The electric utility industry has established two related programs to evaluate and sponsor forest carbon management activities, the UtiliTree Carbon Company and the Utility Forest Carbon Management Program.

UtiliTree Carbon Company. A new non-profit corporation called the UtiliTree Carbon Company was established by 40 utilities to sponsor the projects identified by the Utility Forest Carbon Management Program (see below). The five projects in the final pool represent a diverse mix of rural tree planting, forest preservation, forest management and research efforts at both domestic (eastern and western U.S.) and international sites. The UtiliTree Carbon Company has committed slightly over $2.4 million to fund the pool of projects. Carbon dioxide (CO₂) will be managed at a cost of under $1 per ton, including administrative expenses. Over 2 million tons of CO₂ benefit will result from the five projects over their lifetimes. Participants will share on a pro rata basis reporting of CO₂ benefits into the voluntary Energy Policy Act section 1605(b) data base.

Utility Forest Carbon Management Program (UFCMP). This program is an initiative developed by the Edison Electric Institute, with support from 55 electric utilities, to expand electric utility industry efforts to manage CO₂ via forestry projects, both domestic and international. The goals of the program are to:

- Advance the state of knowledge regarding options for managing greenhouse gases (GHG's) via forestry.
- Establish low-cost forestry options to manage GHG's.
- Implement projects to manage GHG's.
- Promote environmental stewardship by the electric utility industry, including helping to demonstrate that a voluntary approach to environmental protection can work.

The UFCMP developed criteria and a process to review proposed projects and, subsequently, a request for proposals was issued to hundreds of individuals and organizations in February 1995. Thirty-two proposals were received in March 1995 and reviewed by the UFCMP committees, an outside consultant and, to a limited extent, by the UFCMP Advisory Council (representatives from nine non-electric utility organizations -- American Forests, Resources for the Future, Trees Forever, Society of American Foresters, Smithsonian Tropical Research Institute, U.S. Country Studies Program, U.S. Department of Energy, Oak Ridge National Laboratory, and USDA Forest Service). Proposed projects were located in the U.S., Central America, South America and Asia.

Technical criteria address estimation of full life cycle carbon sequestration benefits (taking into account "leakage" and the fate of harvested biomass), project GHG calculations, monitoring, contingency plans, and non-GHG impacts, as well as project developer qualifications and experience. The cost-effectiveness of the project in terms of $ per ton CO₂ managed was a key project criterion. Projects were ranked and a "pool" of five projects emerged as the final product for which sponsorship was sought. Subsequently, 40 UFCMP members joined together to form UtiliTree Carbon Company and provide cooperative funding.

Contacts:
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John Kinsman

http://www.ji.org/iuep/utree2.shtml
UtiliTree Carbon Company

The non-profit UtiliTree Carbon Company has been established by 40 utilities to sponsor five forest management projects with greenhouse gas benefits. The projects in the final pool represent a diverse mix of rural tree planting, forest preservation, forest management and research efforts at both domestic (eastern and western U.S.) and international sites.

The UtiliTree Carbon Company has committed slightly over $2.4 million to fund the pool of projects. Carbon dioxide (CO₂) will be managed at a cost of under $1 per ton, including administrative expenses. Over 2 million tons of CO₂ benefit will result from the five projects over their lifetimes. Participants will share on a pro rata basis the reporting of greenhouse gas benefits into the voluntary Energy Policy Act section 1605(b) data base.

Brief descriptions of the five projects are provided below.

**Bottomland Hardwood Forest Restoration in the Mississippi River Valley: A Carbon Sequestration Opportunity**

This project will investigate the feasibility of using bottomland hardwood forest restoration on marginal farmland in the Mississippi River Valley as a means of sequestrating atmospheric carbon. The project, conducted by the School of Forestry at Louisiana Tech University, will also seek to improve the methods of reestablishing such forests. The 80 acre study site in Catahoula Parish, Louisiana is owned by the Louisiana Department of Wildlife and Fisheries. The restored forest will be part of an adjacent state wildlife refuge. Anticipated CO₂ benefits are 47,000 tons over 70 years.

**The Rio Bravo Carbon Sequestration Project**

The Rio Bravo Carbon Sequestration Pilot Project is a partnership between Programme for Belize, The Nature Conservancy, Wisconsin Electric Power Co., Cinergy Corp., Detroit Edison Company, PacifiCorp, and UtiliTree Carbon Company. The project consists of two components. Component A includes the purchases of a 14,400-acre parcel of endangered forest land that will link two forested Rio Bravo properties owned by Programme for Belize in the northwestern corner of Belize. Component B establishes a sustainable forestry management program at the Rio Bravo Conservation and Management Area that will increase the total pool of sequestered carbon in the 120,000-acre area of Rio Bravo. The partners established the following as the primary objective of Rio Bravo project: explore and demonstrate incentive-based opportunities for private voluntary international cooperation in greenhouse gas mitigation, conservation and sustainable development. Anticipated CO₂ benefits attributable to UtiliTree Carbon Company's contribution equal about 1,060,000 tons over 40 years.

**Reduced Impact Logging of Natural Forests in Sabah, Malaysia**

A successful forest based greenhouse gas emission offset project in Sabah, Malaysia, is being expanded. The Reduced Impact Logging project involves implementation of techniques to reduce the release of sequestered CO₂ associated with uncontrolled logging of natural tropical forests. New England Power Company (NEP) developed the project. Rakyar Berjaya Sdn. Bhd. (RBJ) of Malaysia, will implement reduced impact logging on 2,500 acres within its 2.4 million acre timber concession. The anticipated greenhouse gas benefit is 379,000 tons CO₂ over the 40 year project life. Non-greenhouse gas benefits are substantial. The reduced damage to the forest and forest soils represent a giant step toward sustainable tropical forest management.

http://www.ji.org/iuep/utree2.shtml
**Maximizing Carbon Storage through Forest Stewardship**

The Pacific Forest Trust (PFT) has created a new incentive for forest stewardship through utilizing the tremendous carbon storage capability of the Pacific Northwest forest to increase carbon sequestration through restoring older growth forests to the private landscape. In a pilot project on approximately 500 acres of prime redwood land in California, the PFT is working with private forest landowners to significantly increase short and long-term CO₂ stores through forest stewardship. By ensuring that this land will be managed for older age cohorts of trees, the project will increase both total volumes of timber harvested and CO₂ stores. The forest land owners will be compensated for their costs of forest management changes to maximize carbon storage. Through a perpetual conservation easement, the project also protects this land, including critical habitat for salmon and other threatened species, as forest forever. This project is expected to produce a CO₂ benefit of 242,000 tons over 100 years.

**Western Oregon Carbon Sequestration Project**

The Western Oregon Carbon Sequestration Project will sequester carbon by planting trees on 900 acres of unforested non-industrial private timberland in western Oregon that otherwise would not be replanted. Participating landowners will agree to grow the trees for at least 65 years before harvest and to engage in sustainable forest management practices to ensure maximum growth per acre. Any harvested timber will likely be used for long-term purposes such as construction, continuing sequestration of much of the carbon. The project will have numerous additional benefits including expanding wildlife habitat, improved water quality and increased forest industry employment. The project will be implemented by Trexler and Associates in cooperation with Oregon Woods, Inc. Anticipated CO₂ benefits are in the range of 564,000 - 747,000 tons.

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**Bottomland Hardwood Forest Restoration in the Mississippi River Valley: A Carbon Sequestration Opportunity**

UtiliTree Carbon Company is funding a project entitled, "Bottomland Hardwood Forest Restoration in the Mississippi River Valley: A Carbon Sequestration Opportunity," that will investigate the feasibility of using bottomland hardwood forest restoration on marginal farmland in the Mississippi Valley as a means of sequestering atmospheric carbon dioxide (CO₂), a principal greenhouse gas. The project will also seek to improve the methods of reestablishing such forests. The 80 acre study site, located in Catahoula Parish, Louisiana, is a part of a 7,000 acre tract that is available for afforestation. The restored forest will be part of an adjacent state wildlife refuge.

The $176,493 project is being conducted by the School of Forestry at Louisiana Tech University on lands owned by the Louisiana Department of Wildlife and Fisheries. Drs. Kenneth W. Farrish, Charles E. Rowell, John C. Adams and Ray A. Newbold will manage the project.

Hardwood forests planted in 1996 on these marginal farmlands will sequester an estimated 7.4 tons of CO₂ per acre by the year 2000, and 593 tons per acre by the end of a 70 year growing period. Anticipated CO₂ benefits are 47,000 tons over 70 years.

http://www.ji.org/iuep/utree2.shtml
Restoration of bottomland hardwood forests in the Mississippi River Valley would also improve depleted wildlife habitats and provide potential economic stimulus for a depressed region. Over 4 million acres of bottomland hardwood forests were cleared in the Mississippi River Valley in the 1970s for agricultural crop production. However, much of the land was poorly suited for crops. The extensive clearing was also devastating to wildlife habitats. Reestablishment of forests for carbon sequestration purposes could be planned to also serve as wildlife corridors, connecting sections of currently fragmented habitats, as well as serving to increase biodiversity. In addition, the planted forests may eventually serve as a sustainable source of raw materials for the forest products industry and as a source of recreation revenues. The project also will evaluate site preparation techniques aimed at enhancing early survival and growth of the planted trees. Older planted hardwood forests (up to 30 years old) will be sampled in the region to make projections on longer-term carbon sequestration rates.

Carbon sequestration will be monitored through annual measurements of the planted trees and soil carbon accrual on permanent sample plots in the study area by Louisiana Tech University personnel. An audit-verification of these plot measurements will be made by representatives of UtiliTree Carbon Company.

The non-profit UtiliTree Carbon Company was established by 40 utilities to sponsor a collection of five forestry projects that manage greenhouse gases, especially CO₂. The projects consist of a diverse mix of rural tree planting, forest preservation, forest management and research efforts at both domestic (eastern and western U.S.) and international sites. The UtiliTree Carbon Company has committed slightly over $2.4 million to fund these projects.

The contact person for the project is Dr. Kenneth W. Farrish, who can be reached at (318) 257-3714 or plymouth@vm.cc.latech.edu. His mailing address is School of Forestry, Louisiana Tech University, P.O. Box 10138 Tech Station, Ruston, Louisiana 71272. For information about the UtiliTree Carbon Company, contact John Kinsman, Edison Electric Institute, at (202) 508-5711.

Quotes

**Bottomland Hardwood Forest Restoration in the Mississippi River Valley: A Carbon Sequestration Opportunity**

"The Mississippi River Valley encompasses the nation's poorest counties and parishes. Economic development can be based on renewable natural resources. Forests and the associated forest products industry offer an opportunity to build a capacity for long-term wealth generation. By utilizing cost efficient natural resources and abundant local labor, the program to sequester atmospheric carbon dioxide by growing forests offers a unique opportunity to generate a renewable natural resource with associated opportunities for local value added manufacturing."

Dr. G.H. Weaver, Director, School of Forestry, Louisiana Tech University

"Too often forestry practitioners narrowly focus on a specific interest and discount the interrelationships and by-products of what they do. In the process of planting bottomland hardwoods on abandoned agricultural land, this project addresses atmospheric carbon sequestration, land use and productivity, long-term ecosystem restoration, and will also fill data gaps in the accurate projection of bottomland forest development."

Dr. Ray A. Newbold, Associate Professor, School of Forestry, Louisiana Tech University

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"I am excited about the opportunity to conduct some important and needed research on improving the methods of reestablishing hardwood forests on these old fields".

Dr. John C. Adams, Professor, School of Forestry, Louisiana Tech University

"This approach to carbon sequestration has the potential to be a win-win proposition for the UtiliTree Carbon Company, the State of Louisiana, and wildlife. This is a project that everyone involved can feel good about".

Dr. Kenneth W. Farrish, Associate Professor, School of Forestry, Louisiana Tech University

"The project will examine the potential to sequester carbon with hardwood tree plantings while also improving forest regeneration methods for afforestation of agricultural lands in the Mississippi River Valley."

Dr. Charles E. Rowell, Associate Professor, School of Forestry, Louisiana Tech University

"We have a large amount of former agricultural land that is slated for afforestation in the State. The problem that is slowing our planting efforts is limited funding for that purpose. This looks like a good opportunity for both UtiliTree and our agency."

Mr. Kenny Ribeck, Forestry Supervisor, Louisiana Department of Wildlife and Fisheries

The Rio Bravo Carbon Sequestration Project

The Rio Bravo Carbon Sequestration Pilot Project is a partnership between Programme for Belize, The Nature Conservancy, Wisconsin Electric Power Company, Cinergy Corp., Detroit Edison Company, PacifiCorp, and UtiliTree Carbon Company. The project consists of two components. Component A includes the purchases of a 14,400-acre parcel of endangered forest land that will link two forested Rio Bravo properties owned by Programme for Belize in the northwestern corner of Belize. Component B establishes a sustainable forestry management program at the Rio Bravo Conservation and Management Area that will increase the total pool of sequestered carbon in the 120,000-acre area of Rio Bravo.

This project has been selected as one of 15 projects to date acknowledged by the U.S. Initiative on Joint Implementation (USJIJI) as reducing the potential for climate change and contributing to sustainable development worldwide.

The partners established the following as the primary objective of Rio Bravo project: explore and demonstrate incentive-based opportunities for private voluntary international cooperation in greenhouse gas mitigation, conservation and sustainable development.

Partnerships require commitment, active participation, and a contribution of time, talent and treasury. The electric utilities, as signatories to the U.S. Department of Energy/electric utility industry "Climate Challenge" Program have each committed to undertake substantial voluntary greenhouse gas mitigation strategies within the U.S. and were eager to pursue similar efforts internationally. Programme for Belize is principally dedicated to biodiversity conservation and the sustainable management of endangered hardwood forest in Belize, including management of the Rio Bravo area. The Nature Conservancy protects and conserves endangered flora and fauna within the U.S. and assists non-government conservation organization in other countries. These partners were able to come together for a voluntary collaboration to achieve common goals on this project.

The management and preservation aspects of the project will result in many direct and indirect benefits to the people and natural resources of Belize. The estimated net carbon dioxide (CO₂) benefits attributable to UtiliTree Carbon Company's contribution equal about 1,060,000 tons over 40 years, with total project benefits five times that amount.
Although not quantifiable at this time, other benefits include:

- A reduction in soil erosion and pollution of surface waters
- Maintenance of high level of biodiversity
- Sustainable economic development through sustainable forestry
- Better regional employment because harvesting forestry products and converting them to products means jobs.
- Maintenance of land productivity
- Protection of archaeological Mayan sites

Through technology transfer, sustainable forest management models can be used for application to other private land holding in Belize to demonstrate economic and environmental benefits to other Belizean communities.

The forest land purchased as part of the project was threatened by imminent conversion to intensive agricultural land. By retaining the parcel in its native forest convert and combining its acreage with adjoining forested lands, an area large enough to implement a sustainable forestry program is created. The challenge was to develop a workable project to achieve a critical balance between the needs of people and the needs of the environment. This project has been successful in meeting this balance.

Implementation of the project includes establishment of an accurate baseline assessment of the amount of carbon in the tropical forest vegetation and soils and the development of an effective monitoring protocol to document changes in the carbon budget over the next 40 years. The USII program requires a detailed reporting and evaluation process where a number of project-related factors are documented. There are also third-party inspections of the project and independent external verification of the greenhouse gas emission reduction (carbon sequestered) that is credited to the electric utility partners.

The non-profit UtiliTree Carbon Company was established by 40 utilities to sponsor a collection of five forestry projects that manage greenhouse gases, especially CO₂. The projects consist of a diverse mix of rural tree planting, forest preservation, forest management and research efforts at both domestic (eastern and western U.S.) and international sites. The UtiliTree Carbon Company has committed slightly over $2.4 million to fund these projects.

The contact person for the project is Mr. Paul Schumacher, Manager, Environmental Process, Wisconsin Electric Power Company, 231 W. Michigan Street, Milwaukee, WI 53203. He can be reached at (414) 221-2449. For information about the UtiliTree Carbon Company, contact John Kinsman, Edison Electric Institute, at (202) 508-5711.

**Quotes**

**The Rio Bravo Carbon Sequestration Project**

"The Rio Bravo project is a significant case study for international recognition. We hope to demonstrate that environmental solutions of lasting value can be achieved through partnerships, innovation and vision."

Richard A. Abdoo, Chairman and CEO, Wisconsin Electric Power Co.

"Detroit Edison believes that economic growth and environmental stewardship are totally consistent corporate objectives. The Rio Bravo project reflects this desire for sustainable development by fulfilling the mutual goals of the U.S. government and

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companies like Detroit Edison to offset carbon dioxide emissions and foster economic growth."

Anthony F. Earley, Jr., President and COO, Detroit Edison

"Our experience with carbon offset programs shows that they provide a scientifically sound, cost-effective way of addressing CO2 emissions. International activities like the Belize project are a critical part of our CO2 strategy, which also includes planting trees in the U.S., developing wind power, conservation and an ethanol project for the transportation sector."

Fred Buckman, President and CEO, PacifiCorp

"Cinergy Corp takes very seriously its role as a leader in environmental protection. Our involvement with the Belize project on rain forest preservation is another in the many steps we have taken to operate in an environmentally friendly manner."

Jackson H. Randolph, Chairman, Cinergy Corp.

"By working with The Nature Conservancy and the Programme for Belize, these utility companies are pioneering an environmental strategy that combines an impressive mix of energy improvements in their own service areas with forest preservation action abroad. This project represents the new breed of cost-effective voluntary partnership that are the hallmark of the Clinton Administration's approach to climate change."

Hazel O'Leary, Secretary, U.S. Department of Energy

"We're pleased to join in this truly innovative effort to demonstrate creative market-based incentives for mitigating the effects of greenhouse gases while achieving important conservation goals. Through land protection and sustainable forestry practices, we are helping to address an environmental challenge that has no territorial boundaries."

John C. Sawhill, President and CEO, The Nature Conservancy

"The Government of Belize believes that the greatest conservation good will come from strong partnerships between the public and private sectors. Belize has made a strategic move to be one of the first countries for a carbon sequestration project under the U.S. Initiative on Joint Implementation. The Government of Belize is committed to conservation and wise resource use and is always seeking innovative means of achieving this goal, which is befitting of a country with 70 percent natural vegetation cover."

Manual Esquivel, Prime Minister of Belize

**Maximizing Carbon Storage through Forest Stewardship**

The Pacific Forest Trust's Forests Forever Fund project, "Maximizing Carbon Storage through Forest Stewardship," pioneers a new approach to addressing potential climate change through improving forest management. This project will increase carbon sequestration on a prime redwood forest in Northern California by at least 104,310 tons CO2 by the year 2000, and by 242,082 tons CO2 by 2095 through ensuring forest management that increases older age stands, reduces soil carbon loss and restores natural forest composition. These redwood forests are the most effective carbon sinks in the world.

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The Project Team includes: Laurie A. Wayburn, co-founder and executive Director of the PFT, who is the project leader; Constance L. Best, co-founder and President of the PFT; Roger Sternberg, MS, PFT’s Forest Conservation Director; Mark Harmon, Ph.D, a leading researcher on forest-based carbon stores with the Oregon State University who developed the Stewardship Forestry Carbon Model (SFCM) with PFT; William Hutton, PFT’s Counsel, one of the nation's leading conservation lawyers; and Dale Thornburg, Ph.D RPF, PFT’s Senior Forester. Dr. Thornburg is also Silviculture Professor at Humboldt State University and member of California Licensed Forester Examine Committee as well as of the USFWS Spotted Owl Recovery Team.

The project utilizes a highly sophisticated, proprietary computer modern, SFCM, to simulate forest dynamics under different management scenarios and project changes in carbon stores over time. It was specifically designed to estimate carbon flux under varying forest management scenarios in 26 commercial Pacific Northwest species. It accounts for carbon fluxes due to past management history as well as future management actions. Carbon pools in the soil, root masses, bole, branches and understory are accounted for, as is the fate of carbon in forest products.

The project involves the acquisition of restricted rights from a willing landowner, in the form of a conservation easement held by the Pacific Forest Trust. The conservation easement guides forest management to achieve carbon storage goals.

Field research at the site will provide ground truthing and verification of carbon stores. Independent verification is assured through the California Department of Forestry reviewing timber harvest plans, by the Nature Resources Conservation Service reviewing the forest management plan and by the Pacific Forest Trust.

The landowners are participating because this allows them to achieve goals they otherwise could not gain. The project pays the opportunity costs of a forgone harvest that they would otherwise need, yet allows for ongoing harvest that maximizes their long-term returns and achieves environmental gains that they could not otherwise afford.

Conservation easements are an elegant and appropriate tool for the Project as they create a permanent carbon sink, where gains will not be lost with a new landowner or at the project termination. The Pacific Forest Trust is the only land trust in the Pacific Northwest dedicated to management and protection of productive private forestlands. As the easement holder, PFT is legally bound to carry out annual monitoring and enforcement of the easement, into perpetuity.

The project also achieves multiple additional environmental and social gains, protecting a vital watershed for Mendocino County; restoring and protecting salmon habitat; enhancing and protecting habitat for threatened and endangered species; protecting biological diversity and habitat connectivity; ensuring long-term supplies of high-quality timber, forest-dependent jobs and preserving production timberlands. These are all desired goals of Mendocino County. The Project is warmly welcomed by the County and other forest stakeholders, (including the Sierra Club), as providing needed incentives for forest stewardship that cannot otherwise be achieved.

The non-profit UtiliTree Carbon Company was established by 40 utilities to sponsor a collection of live forestry projects that manage greenhouse gases, especially CO₂. The projects consist of a diverse mix of rural tree planting, forest preservation, forest management and research efforts at both domestic (eastern and western U.S.) and international sites. The UtiliTree Carbon Company has committed slightly over $2.4 million to fund these projects.

The contact person for the project is Laurie A. Wayburn, Pacific Forest Trust, P.O. Box 858 Boonville, CA 95415. Ms. Wayburn can be reached at 707-895-2090. For information about the UtiliTree Carbon Company, contact John Kinsman, Edison Electric Institute, at (202) 508-5711.

Quotes

Maximizing Carbon Storage through Forest Stewardship

"In the often bitter disputes over forests in the Pacific Northwest, we frequently lose sight of the fact that environment and economics are not only compatible but complementary, if we approach the situation creatively. The Pacific Forest Trust carbon project is a great example of how to solve society's multiple demands on forests: for habitat for endangered fish and wildlife, clean air, healthy forests, and multiple timber products, by providing new economic incentives to private landowners for forest stewardship."

Curt Smitch, Assistant Regional Director, Pacific Northwest, US Fish and Wildlife Service.

"The Pacific Forest Trust project provides an incentive to private forestland owners to grow more trees and more trees to older ages, thereby restoring depleted inventories in Mendocino County. This helps ensure a long-term sustainable harvest of high quality timber products, as well as restoring a broad range of forest functions. This restoration of forest health, productivity, timber inventory and timber jobs is a key goal for Mendocino County."

Charles Peterson, Supervisor, Mendocino County

"Forests provide many services-- such as water storage and purification, habitat for fish and wildlife and mitigation of global warming through carbon storage-- that forest landowners are not paid for. These services are substantially enhanced by managing for older forests, ones that are increasingly rare on the private forest landscape. Our goal with this project is to create a win-win-win solution to the conflict between landowners' need for economic return, forest workers need for long-term jobs, and our society's need to restore and maintain older forests on which so many forest resources depend. Carbon storage is a very effective surrogate for all these forest values. This project also solves US CO₂ problems at home in the US, ensures the long-term productivity of private forestlands and creates a real incentive for forest stewardship."

Laurie Wayburn, Executive Director, The Pacific Forest Trust

"A major challenge for management of private forests is to restore old growth structure that will maintain forest health and also habitat values for fish and wildlife. From working with both industrial and non-industrial private forest landowners, I know how hard it is to restore older forests. Economic incentives are essential to make this work. This is a very worthwhile project with a high chance of success."

Dr. Dale Thornburg, RPF, Professor of Silviculture, California State University, Humboldt

"By creating a new means to derive economic return from private forest conservation which does not depend on scarce federal dollars, the Pacific Forest Trust is introducing a welcome new concept. This creative solution to forest management conflicts will result in increasing stability for timber dependent communities and restoration of healthy forests."

Kathy Bailey, Chair for State Forestry, Sierra Club California

Western Oregon Carbon Sequestration Project

The Western Oregon Carbon Sequestration Project will sequester carbon by planting trees on 900 acres of unforested non-industrial timberland in western Oregon that otherwise would not be replanted. These lands are among the most productive timberland in the United States. If the stands

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are harvested, much of the timber will likely be used for long-term purpose such as construction that will continue to keep CO₂ sequestered.

Principal participants in the Project are Trexler and Associates, Inc (TAA); Oregon Woods, Inc. (OWI), and participating landowners. TAA assists companies in identification and implementation of greenhouse gas emissions reduction and offset strategies, and has played a major role in development of the carbon offset forestry field. OWI develops commercially viable sustainable forestry operations in the Pacific Northwest and around the world. OWI principals have extensive forestry experience and have completed hundred of contracts for the federal government.

Greenhouse gas benefits by 2000 will be minor as the plantings becomes established. By 2062, the Project will sequester between 573 to 759 tons of CO₂ per acre. Anticipated CO₂ benefits total 564,000 - 747,000 tons. The Project will yield environmental and economic benefits beyond carbon sequestration, including expanding wildlife habitat, improving water quality, and reducing the risk of soil erosion. Additionally, the Project will increase regional timber supply and create new jobs from future employment in the forest products industry.

The Project brings a notable sustainable management forestry program to the region. The approach taken by OWI and TAA in the development of the Project can be characterized by the concept of "extended stewardship." In the stewardship approach, the forester negotiates with the landowner to develop contract specifications based on the landowner's objectives and specific land conditions. Typically, the forester's responsibility terminates five years after planting based on achievement of a "free-to-grow" status; OWI and TAA utilize an expanded operationalization of the stewardship concept that continues through the juvenile, maturity and harvest phases. This extended stewardship regime reduces political conflicts over forest management and provides an important example of ecologically sound forest management and harvest principles. The significant beneficial impacts of extended stewardship uphold the highest principles of sustainable resources management, an approach that is receiving increasing attention as an effective offset option in the climate change debate.

The Project includes a long-term management plan for each site to assure that carbon sequestration goals conform to forest management initiatives and landowner concerns. The plan is a contractual agreement between landowners and the Project's developer, TAA. The contract, which obligates landowners for a minimum of 65 years, assures that the land will remain forested within the provisions required for a successful carbon sequestration project. Annual monitoring will follow planting to ensure that sites remain fully stocked through the free-to-grow stage. Furthermore, TAA has designed a carbon offset silvicultural easement to assist in monitoring and enforcing landowner contracts. This easement mechanism is currently being implemented in TAA's carbon offset projects in the Pacific Northwest.

The non-profit UtiliTree Carbon Company was established by 40 utilities to sponsor a collection of five forestry projects that manage greenhouse gases, especially CO₂. The projects consist of a diverse mix of rural tree planting, forest preservation, forest management and research efforts at both domestic (eastern and western U.S.) and international sites. The UtiliTree Carbon Company has committed slightly over $2.4 million to fund these projects.

The contact person for the project is Laura H. Kosloff, Trexler and Associates, Inc., 1131 S.E. River Forest Road, Portland Oregon 97267-3513; Phone: 503-786-0559; Fax: 503-786-9859; e-mail: taa@teleport.com. For information about the UtiliTree Carbon Company, contact John Kinsman, Edison Electric Institute, at (202) 508-5711.

Quotes

Western Oregon Carbon Sequestration Project

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"Long rotation forestry on currently unforested lands is a particularly attractive climate change mitigation strategy. Favorable silvicultural and climatic conditions and the dominance of long rotation tree species combine to make the Pacific Northwest an especially appropriate location for carbon sequestration forestry. Trexler and Associates, Inc. believes the Western Oregon Carbon Offset Project will very favorably complement the project portfolio UtiliTree has put together."

Dr. Mark C. Trexler, President, Trexler and Associates, Inc.

"Oregon Woods Inc. personnel have been involved in reforestation activities since 1971. We have experience in working with landowners and land managers to successfully generate new stands of trees in a wide range of topographies. With TAA's leadership experience in policy development of carbon offsets, technical expertise in climate change, and knowledge of carbon sequestration in the forestry arena, the TAA/OWI team will result in development of multiple forestry offset projects in the Pacific Northwest. The TAA/OWI Western Oregon Carbon Offset Project combines our advanced extended stewardship program with an extremely credible and verifiable forestry carbon offset program; the Project will provide reliable offsets and advance the state of knowledge in this field."

Rick Herson, President, Oregon Woods, Inc.

**Reduced Impact Logging of Natural Forests in Sabah, Malaysia**

New England Power Company's (NEP) successful forest based greenhouse gas emission offset project in Sabah, Malaysia, is being expanded by the UtiliTree Carbon Company.

The Reduced Impact Logging (RIL) project involves implementation of techniques to reduce carbon dioxide (CO₂) emissions associated with uncontrolled logging of natural tropical forests in Malaysia. The NEP pilot project, completed in 1995 on 3,500 acres, will reduce CO₂ emissions by 580,000 tons over the 40 year life of the project.

The expanded project will be carried out on 2,500 acres. Rakyat Berjaya Sdn. Bhd (RBJ) of Malaysia, will implement Reduced Impact Logging on land within its 2.4 million acre timber concession. RBJ is a subsidiary of Innoprise Corporation Sdn. Bhd., the commercial arm of the Sabah Foundation. The Forest Research Institute of Malaysia, Sabah Forestry Department, Center of International Forestry Research in Bogor, Indonesia, and Rainforest Alliance, a New York based non-governmental environmental organization, join NEP as cooperators in the project. Foresters from the Queensland Forest Service, the Swedish University of Agriculture and Science and the University of Florida have been consultants to the project and will continue as advisors.

Most forest based carbon sequestration projects have been based on reforestation of degraded forests or abandoned agricultural lands. The RIL project aims to reduce greenhouse gas emissions from natural forests by preventing degradation and loss of natural tropical forests, and sustain the level of forest products. This approach presents an environmental win-win situation where mitigation of greenhouse gas emissions is linked to tropical forest conservation.

Greenhouse gas benefits are derived from reduced emissions due to less forest destruction and enhanced sequestration by the residual forest following harvest for forest products. The anticipated greenhouse gas benefits are 147,000 tons CO₂ by the year 2000 and 379,000 tons CO₂ over the 40 year life of the project. Non-greenhouse gas benefits of the project are substantial. RIL harvested forest stands are better stocked, less damaged, faster growing and will produce higher volumes and

higher value forest products in the future.

Maintenance of forest cover and protection of surface soils results in substantially reduced rates of erosion. In short, implementation of RIL is a giant step toward sustainable tropical forest management.

Implementation of RIL and verification of greenhouse gas benefits will be monitored by an Environmental Audit Committee (EAC) comprised of three organizations/individuals: Rainforest Alliance, the Forest Research Institute of Malaysia and Dr. Francis E. Putz of the University of Florida. The research effort to quantify the greenhouse gas benefits, led by Dr. Putz and Dr. Michelle A. Pinard during the pilot project, will continue. Research on the methane component of emissions will also be carried out and monitored by the EAC. Results will continue to be published in peer reviewed literature.

The non-profit UtiliTree Carbon Company was established by 40 utilities to sponsor a collection of five forestry projects that manage greenhouse gases, especially CO₂. The projects consist of a diverse mix of rural tree planting, forest preservation, forest management and research efforts at both domestic (eastern and western U.S.) and international sites. The UtiliTree Carbon Company has committed slightly over $2.4 million to fund these projects.


Quotes

**Reduced Impact Logging of Natural Forests in Sabah, Malaysia**

"Sabah Foundation through its commercial arm, Innoprise Corporation, takes pride in innovative forest management practices. This project with NEP has allowed us to improve our record even further."

Datuk Musa Aman, Director, Sabah Foundation

"The Malaysian Rainforest project has been a real success story. The innovative project, which NEP pioneered in 1992, is projected to offset about 580,000 tons of carbon dioxide. The contract with UtiliTree will enable the project to move forward and achieve greater success."

Jeffrey M. Tranen, President, New England Power Company

"This initiative is important for tropical forest conservation because it shows how a Malaysian forestry company and a North American electric utility can combine efforts to demonstrate immediate clearly accountable improvements in timber harvesting, that I believe are replicable throughout the region."

Richard Z. Donovan, Rainforest Alliance

"By minimizing damage to the residual forest and soil, Reduced Impact Logging results in readily quantified reductions in greenhouse gas emission, increased biodiversity, and maintenance of ecosystem functions."

Trees are referred to as "carbon sinks," because they take carbon dioxide (CO₂) out of the air and sequester it in living plant tissue. About one-half of a tree is carbon. Carbon can be managed through many different types of forestry activities, including: forest preservation and management projects to maintain carbon sequestered by reducing deforestation and harvest impacts; forest management to enhance existing carbon sinks; creation of new carbon sinks by planting on pasture, agricultural land or degraded forest sites; storing carbon in wood products; and energy conservation through shading buildings and homes.

The technical potential for forest carbon management is great, able to counteract a meaningful portion of the 3 Pg (1 Pg = 1 billion tonnes) carbon annual addition to the atmosphere. In addition, vigorous efforts to control land degradation in these areas could result in a net sequestration of up to one Pg carbon per year. Carbon offsets, properly documented and monitored, should be a major component of an international strategy to respond to greenhouse gas (GHG) concerns.

Utilities have also recently initiated numerous forestry projects specifically to conserve energy and to offset CO₂ emissions. A dozen or more electric utility companies are involved in urban forestry energy conservation programs such as American Forests' Global ReLeaf and the DOE/American Forests' Cool Communities. A few electric utility companies, such as the New England Electric System, PacifiCorp, American Electric Power Company, Wisconsin Electric Power Company, Cinergy Corp., Detroit Edison Company and Southern Company have initiated forestry efforts targeted at managing carbon. The Southern Company is sponsoring research by the Smithsonian Tropical Research Institute to investigate carbon sequestration rates, the long-term benefits of standing tropical forests, and the role of rain forests in tropical economies. In addition, some utilities are using biomass as a fuel to produce electricity.

In early 1995, many electric utilities entered into voluntary agreements under the Climate Challenge. Many of these voluntary commitments included forestry activities. Utilities have reported over 70 forestry projects in the Energy Policy Act section 1605(b) voluntary data base.

Some specific reasons for utilities to participate in forest carbon management include:

- There is a large technical potential for forest carbon management -- a project can offset millions of tons of carbon emissions.
- Forestry options to manage carbon are cost effective in many cases -- e.g., a few dollars per ton of carbon offset. Forest carbon management opportunities can be among the most economical ways to address CO₂ emissions.
- Forestry carbon management adds flexibility, thus expanding the electric utility repertoire of options.
- Experience leads to improved future projects.
- Forestry projects yield positive public relations -- using forestry to manage CO₂ is well received by the public and environmental groups.
- Forestry efforts have positive secondary environmental and social benefits -- e.g., restoration.

of degraded lands and protection of biodiversity.

- International projects will help to demonstrate the effectiveness of joint implementation activities with other nations, which is a critical tool for economically addressing GHG issues.
- As is the case with this initiative, joint sponsorship of projects by many utilities also means that risk is shared.

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The Climate Challenge Program -- Voluntary Initiatives to Manage U.S. Electric Utility Greenhouse Gases

The Climate Challenge Program is a joint, voluntary effort of the electric utility industry and the U.S. Department of Energy (DOE) to reduce, avoid, limit or sequester (hereinafter referred to as "reduce") greenhouse gases.

There are numerous incentives for voluntary actions by the electric utility industry to reduce greenhouse gases (GHG's). First, the U.S. is a signatory to the Framework Convention on Climate Change, and President Clinton has pledged action to limit GHG's. Second, a "do-nothing-until-it's-proven-beyond-everyone's-doubt" approach would diminish the industry's influence in helping to determine policy responses. Utilities must pro-actively retain the operational flexibility to achieve GHG reductions using the most cost-effective methods. Third, the electric utility industry has unique contributions to make in GHG management, possessing special competence in providing cost-effective customer service and in achieving environmental excellence through technical innovation, such as energy-efficient electrotechnologies; increasing supply-side efficiencies related to clean coal technologies, nuclear energy, natural gas and renewable energy technologies; and demand-side management.

The basic principles of the Climate Challenge were laid out in a Memorandum of Understanding signed on Earth Day in 1994 by DOE, the Edison Electric Institute (EEI), the American Public Power Association, the Large Public Power Council, the National Rural Electric Cooperative Association and the Tennessee Valley Authority. Individual (or groups of small) utilities enter into a Participation Agreement with DOE, specifying one or more types of commitments:

- Make a specified contribution to particular industry initiatives.
- Reduce GHG emissions by a specified amount below the electric utility's 1990 baseline level by the year 2000.
- Reduce GHG emissions to the electric utility's 1990 baseline level by the year 2000.
- Reduce GHG emissions by or to some other specified level.
- Reduce or limit the rate of GHG emissions to a particular level, expressed in terms of emissions per kiloWatt-hour generated or sold.
- Undertake specific projects or actions, or make specific expenditures on projects or actions, to reduce GHG emissions.

Utilities make a commitment to report annually on activities and achievements under the Climate Challenge Program. In a Participation Agreement, the electric utility describes the actions that it has taken or intends to take toward achieving its commitment(s). The electric utility will report annually on activities and achievements under the Climate Challenge Program, in a clear and understandable manner that is consistent with the guidelines adopted pursuant to subsection 1605(b) of the Energy Policy Act and the MOU.

http://www.ji.org/iuep/utree2.shtml

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The first agreements were finalized in late 1994. DOE reports that as of May 1996 there have been 114 agreements signed by almost 600 utilities. The 114 agreements represent 61% of 1990 electric generation and electric utility carbon dioxide (CO₂) emissions. DOE estimates that the Climate Challenge will reduce, avoid or sequester over 160 million metric tons of CO₂ equivalent in the year 2000. The estimate is conservative, as it does not include reduction commitments not yet quantified or most of the benefits of the electric utility industry-wide initiatives. No estimate is made for reductions from utilities that have not yet joined the Climate Challenge. According to DOE, the electric utility industry is the number one U.S. industry in pledging GHG reductions.

An analysis for DOE reports that the 160 million tons of CO₂ equivalent consist of:

- 26 million metric tons CO₂ equivalent over and above any actions contemplated in the Administration's Climate Change Action Plan (CCAP) or its Base Case;
- 11 million metric tons CO₂ equivalent clearly included in other CCAP actions, such as the U.S. Environmental Protection Agency's (EPA) Green Lights program;
- 15 million metric tons CO₂ equivalent attributable to international activities or reductions in GHG's other than CO₂, CH₄, and N₂O (not addressed in the CCAP);
- 33 million metric tons CO₂ equivalent related to either CCAP actions or the baseline; and
- 88 million metric tons CO₂ equivalent accounted for in the Administration's Base Case.

About 25% of Climate Challenge commitments (in terms of GHG benefits) are related to nuclear activities such as new capacity and increases of efficiency, capacity and capacity factor; 18% to fossil efficiency improvements and fuel switching; 15% to demand-side management; 14% to the combination of methane, carbon sequestration and offsets activities; 8% to renewables; and the remainder to transmission/distribution and other activities (20%).

The magnitude of these pledged, real reductions and the effects of electric utility contributions to other actions will grow when more utilities join the Climate Challenge program.

A Climate Challenge Options Workbook has been developed that identifies approximately 50 different types of opportunities for GHG reductions. For each type of option, the Workbook presents the following information: name; a narrative description of the option; barriers to implementation; possible solutions to overcome the barriers; potential partnerships that could be developed to implement the option; and case studies that illustrate use of the option.

Utilities can undertake actions on their own such as described in the Options Workbook or can participate in industry-wide initiatives. EEI has led or supported development of five major initiatives for the electric utility industry to jointly support. These initiatives address electrotechnologies and renewable energy; forest carbon management; international energy projects; geothermal heat pumps; and electric vehicles. A sixth initiative addressing truck stop electrification is also under development.

DOE Secretary Hazel O'Leary, speaking on Earth Day 1994, termed the Climate Challenge a "win/win/win" situation for the environment, energy and the economy.