HB

196

SENATE COMMITTEE REPORT

DATE: 5/17/03

FURTHER:

DATE TURNED IN TO OFFICE: 5-6-04

Resources Committee considered CS FOR HOUSE BILL NO. 196(RES)

HB 196 CARBON SEQUESTRATION

"An Act relating to carbon sequestration; and providing for an effective date."

and recommends:

Senate Bill:
[ ] same title
[ ] new title
House Bill:
[X] same title
[ ] technical title
[ ] new: SCR #____

[✓] be **replaced** with S **CS** CSHB 196 (RES)

[ ] adopt **previous** _____ **CS** _____ (_____)

[ ] attached amendment(s)

[ ] adopt Letter of Intent by _____ Committee

[ ] further referral to _____ Committee

NEW FISCAL NOTE(S):

Department	Date	Fiscal	Zero	FN#
DNR	5/4/04		✓	
DEC	5/4/04		✓	

PREVIOUS FISCAL NOTE(S):

Department	Date	Fiscal	Zero	FN#

[ ] **APPROPRIATION - no fiscal note**

SIGNATURES AND RECOMMENDATIONS:	DO PASS	DO NOT PASS	NO REC	AMEND
	✓			
	✓			
	✓			
	✓			
	✓			
CHAIR:				✓

SENATOR SCOTT OGAN 23RD Alaska State Legislature

Senate District H Lazy Mountain * Butte * Chugiak * Peters Creek * Fairview Loop
Knik-Goose Bay * Big Lake * Houston * Willow * Talkeetna * Trapper Creek

State Capitol, Room 103, Juneau Alaska 99801 * (907) 465-3878 * 1 (800) 862-3878 * Fax (907) 465-3265
Senator_Scott_Ogan@legis.state.ak.us Http://www.akrepublicans.org/ogan

FACSIMILE TRANSMITTAL SHEET

TO: D. Bullock
FROM: Linda Hay, S. Resources
COMPANY: Leg Legal
DATE: 5-6-04
FAX NUMBER:
TOTAL NO. OF PAGES INCLUDING COVER: 1
PHONE NUMBER:
RE: CS

☐ URGENT ☐ FOR REVIEW ☐ PLEASE COMMENT ☐ PLEASE REPLY ☐ PLEASE RECYCLE

NOTES/COMMENTS:

Senate Resources adopted work draft # 23-LS0762Q (4/12/04) as the CS for HB 196 - Please prepare a final - no changes were made.

If there are questions - I can be CONTACTED @ 4907

Thank You

23-LS0762\Q
Bullock
4/12/04

SENATE CS FOR CS FOR HOUSE BILL NO. 196( )

IN THE LEGISLATURE OF THE STATE OF ALASKA

TWENTY-THIRD LEGISLATURE - SECOND SESSION

BY

Offered:
Referred:

Sponsor(s): REPRESENTATIVES BERKOWITZ, Gara, Guttenberg, Kerttula, Hawker, Kott, Wilson, Lynn

A BILL

FOR AN ACT ENTITLED

"An Act relating to carbon sequestration; and providing for an effective date."

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

*** Section 1.** The uncodified law of the State of Alaska is amended by adding a new section to read:

LEGISLATIVE FINDINGS; INTENT. (a) The legislature finds that

(1) there is a growing interest in national and international forums for implementing measures to slow and reverse the buildup of atmospheric gases such as carbon dioxide; these measures may potentially include the establishment of systems of trading in credits for adoption of practices, technologies, or other measures that decrease net emissions of carbon dioxide;

(2) improved agricultural, forest, and soil management and conservation practices and other methods of stewardship of soil and other land resources have great potential to increase carbon sequestration on state and private lands and help offset carbon dioxide emissions from other sectors of the economy; and

(3) it is in the interests of the state, private landowners, and the public in

general that the commissioner of natural resources investigate the potential for carbon sequestration associated with agricultural, forestry, and soil management systems and land uses occurring on state and private land in Alaska.

(b) It is the intent of the legislature that efforts to investigate the potential for carbon sequestration on state and private lands enhance the ability of the state to participate in any system of carbon sequestration marketing or trading.

*** Sec. 2.** AS 44.37 is amended by adding new sections to read:

Sec. 44.37.200. Carbon sequestration studies and recommendations. (a) The commissioner of natural resources, in consultation with the commissioner of environmental conservation, shall conduct research, surveys, and appropriate studies relating to carbon sequestration.

(b) The commissioner of natural resources, in consultation with the commissioner of environmental conservation, shall

(1) prepare the reports required by this chapter and conduct the assessment described in AS 44.37.210;

(2) recommend policies or programs to enhance the ability of the state to participate in systems of carbon trading; the recommendations may include potential policies or programs designed to optimize economic benefits to private landowners participating in carbon transactions; the policies or programs may include identifying existing nonprofit organizations or other public or private entities or the potential of creating nonprofit organizations or other public or private entities capable of serving as assemblers of carbon credits or as intermediaries on behalf of producers in carbon-trading systems;

(3) encourage the production of educational and advisory materials regarding carbon sequestration on state and private land and participation in systems of carbon emissions trading;

(4) identify and recommend areas of research needed to better understand and quantify the process of carbon sequestration; and

(5) review the carbon sequestration programs and policies of other states.

Sec. 44.37.210. Assessment by the commissioner. (a) In consultation with

the commissioner of environmental conservation, the commissioner shall make efforts to assess state and private land in the state for past carbon sequestration and future carbon sequestration potential. The assessment shall seek to quantify carbon sequestration associated with agricultural, forest, soil, and land management systems in this state. From time to time, the commissioner may update the findings as advancements in understanding of the processes of carbon sequestration and new data become available.

(b) The assessment described in this section shall be conducted in a manner that provides a means for the state and owners of private land to estimate past and future net carbon sequestration resulting from agricultural and forestry practices, conservation measures, management systems, and land uses.

Sec. 44.37.220. Definitions. In AS 44.37.200 - 44.37.220,

(1) "carbon sequestration" means the long-term storage of carbon in forests, soils, the ocean, and other carbon sinks;

(2) "commissioner" means the commissioner of natural resources.

*** Sec. 3.** AS 44.37.200, 44.37.210, and 44.37.220 are repealed June 30, 2009.

*** Sec. 4.** The uncodified law of the State of Alaska is amended by adding a new section to read:

REPORT TO THE LEGISLATURE. Within one year after the effective date of this section, the commissioner of natural resources, in consultation with the commissioner of environmental conservation, shall prepare and submit a report to the legislature regarding carbon sequestration. The report may include a discussion of

(1) the potential for and potential forms of carbon dioxide emissions regulation;

(2) the potential for development of a system or systems of carbon emissions trading or markets for carbon sequestered on state and private land;

(3) agricultural, forest, and soil management systems or land uses that increase stored soil carbon;

(4) methods for measuring and modeling net carbon sequestration associated with various agricultural, forestry, and soil practices, management systems, or land uses occurring on state and private land;

(5) areas of scientific uncertainty with respect to quantifying and understanding carbon sequestration associated with soil and forest management activities;

(6) recommendations developed under AS 44.37.200;

(7) the assessment as described in AS 44.37.210.

*** Sec. 5.** The uncodified law of the State of Alaska is amended by adding a new section to read:

DIRECTION TO SEEK FUNDING SOURCES. (a) The Department of Natural Resources shall seek and apply for funding of the activities that would be authorized by secs. 2 and 4 of this Act by contacting the United States Department of Energy, The Pew Charitable Trusts, and other appropriate federal and private sources.

(b) The Department of Natural Resources shall notify the revisor of statutes of the day on which the department receives approval for funding under (a) of this section that is sufficient to cover the costs of the activities that would be authorized by secs. 2 and 4 of this Act.

*** Sec. 6.** The uncodified law of the State of Alaska is amended by adding a new section to read:

CONDITIONAL EFFECT OF SECTIONS 2, 3, AND 4 OF THIS ACT. Sections 2, 3, and 4 of this Act take effect only if the Department of Natural Resources receives the approval for funding described in sec. 5(b) of this Act.

*** Sec. 7.** If, under sec. 6 of this Act, secs. 2, 3, and 4 of this Act take effect, they take effect on the date that the Department of Natural Resources receives the approval for funding under sec. 5(b) of this Act but not later than the date set out in sec. 3 of this Act on which AS 44.37.200, 44.37.210, and 44.37.220 are repealed.

*** Sec. 8.** Sections 1, 5, and 6 of this Act take effect immediately under AS 01.10.070(c).

Discussed but not offered

AMENDMENT

OFFERED IN SENATE RESOURCES

TO: CSHB 196 (RES)

Page 2, line 2: Delete "document and quantify"
Insert ""investigate the potential for"

Page 2, line 5: Delete "quantify and verify"
Insert "investigate the potential for"

Page 2, line 16: Delete "required"
Insert "described"

Page 2, line 18: Delete "must"
Insert "may"

Page 3, line 2: After "shall" insert "make efforts to"

Page 3, line 9: Delete "assessment required"
Insert "assessment developed"

Page 3, line 19: Delete "On or before the first day of the Second Regular Session of the Twenty-Third Alaska State Legislature"
Insert: "Within nine months after the effective date of this section"

Page 3, line 21: After "prepare" insert "and submit"

Page 3, line 22: After "legislature" insert "regarding carbon sequestration"

Page 3, line 22: Delete "must"
Insert "may"

Page 4, line 4: Delete all material and insert:

"***Sec. 4.** The uncodified law of the State of Alaska is amended by adding a new section to read:

DIRECTION TO SEEK FUNDING SOURCES. (a) The Department of Natural Resources shall immediately seek and apply for funding of the activities that would be authorized by secs. 2 and 3 of this Act by contacting the federal Department of Energy, the Pew Charitable Trust, and other appropriate federal and private sources.

(b) The Department of Natural Resources shall notify the revisor of statutes of the day on which the department receives approval of an application or applications under (a) of this section that would result in receipt of $91,600 or more from federal or private sources.

***Sec. 5.** Sections 1 and 4 of this Act take effect immediately under AS 01.10.070(c).

***Sec. 6.** Sections 2 and 3 of this Act take effect on the day on which the department receives approval of an application or applications under sec. 4(a) of this Act that would result in receipt of $91,600 or more from federal or private sources for the activities that would be authorized by secs. 2 and 3 of this Act. "

Proposed Changes in Draft Committee Substitute for
CSHB 196 (RES)
"An Act relating to carbon sequestration; and
providing for an effective date."

In general, the proposed CS for HB 196 provides more flexibility to DNR and DEC for investigating the carbon sequestration and carbon market participation potential for Alaska; removes references to greenhouse gases; and makes the effective date for the action portions of the legislation contingent on receipt of grant funds.

During the Senate Resources committee hearing, a suggestion was made to include the use of oceans for carbon sequestration. That reference can be found in the definition section where carbon sequestration is defined as "the long-term storage of carbon in forests, soils, the ocean, and other carbon sinks." (in the original bill).

The specific changes proposed in the CS are as follows:

Section 1. Legislative Findings; Intent.

Page 1, line 6: deletes "Increasing levels of carbon dioxide and other greenhouse gases in the atmosphere have led to" and inserts "there is"

Page 2, line 1: replaces "document and quantify" with "investigate the potential for"

Page 2, line 2: after "carbon sequestration" deletes "and greenhouse gas emissions reductions"

Page 2, line 4: replaces "quantify and verify" with "investigate the potential for"

Sec. 44.37.200. Carbon sequestration studies and recommendations.

Page 2, line 15: replaces "assessment required under this section" with "assessment described under this section"

Page 2, line 17: replaces "the recommendations must" with "the recommendations may"

Page 2, line 25: after "participation in systems of carbon" deletes "or greenhouse"

Sec. 44.37.210. Assessment by the commissioner.

Page 3, line 1: after "the commissioner shall" inserts "make efforts to"

Page 3, line 8: replaces "required" with "described"

Sec. 3. New section. Repeals the law June 30, 2009.

Sec. 4. Report to the Legislature.

Page 3, line 19: deletes "On or before the first day of the Second Regular Session of the Twenty-third Alaska State Legislature" and inserts "Within one year after the effective date of this section"

Page 3, line 21: after "shall prepare" inserts "and submit"
after "a report to the legislature" inserts "regarding carbon sequestration"

Page 3, line 22: deletes "must" and inserts "may"

Page 3, line 23: deletes "greenhouse emissions" and inserts "carbon dioxide emissions"

Sec. 5. Direction to Seek Funding Sources. New section. Directs the Department of Natural Resources to seek and apply for federal and private sources to cover the costs of implementing the Act.

Sec. 6. Conditional Effect of Sections 2, 3, and 4 of this Act. New section. Makes the studies, assessment and report sections of the Act effective only if DNR receives sufficient funds from federal or private sources.

Sec. 7. New section. In order for secs. 2, 3, and 4 of the act to take effect, approval for federal or private funds must be received no later than the date the laws are repealed.

Sec. 8. New section. The findings and intent, direction to seek funding sources and conditional effective date sections take effect immediately (sections 1, 5 and 6).

CSHB 196 (RES) – Carbon Sequestration

POSSIBLE FUNDING SOURCES

West Coast Regional Carbon Sequestration Partnership

Contact: Larry Meyer, Program Manager, University of California
510-486-6456 or 510-508-6627(cell)

Current Grant: $1.6 million from Department of Energy (DOE)

Background: The DOE/National Energy Technology Laboratory is sponsoring an effort to create a nationwide network of partnerships to determine suitable technologies, regulations, and infrastructure needs for carbon capture, storage and sequestration in geographically diverse regions.

The California Energy Commission applied for and received a $1.6 million DOE grant to form the West Coast Regional Carbon Sequestration Partnership. The partnership plans to "identify, characterize and locate CO2 emission sources in the region and determine long-term capturing and sequestering methods by enlisting the help of numerous federal, state, local government agencies and industry sources."

As part of their participation in the partnership, Oregon, Washington and California are investigating their carbon sequestration potential on forested land. As for Alaska, at the time the grant proposal was being crafted, the state, through the University of Fairbanks, chose to go it alone to form its own region. Apparently, the Alaska effort collapsed two days before grant proposals were due. California scrambled to get something from Alaska included and ended up with a BP geologic sequestration project on the North Slope. That is the extent of Alaska's participation in the partnership at this time.

Comments: According to Larry Meyer, the West Coast partnership would welcome Alaska as a partner. HB 196 fits within the scope of the project. Mr. Meyer has informed DOE that without Alaska, there is a hole in the partnership. He is seeking additional funds from DOE. Passage of HB 196 would help leverage additional funding. The partnership is up and running and will help Alaska get funds and implement the state's project.

National Carbon Offset Coalition/Montana's Governor Carbon Sequestration Working Group

Contact: Emily Tafoya, Marketing Director, National Carbon Offset Coalition
409-491-4472
Emily_Tafoya@msn.com

Current Grant: $1.6 million from Department of Energy

Background: Montana also received a $1.6 million grant from the Department of Energy to lead a regional partnership with South Dakota and Idaho for research into carbon sequestration. As part of this effort, the National Carbon Offset Coalition (a non-profit support organization) is

working with the Montana Governor's Carbon Sequestration Working Group to develop and market carbon sequestration projects in Montana and nationally.

Comments: NCOC is approaching a foundation for further funding to expand on their project to develop a carbon credit market. They have offered to include Alaska as a prospective area that will be involved in their effort.

NASA Grant Program "Carbon Cycle Science"

Contact: Dr. William Emanuel, Program Scientist, NASA
202-358-0559 William.Emanuel@nasa.gov

Dr. Roger Dahlman, Department of Energy
301-903-4951

Available Grant Funds: $36 million over three years for projects up to $500,000.

Background: As part of President Bush's climate change initiatives, NASA is investing over $120 million in the next three years in research on the carbon cycle and climate. A research grant announcement was issued January 7, 2004. Research is requested in four areas, including carbon management. Letters of intent were due February 11, 2004 and proposals were due April 7, 2004.

Comments: Spoke with Dr. Dahlman. It is possible HB 196 would fit under the "carbon management" criteria. Though the proposal deadline has passed, given the level of interest in carbon processes, there may be additional funding opportunities in the future.

OTHER USEFUL CONTACTS

Jennifer Duval, UAF Graduate Student: Ms.Duval is researching carbon sequestration market opportunities in Alaska. Jennifer and possibly another graduate student may be available to assist DNR with grant applications.

Phone: 474-1809
Email: ftjed@uaf.edu

Jim Cathcart, Oregon Department of Forestry. As part of their participation in the West Coast Regional Carbon Sequestration Partnership, Mr. Cathcart is leading Oregon's effort to determine the state's carbon sequestration potential on state and private forest land. May be able to provide information to assist Alaska's research.

Phone: 503-945-7493
Email: jcathcart@odf.state.or.us

Michael Walsh, Senior Vice President, Chicago Climate Exchange: Mr. Walsh contacted Rep. Berkowitz's office. He provided carbon market information and is interested in discussing market participation options with the state.

Phone: 312-554-3380
Email: mwalsh@ChicagoClimateExchange.com

William Hohenstein, Director, USDA Global Change Program: No funds available through their program but Mr. Hohenstein contacted the Forest Service and Cooperative State Research Education Service (CSREES). CSREES is currently funding Alaska projects at the Agriculture Experiment Station and through the McIntire-Stennis program at UAF. These projects may assist DNR and DEC's efforts should HB 196 pass.

Phone: 202-720-6698
Email: whohenst@oce.usda.gov

Steve Kallick, Assistant Director, PEW Charitable Trusts: PEW is providing some funds for carbon sequestration work but so far only a small amount. There may be more funding opportunities in the future.

Phone: 215-575-4747

FISCAL NOTE

STATE OF ALASKA
2004 LEGISLATIVE SESSION

Fiscal Note Number:
Bill Version: HB196-SCS-RES-EC-AWQ-5-4-04
() Publish Date:

Revision Date/Time (Note if correction):
Title: Carbon Sequestration
Sponsor Rep. Berkowitz
Requester Senate Resources

Dept. Affected: Environmental Conservation
RDU Air & Water Quality
Component Air Quality
Component No. 2061

Expenditures/Revenues (Thousands of Dollars)

Note: Amounts do not include inflation unless otherwise noted below.

OPERATING EXPENDITURES	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010
Personal Services	0.0	0.0	0.0	0.0	0.0	0.0
Travel	0.0	0.0	0.0	0.0	0.0	0.0
Contractual	0.0	0.0	0.0	0.0	0.0	0.0
Supplies	0.0	0.0	0.0	0.0	0.0	0.0
Equipment	0.0	0.0	0.0	0.0	0.0	0.0
Land & Structures	0.0	0.0	0.0	0.0	0.0	0.0
Grants & Claims	0.0	0.0	0.0	0.0	0.0	0.0
Miscellaneous	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL OPERATING	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
CAPITAL EXPENDITURES						
CHANGE IN REVENUES ( )						

FUND SOURCE (Thousands of Dollars)

1002 Federal Receipts	0.0	0.0	0.0	0.0	0.0	0.0
1003 GF Match	0.0	0.0	0.0	0.0	0.0	0.0
1004 GF	0.0	0.0	0.0	0.0	0.0	0.0
1005 GF/Program Receipts	0.0	0.0	0.0	0.0	0.0	0.0
1037 GF/Mental Health	0.0	0.0	0.0	0.0	0.0	0.0
Other (Specify Type--Do not abbreviate)						
TOTAL	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Estimate of any current year (FY2004) cost: 0.0
Check this box (X) if funding for this bill is included in the Governor's FY 2005 budget proposal:

POSITIONS

Full-time	0.0	0.0	0.0	0.0	0.0	0.0
Part-time	0.0	0.0	0.0	0.0	0.0	0.0
Temporary	0.0	0.0	0.0	0.0	0.0	0.0

ANALYSIS: *(Attach a separate page if necessary)*

This bill will have no fiscal impact on the department.

Prepared by: Tom Chapple, Director — Phone 269-7686
Division Air & Water Quality — Date/Time 5/4/04
Approved by: Kurt Fredriksson, Deputy Commissioner — Date 5/4/04
Agency Environmental Conservation

(Revised 9/2003 OMB)

FISCAL NOTE

STATE OF ALASKA
2004 LEGISLATIVE SESSION

Fiscal Note Number:
Bill Version: CSHB196(RES)
() Publish Date:

Revision Date/Time (Note if correction):
Dept. Affected: Environmental Conservation
Title: Carbon Sequestration
RDU Air & Water Quality
Component Air Quality
Sponsor Rep. Berkowitz
Requester Senate Resources
Component No. 2061

Expenditures/Revenues (Thousands of Dollars)

Note: Amounts do not include inflation unless otherwise noted below.

OPERATING EXPENDITURES	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010
Personal Services	0.0	0.0	0.0	0.0	0.0	0.0
Travel	5.0	0.0	0.0	0.0	0.0	0.0
Contractual	37.7	0.0	0.0	0.0	0.0	0.0
Supplies	0.5	0.0	0.0	0.0	0.0	0.0
Equipment	0.0	0.0	0.0	0.0	0.0	0.0
Land & Structures	0.0	0.0	0.0	0.0	0.0	0.0
Grants & Claims	0.0	0.0	0.0	0.0	0.0	0.0
Miscellaneous	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL OPERATING	43.2	0.0	0.0	0.0	0.0	0.0
CAPITAL EXPENDITURES						
CHANGE IN REVENUES ( )						

FUND SOURCE (Thousands of Dollars)

1002 Federal Receipts						
1003 GF Match						
1004 GF	43.2	0.0	0.0	0.0	0.0	0.0
1005 GF/Program Receipts						
1037 GF/Mental Health						
Other (Specify Type--Do not abbreviate)						
TOTAL	43.2	0.0	0.0	0.0	0.0	0.0

Estimate of any current year (FY2004) cost: 0.0
Check this box (X) if funding for this bill is included in the Governor's FY 2005 budget proposal:

POSITIONS

Full-time						
Part-time						
Temporary						

ANALYSIS: *(Attach a separate page if necessary)*

This bill requires the Department of Natural Resources in consultation with the Department of Environmental Conservation to prepare a report to the Legislature on the concept of carbon trading and accounting, and identify specific opportunities for carbon sequestration projects on public and private lands in Alaska.

Prepared by: Tom Chappie, Director
Phone 269-7686
Division Air & Water Quality
Date/Time 2/2/04
Approved by:
Date 2/2/04
Agency Environmental Conservation

(Revised 9/2003 OMB)

FISCAL NOTE

STATE OF ALASKA
2004 LEGISLATIVE SESSION

BILL NO. CHSB196 (RES)

ANALYSIS CONTINUATION

Travel 5.0
Provides funds for travel needs associated with the work identified in the legislation.

Contractual 37.7
Provides funding for a part-time, long-term non-perm, range I8 (Environmental Specialist III) to conduct and coordinate the work identified in the legislation.

Supplies 0.5
Provides for routine operating supplies for staff.

FISCAL NOTE

STATE OF ALASKA
2004 LEGISLATIVE SESSION

Fiscal Note Number:
Bill Version: HB196CS(RES)-DNR-FOR-
() Publish Date:

Revision Date/Time (Note if correction): 1/12/2004
Dept. Affected: Natural Resources
Title: Carbon Sequestration
RDU: Resource Development
Component: Forest Mgt & Development
Sponsor: Berkowtiz
Requester: (S) RES
Component No.: 435

Expenditures/Revenues (Thousands of Dollars)

Note: Amounts do not include inflation unless otherwise noted below.

OPERATING EXPENDITURES	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010
Personal Services	65.6	65.6				
Travel	10.0	6.0				
Contractual	10.0	10.0				
Supplies	1.0	1.0				
Equipment	5.0					
Land & Structures						
Grants & Claims						
Miscellaneous						
TOTAL OPERATING	91.6	82.6	0.0	0.0	0.0	0.0
CAPITAL EXPENDITURES						
CHANGE IN REVENUES ( )						

FUND SOURCE (Thousands of Dollars)

1002 Federal Receipts						
1003 GF Match						
1004 GF	91.6	82.6				
1005 GF/Program Receipts						
1037 GF/Mental Health						
Other (Specify Type--Do not abbreviate)						
TOTAL	91.6	82.6	0.0	0.0	0.0	0.0

Estimate of any current year (FY2004) cost: 0.0
Check this box (X) if funding for this bill is included in the Governor's FY 2005 budget proposal:

POSITIONS

Full-time						
Part-time						
Temporary	1	1				

ANALYSIS: *(Attach a separate page if necessary)*

This bill establishes an initiative to investigate the concept of carbon trading and accounting, and would identify specific opportunities for carbon sequestration projects on public and private lands in Alaska.

Prepared by: John "Chris" Maisch
Phone 451-2666
Division: Forestry
Date/Time 1/12/04
Approved by: Thomas Irwin, Commissioner
Date 1/12/04
Agency: Natural Resources

(Revised 9/2003 OMB)

ANALYSIS CONTINUATION

Personal Services $65.6
This provides for a range 18 (Natural Resources Manager I or Forester III) to conduct and coordinate the work identified in the legislation.

Travel $10.0
Provides funds for travel needs associated with the work identified in the legislation.

Contractual $10.0
Assumes portions of the project will be conducted with the assistance of faculty and graduate students at the University of Alaska ($5000). Balance is for DNR lease space, phones, computer services etc.

Supplies $1.0
Routine operating supplies for staff.

Equipment $5.0 (one-time)
One-time computer, equipment purchase for staff.

FISCAL NOTE

STATE OF ALASKA
2003 LEGISLATIVE SESSION

Fiscal Note Number:
Bill Version: CSHB 196 (RES)
() Publish Date:

Revision Date/Time (Note if correction):CORRECTED
Dept. Affected: Natural Resources
Title: Carbon Sequestration
BRU: Management & Administration
Component: Commissioner's Office
Sponsor: Berkowtiz
Requester: House Rules
Component No.: 423

Expenditures/Revenues (Thousands of Dollars)

Note: Amounts do not include inflation unless otherwise noted below.

OPERATING EXPENDITURES	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Personal Services						
Travel						
Contractual						
Supplies						
Equipment						
Land & Structures						
Grants & Claims						
Miscellaneous						
TOTAL OPERATING	0.0	0.0	0.0	0.0	0.0	0.0
CAPITAL EXPENDITURES						
CHANGE IN REVENUES ( )						

FUND SOURCE (Thousands of Dollars)

1002 Federal Receipts						
1003 GF Match						
1004 GF						
1005 GF/Program Receipts						
1037 GF/Mental Health						
Other (Specify Type--Do not abbreviate)						
TOTAL	0.0	0.0	0.0	0.0	0.0	0.0

Estimate of any current year (FY2003) cost: 0.0
Mark this box (X) if funding for this bill is included in the Governor's FY 2004 budget proposal:

POSITIONS

Full-time						
Part-time						
Temporary						

ANALYSIS: *(Attach a separate page if necessary)*

Prepared by: Janet Seitz, Committee Assistant
Phone 465-3764
Division: House Rules Committee
Date/Time 5/17/03 1:42 PM
Approved by: Representative Norman Rokeberg, Chairman
Date 5/17/2003
Agency: House Rules Committee

(Revised 9/2002 OMB)

Alaska State Legislature

House of Representatives

Minority Leader

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1-907-269-0132 (fax)

Representative Ethan Berkowitz

District 13

MEMORANDUM

Date: January 26, 2004

To: Senator Scott Ogan, Chair
Senate Resources Committee

From: Representative Ethan Berkowitz EAB

Re: CSHB 196 (RES)

I respectfully request that you schedule a hearing in the Senate Resources Committee for CSHB 196 (RES), an act relating to carbon sequestration.

A copy of the bill, a sponsor statement, fiscal note, a sectional summary and additional background material are attached.

There may be someone from Fairbanks who wishes to testify via teleconference. If you have any questions or need additional information, please call Lisa Weissler at 465-3163.

Thank you.

Attachments

E-mail: Representative_Ethan_Berkowitz@legis.state.ak.us

Sponsor: Representative Ethan Berkowitz

SPONSOR STATEMENT

Committee Substitute House Bill 196(RES)

"An Act relating to carbon sequestration; and providing for an effective date."

This bill provides the basis for Alaska's participation in the growing global market for carbon sequestration credits – a market that could provide the state upwards of $450 million in revenue (based on extrapolations from current trading).

Carbon sequestration is the use of measures that increase the retention of carbon in the land or the oceans with the effect of offsetting carbon dioxide emissions from other sources. In order to offset carbon production, carbon producers can use carbon sequestration measures as a mitigation method. These measures translate into credits. Consequently, a new commodity market has evolved.

The bill responds to increased interest in slowing or reducing the levels of carbon dioxide and other greenhouse gases in the atmosphere. International agreements such as the Kyoto Protocol establish a limit on the amount of carbon that can be emitted into the atmosphere. Even if the U.S. does not sign the Protocol, in order to conduct business with signatory countries, U.S. companies will need to either reduce their carbon emissions below the baseline established in the Kyoto Protocol or obtain carbon sequestration credits to offset the amount that exceeds the established level.

Agricultural, forest and soil management practices and restoration of degraded habitat and wetlands have the potential to increase carbon sequestration on land. With Alaska's large land base and forested areas, the state could substantially profit from carbon sequestration credit trading.

The state must answer many questions before Alaska can enter the carbon credit market. CSHB 196(RES) requests the commissioner of the Department of Natural Resources, in consultation with the commissioner of Environmental Conservation, to research the possibilities for Alaska to participate in the emerging carbon credit trading market and report back to the legislature. The process is modeled on legislation enacted in Idaho and Nebraska.

Though the carbon credit market is growing, it is a limited market. If Alaska fails to prepare now, we may miss this unique opportunity - and miss out on millions in revenue.

For more information:

http://www.fe.doe.gov/programs/sequestration/
http://www.chicagoclimatex.com/

Revised 1/22/04

Alaska State Legislature
House of Representatives
Minority Leader

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Representative Ethan Berkowitz
District 26

Sectional Summary
CSHB 196 (RES)

"An Act relating to carbon sequestration; and providing for an effective date."

Section 1. Legislative findings that, due to increasing interest in slowing or reversing greenhouse gases in the atmosphere, there is the potential for a carbon credit trading market; the state has the potential to increase carbon sequestration on state and private land; and it is in the interest of the state for the commissioner of natural resources to document the state's carbon sequestration potential. Specifies legislative intent to enhance the ability of the state to participate in carbon credit trading.

Section 2. Adds new sections to AS 44.37 (Department of Natural Resources).

Sec. 44.37.200. The commissioner of natural resources, in consultation with the commissioner of environmental conservation, shall conduct research, surveys, and appropriate studies relating to carbon sequestration. The commissioner shall develop reports, recommend policies or programs to enhance the state's ability to participate in carbon trading, encourage production of carbon sequestration educational and advisory materials, recommend research needs, and review other states' carbon sequestration programs and policies.

Sec. 44.37.210. The commissioner of natural resources, in consultation with the commissioner of environmental conservation, shall assess state and private land for past carbon sequestration and future carbon sequestration potential.

Sec. 44.37.220. Definitions.

Section 3. On or before the first day of the Second Regular Session of the 23rd Legislature, the commissioner of natural resources, in consultation with the commissioner of environmental conservation, shall prepare a report to the legislature that includes the potential for greenhouse emissions regulation, the potential for development of a carbon trading market, systems or uses that increase stored soil carbon, methods for measuring carbon sequestration, areas of scientific uncertainty regarding carbon sequestration and advisory committee recommendations.

Section 4. Makes the Act effective July 1, 2003.

For questions, contact Lisa Weissler, 465-3163
January 22, 2004

Alaska State Legislature
House of Representatives
Minority Leader

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CSHB 196 (RES)
CARBON SEQUESTRATION
FAQS

Q: What is carbon sequestration?

A: Carbon sequestration refers to the capture and long-term storage of carbon in forests, soils or in the ocean. For example, a tree absorbs carbon dioxide during photosynthesis and uses it to construct its roots, trunk, stems and foliage. In the process, the tree sequesters (stores or conserves) carbon.

In the context of HB 196 and SB 144, carbon sequestration is the use of practices, technologies, or other measures that increase the retention of carbon in vegetation or soil to offset carbon dioxide emissions from other sources.

Q: Why is carbon sequestration important?

A: There is increased interest in reducing the levels of carbon dioxide and other greenhouse gases in the atmosphere. An international agreement known as the "Kyoto Protocol" is an agreement by industrialized and developing countries to reduce emissions of gases that contribute to the greenhouse effect and climate change. Carbon sequestration is a way to reduce greenhouse gas emissions while still enjoying the benefits of fossil fuel use.

Q: How is carbon sequestration a marketable commodity?

Though the Kyoto Protocol has not yet come into force, and the U.S. likely will not sign the protocol, many countries and industries are taking steps to address anticipated emission limits. In order to meet emission targets, a country or industry can purchase emission reductions, such as through enhanced carbon sequestration, by way of emissions reduction trading. Emission reductions are measured in terms of tons of carbon dioxide reduced and are often termed "carbon credits." Europe has already established a carbon credit trading market. In the U.S., a new market called the Chicago Climate Exchange began trading December 12, 2003.

Q: How will Alaska benefit from carbon sequestration and carbon credit trading?

Agricultural, forest and soil management practices and restoration of degraded habitat and wetlands have the potential to increase carbon sequestration on land. With Alaska's large land base and forested areas, the state could substantially benefit from carbon sequestration credit trading. The potential exists for Alaska to receive revenues upwards of $450 million.

Q: How can Alaska participate in carbon credit trading?

A: There are significant questions about how carbon credit trading markets will develop nationally and internationally. CSHB 196 calls for the commissioner of the Department of Natural Resources, with the assistance of the Department of Environmental Conservation, to begin the process of answering these questions and to see that Alaska is able to fully and efficiently take advantage of any opportunities that might arise from carbon trading markets. The potential for Alaska to profit will increase if the state takes immediate action to benefit from emerging carbon markets.

The carbon credit trading market is finite. If Alaska fails to prepare, the opportunity may be lost to other nations or states, such as Idaho and Nebraska, that have already launched carbon trading initiatives.

For additional information, contact Representative Ethan Berkowitz or Lisa Weissler, Legislative Aide, at 465-4919

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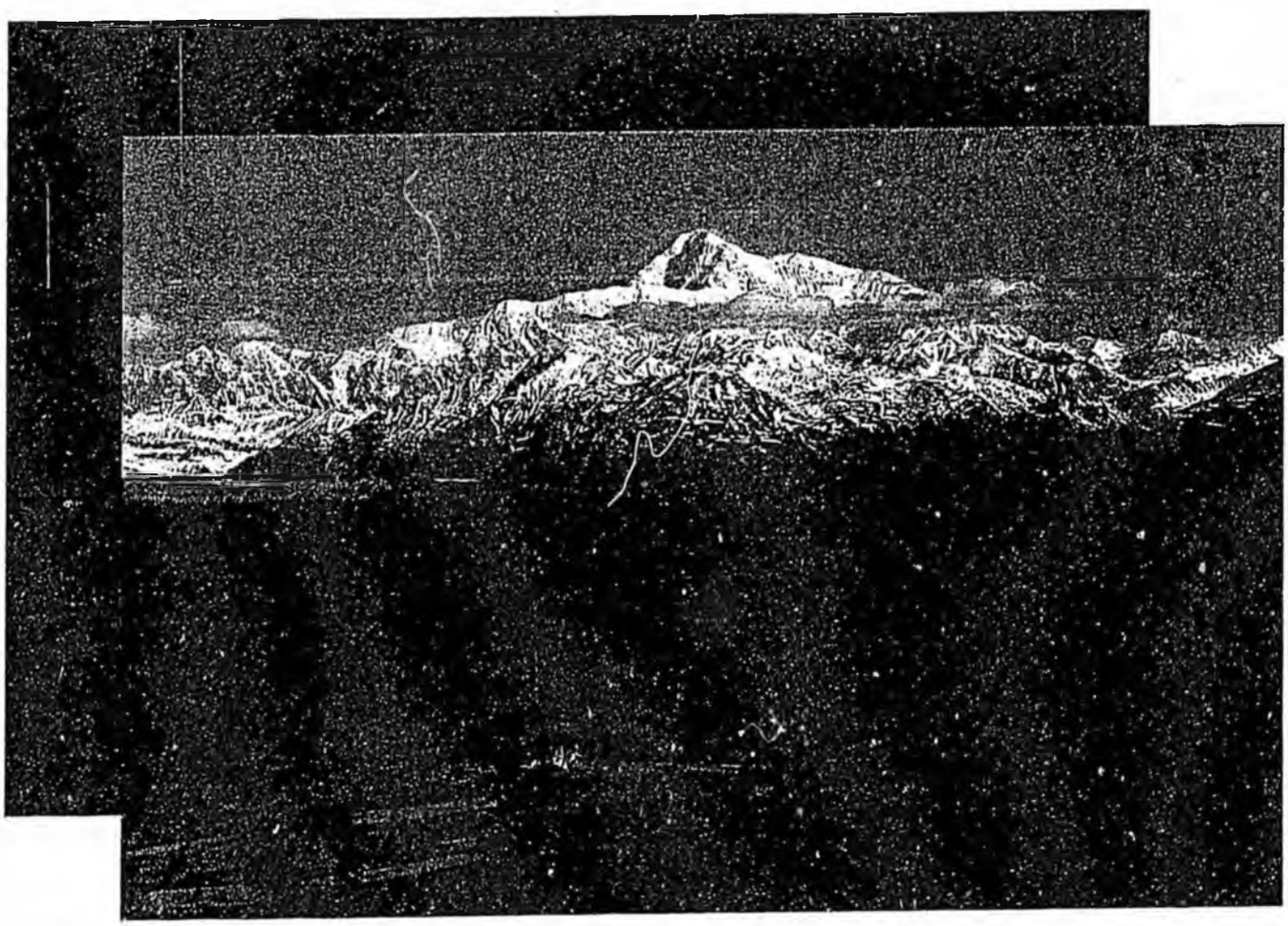
Reforestation Needs and Opportunities for Carbon Sequestration in Alaska

Proceedings of the Alaska Reforestation Council
May 24, 2000 Workshop
University of Alaska Anchorage



Misc. Publication 2001-2
December 2001

Agricultural and Forestry Experiment Station
University of Alaska Fairbanks

Opportunities for Carbon Offset Programs in Alaska

by
Tim King
Pacific Rim Regional RC&D,
Spokane, WA

Abstract

Timber salvage and reforestation of disturbed forests in Alaska offers several opportunities for offsetting carbon emissions and marketing emission reduction credits. First, trees killed by the spruce beetle or wildfires can be harvested for production of "bio-fuels" as renewable energy alternatives to fossil fuels. Secondly, the dead biomass is converted to useful energy before it decays, replacing fossil fuels. Finally, returns from salvage and bio-fuel sales can be used for reforestation and carbon sequestration. A major goal of regional and local Resource Conservation and Development Councils in Alaska is to establish producer-buyer partnerships for marketing carbon offset programs.

Key words: Carbon emission reduction credits (CERCs), spruce beetle (*Dendroctonus rufipennis* Kirby) epidemics, forest disturbances, forest health, timber salvage, "bio-fuels," biomass, Resource Conservation and Development Councils, Kenai Peninsula, Alaska, reforestation

Introduction

Presentations at the May 24, 2000 Alaska Reforestation Council's meeting on "Opportunities for Carbon Sequestration in Alaska" from representatives of the American Forest's Global ReLeaf Program, Washington, D.C., the USFS Southern Research Station, Triangle Park, North Carolina, and Edison Electric Institute's UtiliTree Carbon Company, Washington, D.C., indicated that partnership opportunities for market based carbon offset programs are now possible. Regional Resource Conservation and Development Councils (RC&Ds), nonprofit organizations dedicated to improving natural resources for economic and social benefits, support partnership agreements between private and public sectors for marketing carbon offset programs throughout the United States.

The Pacific Rim Regional RC&D Association has recently signed a nonbinding, nonexclusive carbon aggregation agreement with CQuest Ltd. of West De Moines, Iowa, a carbon market brokerage firm for marketing international carbon credits[a]. Under this agreement, local RC&Ds with support from their Pacific Rim RC&D Region and their partners work together as a team to establish terrestrial-based changes in land use and land use management for sequestering measurable carbon.

The RC&D Team Concept

The RC&D team concept is a network of carbon producers, sellers, administrators, marketers, brokers, and buyers working to change land uses and land use management for sequestration and storage of atmospheric carbon in the earth's vegetation and soils. The team insures accurate base-line carbon measurements before land management changes, models increases in stored carbon from proposed land use changes, and verifies actual carbon stored for the life of the project from field biomass inventories.

Regional RC&D Associations also assist in establishing State Carbon Advisory Committees for third party carbon credit accounting (verification and registration) to assure non-duplication of carbon sales and accurate sequestration assessments. In support of the team networking process, RC&D Associations may establish Carbon Technology Transfer Centers to provide technical assistance for project development, establish science and research programs for solving carbon sequestration and storage problems, and provide outreach and education on the carbon cycle and climate warming.

Carbon Emission Reduction Credits

Carbon sequestered from partnership projects in land management and use changes would be marketed through services provided by CQuest and other companies as Carbon Emission Reduction Credits (CERCs). CERCs are measured in metric tons (tonnes) of C or CO^2 equivalent.

All overstocked or understocked forest stands have the potential for improving net carbon sequestration and storage. Carbon sequestered and stored in phytomass is the basis for CERCs. Any stand threatened by disease, insects, or fire has the potential for increasing net carbon storage. The first step is to establish a baseline for capturing carbon by inventorying the carbon stored in the vegetation and soil. The next step is to develop a management plan for increasing tree growth and carbon storage in the live phytomass. Using growth and yield models, the final step is to compare the net change in carbon sequestration between managed and unmanaged stands on the same sites.

New Markets for Alaska's Forest Resources

The Alaska State Division of Forestry (DOF) and Alaska Reforestation Council (ARC) presented many specific examples and studies of severe forest health problems currently affecting Alaska's forests. General discussions addressed how these problems, mainly forest disturbance issues, may be brought on by climate change. Restoration of forests following spruce beetle (*Dendroctonus rufipennis* Kirby) epidemics, wildfires, and other disturbances offer many good projects for land use management change, which could provide carbon offsets for emissions from combustion of fossil fuels and the conversion of forests to agriculture. Teamwork between both private and public sectors in Alaska is needed to plan and implement forest restoration projects for generating CERCs, which in turn, will fund additional intensive forest management programs for sequestering carbon.

On a three day tour of many forest health issues, RC&D, UtiliTree, Global ReLeaf, ARC, and DOF representatives concurred on the immense need and opportunities for carbon offset programs across Alaska. Our first stop was on Kenai Peninsula. Spruce forests, mostly composed of mature Lutz Spruce (*Picea* X *lutzii* Little), appeared as an expanse of gray-brown dead trees. With only slight increases in summer temperatures of the 1990s, overstocked spruce stands quickly fell victim to competition and moisture stress. Bark beetle populations flourished with the mild temperatures and prime feeding conditions. Scattered stands of smaller diameter black spruce (*Picea mariana* (Mill.) B.S.P.) could not support the beetle's life cycle and were standing alone among the dead stands of taller Lutz spruce. Only a few stands of larger Sitka spruce (*Picea sitchensis* (Bong.) Carr.) dominated the hybrid spruce on the higher, more productive sites. Only the large Sitka spruce appeared to have sufficient health and vigor to withstand the beetle attacks.

The Ninilchik Native Corporation Manager was busy salvaging and marketing dead Lutz Spruce. Proceeds from the timber sales were utilized for site prep and planting. Although these efforts seemed phenomenal in scale to previous restoration efforts, they are only a minute token of the reforestation and management needs in the region. The dead spruce export market was only temporary and finite, and failed to provide sufficient returns for the region's forest restoration needs.

The need to find new markets large enough to handle the dead wood volume without financially breaking everyone from excessive competition was apparent. Bio-fuels, a renewable energy replacement for fossil fuels, are a major opportunity for marketing dead wood. Bio-fuel options range from wood-fired gasifiers and steam electrical production plants to new technologies in ethanol production from cellulose.

The technology for converting wood waste to steam and electrical energy is very basic. Production costs per kilowatt range nationally from $0.06–$0.12. In the Pacific Northwest where hydroelectric power is abundant and cheap, converting wood to steam and electrical power is not competitive. Nevertheless, wood is still converted to electricity commercially in northeast Washington. When touring the Copper River Area, we learned that electricity was approximately $0.50 per kilowatt-hour with the state subsidizing up to $0.30 per kilowatt using fossil fuel energy sources. Wood to steam and electrical energy conversion appears to offer multiple carbon offset opportunities. First, wood is an alternative energy source for fossil fuels. Second, the dead spruce is converted to energy before it decomposes into carbon dioxide and water via respiration of heterotrophic microbes. Third, returns from the sale of the wood for electricity can be used for putting forests back into wood production for carbon sequestration to offset wood fire and fossil fuel emissions.

The carbon offset opportunities from the sale of dead wood and the pure economics of producing electricity for 25% of current costs provide savings both to the public and state. Inexpensive power also means new jobs and manufacturing opportunities, which also utilize the abundant local natural wood resources.

The Sealaska Native Corporation of southeast Alaska has been working with Arthur Daniels Midland (the owner of patents on cellulose to ethanol conversion) and the Environmental Protection Agency on converting bio-fuels and wood waste to ethanol production in the Ketchikan area. One ethanol production plant at Ketchikan could provide the full gasohol needs of the Anchorage area. Alaska is the domestic leader in fossil fuel production, and needs to examine the possibility of becoming one of the nations major sources of bio-fuels.

Summary and Recommendations

Alaska's forests need a great deal of management to improve their health, and to reduce the impact of natural and human-caused disturbances. Funding for forest management and protection is imperative. Carbon offsets and bio-fuels production are sources of funding for which Alaska has both the need and resources.

Existing and proposed RC&D regions situated across Alaska have the potential to bring together the "TEAM" Internet concept. The Internet concept merges the efforts of local, state, and federal agencies and programs with Native Corporations, the general public, private business, and industry. These entities work together to benefit Alaska, it's people, it's resources, and the world. The time is now; the opportunity is at hand and it is knocking. Will you answer the call?

Notes

[a] A carbon credit is one metric ton (tonne) of carbon or CO_2 equivalent that is captured from the atmosphere and stored in plants and organic matter (biomass).

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Carbon Credits: New Income Source for Forestry?

Carbon credits could provide a new source of income for landowners and foresters.

"Growing Carbon" — that's how a brochure describes using trees and crops to sequester, or store, carbon. The goal is to balance our carbon cycle — to soak up excess carbon in greenhouse gas emissions with greater CO_2 absorption by plants.

Many leaders in this emerging field believe that U.S. forest landowners and farmers will eventually make money by participating in this process. In essence, they will earn "credits" by optimizing carbon sequestration in the soil or trees. The landowner will then sell the credits to manufacturers who want to offset their own greenhouse gas emissions.

Such a system already operates in Europe, Australia and other parts of the world. The United States is playing catch-up, but progress is being made. In fact, our nation is ideally suited for the carbon credit trade, according to Tim King, director of the Carbon Technology Transfer Center (CTTC) in Spokane, Wash. "We produce 20 to 30 percent of global CO_2 emissions and, with our temperate climate and vast farming and forest regions, we have the greatest potential to sequester carbon," he said.

As an example of the type of income that forest landowners could achieve from carbon credits, King cited a pilot project done with a 5,000-acre native conifer forest in the Northwest. At currently projected market values, the carbon credits would be worth $300 to $500 per acre for a 50-year sequestration commitment.

"The range in value is due to growing conditions, health and condition of the stand and other factors," King said. "Each parcel of land must be evaluated to determine what its baseline value is and what changes in management or use could increase its net carbon absorption."

King explains that the objective is not to "chase carbon for carbon credits," but instead to manage for healthy, sustainable production, focusing on the end products of lumber and fiber. "Carbon provides a tool to measure and improve current conditions and as a value to fund investment back into the forest and land," he said. "The key point is that we are no longer mining our resource base, we are building it back up, providing sustainable production for our children and their children."

Landowners won't be the only ones to earn money from the carbon credit system. King envisions a nationwide field force of personnel to "authenticate" or assess how many carbon credits a particular forest unit or farm field is worth and then periodically visit the site to verify that it remains as agreed upon. Resource specialists will advise landowners on the best ways to optimize their land's productive and carbon credit values.

"It's going to be a lot of work, and that means a lot more jobs," King said. "Foresters are in a prime position to benefit."

In forestry, King sees the greatest potential for earning carbon credits by rehabilitating older, overstocked stands and revitalizing their growth. New stand establishment is another opportunity, but site preparation must be managed carefully to avoid releasing too much carbon.

But, in general, harvesting and timber use furthers the sequestration process. For example, lumber used to build homes "locks up" carbon even longer. "A healthy, sustainable forest system is in the best position to optimize its carbon sequestration value," King said.

For more information, see CTTC's Web site at www.carboncenter.net.

For more information about forestry news and issues, visit BASF's professional foresters' website at www.forestryfacts.com.

> Coal & Natural Gas Power Systems
> Carbon Sequestration
> Hydrogen & Other Clean Fuels
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> Natural Gas Regulation
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> Petroleum Reserves

Go to DOE Home Page

Carbon Sequestration R&D

"Carbon sequestration" is a family of methods for capturing and permanently isolating gases that otherwise could contribute to global climate change. Affordable and environmentally safe sequestration approaches could offer a way to stabilize atmospheric levels of carbon dioxide without requiring the United States and other countries to make large-scale and potentially costly changes to their energy infrastructures.

"We all believe technology offers great promise to significantly reduce [greenhouse gas] emissions -- especially carbon capture, storage and sequestration technologies."

President George W. Bush
June 11, 2001

Key R&D Programs and Initiatives

The Carbon Sequestration Leadership Forum
DOE is working with the Department of State to organize an international ministerial-level panel that will meet regularly to discuss the growing body of scientific research and emerging technologies and plan joint projects for carbon sequestration. Read More >

Regional Partnerships Program
DOE is creating a nationwide network of federal, state and private sector partnerships to determine the most suitable technologies, regulations, and infrastructure for future carbon capture, storage and sequestration in different areas of the country. Read More >

***FutureGen* - A Full-Scale Sequestration Demonstration Project**
The $1 billion *FutureGen* project, announced by President Bush on February 27, 2003, will capture and store carbon emissions, making it the world's first coal-fueled prototype power plant to incorporate carbon sequestration technologies. Read More >

Carbon Sequestration Core R&D Program
DOE's Fossil Energy program is developing a portfolio of technologies that can capture and permanently store greenhouse gases. Read more about DOE's sequestration R&D program by clicking on the following links:

Sequestration Overview > | Carbon Capture R&D >
Geologic Sequestration > | Terrestrial Sequestration >
Ocean Sequestration > | Novel Concepts >

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- DOE Oil Field Takes Pioneering Role In Large-Scale CO2 Sequestration

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Projects

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- Carbon Sequestration R&D Projects and Papers [Government-Wide]
- National Energy Technology Laboratory Carbon Sequestration Web Site

Publications

- Carbon Sequestration Technology Roadmap & Program Plan - 2003

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Introduction

Fossil fuels will remain the mainstay of world energy production well into the 21st century. Coal, for example, is abundant, comparatively inexpensive, and geographically diverse. The International Energy Agency estimates that overall world coal use will increase by about 50 percent between now and 2030, and by nearly 67 percent for power generation, mostly in developing countries.

The United States has an estimated 250-year supply of coal. In terms of energy value (Btus), coal constitutes approximately 95 percent of U.S. fossil energy reserves. Because of its abundance and low cost, coal now accounts for more than half of the electricity generated in the United States.

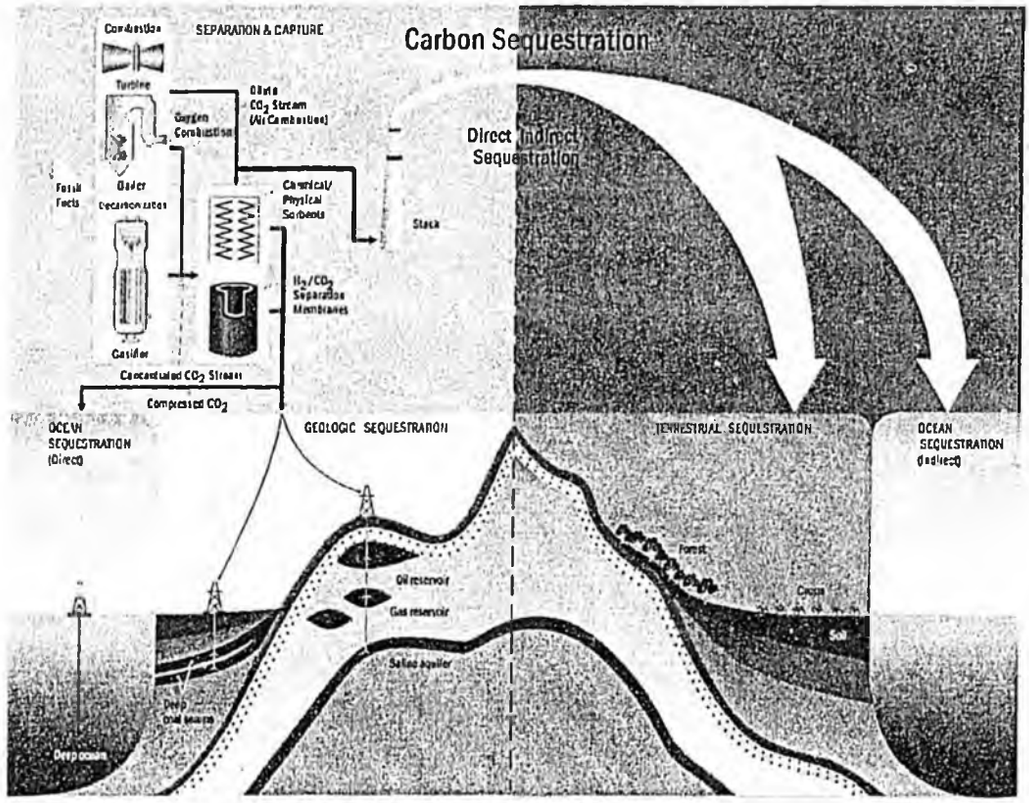
Availability of fossil fuels to provide clean, affordable energy is essential for the prosperity and security of the United States. However, increased concentrations of carbon dioxide (CO_2) due to increased carbon emissions are expected. To stabilize and ultimately reduce concentrations of this greenhouse gas, it will be necessary to employ new technologies, such as carbon sequestration, to capture carbon dioxide and other greenhouse gas emissions before they are released into the atmosphere.

Along with improved efficiency and low carbon fuels, carbon sequestration is a third option for greenhouse gas mitigation. Carbon sequestration is the process of capturing CO_2 emissions, which would otherwise be released into the atmosphere, and permanently storing them in geologic formations, including oil and gas reservoirs, unmineable coal seams and deep saline reservoirs, or deep in the oceans. Carbon sequestration can also be done terrestrially in forests, crop and agricultural lands, and in wetlands. Additionally, naturally occurring reservoirs of CO_2 can be found in geologic formations throughout the United States and the world.

> ***"...our investment in advanced energy and sequestration technologies will provide the breakthroughs we need to dramatically reduce our [greenhouse gas] emissions in the longer term."***
>
> **President George W. Bush**
> **Global Climate Change Policy Book**
> **February 2002**

The Global Climate Change Initiative set forth by President George W. Bush calls for an 18 percent reduction in the carbon intensity of the United States economy by 2012. Technology solutions that provide energy-based goods and services with reduced greenhouse gas emissions are the President's preferred approach to achieving the Global Climate Change Initiative goal.

Recognizing the importance of carbon sequestration, the U.S. Department of Energy (DOE) established a Carbon Sequestration Program within the Office of Fossil Energy (FE) in 1997, and a basic research program in the Office of Science (OS) in 1999. Both programs seek to move sequestration technology forward so that its potential can be realized. They also directly implement the President's Global Climate Change Initiative, as well as several National Energy Policy goals targeting the development of new technologies, market mechanisms, and international collaboration to reduce greenhouse gas intensity and greenhouse gas emissions.



There are two main types of sequestration: direct sequestration, where CO_2 is removed from energy systems (such as power plants and oil refineries) and is permanently stored or converted to value-added products, and indirect sequestration, where CO_2 is removed from the atmosphere by enhanced natural processes.

To be successful, the techniques and practices to sequester carbon must meet the following requirements:

- be effective and cost-competitive,
- provide stable, long-term storage, and
- be environmentally benign.

Using present technology, estimates of sequestration costs are in the range of $100 to $300/ton of carbon emissions avoided. The overarching goal of sequestration research and development is to achieve sequestration with less than a ten percent increase in energy system costs, or roughly $10/tonne CO_2 avoided. Achieving this goal would save the United States trillions of dollars.

Near term research is examining and identifying a spectrum of science-based sequestration approaches that have the greatest potential to yield the cost-effective technologies that are required. In the mid-term, sequestration pilot testing will develop options for direct and indirect sequestration, and the measuring, monitoring, and verification technologies and techniques necessary to quantify actual CO_2 storage. In the long term, the technology products will be more revolutionary and rely less on site-specific or application-specific factors to ensure economic viability.

The sequestration portfolio covers the entire carbon sequestration "life cycle" of capture, separation, transportation, and storage or reuse, as well as the capability to measure and monitor the amount of CO_2 stored. Specifically, the DOE's carbon sequestration research can be broken down into six major research elements:

- Cost-effective CO_2 capture and separation processes. (FE)
- CO_2 sequestration in geological formations including oil and gas reservoirs, unmineable coal seams, and deep saline reservoirs. (FE, OS)
- Direct injection of CO_2 into the deep ocean and stimulation of phytoplankton growth. (FE, OS)
- Improved full life-cycle carbon uptake of terrestrial ecosystems. (FE, OS)
- Breakthrough chemical, biological, and decarbonization concepts. (FE, OS)
- Measurement, monitoring and verification of stored CO_2. (FE, OS)

Current carbon sequestration research within FE consists of more than 60 highly leveraged projects with more than 40 percent of the funding provided by industry and international partners, such as BP, American Electric Power, Chevron/Texaco, and the Department of Natural Resources of Canada.

In November, 2002, DOE Secretary Spencer Abraham announced that the FE sequestration program intends to create a nationwide network of up to ten "regional sequestration partnerships" beginning in September, 2003. The partnerships will help determine the sequestration technologies, regulations, and infrastructure that are best suited for specific regions of the country.

Carbon Separation and Capture

Carbon dioxide separation and capture is the first step of direct sequestration and entails capturing CO_2 from power plants, industrial processes, fuels manufacturing, and other energy systems before it is emitted to the atmosphere.

This technology exists today, but it can raise energy costs by 50 percent or more. Driving the need for separation and capture technology is the fact that one-third of U.S. man-made CO_2 emissions come from power plants. The challenge is that these emissions are dispersed and not concentrated enough to be captured cost-effectively. The Carbon Sequestration program is pursuing evolutionary improvements in existing CO_2 capture systems, and exploring revolutionary new capture and sequestration concepts to achieve more concentrated CO_2 streams.

Separating and capturing CO_2 from energy systems can be accomplished before, during, or after a high-carbon fuel is combusted. Pre-combustion decarbonization research aims to remove CO_2 in concentrated streams before a fuel is burned. Oxygen-fired combustion research focuses on using oxygen (rather than air) to either gasify or combust high-carbon fuels, resulting in a more concentrated stream of CO_2 that can be captured within the system. Post-combustion research and development centers on techniques to remove CO_2 from flue gas exhaust.

DOE's Carbon Sequestration Programs fund separation and capture R&D projects covering a wide range of technology areas including: amine absorbents, carbon adsorbents, membranes, sodium and other metal-based sorbents, electrochemical pump, hydrates, and mineral carbonation. Also, advanced fuel conversion technologies such as gasification, oxygen combustion, and advanced steam reforming are being evaluated for their impact in reducing overall carbon emissions in fossil-fuel energy systems.

Opportunities for significant cost reductions exist since very little R&D has been devoted to CO_2 capture and separation technologies. Several innovative schemes have been proposed that could significantly reduce CO_2 capture costs, compared to conventional processes. For example, "one box" concepts that combine CO_2 capture with sulfur dioxide, nitrogen oxides, and mercury control can lessen or eliminate the need for scrubbers and other emissions abatement systems. This type of systems integration technology is being explored through laboratory- and pilot-scale experiments, and ultimately, may be used in the Energy Department's commercial FutureGen facility.

Geologic Sequestration

Geologic sequestration is a form of direct sequestration where CO_2 is stored in underground formations, such as depleted oil and gas reservoirs, unmineable coal seams, and saline reservoirs. These formations have the capacity, structure, seals, porosity, and other properties that make them amenable to decades or centuries worth of CO_2 storage.

Oil and Gas Reservoirs. In some cases, production from an oil or natural gas reservoir can be enhanced by pumping CO_2 gas into the reservoir to push out the product, which is called enhanced oil or gas recovery. The United States is the world leader in enhanced oil recovery technology, using about 32 million tons of CO_2 per year for this purpose. From the perspective of the sequestration programs, enhanced oil recovery represents an opportunity to sequester carbon at low net cost due to the revenues from recovered oil or gas.

In an enhanced oil recovery application, the integrity of the CO_2 that remains in the reservoir is well-understood and very high, as long as the original pressure of the reservoir is not exceeded. The scope of this enhanced oil recovery application is currently economically limited to point sources of CO_2 emissions that are near an oil or natural gas reservoir.

Unmineable Coal Seams. Coal beds typically contain large amounts of methane-rich gas that is adsorbed onto the surface of the coal. The current practice for recovering coal bed methane is to depressurize the bed, usually by pumping water out of the reservoir. An alternative approach is to inject CO_2 gas into the bed. Tests have shown that CO_2 is roughly twice as adsorbing on coal as methane, giving it the potential to efficiently displace methane and remain sequestered in the bed. CO_2 recovery of coal bed methane has been demonstrated in limited field tests, but much more work is necessary to understand and optimize the process.

Similar to the by-product value gained from enhanced oil recovery, the recovered methane provides a value-added revenue stream to the carbon sequestration process, creating a low net cost option. The United States' coal resources are estimated at 6 trillion tons, and 90 percent of it is unmineable due to seam thickness, depth, and structural integrity.

Another promising aspect of CO_2 sequestration in coal beds is that many of the large unmineable coal seams are near electricity generating facilities that are large point sources of CO_2 gas. Thus, limited pipeline transport of CO_2 gas would be required. Integration of coal bed methane with a coal-fired electricity generating system can provide an option for additional power generation with low emissions.

Saline Formations. Sequestration of CO_2 in deep saline formations does not produce value-added by-products, but it has other advantages. First, the estimated carbon storage capacity of saline formations in the United States is large, making them a viable long-term solution. It has been estimated that deep saline formations in the United States could potentially store up to 500 billion tonnes of CO_2. Second, most existing large CO_2 point sources are within easy access to a saline formation injection point. Therefore, sequestration in saline formations is compatible with a strategy of transforming large portions of the existing U.S. energy and industrial assets to near-zero carbon emissions via carbon sequestration.

Assuring the environmental acceptability and safety of CO_2 storage in saline formations is important. Determining that CO_2 will not escape from formations and either migrate up to the earth's surface or potentially contaminate drinking water supplies is a key aspect of this research.

Although much work is needed to better understand and characterize sequestration of CO_2 in deep saline formations, a significant baseline of information and experience exists. For example, as part of enhanced oil recovery operations, the oil industry routinely injects brines from the recovered oil into saline reservoirs, and the U.S. Environmental Protection Agency (EPA) has permitted some hazardous waste disposal sites that inject liquid wastes into deep saline formations.

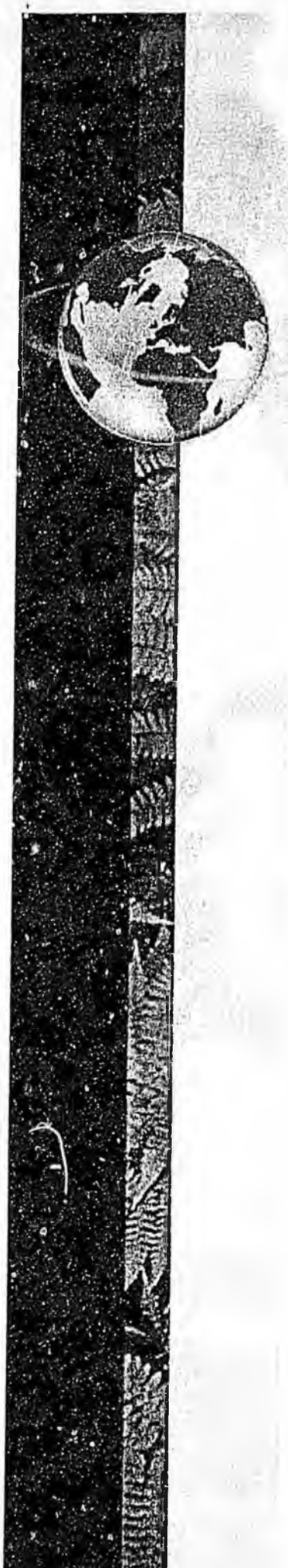
Since 1996, the Norwegian oil company, Statoil, has injected approximately one million tonnes per year of recovered CO_2 into the Utsira Sand, a saline formation under the North Sea associated with the Sleipner West Heimdel gas reservoir. The amount being sequestered is equivalent to the output of a 150-megawatt coal-fired power plant. This is the only commercial CO_2 geological sequestration facility injecting CO_2 into a saline formation.

Terrestrial Sequestration

Terrestrial sequestration is a form of indirect sequestration whereby ecosystems (*e.g.*, forest and agricultural lands, and wetlands) are maintained, enhanced, or manipulated to increase their ability to store carbon beyond current conditions.

Enhancing the natural processes that remove CO_2 from the atmosphere is thought to be one of the most cost-effective means of reducing atmospheric levels of CO_2, and forestation and deforestation abatement efforts are already under way.

The terrestrial biosphere is estimated to sequester large amounts of carbon (approximately 2 billion metric tons of carbon per year). Research and development in this area seeks to increase this rate while properly considering all the ecological, social, and economic implications.



The Department of Energy's research is focused on integrating measures for improving the full life-cycle carbon uptake of terrestrial ecosystems, including farmland and forests, with fossil fuel production and use. The following ecosystems offer significant opportunity for carbon sequestration:

Forest lands. The focus includes below-ground carbon and long-term management and utilization of standing stocks, understory, ground cover, and litter.

Agricultural lands. The focus includes crop lands, grasslands, and range lands, with emphasis on increasing long-lived soil carbon.

Biomass croplands. As a complement to ongoing efforts related to biofuels, the focus is on long-term increases in soil carbon.

Deserts and degraded lands. Restoration of degraded lands offers significant benefits and carbon sequestration potential in both below-and above-ground systems. Boreal wetlands and peatlands. The focus includes management of soil carbon pools and perhaps limited conversion to forest or grassland vegetation where ecologically acceptable.

DOE's terrestrial sequestration research programs are being conducted in close collaboration with the U.S. Forest Service of the U.S. Department of Agriculture.

Ocean Sequestration

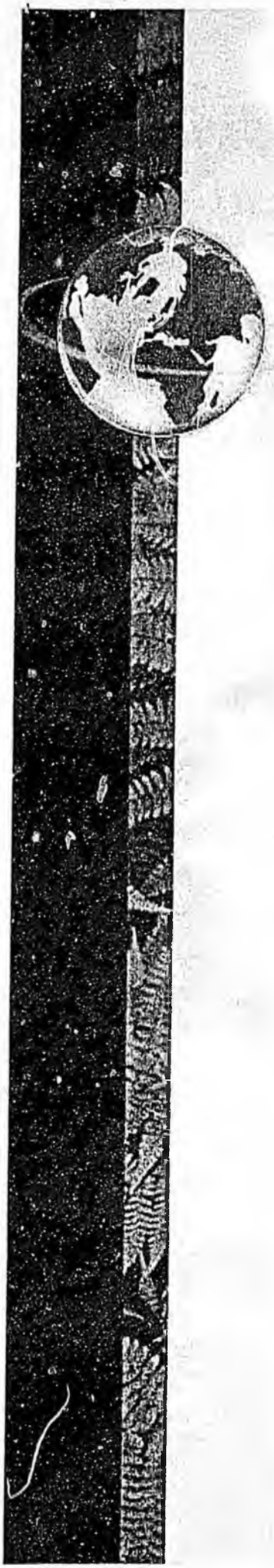
Carbon dioxide is soluble in ocean water, and through natural processes the oceans both absorb and emit huge amounts of CO_2 into the atmosphere.

It is widely believed that the oceans will eventually absorb most of the CO_2 in the atmosphere. However, the kinetics of ocean uptake are unacceptably slow, causing a peak atmospheric CO_2 concentration of several hundred years. The Energy Department's research programs, largely conducted by DOE's Office of Science, are exploring options for speeding up the natural processes by which the oceans absorb CO_2, and for injecting CO_2 directly into the deep ocean.

Enhancement of Natural Carbon Sequestration. One approach to enhancing the rate of CO_2 absorption in the ocean involves adding combinations of micronutrients and macronutrients to those ocean surface waters deficient in such nutrients. The objective is to stimulate the growth of phytoplankton, which are expected to consume greater amounts of carbon dioxide. When CO_2 is thus removed from the ocean surface waters, it is ultimately replaced by CO_2 drawn from the atmosphere. The extent to which the carbon from this increased biological activity is sequestered is unknown at this point, and would require additional research. Any R&D on natural enhancement would also require complete examination of potential environmental issues.

Direct Injection of CO_2. Technology exists for the direct injection of CO_2 into deep areas of the ocean; however, the knowledge base is not adequate to optimize the costs, determine the effectiveness of the sequestration, and understand the resulting changes in the biogeochemical cycles of the ocean.

To assure environmental acceptability, developing a better understanding of the ecological impacts of both ocean fertilization and direct injection of CO_2 into the deep ocean is a focus of DOE's carbon sequestration research. It is known that small changes in biogeochemical cycles may have large consequences, many of which are secondary and difficult to predict. Of particular concern is the effect of CO_2 on the acidity of ocean water.



Compared to terrestrial ecosystems and geologic formations, the concept of ocean sequestration is in a much earlier stage of development. A small level of funding in ocean sequestration research is providing leading researchers in this area an opportunity to develop the necessary scientific understanding on feasibility of ocean storage.

Advanced Concepts

Recycling and reuse of CO_2 from energy systems would be an attractive alternative to storage of carbon dioxide. Research into advanced concepts seeks to reduce the cost and energy required to chemically or biologically convert CO_2 into either commercial products that are inert and long-lived, or stable solid compounds.

Numerous conversion phenomena are found in nature, such as photosynthesis and mineral uptake to form carbonates. Carbon dioxide conversion research and development is trying to mimic these naturally occurring phenomena, but the task is challenging. Carbon dioxide is a highly stable compound containing a very low amount of chemical energy, and the natural conversion processes are slow and inefficient as a result.

The potential of chemical pathways is immense. For instance, the entire global emissions of carbon in 1990 could be contained as magnesium carbonate in a space 10 kilometers by 10 kilometers by 150 meters.

Concerning biological systems, incremental enhancements to the carbon uptake of photosynthetic systems could have a significant positive effect. Also, harnessing naturally occurring non-photosynthetic microbiological processes capable of converting CO_2 into useful forms, such as methane and acetate, could represent a technology breakthrough. An important advantage of biological systems is that they do not require pure CO_2 and do not incur costs for separation, capture, and compression of CO_2 gas.

Research into advanced concepts for capture, reuse, and storage of CO_2 from energy production and utilization systems based on, but not limited to:

- biological systems;
- advanced catalysts for CO_2 or carbon monoxide conversion;
- novel solvents, sorbents, membranes and thin films for gas separation;
- engineered photosynthesis systems;
- non-photosynthetic mechanisms for CO_2 fixation;
- genetic manipulation of agricultural soils and trees to enhance CO_2 sequestering potential; and
- advanced decarbonization systems.

Measurement, Monitoring, and Verification

Measurement, monitoring, and verification, or MM&V, is defined as the capability to measure the amount of CO_2 stored at a specific sequestration site, to monitor the site for leaks or other deterioration of storage integrity over time, and to verify that the CO_2 is stored and poses no harm to the host ecosystem.

MM&V capability will ensure safe permanent storage, will reduce the risk associated with buying or selling credits for sequestered CO_2, and will help satisfy regulators and local government officials who must approve large sequestration projects. MM&V will also provide valuable feedback for continual refinement of injection and management practices.

DOE's sequestration programs are pursuing MM&V technology for a broad range of sequestration options including terrestrial ecosystems, geologic formations, and oceans. MM&V for terrestrial ecosystems includes 3-dimensional videography methods for modeling and tracking above-ground carbon and in-field technology to measure soil and other below-ground carbon.

In geologic sequestration, the programs are developing both below-ground and above-ground MM&V technology. Work in below-ground MM&V systems draws upon a significant capability developed for fossil resource exploration and production. Options include surface-to-borehole seismic, micro-seismic, and cross-well electromagnetic imaging devices. The area of above-ground MM&V is less mature, and is focused on detecting leaks from a geologic reservoir.

Measurement, monitoring and verification also includes the development of protocols and methodologies for calculating the net avoided CO_2 emissions from systems with carbon capture, specifically considering methods for replacing capacity.

Chicago Climate Exchange

About Trading Environment

Welcome to the Chicago Climate Exchange

Chicago Climate Exchange,® Inc. (CCX®) is a self-regulatory exchange that administers the world's first multi-national and multi-sector marketplace for reducing and trading greenhouse gas emissions. CCX represents the first voluntary commitment by a cross-section of North American corporations, municipalities and other institutions to establish a rules-based market for reducing greenhouse gases. (learn more About CCX)

Climate Change and Environmental Risk

The scientific community is warning that rapid increases in the concentration of greenhouse gases in the earth's atmosphere is caused by human activity — mainly fossil fuel combustion and deforestation -- and is introducing the risk of fundamental and costly changes in the earth's climate system. The risks include more severe drought/precipitation cycles; longer and more extreme heat waves; damage to vegetation and agricultural systems; and threats to coastlines and property due to higher sea levels and storm surges. Independent of the scientific debate, the perception that global warming presents a problem that needs to be addressed is widespread. (more on our Environment and the role of greenhouse gases)

Market-Based Solutions to Environmental Concern

The demand for action from governments and the private sector to take cost-effective steps to address the threat of climate change has grown steadily over the past decade. CCX enables members to receive credits for greenhouse gas emission reductions, and to buy and sell reduction credits to determine the most cost-effective means of reducing overall emissions. (more about Market-Based Solutions to Environmental Concerns)

The New York Times
nytimes.com

January 31, 2004

Greenhouse Gases

To the Editor:

In "Warming Up" (editorial, Jan. 25), you say that "a Washington Post survey found that only a tiny number of American companies" have agreed to participate in voluntary programs to curb greenhouse gas emissions.

In fact, trade associations representing thousands of companies from 12 energy-intensive industry sectors — accounting for about 40 to 45 percent of United States greenhouse gas emissions — now participate in the administration's Climate Vision program. Nearly all these organizations have made specific commitments on behalf of their members to reduce greenhouse gas emissions intensity.

The administration has made significant efforts to reduce greenhouse emissions over the longer term. To meet the energy demand of a growing world population, lift people out of poverty and stabilize atmospheric greenhouse gas concentrations, new low- or zero-emission technologies must be created and adopted by the market. The United States is leading the way in developing transformational technologies in carbon sequestration, hydrogen, renewable energy, nuclear fission and fusion.

SPENCER ABRAHAM
Secretary of Energy
Washington, Jan. 27, 2004

President Bush Announces Climate Change Initiatives

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President George W. Bush
The White House
July 13, 2001

Last month, I announced the fundamental principles to guide a scientifically sound and effective global effort to reduce the buildup of greenhouse gases in the atmosphere. As I said then, my Administration's climate change policy will be science-based, encourage research breakthroughs that lead to technological innovation, and take advantage of the power of markets. It will encourage global participation and will pursue actions that will help ensure continued economic growth and prosperity for our citizens and for citizens throughout the world.

Today I am pleased to report on specific initiatives that have been advanced in the past month by my Cabinet-level climate change working group. These initiatives represent important steps in putting our principles to work through partnerships with other nations, industry and non-governmental organizations. They are designed to increase our scientific understanding of climate change, to tap the enormous promise of technology in addressing greenhouse gas emissions, and to promote further cooperation on climate change with our partners in the Western Hemisphere and beyond.

To advance the science of climate change, the Secretary of Commerce has convened an interagency work group charged with developing a federal research plan that will prove vital to increasing our understanding of the dimensions and dynamics of climate change. Prominently, NASA will invest over $120 million in the next three years in research on the natural carbon cycle, climate modeling, and the link between atmospheric chemistry and climate to help reduce uncertainties in the science highlighted by the recent National Academy of Sciences report requested by my Cabinet-level working group.

To advance technological innovation, the Department of Energy has just signed agreements to begin two significant new projects to study carbon sequestration. The first agreement is with The Nature Conservancy, the world's largest private international conservation group, to study land use and forestry practices for storing carbon more effectively in Brazil and Belize. The second is with an international team of energy companies BP-Amoco, Shell, Chevron, Texaco, Pan Canadian (Canada), Suncor Energy (Canada), ENI (Italy), Statoil Forskningssenter (Norway) and Norsk Hydro (Norway) to develop a new set of technologies for reducing the cost of capturing carbon dioxide from fossil fuel combustion plants. Grants for six other sequestration research projects have also been awarded under this $25 million initiative that leverages an additional $50 million from the private sector and foreign governments.

To further cooperation in the Western Hemisphere and beyond on climate change, the Department of Treasury yesterday entered into a $14 million debt for forest agreement with the Government of El Salvador under the Tropical Forest Conservation Act. By funding tropical forest conservation in that country, the agreement will secure important benefits of carbon sequestration and climate change mitigation.

Fostering further scientific cooperation on climate change among nations in our hemisphere, the Department of Commerce is bringing together more than one hundred scientists from the United States, Mexico and South America to study the regional impacts of climate change, another important area of uncertainty highlighted by the National Academy of Sciences study.

My Environmental Protection Agency Administrator also met with the Canadian and Mexican environment

ministers on June 29 and pledged to jointly consider market-based approaches for carbon sequestration, energy efficiency and renewable energy in North America. Today, the United States will host a meeting with the Japanese Environment Minister at which they will focus on opportunities for bilateral cooperation on climate change, including enhanced, joint climate modeling research.

Finally, in keeping with my commitment to engage internationally, the United States has participated and will continue to participate constructively in international discussions on climate change, including in the upcoming Sixth Conference of the Parties to the Framework Convention on Climate Change (COP-6) that begins this Monday in Bonn, Germany.

These initiatives illustrate the efforts my Administration will continue to encourage strongly. These partnerships leverage resources to achieve tangible results. In many cases, their scope is international, reflecting the fact that both the problem and solutions for climate change extend beyond the borders of any one nation. And they represent the kind of investments in scientific and technological knowledge on which real progress on this long-term challenge must be based. I am pleased that those who are signing agreements with us or who have otherwise pledged to pursue joint research with our government share our vision of enhancing our knowledge and making progress on this important issue.

Last Modified on Friday, January 7th, 2000
URL: yosemite.epa.gov/oar/globalwarming.nsf
/content/NewsandEventsSpeechesBush-7-13-01.html

Alaska State Legislature

House of Representatives

Minority Leader

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Representative Ethan Berkowitz

District 13

MEMORANDUM

This is the best $400 million sea-lion you'll ever have. Pls. schedule it!

Ethan Banks.

Date: May 17, 2003

To: Senator Scott Ogan, Chair
Senate Resources Committee

From: Representative Ethan Berkowitz EB

Re: CSHB 196 (RES)

I respectfully request that you schedule a hearing in the Senate Resources Committee for CSHB 196 (RES), an act relating to carbon sequestration.

A copy of the bill, a sponsor statement, fiscal note, a sectional summary and additional background material are attached.

There may be someone from Fairbanks who wishes to testify via teleconference. If you have any questions or need additional information, please call Lisa Weissler at 465-3163.

Thank you.

Attachments.

E-mail: Representative_Ethan_Berkowitz@legis.state.ak.us

Carbon Sequestration

Carbon Sequestration is a Category on the CO2e Trading Floor (Abbreviation: Sequestn). It refers to projects that capture and store carbon in a manner that prevents it from being released into the atmosphere for a specified period of time, the storage area is commonly referred to as a carbon sink. Carbon Sequestration projects include:

- Forest Sequestration (Forest)
- Land Conservation (Land)
- Soil Conservation & Land Use (Soil)
- Waste CO2 Recovery/Deep Injection (Wast/Inj)

Carbon Sink

A carbon sink is a reservoir that can absorb or "sequester" carbon dioxide from the atmosphere. Forests are the most common form of sink, as well as soils, peat, permafrost, ocean water and carbonate deposits in the deep ocean.

Carbon Taxes

A surcharge or levy on the carbon content of oil, coal, and/or gas to discourage the use of fossil fuels, with the aim of reducing carbon dioxide emissions

Forest Sequestration

Forest Sequestration is a Class under the Carbon Sequestration Category on the CO2e Trading Floor (Abb: Forest) Sequestration includes Afforestation and Reforestation.

GHG Sequestration & Quantification:
Farmers and/or landowners enter into conservation agreements that restrict the activities implemented on contracted lands and set up forest management plans. Keeping the lands out of production and replacing lost biomass maintains the carbon currently stored in land biomass and the conserved vegetation continues to increase carbon sequestration. Such actions can be scientifically quantified through periodic plant samples that measure the carbon levels and any increases in sequestration.

Additionality:
Entering into conservation agreements is a voluntary action by the landowner.

Verification:
Reforestation and Aforestation can be verified by independent third parties to confirm that these lands are held out of production and that the scientific measurement is consistent.

Ancillary Benefits:
a) Protection of local ecosystem that is easy to publicly identify, b) Positive public relations with involved farmers and landowners.

Land Conservation

Land Conservation is included in the project Class under the Carbon Sequestration Category on the CO2e Trading Floor (Abb: Land)
Land conservation prevents the release of carbon into the atmosphere, which occurs when lands come into production, by preventing production (eg. agriculture) from occurring.

GHG Sequestration & Quantification: Farmers and/or landowners enter into conservation agreements that restrict the activities implemented on contracted lands. Keeping the lands out of production maintains the carbon currently stored in the plant matter and soils of the conserved land, and the conserved vegetation continues to increase carbon sequestration. Such actions can be scientifically quantified through periodic soil/plant samples that measure the carbon levels in the soil and any increases in sequestration.
Additionality: Entering into conservation agreements is a voluntary action by the landowner.
Verification: Land conservation/reforestation can be verified by independent third parties to confirm that these lands are held out of production and that the scientific measurement is consistent.
Ancillary Benefits: a) Protection of local ecosystem that is easy to publicly identify, b) Positive public relations with involved farmers and landowners.

Soil Conservation & Land Management

Soil Conservation & Land Management is included in the project Class under the Carbon Sequestration Category on the CO2e Trading Floor (Abb: Soil) Current farming practices incorporate the tillage of land in preparation for planting. Soil has organic carbon stored below its surface, and tilling the soil exposes the carbon to microbial breakdown that releases CO_2 into the atmosphere. Instituting a no till/low till land management program can result in a net sequestration of soil carbon. Additional GHG reductions occur due to decreased fertiliser and on-the-farm energy use.

GHG Sequestration & Quantification:

Alternative land management practices incorporate soil conservation practices that increase the carbon content of the soil. Such actions can be scientifically quantified through periodic soil samples that measure the carbon levels in the soil and any increases in carbon sequestration.

Additionality:

There is no mandate requiring farmers to incorporate any such soil conservation practices. To the contrary, short-term business pressures make it economically difficult for farmers to transfer to these practices.

Verification:

Such soil conservation/land management practices can be verified by independent third parties to confirm that these lands are held out of production and that the scientific measurement is consistent. An independent third party can implement a baseline study to determine the net sequestration derived from soil conservation/land management activities; other estimation techniques are also available.

Ancillary Benefits:

a) Protection of nutrient value of conserved lands
b) Positive public relations with involved farmers and land-owners
c) secondary environmental benefits due to decreased fertiliser usage/run off.

adn.com
Anchorage Daily News

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Turning carbon into money in the bank

The Associated Press
(Published: May 18, 2003)

JUNEAU -- The state would study whether it can make money by absorbing greenhouse gases under a bill that passed the House on Saturday.

The bill by Rep. Ethan Berkowitz, D-Anchorage, calls for an advisory committee working with the Department of Natural Resources to study the idea of carbon sequestration. That refers to measures taken to capture and store carbon in forests, soils or the ocean.

Berkowitz said a worldwide market is developing for trading in "carbon credits." That's because a number of countries and companies anticipate facing limits in the amount of carbon dioxide and other so-called greenhouse gases they can put into the environment. Such emissions have been blamed for global warming.

Alaska should investigate whether it can make money from that market, Berkowitz said. With Alaska's large land base and forested areas, he estimates there's a potential to make up to $450 million. He pointed to reforestation after harvest of timber killed by bark beetles as a possible way to generate carbon credits.

House Bill 196 passed the House 35-1, with Rep. Kelly Wolf, R-Kenai, voting no.

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Questions:

1. What affect would the implementation of Carbon Sequestration trading have on our current forest management plan?

2. What is the estimated cost to participate in Carbon Sequestration trading?

3. What has been the result of the Legislation passed in Idaho and Nebraska?

4. Would our participation in selling credits increase pollution in other locations?

5. What affect would increased pollution levels in other regions have on Northern regions such as Alaska (i.e. the health of our waters and fisheries)?

6. Would Alaska benefit from Carbon Sequestration on Federal and private lands?

7. What is the estimated level of job loss or gain if we implement CS trading?

8. How do you come up with $450 million in state revenue? What is this number based on?