and Wildlife Service, the National Park Service, the Bureau of Land Management, and others.
 - a. Product – Collaborative Workshop
 - b. Schedule – Complete by June 2010
2. Produce a report detailing the results of the workshop, and highlighting current requisite permits, overlapping areas of information required by permits, and lead times associated with each type of Federal permit.
 - a. Product – Workshop Report
 - b. Schedule – Complete 3 months after conclusion of Workshop

VI. COMMUNICATIONS AND COORDINATION

To foster the sharing of information and to facilitate contact between the Agencies, DOE, USACE and DOI should provide each respective Agency with a list of points of contacts responsible for program areas and other areas of mutual interest. In addition to the quarterly Federal Inland Hydropower Working Group teleconferences, these points of contact should communicate as needed. Early communication should improve public services consistent with the above mission statements for all Agencies through increased efficiency and avoidance of potential conflict. Coordination should occur for planning, programs, research and development, and other management actions of mutual interest. To the extent possible, each Agency should offer the other informal and formal opportunities to review and comment on proposed additions, changes, or updates to Agency guidelines, regulations, procedures, directives and policies that may have impacts on the programs and mission of the other Agency.

Implementation: The Agencies have mutually set performance goals and will foster a spirit of teamwork between the organizations at all levels to achieve the goals. The MOU sets out action items to accomplish these goals and also sets forth deadlines for completion of the action items. The Agencies intend to meet regularly to exchange information and collaborate in a variety of different manners to work toward the achievement of those goals to the extent that funding, resources, and staffing are available. The Agencies also agree to coordinate with and communicate action plans to Federal land management agencies and other interested parties.

Effective Date, Modification and Termination:

- This MOU will become effective upon the date of the last signature and remain in effect for a period of 5 years.

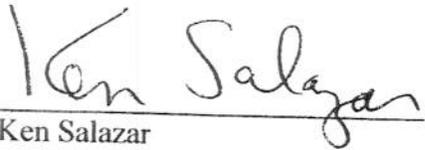
- Modifications to this MOU may be proposed by any signatory Agency (or designated representatives). Proposals for modification will be circulated to the receiving Agencies for a 30 calendar-day period of review. Approval of modifications will be indicated by written acceptance by the signatory agencies. Following acceptance by all Agencies, a revised MOU or amendment to the MOU will be circulated for execution.
- Participation in this MOU may be terminated by any signatory Agency. As a courtesy to the other signatory Agencies, a terminating Agency will endeavor to provide sixty (60) calendar days after providing written notice of such termination to the other signatory Agencies.

Qualifications and Limitations:

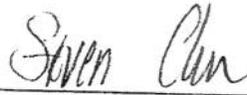
- Participation in this process does not imply endorsement of a proposed plan or project. Nothing in this Agreement is intended to diminish, modify, or otherwise affect the statutory or regulatory authorities of the signatory Agencies.
- This MOU is strictly for internal management purposes for each of the parties. It is not legally enforceable and shall not be construed to create any legal obligation on the part of any of the Agencies. This MOU shall not be construed to provide a private right or cause of action for or by any person or entity.
- This MOU is not a fiscal obligation document. Nothing in this Agreement authorizes or is intended to obligate the Agencies to expend, exchange, or reimburse funds, services, or supplies, or transfer or receive anything of value. Each Agency will provide its own resources to meet the outlined objectives in an amount that they deem acceptable.
- When the Agencies agree to undertake joint projects with defined specific projects and goals, they will develop a separate written agreement for each project setting out each party's contribution, deliverables, and responsibilities.
- This MOU in no way restricts any of the Agencies from participating in any activity with other public or private agencies, organizations, or individuals.
- All agreements herein are subject to, and will be carried out in compliance with, all applicable laws, regulations, and other legal requirements.
- As used in this document, the term "collaboration" shall not include any practice prohibited by fiscal statutes including 31 U.S.C. § 1552, 31 U.S.C. § 1301, 31 U.S.C. § 1341, 31 U.S.C. § 1342, nor by any fiscal or ethics regulations specifically applicable to the individual Agencies, and shall not include any preferential treatment of any private organization nor access to any non-public, pre-decisional or procurement sensitive information. Further, all limitations stipulated in the Federal Rules of Acquisition are to be made for any collaboration under this memorandum and any addenda thereof.
- All partnerships and arrangements with private entities will comply with all authorities regulating relationships between the Federal Government and private entities.
- Nothing in this MOU is intended to create a committee subject to the requirements of the Federal Advisory Committee Act (5 U.S.C. App).

Statutory Authorities

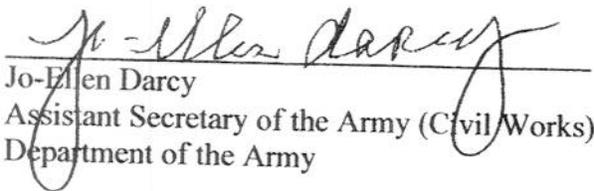
DOE enters into this MOU under the authority of Section 646 of the Department of Energy Organization Act (Pub.L.95-91), as amended (42 U.S.C. §7256).
Reclamation enters into this MOU under the authority of the Act of June 17, 1902 (32 Stat. 388) and Acts amendatory thereof and supplementary thereto.
USACE enters into this MOU under Section 212 of the Water Resources Development Act 2000 (33 U.S.C. § 2321a) and the various project authorization for hydropower development.



Ken Salazar
Secretary
Department of the Interior



Steven Chu
Secretary
Department of Energy



Jo-ellen Darcy
Assistant Secretary of the Army (Civil Works)
Department of the Army