

CHAPTER 10 -- OBTAINING EARLY ACTION CREDIT FOR CARBON

One of the most important policy actions taken by the U.S. government to promote carbon sequestration is the development of an “early action” program. Early action refers to action taken to mitigate climate change in advance of any formal system of carbon controls that might be adopted to meet the proposed binding commitments of the Kyoto Protocol. In 1994 the Department of Energy (DOE) established a Voluntary Reporting of Greenhouse Gases Program. It represents the most structured, comprehensive step that the U.S. Government has taken to stimulate current efforts to reduce greenhouse gas (GHG) emissions.

Between 1994 and 1997, the number of sequestration projects filed grew nearly 400 percent. This growth represents an expanding opportunity to refine carbon sequestration project design, reporting, measurement, and monitoring through continued experience. This is especially true for forestry-related sink projects.

This chapter describes the DOE early action program, identifies key issues with sequestration reporting in the program, and offers recommendations for standardizing it to ensure that sink projects are properly incorporated into a credit for an early action scheme.

I. Development of the DOE Voluntary Reporting Program

The Energy Policy Act of 1992 laid the foundation for early action. Section 1605 specifically calls for the Energy Information Administration (EIA), located within DOE, to: (1) develop and “issue guidelines for the voluntary collection and reporting of information on sources of greenhouse gases,” (2) outline procedures for the accurate voluntary reporting of information on GHG emissions for the baseline period of 1987-1990 and all years thereafter on an annual basis, (3) allow “*any measures* [emphasis added]” which achieve reductions in GHG emissions to be reported, and (4) draft and issue upon request forms for voluntary reporting.

Under these directions the DOE developed a program with published guidelines in October 1994. The purpose of the program is to 1) provide a structure for reporting entities to record GHG emissions reduction activities and 2) to help reporting entities measure the impact of their activities. Its overall goal is to achieve broad participation. It is, therefore, “simple” and “flexible” and allows for significant leeway in what is reported and how the reported information is estimated (DOE, 1994a). The Voluntary Reporting Program accepts reports for projects from other government initiatives such as the DOE Climate Challenge, the Green Lights Program, Climate Wise and the U.S. Initiative on Joint Implementation (USIJI). It also accepts reports from privately developed programs such as American Forest’s Global ReLeaf program and reports that are unassociated with other formal programs.

Participation in the DOE program has grown since its inception in 1994 and could be expanded with further incentives such as credits for early action. As shown in Table 10.1, by 1997 the program included participation from 156 entities reporting 1,228 projects, compared to only 645 in 1994, a 90% increase. The program has had its largest impact on carbon dioxide (CO₂) emissions. Participants have reported over 400 million metric tons carbon equivalent

(MMTCE) in CO₂ reductions and sequestrations for the years 1991-1997. Carbon reduction and sequestration projects represented nearly 83% of total projects reported in 1997.

Table 10.1: DOE Voluntary Reporting Program Reduction and Sequestration 1994-1997

Reduction Impact and Project Type	Number of Projects			
	1994	1995	1996	1997
Reducing Carbon Dioxide Emissions	471	629	661	722
Reducing Methane and Nitrous Oxide	43	58	91	101
Carbon Sequestration	78	199	198	296
Reducing Emissions of Halogenated Substances	15	22	23	26
Other Emissions Reduction Activities Reduction	38	59	66	83
Total	645	967	1,039	1,228

*source: Adapted from DOE Table 2. Distribution of Projects by Reduction Objective and Project Type, Data Years 1994, 1995, 1996 and 1997.

II. Carbon Sequestration in the Early Action Program

Growth of projects has been especially large for carbon sequestration projects. The number of sequestration projects grew 379% between 1994 and 1997. This compares to 153% growth for carbon emissions reductions projects and 190% for total projects over the same period. In 1994 only 78 out of 645 projects (or 12%) were based on carbon sequestration activities. By 1997, 296 out of 1,228 (24%) were carbon sequestration projects. As the number and share of sequestration projects reported grows, the DOE program increasingly represents the most comprehensive sequestration program undertaken by the U.S. government (DOE, 1998b).

For reporting purposes, the DOE further breaks carbon sequestration projects into the following categories:

- Afforestation
- Reforestation
- Urban Forestry
- Forest Preservation
- Modified Forest Management
- Agroforestry
- Woody Biomass Production
- Conservation Tillage
- Other

*See Appendix 10 for definitions of each of these categories.

The distribution of reported projects has been skewed toward afforestation and reforestation. As the Table 10.2 shows, in 1997, 32% of carbon sequestration projects were reforestation projects and 31% were afforestation. The table also shows that of total carbon sequestration, forestry activities constitute nearly all (96%). This shows that while reported carbon sequestration activities are growing, experience with such activities is centered almost solely around forestry.

Table 10.2: Distribution of Sequestration

Type	No. of Projects	% of Projects
Afforestation	87	31
Reforestation	91	32
Urban Forestry	22	8
Forest	36	13
Modified Forest	32	11
Agroforestry	3	1
Conservation Tillage	2	1
Other	10	4
Total Projects	283	100
Forest Sub-total	272	96

*source: Adapted from DOE, EIA - Project Count by Project Type and Section.

III. Reporting and Measuring Forestry Activities

The DOE program was designed to encourage broad participation and to stimulate innovation. It is therefore flexible and limited in its requirements. As a result, several issues with the DOE program prevent easy translation of sequestration activities into credits for early action. Three issues in particular present problems: 1) the estimation methods allowed by the DOE program, 2) the baseline guidelines provided by the program, and 3) the scope of emissions and projects accepted by the DOE for the program.

Estimation Methods -- The DOE recognizes that estimating the sequestration effects of forestry activities is “especially challenging.” (DOE, 1994b, section 5.3). The many different tree species, combinations of species, regional differences, number of trees per acre, growth rates and location-specific factors among others make it difficult to pinpoint the sequestration impacts of a particular project. A forest’s ability to sequester carbon also changes over time. As trees grow, a forest can generally sequester greater amounts of carbon. Yet every action in forestry management triggers changes that influence the forests’ abilities to sequester, so linear projections of sequestration may not be reliable.

Critics of plans to include sequestration in a U.S. credit for early action program cite these difficulties as grounds for their hesitancy. The National Environmental Trust (NET), for instance, states that a U.S. credit program “should only provide credits for activities that are proven to reduce global warming pollution, not for tree planting and other activities whose impacts are not yet known” (NET, 1999a, 2). If the DOE voluntary program’s reports are to be included in a credit for early action initiative, DOE or the reporting entity will have to demonstrate that sequestration claims are valid and comparable.

The DOE program allows entities to report in either of two estimation methods: *standard* or *reporter-generated*. Standard projects include those “for which the guidelines and supporting

documents [from DOE] provide the procedures and information to estimate the emissions reductions or carbon sequestration” for the project (DOE, 1994b, 16). For reporter-generated estimation, entities may derive their data through direct measurement of project emissions levels or by using estimation methods suggested by other sources. Other sources include engineering manuals, computer models or academic research (16-18).

For forestry sequestration, the DOE program offers limited standard methods. To guide estimators, the DOE program issues tables of specific tree species’ abilities to sequester carbon. The DOE guidelines list only seven different species classifications: southern pine, white/red pine, spruce/fir, oak/hickory, Ponderosa pine and Douglas fir. It further separates the estimations into geographical region, tree height, land status and tree age. If a reporter’s project fits into the categories offered in the DOE guidelines, tables developed by DOE can be used. If a reporter’s project does not fit into the categories provided, the DOE suggests “that [the] project is not a standard project” and the party must develop his/her own analysis for a reporter-generated project. For these reporter-generated submissions, entities have “considerable freedom” to determine the effects of their project. To determine the sequestration rates, they may use actual data from the site or research from elsewhere to extrapolate the carbon sequestration (Section 5). Given this responsibility, companies such as Pacificorp choose the basis for their estimation methods on a project-by-project basis (see Table 10.3).

This flexibility does permit the sharing of different methodologies to stimulate innovation. However, as a Congressional Research Service report notes, it creates wide variation in how sequestration projects are measured and in how data is used. This makes comparisons among projects difficult. This is true from both company to company and among a company’s own projects as the Pacificorp example shows.

If the DOE sequestration project inventory is to be incorporated in a future credit for early action program, it must identify further standard methods for comparing projects. Furthermore, as the program progresses, DOE must continually improve its standard procedures.

IV. Reference Cases

The DOE program allows reporters to choose the baseline against which their project is measured. In the DOE guidelines these baselines are referred to as “reference cases.” DOE outlines two specific reference cases as valid for voluntary reporting: *Basic* and *Modified*. Basic reference cases rely on historical data. Under the basic methodology entities compare project emissions with emissions of a specific previous year. Under a modified reference case, reporters assume that emissions levels would change over time even without their project (DOE, 1994a). Using modified reference cases further compounds the estimation issue described above. Without a standard reference case, reported annual sequestration figures cannot be reliably compared in many situations.

Table 10.3. Pacificorp - Examples of Projects Reported in 1997

Project	Type	Estimation Basis Cited
Salt Lake City Urban Forestry Project	Urban Tree Planting	Research by David Nowak (1994) on carbon sequestration rates in individual trees in Chicago
Reforestation in Eastern Washington	Reforestation	Tables developed by Birdsley (1990) for Ponderosa pine on sites in the Intermountain region Y
Reforestation of Private Lands in Oregon - Site Class II	Afforestation	Tables supplied by the Oregon Department of Forestry for Douglas fir on Site Class II lands
Reforestation of Private Lands in Oregon - Site Class III	Afforestation	Tables supplied by the Oregon Department of Forestry for Douglas fir on Site Class II lands
Noel Kempff Mercado Climate Action Project	Forest Preservation	Primary Data from project site
Reduced Impact Logging of Natural Forest in Malaysia	Modified Forest Management	Primary Data from project site
Rio Bravo Carbon Sequestration Pilot Project	Forest Preservation	Primary Data from project site

The Reduced Impact Logging Project reported by the New England Electric System (NEES) Company (and described below in further detail) illustrates difficulties with non-standard reference cases. For the project, which was conducted in Malaysia as a Modified Forest Management project, NEES contracted a local logging company to perform forest management activities. NEES also involved third-party environmental auditors and had the reported CO₂ reduction figures reviewed by experts from the University of Florida. According to the NEES project report, the reference case used was a “conventional logging practices” method. The project case was “Reduced Impact Logging (RIL).” To develop reliable differences, the NEES contractor performed a test prior to logging. The contractor logged two separate plots, one with the reference case method and one with the project case method. NEES based its reported additional carbon offset figures on the difference in carbon sequestered between the two sets of test plots.

The NEES example represents a comprehensive approach to defining a reference and potentially a valid one. However, since the method used to define the reference case is very specific, it represents a different approach than those reported in Modified Forest Management projects of other entities. For example, in a project reported by American Electric Power (AEP),

AEP estimated annual offsets by comparing “active and passive forest management for mixed hardwoods, in the Corn Belt Region,” as recommended by a U.S. Forest Service publication. Again, while the methodology used by AEP may be comprehensive and valid, comparing its estimations with that of the NEES project would be extremely difficult. Until DOE develops standard methods, differences in reference case development such as these will continue to be reported. This will fuel continued opposition to including carbon sequestration in a credit for early action initiative.

Scope: Levels of Reporting -- DOE encourages entities to file “comprehensive” reports. In particular, DOE recommends that all entities submit entity level reports. According to DOE, entity level reporting allows an entity’s “audience” to get a full picture of the cumulative effects of the reporter’s actions. Entities are not required, however, to report at any specific level. They may report at the project level or at the entity level or both. Reporters may even submit only the projects that they want made public.

The result of this flexibility is a confusing conglomeration of different levels of reporting. The AES Corporation, for example, reports through three different subsidiaries separately: AES Hawaii, AES Shady Point and AES Thames. Each of these is considered entity level by the DOE program even though they are subsidiaries of the larger AES company.

Furthermore, while many companies report both entity level and project level emissions, others report only at the project level. American Forests (AF), for instance, reported 85 projects in 1997. It reported, however, no entity level results (DOE, 1997). This is not a surprise. As a non-profit conservation organization, its entity level emissions are likely to be very low. AF could sum up the annual GHGs that its employees cars emit on their commutes and on travel for the organization, then add in the GHGs that it emits through energy use from its offices, and so on. However, the net effect of AF’s emissions minus its sequestration activities would not reflect the true net effect that its projects aim to achieve. AF works with companies such as Mobil through its Global ReLeaf campaign on tree planting projects. While AF reports these projects to the DOE, the emissions that they offset are those of AF’s corporate partners. Currently such effects are not taken into account in the DOE program.

The result of this approach is partial reporting of true emissions impacts. Under a credit for early action program, assigning credit will most likely require full reports of net emissions impacts. The DOE will need to take steps to standardize the level at which projects report if its submissions are to be used for such a program. Specifically, the DOE must require entity level reports of net emissions in all cases. In cases such as AF’s, it should require that the sequestration impacts are measured against the emissions that they are intending to offset.

Other companies report groups of projects under one project description. In many cases, this leaves the DOE program open to faulty, unverifiable reporting. While under the program’s current guidelines companies self-certify their own project reports, any future credit program will likely include either government or third-party verification. To receive credit, such projects in the current Voluntary Reporting Program inventory would need to be disaggregated. Two examples of groupings of projects include those cited by Cinergy and Detroit Edison in 1997.

The Detroit Edison case in particular highlights the limited information on groups of projects that the DOE currently accepts (see Figures 10.1. and 10.2 below).

Figure 10.1 Project Description: Cinergy Forestry Projects

Cinergy annually plants trees at certain facilities, such as power plants, as conservation programs. Also, Cinergy plants trees at its facilities for landscaping and screening purposes. In addition, Cinergy annually sponsors various civic projects such as tree give-aways at schools and other civic groups, such as the Boy Scouts or Girl Scouts. Cinergy sponsors urban forestry programs with local parks departments and/or local forestry departments. The urban forestry programs for the years 1991 through 1995 have been designed as tree planting programs in parks and designated urban forests such as Mt. Airy Forest in Hamilton County, Ohio; and not as energy conservation programs.

The following table represents Cinergy's tree planting programs as described above:

Year	Trees Planted	
	Hardwood	Softwood
1991	247	185
1992	7,657	646
1993	82,754	16,674
1994	40,780	4,975
1995	19,500	3,250
1996	30,000	35,000

(Taken from the DOE Voluntary Reporting Program Public Database: Cinergy Forestry Projects project description as filed by Cinergy with the DOE in 1997).

Figure 10.2 Project Description: DTE Energy/Detroit Edison Miscellaneous Tree Plantings, 1995

This project represents the accumulation of trees planted at various suburban and urban sites. Tree species included: white pine, scotch pine, austrian pine, red maple, red oak, poplar, crabapples, and pears.

Taken from the DOE Voluntary Reporting Program Public Database: Miscellaneous Tree Plantings - 1995 project description as filed by DTE Energy/Detroit Edison with the DOE in 1997.

Scope: Domestic/International—DOE also allows entities to report both domestic and international projects. Including international projects in a credit for early action program would be controversial. Critics such as the Natural Resources Defense Council (NRDC) argue that a U.S. credit initiative should only include domestic projects. They contend that the U.S. should wait until international accounting rules for sink projects are finalized. Otherwise, credits may be granted by the U.S. to some sequestration projects which are not recognized once international rules are established (Lashof, 1999).

Companies participating in the USJI program have welcomed the opportunity to include international projects and are investing large sums of money to finance ones that could lead to credits for early action. Wisconsin Electric, one of the partners involved in the Rio Bravo Carbon Sequestration Project, has committed \$600,000 in expenditures by 2004 for forest preservation. Other companies are relying solely on international projects as the basis for their emissions mitigation. AES Hawaii, for instance, has reported only one project since the inception of the DOE program, the Mbaracayu Conservation forest preservation project. Under this project, AES Hawaii has reported over 9 MMTCE (DOE, 1997). Denying companies such as these credits would incite unfavorable reaction. To avoid conflict the DOE should determine sooner rather than later whether international projects would be included in a U.S. credit program. Furthermore, it should consider “opting-in” international projects once global standards are developed.

V. Conclusion

As many argue, the DOE program will need to be much tighter to accommodate a credit for early action initiative. A GAO report indicates, “Many of the claims for reducing greenhouse gas emissions that have been submitted to the Voluntary Reporting Program would probably be ineligible for credit because the voluntary program was designed to encourage wide participation by allowing companies to submit emissions reduction claims under flexible reporting criteria...” (GAO, 1998a).

The above analysis indicates that this is particularly true for the DOE’s handling of sequestration projects within the program. To raise the sequestration portion of the program to a level worthy of a credit initiative, it will have to focus mainly on outlining stricter guidelines and standardizing procedures for: 1) estimation of sequestration effects, 2) baseline methods allowed, and 3) the scope of reporting accepted.

This will be difficult yet not impossible. To move towards the necessary standardization, DOE should:

- Establish a technical advisory committee
- Conduct a review of all reported sequestration projects
- Perform a review of available studies on estimation methods
- Institute a third-party verification stipulation
- Review and adjust the program at regular intervals

The level of complexity in estimating sequestration emissions impacts, in determining valid methodologies, and in maintaining up-to-date reporting requirements for sequestration projects is high. Securing the proper expertise to deal with this complexity should be a priority. EPA Act 1605 does not provide for any extra entity or position within the DOE to administer or advise the Voluntary Reporting Program (EPA Act, 1992, Section 1605). However, to ensure the necessary technical expertise to adjust the program for a credit for early action program, this situation must change. DOE should establish a technical advisory committee of experts for sequestration, potentially disaggregating this committee into forest versus other expertise. This committee should then be responsible for reviewing and standardizing the program to accommodate a credit initiative. For categories where standardization is not possible (for instance, for those with few reports, such as conservation tillage) or not appropriate (such as international projects), the committee should consider eliminating them from a credit for early action program. These categories should be considered as potential “opt-ins” for the future.

Once the committee is established, it should review the program’s sequestration history. By reviewing all reported sequestration projects, the DOE technical committee should be able to identify the important differences among projects and to determine a range of differences that it can accept while keeping projects comparable. Currently, DOE reviews projects on a report-by-report basis, focusing on whether the submission is “internally consistent”. DOE must broaden this review process to include comparisons across projects. DOE should specifically focus on comparisons within categories such as sequestration, leveraging the technical advisory committee’s expertise. Throughout the review, the committee should focus on the three major issues as described above: 1) estimation methods, 2) reference cases, and 2) scope. It must determine the acceptable level of variety in each of these areas. Once it determines the range of differences it can accept, the committee should standardize DOE reporting requirements to ensure that this range is maintained. Examples could include 1) requiring that all entities submit entity level reports so that net emissions results may be compared and 2) narrowing acceptable reports to domestic projects only. The committee should also review other government programs, such as the Australian Greenhouse Challenge, to inform its adjustment decisions.

Next, the DOE committee must identify which available studies and actual measurement procedures are considered acceptable as references upon which to base estimation methods. To do this, it must perform a review of available sequestration studies and actual measurement processes. It should consider all those referred to in past submissions to the program. Once it identifies acceptable studies, the committee should standardize reporting requirements to include these studies only. It should, however, allow for entities to propose additional studies and procedures. The committee should review these proposed methods on an ad hoc basis, only accepting reports if they are approved.

DOE should then revisit its self-certification policy as outlined by EPA Act 1605. To avoid misrepresentations of sequestration effects in reports, DOE should establish a third-party review process. The technical advisory committee itself should include non-government and non-reporter members to avoid conflicts of interest. The committee should also establish a list of acceptable third-party verification entities. These entities would be responsible for monitoring and verifying claims made by reporters.

Finally, the committee should establish regular reviews of the program. It will always need improvement and should be readjusted over time. The committee should review both the inventory of reports in the program and available estimation methods for each review period. In the event of major policy changes related to the program, the committee should perform an ad hoc review to determine any necessary adjustments.

The DOE program can be adapted for a credit for early action initiative if it is further standardized. Further standardization of the DOE program does not mean that it would no longer be voluntary. Rather, it would require that any entity wishing to report must report specific information within standards. While this may inhibit some entities from reporting, it will make the program more comparable across projects and will allow credits to be offered for net reductions. As many believe, offering credit will increase incentives for entities to report. The net effect, therefore, may actually be an increase in participation and could push voluntary action toward the level necessary for meeting future binding requirements.

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APPENDIX 10: TYPES OF CARBON SEQUESTRATION PROJECTS IN THE DOE VOLUNTARY REPORTING PROGRAM

Afforestation—Planting trees in an area that has not recently been forested, thereby changing the land use from a non-forest use such as crop or pasture.

Reforestation—Planting trees in a recently harvested forest area.

Urban Forestry (Sequestration Effects Only)—Planting of trees in urban or suburban areas to sequester carbon. The energy impacts of urban forestry projects are reported in a different section.

Forest Preservation—Protecting an existing forest from harvest or conversion to another land use.

Modified Forest Management—Improving the management regime of an existing forest to increase carbon storage in the forest or reduce the release of greenhouse gases resulting from forestry activities. Activities include treatments such as fertilization and prescribed fire, and site preparation techniques at the time of harvest and regeneration such as mechanical site preparation, site preparation burning, and chemical site preparation.

Agroforestry—Combining agriculture and forestry on the same land area to provide agricultural products with less intensive energy uses and sequester more carbon than traditional agriculture.

Woody Biomass Production - Planting and harvesting trees for the purpose of displacing fossil fuels as an energy source. Note: Only the carbon storage of this type of project should be reported in this section.

Wood Products - Increased wood products usage so that carbon is stored over the long term in wood products that substitute for non-wood products such as steel, aluminum, and portland cement.

Conservation Tillage - Adopting conservation tillage methods such as reduced till or no-till that increase carbon storage on cropland compared to conventional tillage methods.

Other- Activities not included in any of the previous project types.

*source: DOE, Voluntary Reporting of Greenhouse Gases 1999 Electronic Form and 1997 Public Use Database CD-ROM.