Recognition of Carbon Storage in Harvested Wood Products: A Post-Copenhagen Update

Dr. Jim Bowyer
Dr. Steve Bratkovich
Dr. Jeff Howe
Kathryn Fernholz

February 25, 2010

Dovetail Partners Inc.
A Trusted Source of Environmental Information

Recognition of Carbon Storage in Harvested Wood Products
A Post-Copenhagen Update

Introduction

Efforts to recognize carbon storage in wood products within international protocols have been ongoing for over thirteen years. Despite these actions there is still no agreement on language regarding Harvested Wood Products (HWP), and this continued uncertainty is hindering the possibilities for wood to be a more significant part of a carbon solution.

Global climate protocol negotiators recognize that carbon comprises about one half the mass of dry wood in long-lived wooden structures, furniture, finished goods and a myriad of other durable products made of wood. It is also recognized that considerable quantities of carbon are stored for long periods within such products. In addition, there is growing appreciation of the fact that producing useful products from wood results in substantially less energy consumption – and particularly much less fossil energy consumption – than similar products from other raw materials. This lower level of energy consumption translates into far lower carbon emissions linked to manufacturing.

Despite recognition of the carbon storage benefits of wood products and lower carbon emissions during manufacturing, wood products[1] continue to be hampered in climate protocols by a Kyoto-era default assumption: *that all of the carbon stored in harvested wood products manufactured in any given year is totally negated by an equal volume of carbon released to the atmosphere through degradation of such products within the same time frame.* In effect, the current policy assumption is that all of the carbon contained within trees is released at the moment of harvesting.

If the issues were only technical and dependent upon sound research for resolution, then accounting for carbon in HWP would likely have been incorporated into climate protocols long ago. While a few technical questions remain, the primary obstacles are political. The HWP question, like many others linked to climate negotiations, is mired in international politics. For instance, in the case of internationally traded wood, what nation should get credit for carbon stored in harvested wood products – the nation in which trees were grown, or the nation in which the wood is used? Will acknowledging carbon storage in wood lead to more forest harvesting? Will recognizing the longevity of stored carbon in discarded products within landfills encourage waste and discourage durability and recycling? These are a few of the questions that are keeping resolution of the HWP issue in limbo.

The question now is how to move forward so that the carbon benefits of wood products can be realized.

[1] Harvested Wood Products or "HWP" in climate negotiation lingo

Carbon Storage in Wood Products

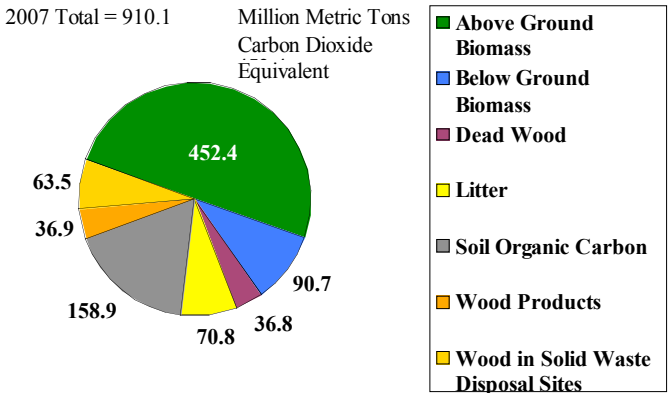
The Big Picture

A starting point for understanding the debate about HWPs is to understand the magnitude of the opportunity for carbon storage in wood.

Estimates for 2005 (USDA 2008, Skog 2008) place the rate of CO_2 sequestration in U.S. forests at 595 million metric tons annually, a quantity 17 percent greater than five years earlier and equivalent to about 10 percent of total carbon emissions nationally (USDA 2008). The rate of carbon accumulation within wood products in use and in landfills was estimated at about 103 million metric tons annually. This accumulation rate was 17 percent of the rate of sequestration within forests.[2]. The same source reported carbon in harvested wood products in use in the United States to be roughly equivalent to 9 percent of the mass of carbon in standing trees and to about 3.4 percent of the mass of carbon contained within forest systems.[3] Carbon within HWPs that occupy landfills was equivalent to another 6+ percent of standing tree carbon. *When considered together, the USDA estimate indicated that the carbon contained within harvested wood products in use and in landfills was about 15 percent of that contained within standing trees and about 6 percent of that in forest systems.*

Estimates reported by the Environmental Protection Agency (USEPA 2009) for the year 2007 are similar but slightly more conservative than those of the USDA. In this case, annual additions to stocks of harvested wood products in use and within landfills[4] were estimated at 12.4 percent (as compared to the USDA's 17% estimate) of annual additions to forests (Figure 1).

Figure 1
Additions to the Volume of Carbon Sequestered in U.S. Forest Lands and Harvested Wood Pools, 2007



Source: U.S. Environmental Protection Agency (2009)

[2] including above and below-ground biomass, deadwood, litter, and soil organic carbon
[3] including standing trees, litter, below ground biomass and soil organic carbon
[4] solid waste disposal sites

Where's the Wood?

The nation's housing stock[5] is where much of the carbon contained within long-lived wood products resides. Wood-framed buildings make up about 90 percent of homes in the U.S., and whether wood framed or not, wood furniture, cabinets, flooring, and trim is dominant in U.S homes. Consequently, as the number of housing units increase, carbon storage in the housing stock increases as well. [6,7]

Whereas wood structures are common in the United States and a few other countries, this is not the case worldwide. Thus, carbon storage in wood, as a percent of overall net carbon emissions, is far smaller globally than in nations that produce and use large quantities of wood products. Globally, the volume of roundwood estimated to go into non-fuelwood forest products annually is about 8 percent of net additions to atmospheric carbon[8]; this means that the global quantity of carbon stored in long-lived forest products is roughly equivalent to 4 percent of overall net carbon emissions.

For more information about the topic of wood use and carbon storage in building materials, see the Dovetail article *Wood Products and Carbon Protocols: Carbon Storage and Low Energy Intensity Should Be Considered*
(Available at: http://www.dovetailinc.org/files/DovetailCarbon0408hz.pdf)

International Carbon Protocols and Harvested Wood Products

Back to the Beginning

To understand the current status of harvested wood products in international climate negotiations, it is important to realize that carbon storage in wood has been recognized from the very beginning of deliberations. The following is from the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

[5] Estimated at 129 million units in 2008
[6] Housing stocks have grown in the twentieth century at a rate of one additional unit for each 2.5 individuals added to the population.
[7] It should be noted that the quantity of carbon sequestered in wooden buildings remains only as long as the buildings do. As wood deteriorates, carbon is returned to the atmosphere while oxygen is used and water re-formed. Carbon storage in housing continues to increase as long as the rate of construction of wooden structures is greater than the rate of removal from the housing stock.
[8] Pingoud et al. 2003 as reported by Marland et al. 2010

The Fate of Carbon in Wood

For the purposes of the basic calculations, the recommended default assumption is that all carbon removed in wood and other biomass from forests is oxidised in the year of removal. This is clearly not strictly accurate in the case of some forest products, but is considered a legitimate, conservative assumption for initial calculations. This is further explained as follows:

Harvested wood releases its carbon at rates dependent upon its method of processing and its end use: waste wood is usually burned immediately or within a couple of years, paper usually decays in up to 5 years (although landfilling of paper can result in longer-term storage of the carbon and eventual release as methane or CO), and lumber decays in up to 100 or more years. Because of this latter fact, forest harvest (with other forms of forest management) could result in a net uptake of carbon if the wood that is harvested is used for long-term products such as building lumber, and the re-growth is relatively rapid. This may, in fact, become a response strategy.

For the initial calculations of CO2 emissions from changes in forest and other woody biomass stocks, however, the recommended default assumption is that all carbon in biomass harvested is oxidized in the removal year. This is based on the perception that stocks of forest products in most countries are not increasing significantly on an annual basis. It is the net change in stocks of forest products which should be the best indicator or a net removal of carbon from the atmosphere, rather than the gross amount of forest products produced in a given year. New products with long lifetimes from current harvests frequently replace existing product stocks which are in turn discarded and oxidized. The proposed method recommends that storage of carbon in forest products be included in a national inventory only in the case where a country can document that existing stocks of long term forest products are in fact increasing.

If data permit, one could add a pool to Equation 1 in the changes in forest and other woody biomass stocks calculation to account for increases in the pool of forest products. This information would, of course, require careful documentation, including accounting for imports and exports of forest products during the inventory period.

Houghton et al. 1997

In this statement of some thirteen years ago it is recognized that:

- assuming oxidation in the year of harvest does not reflect reality,
- the default assumption is an artificial simplification, and
- long-term storage of carbon in wood is a reality for a portion of the wood that is harvested.

This statement also indicates that:

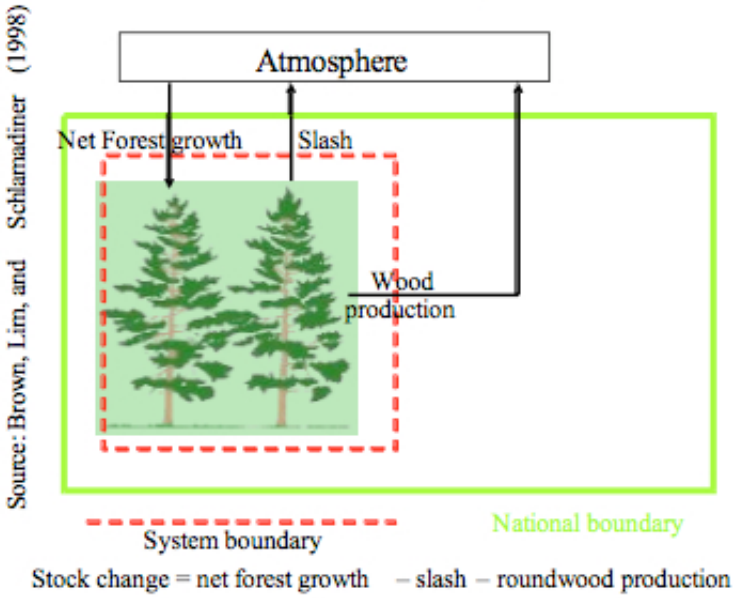
- documented increases in stocks of harvested wood products can be included in national carbon inventories, and
- production of long-lived wood products accompanied by rapid re-growth of replacement trees could, in fact, become a carbon mitigation strategy.

With this kind of start to climate negotiations regarding HWP it is hard to imagine that well over a decade has elapsed without moving beyond the flawed initial assumption.

Understanding the Default Assumption

The default assumption "that all carbon removed in wood and other biomass from forests is oxidized in the year of removal", first articulated in 1997, continues to define HWP in 2010. Conceptually this assumption is depicted in Figure 2.

Figure 2
IPCC Default Assumption



Carbon removed from the atmosphere through tree growth and stored in tree trunks, branches, bark, roots, and forest litter and soils is credited under this approach, while carbon contained in biomass removed through harvest (slash and logs) is assumed to immediately return to the atmosphere. The default assumption ignores the reality that carbon within long-lived wood products can be stored for multiple decades and even centuries. In terms of being able to fully evaluate the potential for wood products to be part of the carbon solution, this default assumption eliminates a significant portion of the wood product life cycle.

Getting Past the Default Assumption: The Politics of Climate Change

A decision on carbon storage issues cannot be based on science alone. Politics are appropriately certain to play an important role. In 1997, it was acknowledged that the default assumption about carbon storage in wood products, though inaccurate, was a conservative way to approach the issue.

One of the leading issues related to accounting for carbon storage in wood products involves determination of which nation gets credit for the carbon – the nation that grows it – the nation that processes it - or the nation that uses it? Which nation, moreover, should be assigned a burden or penalty when products begin to deteriorate and release carbon? These kinds of questions explain part of the reticence in dealing with the stored carbon issue.

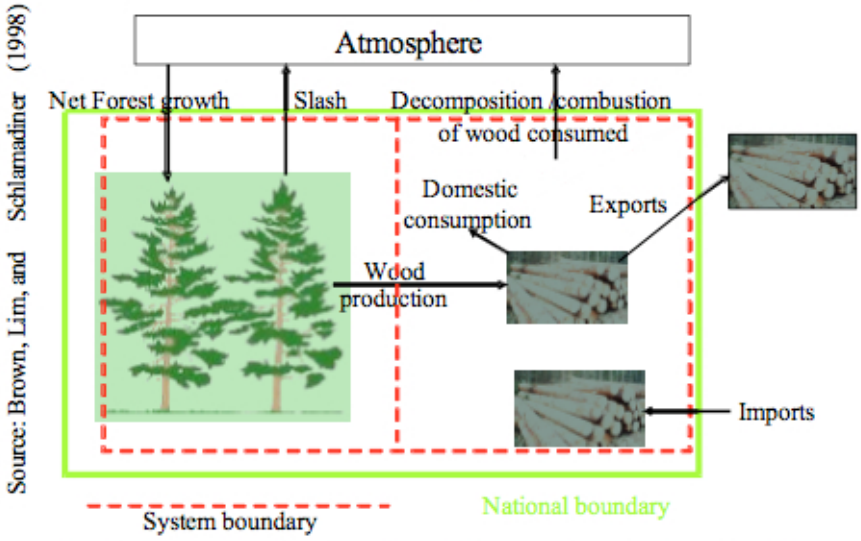
Alternatives to the Default

A number of alternatives to the default assumption have been proposed. These include what are described as the stock change approach, the production approach, and the atmospheric flow approach, and variations of these.

The Stock Change Approach

The stock change approach (Figure 3) takes into account changes in carbon storage attributable to forest growth[9], with carbon removed through forest harvesting[10] subtracted from the quantity of carbon captured.

Figure 3
Stock Change Approach



[9] which is largely positive in the absence of catastrophic events
[10] including logging slash or roundwood

In the stock change approach, logging slash is assumed to decompose in the year of harvest, while roundwood and wood in the form of products is further tracked to account for carbon storage in resulting long-lived products. Using this approach, when domestic consumption plus imports, minus exports is greater than decomposition and/or combustion of wood consumed, then an increase in national stocks of carbon within harvested wood products occurs.

In the stock change approach carbon storage credit is available when:

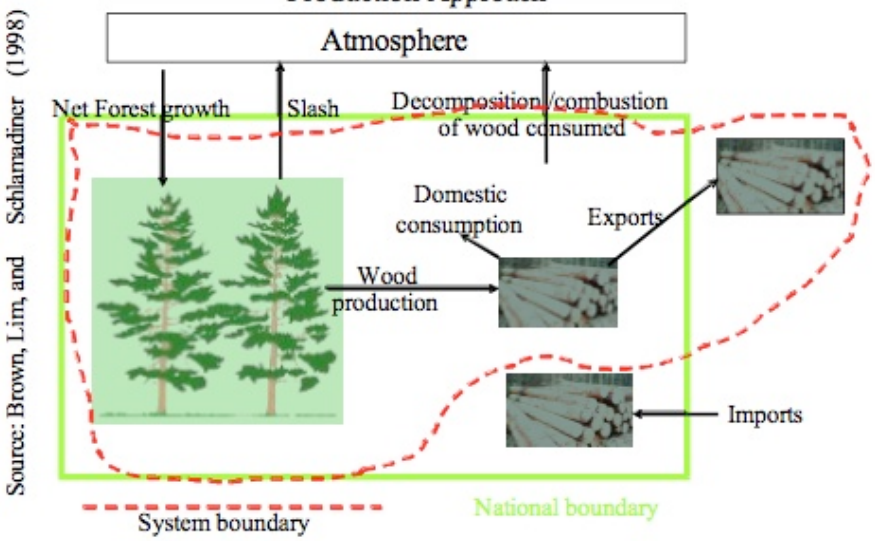
Domestic Consumption + Imports – Exports > Decomposition and Combustion

Under the stock change approach, flows of wood are tracked, with carbon credits awarded when a country realizes a net positive change in stocks of harvested wood products. Conversely, a country that experiences a net loss of stocks of harvested wood products would be penalized.

The Production Approach

In the production approach (Figure 4) a nation has full responsibility for the wood that it produces.

Figure 4
Production Approach



The production approach takes into account the carbon accumulation resulting from forest growth and subtracts the carbon removed through forest harvesting.[11] As in the stock change approach, the slash is assumed to decompose in the year of harvest. Unlike other approaches, in the production approach the carbon contained within roundwood and wood (in the form of

[11] either in the form of logging slash or roundwood

products that are used domestically or exported), minus decomposition or combustion of stocks both domestically and in export destinations, is credited to the nation growing the timber.[12]

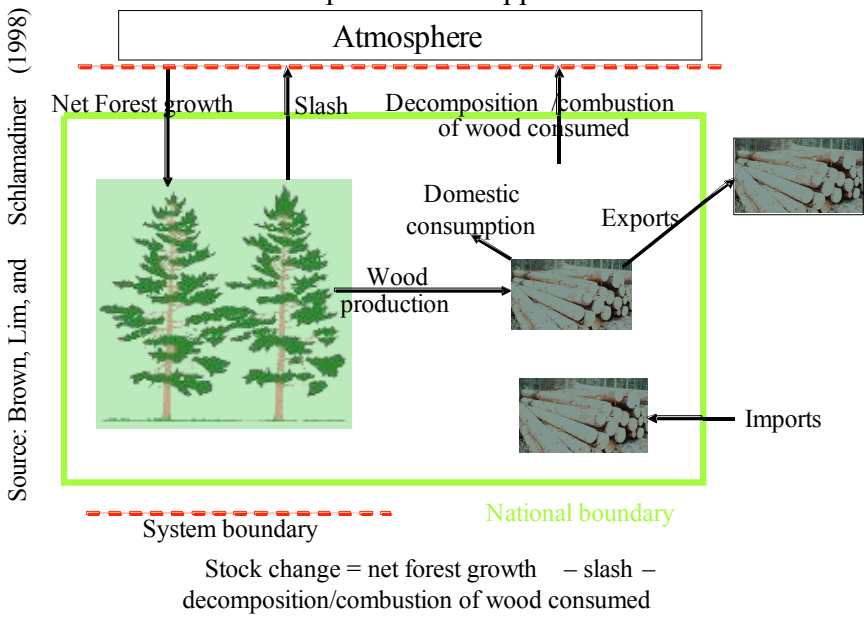
In the production approach carbon storage credit is available when:

Domestic consumption + Exports > Domestic decomposition and combustion + Decomposition and combustion of exported wood

The Atmospheric Flow Approach

The atmospheric flow approach (Figure 5) considers removals or additions to the atmosphere wherever they occur.

Figure 5
Atmospheric Flow Approach



Thus, in the atmospheric flow approach, a nation is credited with carbon sequestration when domestic forests capture carbon and is charged with negative flows in instances in which logging slash or harvested wood products decompose or combust. Credits are not provided for carbon stored within harvested wood products.

In contrast to the stock-change approach, a consuming country with high levels of imports will not increase its pool of carbon in wood products. In the atmospheric approach the importing nation reports emissions as imported wood products decay (Grêt-Regamey et al. 2008).

In the atmospheric flow approach carbon storage credit is available when:

Domestic forest carbon capture > Domestic logging and wood product decomposition and combustion

[12] Imported wood is not considered in the Production Approach as such wood is credited to the producing nation.

Nations React to the Alternative HWP Approaches

It is clear that each alternative approach to crediting carbon storage in forests and harvested wood products has the potential to result in unequal benefits to individual nations.

As part of a series of position statements from various nations, Japan noted that none of the approaches to accounting for carbon in harvested wood products are perfect (IPCC 2003). Commenting, for instance, on the stock change approach, Japan pointed out that this approach might encourage consuming countries to import more from developing countries since there would be an incentive for consuming countries to increase imports and reduce exports in order to maximize carbon credits. New Zealand pointed out that "the stock change approach is not easy to implement for products since there are no simple verifiable methods of conducting an inventory of products, particularly if it is only a subset of the total products pool" (New Zealand Ministry of Agriculture and Forestry 2003). The New Zealand analysis concluded that there would be no incentive to report reductions in the HWP carbon pool within products in use and particularly within HWP contained in solid waste disposal sites.

With regard to the production approach the Japan commentary suggested that there are no incentives for protecting (promoting longevity of) imported wood products. It was also indicated that this approach would require HWP exporting countries to collect data on disposal of HWP that they have exported, something that would be extremely difficult in practice. Regarding the atmospheric flow approach Japan noted that this might encourage developing (producing) countries to increase their exports.

Intuitively, the most highly developed countries should favor the stock change approach. In point of fact, the United States and the EU are on record as favoring the stock change approach or a variation of it. Canada is on record as supporting consistent national accounting for all sources and sinks within a national inventory – a position that aligns with stock change (UNFCCC 2001). Similarly, the production approach should be favored by heavily forested nations that export much of their wood and wood products production. Argentina is on record in support of the production approach.

A final observation from the Japan submission (IPCC 2003) is that any adopted accounting method should recognize the positive impacts of substituting wood products for energy-intensive materials and renewable wood-based energy for fossil fuels. The United States, Canada, and the EU share this position, acknowledging that the substitution of wood for more energy-intensive, non-renewable materials results in substantially lower carbon emissions

Leading up to Copenhagen

The position statement comments of 6½ years ago refer to the same approaches regarding HWP that were under discussion in Copenhagen. In assessing carbon flows and what is or isn't allowable in national accounting, the question of what behaviors are encouraged has come to the fore. Some stakeholder groups have argued that inclusion of HWP in carbon accounting would lead to increased use of wood products and thus to deforestation and that there may be other negative consequences of the various approaches, including encouraging environmentally unsound behavior and wastefulness.

Canada has taken a strong position that any carbon accounting system "should not be designed on the basis of which incentives or disincentives it may provide." In a 2001 submission to the UN Subsidiary Body for Scientific and Technological Advice (UNFCCC 2001, p.6), Canada stated that "An accounting system designed as a policy tool is likely to not only create perverse incentives, *but also fail to accurately measure and estimate C emissions and removals*. . . A system that provides a complete, transparent and accurate attribution of emissions and removals will enable good policy making which in turn can create the appropriate incentives or disincentives to action."

The Canada statement notwithstanding, active debate around what incentives or disincentives might be created through various approaches to HWP carbon accounting continues.

Solid Waste Disposal Sites

The United States took an early position that carbon contained within HWP in solid waste disposal sites should be accounted for (credited) in national accounting schemes. Research showed that the quantity of wood-related carbon in waste sites in the United States is substantial and that rates of degradation within modern landfills are extremely slow (Skog and Nicholson 1998). This reality, however, is in conflict with the position of the climate negotiators from the EU and elsewhere that provisions of the climate protocol should not encourage environmentally unsound behavior – such as placing excessive quantities of materials in solid waste disposal sites. [13]

Waste wood awaits transfer to a landfill. Some worry that crediting the carbon could create a disincentive to reducing waste

Soils

Another issue that has arisen in recent months is that of accounting for changes in soil carbon. Interest groups have questioned whether changes in soil carbon following harvest are adequately accounted for in tracking protocols, and have suggested that carbon balances from harvesting are negative when soil carbon and manufacturing losses are considered. Although this debate highlights an opportunity for additional research and evaluation, the scientific basis for such suggestions is very weak.

Imports

As indicated earlier, another area of HWP account debate is whether providing credit for carbon stored in imported wood products will tend to increase wood importation and/or harvesting globally – with some concerned that accounting for HWP could lead to increased rates of deforestation.

[13] In addition to the U.S., Norway has stated support for accounting for wood related carbon in landfills

Regarding the issue of deforestation, researchers in Switzerland (Hofer 2008) recently examined managed vs. unmanaged forests as carbon repositories through modeling and analysis of various scenarios of forest management and wood use. Part of the research included modeling 1) management of forests so as to significantly reduce harvests (below current levels)[14] and 2) management of forests to maximize the production of long-lived wood products.[15]

Results in the reduced harvest case showed a high initial carbon mitigation effect that decreased steadily over the first 15 years, reaching zero by 2090 (less than 100 years). Furthermore, the research found that reducing harvests to zero resulted in more rapid decreases in mitigation effects. In contrast, the scenario in which the forest increment and harvesting activity were maximized resulted in less carbon mitigation than the reduced harvest scenario for the first 25 years, equal mitigation effects for the next 15, and far greater carbon mitigation thereafter. These results provide some indication that HWP should be considered within the context of short-term and long-term carbon policy.

Measurement

An issue that applies to all approaches to accounting for HWP is the ability to accurately measure the quantities of carbon contained within such products, especially given varying rates of degradation for different kinds of products and for in varied environments. While developed countries, such as the United States, have a fairly good understanding of the carbon cycle in HWP and evolving accounting systems for tracking this carbon, most of the less developed countries do not. In fact, as of 2005 only four countries (the U.S., Canada, Australia, and the U.K.) had reporting mechanisms in place for tracking carbon in HWP. Thus, the original wording from early documents on the HWP issue: "*The proposed method recommends that storage of carbon in forest products be included in a national inventory only in the case where a country can document that existing stocks of long term forest products are in fact increasing"* favors developed nations, and may contribute to a lack of more widespread support for approaches that consider carbon storage within HWP.

Permanence

When a wood product reaches the end of its useful life and either decays or is burned, the carbon contained within is released to the atmosphere. Therefore, the carbon storage in HWP is not permanent. For this reason, a strategy of increasing the use of long-lived wood products in society cannot be expected to forever increase the HWP carbon pool; at some point additions to the pool will be matched by end-of-life losses. This is a fact that has been used to argue against inclusion of HWP in carbon protocols (Kirschbaum 2006). Others[16] strongly argue that even temporary sinks do have value in shifting society to a slower path toward climate change, a path that Dornburg and Marland assert would not otherwise be accessible. A key consideration is that few if any carbon storage options are entirely permanent as cycles of accumulation and decay apply to many systems.

[14] with production and use of wood products reduced accordingly

[15] The research was designed to achieve optimum annual increment with wood production employed to the maximum extent possible in production of long-lived wood products, and subsequent end-of-life utilization for energy generation.

[16] Dornburg and Marland 2008, Fearnside 2008

Substitution Effects

Substitution of wood for more energy-intensive, non-renewable materials results in substantially lower carbon emissions than if a substitution were not made. Emissions differences are often magnified because a large portion of the energy used in producing wood products is typically produced from biomass.[17]

As indicated earlier Japan, Canada, the United States, New Zealand, and other nations have made note of the substitution effect and called for recognition of this reality in climate protocols. However, it has also been pointed out that accounting for substitution effects in HWP language within a comprehensive carbon protocol could result in double counting, since manufacturing industries would have to report emissions.

While double-counting of carbon offsets obviously cannot be included within a carbon protocol, language that highlights the realities of the substitution effect certainly could be. For instance, language in the original Kyoto Protocol document, and in many documents since then, highlights potential "leakage" problems and the need to avoid them.[18] It is an important point. It is also important that references to leakage, and a definition of the term, appear in carbon protocol documents as a constant reminder of the potential for unintended consequences of actions.[19] The consideration of "leakage" may provide a mechanism for addressing material substitution effects and HWP benefits in carbon protocols.

Copenhagen and HWP

The FAO reports that inclusion of HWP in carbon accounting by Annex I countries is gaining support among climate negotiators. As a result of the continuing debate, forward movement on the HWP issue occurred in Copenhagen, including a report[20] that detailed specifics regarding HWP and the approach that countries may take to account for carbon storage in forests and wood products (UNFCCC. 2009). The guidance in this report begins to move past the default assumption where alternative verifiable systems exist.

Included within the report is direction for countries to increase carbon pool accounting to include harvested wood products:

1) Each party included in Annex I shall account for all changes in the following carbon pools: aboveground biomass, belowground biomass, litter, deadwood, [and] soil organic carbon [and] **harvested wood products**.

[17] Substitution effects are further discussed in an earlier Dovetail paper: Wood Products and Carbon Protocols: Carbon Storage and Low Energy Intensity Should Be Considered. (http://www.dovetailinc.org/reports/pdf/DovetailCarbon0408hz.pdf)

[18] The term "leakage" refers to increased carbon dioxide emissions that counter the carbon offset benefit accruing to an emissions reduction project and that occur as a predictable consequence of that project.

[19] It is worth noting that well-intended actions to reduce wood use and substitute the use of alternative materials will, in almost every instance, result in far greater carbon and GHG releases.

[20] Emerging from the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol

2) Emissions from carbon in wood removed from forests accounted for under Article 3[21] shall be accounted for by the producing country, as a default, on the basis of instantaneous oxidation, or on the basis of estimates of when emissions occur, provided that verifiable and transparent data are available. Accounting (*pending accounting rules to be agreed*) shall be confined to harvested wood products (*as defined by FAO*), originating from forest stock for which emissions and removals have been included in the accounting of the Party.

   [This provision, as well as the next, confirms that countries are allowed to account for emissions when they occur, rather than rely upon the default assumption, if a verifiable system for collecting and reporting data is in place, as noted in the following sections]

3) Emissions from carbon in wood removed from forests accounted for under Article 12 [22] shall be accounted, as a default, on the basis in instantaneous oxidation, or on the basis of estimates of when emissions occur, provided that verifiable and transparent data are available. Accounting shall be confined to harvested wood products originating from harvested forest for which emissions and removals have been included in the accounting of the afforestation/reforestation project activity.

4) Accounting may be on the basis of when emissions occur for the domestically produced and consumed harvested wood products pool only, and may also be on the basis of when emissions occur for the exported harvested wood products pool.

   [What this means is that all the various alternative approaches to remain under consideration]

5) Estimates of net emissions from harvested wood products shall specify product categories and the underlying assumptions used for both domestic and export markets.

   [This provision provides specifics regarding the level of detail required in record keeping]

6) When a party accounts for exported harvested wood products on the basis of when emissions occur, estimates shall be reported separately for each country to which the harvested wood products are exported, using nationally specific data on the fate of the wood in the importing country.

   [This provision provides specifics regarding the tracking and reporting of emissions from degradation of exported wood products; the requirement for use of nationally specific data could hinder use of the production approach]

---

[21] Article 3 refers to net changes in greenhouse gas emissions by sources and removals by sinks resulting from direct human-induced land-use change and forestry activities, limited to afforestation, reforestation and deforestation since 1990, measured as verifiable changes in carbon stocks in each commitment period, shall be used to meet the commitments under this Article of each Party included in Annex I.

[22] Article 12 focuses on the clean development mechanism and its purpose of assisting Parties not included in Annex I to achieve sustainable development and to contribute to the ultimate objective of the Convention, and to assist Parties included in Annex I in achieving compliance with their quantified emission limitation and reduction commitments under Article 3.

7) Emissions from harvested wood products in solid waste disposal sites shall be accounted for on the basis of instantaneous oxidation.

   [This provision applies the default assumption of "instantaneous oxidation" to HWP disposal and eliminates the possibility of accounting for landfill carbon storage]

The final two provisions place retroactive requirements for reporting emissions and require consistency in HWP accounting:

8) Emissions that occur during the [current] commitment period from the harvested wood pool arising from wood harvested by the Party prior to 31 December 2007 [and since 1990] shall also be accounted for . . . by those Parties that elected to account for forest management during the period 2008 to 2012.

9) Parties included in Annex I shall maintain consistency in the treatment of harvested wood products in the reference level and in the commitment period, and in order to do so shall make an accounting adjustment if necessary, and shall report on how the adjustment was made.

What came out of Copenhagen, then, was (a) a resolution that HWP in landfills will not be counted, (b) a continued willingness to consider alternative approaches to accounting for HWPs and (c) agreement regarding a bit of detail on reporting requirements. However, the overarching questions of whether or not HWP language will be included in the final agreements, and what basic approach will be used if it is included, remain open to debate.

Next Steps

Ensuring Inclusion of HWP Language

Inclusion of HWP language in the final draft of post-2012 carbon agreements is not yet assured. A variety of arguments continue to be made in opposition to HWP accounting, including concerns about harvesting rates and the risk of deforestation. Critics also believe the potential volume of carbon is not significant enough to warrant specific language being included, storage is not sufficiently long-lived and the accounting systems are too imprecise.

These and other arguments will be heard again and again in the coming months and a more effective response is needed to convincingly illustrate the carbon storage benefits of wood products. Should HWP be excluded from carbon mitigation documents and emissions reduction strategies, the full potential of forests and wood products as part of the carbon solution will not be realized.

Reaching Agreement on the Approach to Use in HWP Accounting

To support HWP language inclusion, it is critical that the interested nations reach agreement on how to account for HWP, and sooner rather than later. New approaches may be needed to break the impasse. In this regard Marland et al. (2010) have proposed a new methodology for calculating degradation rates for HWP that provides a more realistic pattern of carbon releases than methods previously considered, and that avoids the need for the kind of extensive record keeping required by the stock change approach. Thus, the new proposal aligns with the

atmospheric approach and effectively endorses this approach for use in carbon protocols. Whether this or some other approach represents the solution remains to be seen, but the need for timely resolution is great.

Beyond International Carbon Agreements

Short of international agreement, there are things that could be done on a state, provincial, or national level to effectively bring about recognition of the energy-efficiency-related carbon benefits of wood as compared to other building materials. One domestic strategy that has particular promise is a carbon tax. Sathre (2007) observed that a uniform carbon tax applied to all carbon emissions would systematically favor all types of energy-efficient products (and specifically those that use lesser amounts of fossil fuels), while disfavoring products with poor energy performance. While such a tax would not account for carbon storage within wood, it would account for the much larger substitution effect.

Using taxes as a vehicle to either encourage or discourage certain behaviors is a long established strategy. The fact is that if the tax burden shifted from income and property taxes to energy use and carbon emissions, an immediate and dramatic refocusing of attention to energy efficiency, energy conservation, and alternative energy could be expected. Moreover, the change in focus could be more rapid and more consistently achieved via a carbon tax than through adoption of a cap and trade system.

The Bottom Line

Efforts to gain recognition of carbon storage in harvested wood products within international carbon protocols have been ongoing for over thirteen years. Despite these actions there is still no final agreement on whether or how to include language regarding HWP.

Some progress was made in Copenhagen with respect to reporting requirements and retaining options regarding alternative approaches. However, additional work will be needed to ensure that HWP are included in final documents and emission reduction strategies.

One aspect of HWP manufacture and use that is not yet being full considered by climate negotiators is formal recognition that substitution of wood for more energy-intensive, non-renewable materials results in substantially lower carbon emissions. The substitution effect may have be a mechanism for addressing leakage concerns in carbon protocols.

References

Birdsey, R. and Lewis, G. 2002. Carbon in U.S. Forests and Wood Products, 1987-1997: State by State Estimates. USDA-Forest Service, General Technical Report GTR-NE-310. http://www.fs.fed.us/ne/newtown_square/publications/technical_reports/pdfs/2003/gtrne310.pdf

Bowyer, J., Bratkovich, S., Lindburg, A., and Fernholz, K. 2008. Wood Products and Carbon Protocols: Carbon Storage and Low Energy Intensity Should Be Considered. Dovetail Partners, Inc., April 28. (http://www.dovetailinc.org/reports/pdf/DovetailCarbon0408hz.pdf)

Brown, S., Lim, B., and Schlamadinger, B. 1999. Evaluating Approaches for Estimating Net Emissions of Carbon Dioxide for Forest Harvesting and Wood Products. Report from IPCC Expert workshop, Dakar, May 1998. IPCC/OECD/IEA. OECD, Paris. (http://www.ipcc-nggip.iges.or.jp/public/mtdocs/pdfiles/dakar.pdf)

Dornburg, V. and Marland, G. 2008. Temporary storage of carbon in the biosphere does have value for climate change mitigation: a response to the paper by Miko Kirschbaum. Mitigation and Adaptation Strategies for Global Change 13(3): 211-217. (http://www.springerlink.com/content/mh15170338m62213/)

Fearnside, P. 2008. On the value of temporary carbon: a comment on Kirschbaum. Mitigation and Adaptation Strategies for Global Change 13(3):207-210. (http://www.springerlink.com/content/v36k652475665548/)

Food and Agricultural Organization of the United Nations. 2009. UNFF Continues Search for Solution on Financing for Sustainable Forest Management. Forestry Department. (http://www.fao.org/docrep/012/i1025e/i1025e13.htm)

Grêt-Regamey, A., Hendrick, E., Hetsch, S., Pingoud, K., and Rüter, S. 2008. Challenges and Opportunities of Accounting for Harvested Wood Products. Background Paper to the Workshop on Harvested Wood Products in the Context of Climate Change Policies. Geneva, Switzerland, September 9-10. (http://www.unece.org/timber/workshops/2008/hwp/HWP_Background_Paper.pdf)

Hofer, P. 2008. Harvested Wood Products vs Forest Sinks: CO_2 Effects in Swiss Forestry and Timber Industry. In: Harvested Wood Products in the Context of Climate Change Policies. UNECE/FAO Geneva Timber and Forest Discussion Paper 55, pp. 12-15. (September) (http://timber.unece.org/fileadmin/DAM/publications/dp-55.pdf)

Houghton, L., Meirra Filho, L., Lim, B., Treanton, K., Mamaty, I., Bonduki, Y., Griggs, D., and Callander, B. (eds). 1997. Land Use Change and Forestry. Chapter 5 of Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories, Reference Manual Vol. 3, pp. 5-17. (http://www.ipcc-nggip.iges.or.jp/public/gl/guidelin/ch5ref1.pdf)

International Institute for Sustainable Development. 2009. Summary of Forest Day 3. Forest Day Bulletin 148(3): 1-6. December 13. (http://www.iisd.ca/climate/cop15/fd/html/ymbvol148num3e.html)

IPCC. 1996. Cooperation with the UN Intergovernmental Panel on Climate Change. Subsidiary Body for Scientific and Technological Advance, FCCC/SBSTA/1996/18. Geneva, December 16-18, Item 3 of the provisional agenda. (http://unfccc.int/resource/docs/1996/sbsta/18.pdf)

IPCC. 2003. Methodological Issues. Good Practice Guidance and Other Information on Land-Use, Land Use Change, and Forestry: Implications of Harvested Wood Products Accounting. IPCC Subsidiary Body for Scientific and Technological Advance. Bonn, June 4-13, Item 4 (e) of the provisional agenda. [FCCC/SBSTA/2003/MISC.1/Add. 1 & 2] (http://unfccc.int/methods_and_science/lulucf/items/4016.php)

IPCC. 2006. Harvested Wood Products – Chapter 12, Volume 4. In: 2006 IPCC Guidelines for National Greenhouse Gas Inventories. Prepared by Eggleston H., Buendia L., Miwa K., Ngara T. and Tanabe K. (eds), National Greenhouse Gas Inventories Programme,. IGES, Japan. (http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol4.html)

Keenan, R. 2009. Seeing forest for the trees on climate change. The Sydney Morning Herald, December 11. (http://www.smh.com.au/opinion/politics/seeing-forest-for-the-trees-on-climate-change-20091211-kngs.html)

Kirschbaum, M. 2006. Temporary Carbon Sequestration Cannot Prevent Climate Change. Mitigation and Adaptation Strategies for Global Change 11(5/6):1151-1164. (http://www.kirschbaum.id.au/MITI2006.pdf)

Marland, E.S., Stellar, K., and Marland, G. 2010. A Distributed Approach to Accounting for Carbon in Wood Products. Mitigation and Adaptation Strategies for Global Change 15(1): 71-91. (http://www.springerlink.com/content/n183776558258677/)

New Zealand Ministry of Agriculture and Forestry. 2003. Harvested Wood Products Accounting Systems. January 3. (http://www.maf.govt.nz/forestry/publications/harvested-wood-products-accounting/woodproducts02.htm)

Pingoud, K. 2003. Harvested Wood Products: Considerations on Issues Related to Estimation, Reporting and Accounting of Greenhouse Gases. Report to UNFCCC Secretariat, January.

Sathre, R. 2007. Life-Cycle Energy and Carbon Implications of Wood-Based Products and Construction. Mid Sweden University Doctoral Thesis 34, Ecotechnology and Environmental Science, Department of Engineering, Physics and Mathematics, Mid Sweden University. (www.diva-portal.org/diva/getDocument?urn_nbn_se_miun_diva-50-2_fulltext[1].pdf)

Skog, K. and Nicholson, G. 1998. Carbon Cycling Though Wood Products: the Role of Wood and Paper Products in Carbon Sequestration. Forest Products Journal 48(7/8): 75-83. (http://www.fpl.fs.fed.us/documnts/pdf1998/skog98a.pdf)

Skog, K. 2003. Harvested Wood Products: Basis for Future Methodological Development. In: Intergovernmental Panel on Climate Change (IPCC), Report on Good Practice Guidance for Land-use, Land Use Change and Forestry (Task 1), Chapter 3, Appendix 3a.1. (http://www.fpl.fs.fed.us/documnts/pdf2003/skog03a.pdf)

Skog, K. 2008. Sequestration of carbon in harvested wood products for the United States. Forest Products Jour. 58(6): 56-72.
(http://www.fpl.fs.fed.us/documnts/pdf2008/fpl_2008_skog001.pdf)

UNECE. 2008. Conclusions and Recommendations. Proceedings of Workshop on Harvested Wood Products in the Context of Climate Change Policies. Geneva, Sept. 9-10. (http://www.unece.org/timber/workshops/2008/hwp/Proceedings_28Oct08.pdf)

UNFCCC. 2001. Reports on Intercessional Activities. Issues Related to Issues From Forest Harvesting and Wood Products, Submissions from Parties. Fourteenth Session, Bonn. Provisional Agenda Item 3(a).
(http://unfccc.int/resource/docs/2001/sbsta/misc01.pdf).

UNFCCC. 2010. Harvested Wood Products. Key documents related to accounting for harvested wood products in international climate protocols.
(http://unfccc.int/methods_and_science/lulucf/items/4016.php)

UNFCCC. 2008. Land Use, Land Use Change, and Forestry. Draft Conclusions Proposed by the Chair. Ad Hoc Working Group on Further Commitments for Annex I Countries Under the Kyoto Protocol, Sixth Session. FCCC/KP/AWG/2008/L.11. August 21-27. (http://unfccc.int/resource/docs/2008/awg6/eng/l11.pdf)

UNFCCC. 2009. Report of the Ad Hoc Working Group on Further Commitments for Annex I Parties Under the Kyoto Protocol to the Conference of the Parties Serving as the Meeting of the Parties to the Kyoto Protocol in its Fifth Session. FCCC/KP/AWG/2009/ L.15. December 16. (http://unfccc.int/resource/docs/2009/awg10/eng/l15.pdf)

U.S. Department of Agriculture. 2008. Carbon Stocks & Stock Changes in U.S. Forests. In: U.S. Agriculture and Forestry Greenhouse Gas Inventory: 1990-2005. Technical Bulletin 1921. (http://www.usda.gov/oce/climate_change/AFGG_Inventory/4_Forest.pdf)

U.S. Department of Energy, Energy Information Administration. 2009. Emissions of Greenhouse Gases in the United States 2008, p. 46.
(ftp://ftp.eia.doe.gov/pub/oiaf/1605/cdrom/pdf/ggrpt/057308.pdf)

U.S. Environmental Protection Agency. 2009. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2007. EPA Publication 430-R-09-004, April, Table 31.
(http://www.epa.gov/climatechange/emissions/downloads09/GHG2007entire_report-508.pdfl)

This report was prepared by

DOVETAIL PARTNERS, INC.

Dovetail Partners is a 501(c)(3) nonprofit organization that provides authoritative information about the impacts and trade-offs of environmental decisions, including consumption choices, land use, and policy alternatives.

FOR MORE INFORMATION OR TO REQUEST ADDITIONAL COPIES OF THIS REPORT, CONTACT US AT:

INFO@DOVETAILINC.ORG

WWW.DOVETAILINC.ORG

612-333-0430

DOVETAIL PARTNERS, INC.
528 Hennepin Ave, Suite 202
Minneapolis, MN 55403
Phone: 612-333-0430
Fax: 612-333-0432
www.dovetailinc.org