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. <u>Integrated Basin Scale Opportunity Assessments</u>
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. <u>Green Hydropower Certification</u>
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. <u>Federal Inland Hydropower Working Group</u>
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. <u>Technology Development and Deployment</u>:
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. <u>Renewable Energy Integration and Energy Storage</u>:
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. <u>Regulatory Process:</u>
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